DATASIGHT

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ENVIRONMENTAL
DATA MANAGEMENT SOFTWARE

DataSight User Manual

Version 3.13

seveno

DataSight Version 3.13

Help Manual

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Publisher

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DataSight Version 3.12 requires a Windows® operating system.

Manual Outline

Seveno DataSight

https://envault.io/data/

Welcome to the DataSight User Manual.

This manual is designed to provide you with a throrough understanding of DataSight, and giving you the skills to manage your environmental datasets to their full potential. DataSight provides fast and easy access to the information you need to make informed natural resources management decisions. DataSight can also help you ensure that you meet your environmental reporting and compliance requirements.

The following outlines the topics that are covered in this manual.

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1 Introduction

Seveno's DataSight is an Environmental Data Management System (EDMS). It is a client-server desktop application, built using the most current software technology and designed to operate across low-bandwidth wide area networks. DataSight is used by government bodies and consultants as well as mining, exploration, and infrastructure organisations in many remote places of the world.

The configuration of DataSight allows authorised users to enter data from multiple locations and organisations. The software gives its users the ability to enter, analyse, view and output data efficiently with an intuitive user-interface. DataSight provides the functionality to collect and store environmental data from a variety of sources, such as data loggers, LIMS and manual data entry forms.

In a single software package, DataSight includes in-depth data analysis tools, with the ability to perform advanced queries and calculations, along with advanced graphical visualisation and analysis. Flagging, filtering and common variable features greatly assist in accessing data, readily displaying the required information in datasheets and providing quick user-defined filtering to access and review desired datasets. Additionally, automated task scheduling for importing, calculations and reporting assists in managing each user's workload and DataSight can also assist organisations in improving data accuracy while maintaining quality control and data validation processes.

DataSight will help you to:

- **Collect and store** environmental data from **various sources** such as data loggers, LIMS, manual data entry forms, etc.
- Analyse **time series** as well as **discrete** data.
- Perform **advanced queries and calculations** such as gauging and regression.
- **Visualise** data in tables or charts.
- Exercise **quality control and data validation** with in-depth analysis tools.
- Generate **high quality hardcopy** of analysed outputs.
- **Schedule tasks** for imports, calculations and reports.
- **Store templates** centrally on manual data entry forms.
- Manage **any database** with Microsoft SQL Server support.
- Store **Open, ODBC and XML compliant data** that integrates with other systems.

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Using this Guide

Before you start using this guide, it is important to understand the terms and typographical conventions used. The following kinds of formatting in the text identify special information.

- Step-by-step procedures will occur as a numbered list. You can follow these instructions to complete a specific task.
- When referring to names of keys on the keyboard, they appear in capital letters. For example, SHIFT, CTRL, or ALT.
- Key combinations where you must press and hold down one key and then press another are joined by the + symbol. For example, CTRL+P or ALT+F4.
- Menu options, command buttons and dialogue items will be written in bold text. These will indicate an option you must select to complete a specific task. For example, choose **Help** to access the Help Guide from the Application Tab menu. Similarly, where buttons are to be clicked they are in bold text. For example, click the **OK** button.

Getting Help

There are many resources available from Seveno for you to explore, learn and utilise DataSight.

To begin with, free access to comprehensive support documentation is available as this Help Guide when you install DataSight. It can also be retained in print.

In addition to the Help Guide, you can access other resources in the form of tutorials and support material online on the Seveno website. The DataSight Help Centre is one of these resources for DataSight.

If you are unable to find the help you are looking for, please contact us directly.

Help Guide

This Help Guide is available as part of your software installation package. It is designed both as a course in using the software and as an ongoing reference while you are working with the program. Regarding DataSight, it is useful for:

- Easy reference.
- In-depth knowledge.
- Additional information whenever you need.

The **quickest** way to open the Help Guide is using the shortcuts.

1. Press ALT+A.
2. Then press H.

You can also open the Help Guide **without** using shortcuts.

1. Click **Application Tab** (next to Home Ribbon).
2. Then click **Help**.

The DataSight Help Guide is print-friendly. You may choose to print it.

Printing the Help Guide

To print a copy of this Help Guide,

1. Open Help Guide.
2. Then click **Print** on the menu bar.

DataSight Help Centre

The DataSight Help Centre is designed to allow users with current DataSight Upgrade Protection and Support to request assistance through the Support portal, and to access documentation over a range of DataSight topics through the Guide portal.

Support

The Support portal provides a request-based ticketing system for DataSight. You can log in to the Support portal and submit a ticket to request assistance. You can also maintain a history of your tickets. The Support portal enhances our team's ability to respond to and to manage your DataSight support needs, from the moment they are captured through to their resolution.

Guide

The Guide provides access to information about using the DataSight suite of products. In the portal, you can learn how to get started with DataSight, browse help sections and view your recently viewed and related articles. If you cannot find an answer to your query, then you can choose to submit a support ticket by clicking the Submit Request button.

Access DataSight Help Centre

1. Go to the Seveno website at https://support.envirada.com/portal/en/kb and sign in.
2. Click the white plus icon and select Submit a ticket.

Contact Seveno

To help us improve what we offer, we would like your feedback about this Help Guide, and about any other aspect of DataSight.

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2 DataSight Systems

DataSight is a commercial-off-the-shelf environmental data management system (EDMS) that combines an open back-end database (Microsoft SQL Server) with powerful data acquisition, validation, visualization and reporting capability.

DataSight is an intuitive, user friendly system. The software has been designed with flexibility in mind and as a Client/Server application, with the understanding that you may need to be able to manage your data management system as independently as possible. In many remote areas, it is not a viable solution (practically or financially) to have to continually seek support from a software provider. DataSight has been designed to reduce the need for support wherever possible through the design of intuitive interfaces, simple automation for ingestion of data, in built reporting tools and industry standard linkages through ODBC.

Well-designed client-server applications work effectively across the varying quality of WAN and internet, allowing DataSight users to connect to different databases as required even if connectivity is poor. The software (the 'client' side) is installed on a user's PC and connects to Microsoft SQL server databases (the 'server' side) located within a network (LAN or WAN) or via the internet. You can configure the system to have remote access from anywhere in the world.

A DataSight implementation may involve:

- One PC/laptop hosting both the database and the DataSight client
- Multiple, multi-tenanted databases
- Multiple DataSight users connecting to these databases, both on the LAN, WAN and via the internet
- Geographic separation of users and databases
- Web browser access to data and reports by management and other stakeholders
- Real-time data imports
- Overnight database replication, such as from operational sites to company headquarters.

DataSight is currently being used to capture and ingest data from many different sources including manual data import, radio telemetry, GSM/GPRS, GOES, Iridium, email, file transfer protocol, direct linkages to Laboratory Information Management Systems (LIMS), handheld mobile devices and manual data importation. You can build your own import routines and then schedule them as automated tasks. Once data has been captured in DataSight, you have a wide array of charting tools to view your data, undertake data analysis and calculations and develop reports. DataSight has a granular audit trail that tracks the data from the moment it is imported to the moment it is locked (archived).

DataSight is highly scalable. The table structure has been designed to ensure that you have enormous capacity for the number of monitoring sites (tens of thousands), measured variables (thousands) or data points (currently tested to 3 billion records) that you may wish to ingest into DataSight.

DataSight does not add or include any proprietary data formats; it maintains full ODBC and XML compliance and extensibility. All data stored and managed by DataSight is open to other systems if you choose to provide access permission – there are no middleware or additional costs for other systems to access the data tables.

System Design

When designing your DataSight environmental data management system, you have the choice of either:

DataSight On-Premise - DataSight components are installed to your computer or network and licensed for perpetual usage.

DataSight Cloud - A software as a service (SaaS) offering through an annual subscription. This requires access to the internet.

Both systems offer the same functionality.

In addition, you may use either of, or both:

DSWeb for dissemination of your DataSight data to any stakeholder through a web browser.

DSApp for collection of field measurements on a mobile device.

Please contact your local reseller for more information.

DataSight On-Premise

Traditionally, DataSight is installed as a Client/Server application. It requires a Microsoft **local computer** with **Microsoft SQL Server** installed to host the database(s).

DataSight can be packaged for deployment across larger organisations or across large distances on request. In most cases, Microsoft SQL Server is installed on a server farm that is supported by the appropriate IT infrastructure in a controlled environment. The servers are supported by suitably qualified IT professionals who should maintain **strict policies** that ensure disaster recovery and redundancy in the system. DataSight maintains full ODBC and XML compliance. All data stored and managed by DataSight is open to other systems – there is no middleware or additional cost for other systems to access the data.

The data sets that DataSight can manage with an appropriate response time is heavily influenced by the SQL Server hardware and supporting network infrastructure. Before installing DataSight, Users and IT Administrators should refer to System, Server and User requirements to ensure that there is **appropriate IT infrastructure** to support the installation. With the appropriate IT environment, DataSight has the availability to disseminate data in near real time. The only known limitation occurs when users attempt to select and return an extremely large data set and their computer runs out of memory.

For all on-premise installations, a **License** is supplied with your purchase of DataSight. The license is required to authenticate your purchase of the software and protects you against copyright infringement. DataSight licenses can be authenticated online or offline.

With all on-premise DataSight Systems, the Software licensing offered is perpetual. After registration and payment, the software does NOT time out and does not require the payment of an annual fee for continued use.

The pricing schedule for the DataSight client is dependent upon the number of users accessing DataSight and all installations must be authenticated by our server to run.

- Standard User License - Authenticated license locked to a single user computer
- Concurrent User License - Concurrent usage allows a given number of users at any one time to access DataSight. This is a floating network license locked to a single network server. The potential number of DataSight Client installations on the network is unlimited, and licensing is on only the number of active seats.

This chapter will guide you through DataSight steps involving:

- System requirements
- Server requirements
- User requirements
- Microsoft SQL Server
- DataSight Components
- License Authentications
- Launching DataSight

Database administrators may be interested in:

- DataSight License Service
- DataSight Administrator
- DataSight Service Manager
- DSWeb

System Requirements

DataSight requires a .NET framework to run its applications. Currently we do not support non-Microsoft operating systems. Users require only standard experience and tools to manage in a Microsoft environment.

We recommend the following configuration *optimum* for the client computer to run DataSight:

- **OS**: Windows 7, 8, 8.1 or Windows 10.
- **CPU**: 2Ghz or higher CPU speed, minimum 2 Core, minimum 4MB L3 Cache
- **Memory**: 4GB main memory
- **Storage**: 250GB hard drive
- **Network**: Gigabit port, internet connectivity

For the best DataSight experience, it is recommended that the optimal system requirements are met.

Server Requirements

DataSight requires Microsoft SQL Server to host database(s) and does not lock any data. DataSight maintains full ODBC and XML compliance. All data stored and managed by DataSight is open to other systems – there is no middleware or additional cost for other systems to access the data.

The *minimum* recommended configuration for the DataSight database server is:

- **DBMS**: Microsoft SQL Server 2016 or higher
- **CPU**: 1 × 4 Core server CPU with 12 MB Level3 memory, 2.5GHz or more speed
- **Memory**: 6GB PC3 RDIMM Memory
- **Disk Controller**: SATA and SAS disk support. Raid 0, 1, and 5 support
- **Storage**: 6 × Hot Plug 250GB 6G SAS 15K hard drives
- **Network**: 2 × Gigabit port
- **Power supply**: 2 high power redundant power supply

The *optimum* recommended configuration for the database server is:

- **DBMS**: Microsoft SQL Server 2016 or higher
- **CPU**: 2 × 6 Core server CPU with 12 MB Level3 memory, 2.5GHz or more speed
- **Memory**: 12GB or more PC3 RDIMM Memory
- **Disk Controller**: SATA and SAS disk support. Raid 0, 1, and 5 support
- **Storage**: 2 × Hot Plug 146 GB 6G SAS 15K for operating system, 4 × Hot Plug 600GB 6G SAS 15K for data storage
- **Network**: 2 × Gigabit port
- **Power supply**: 2 high power redundant power supply

If the minimum server requirements are **not met**, DataSight will **not** host your database as expected.

Note	The data sets that DataSight can manage with an appropriate response time is heavily influenced by the SQL Server hardware and supporting network infrastructure

User Requirements

On local computer

To install and authenticate DataSight, a user must have administrator rights on the local computer. Once DataSight is installed, users no longer require administrative rights to operate it.

Note	To install and register on Windows Vista, you should have Administrator rights on the system or 'User Account Control' must be turned off. If you are required to re-authenticate your license please ensure that you have administrative privileges on the local computer.

If user requirements on the local computer are **not met**, DataSight will **not** install.

On SQL Server

All DataSight users require read and write permissions to a database, and it is recommended that each user is assigned a 'db_owner' role for DataSight databases. This permission can be granted by a DataSight Administrator user with administrative privileges on the Microsoft SQL Server to perform actions, such as creating and backing-up databases, creating users and editing user permissions.

If you **cannot connect** to your database or **cannot access** all the functionalities of DataSight after successful installation, please contact your IT/Database Administrator to check your permissions of access to the database and/or your DataSight Security rights.

Microsoft SQL Server

Microsoft® SQL Server™ (herein abbreviated as MS SQL Server) is a database management and analysis system for e-commerce, line-of-business, and data warehousing solutions.

Note	The on-premise DataSight software offering does not include Microsoft SQL Server. MS SQL Server Express Edition is available for free, but to a limited database size of 10GB.

DataSight relies on MS SQL Server to host all databases. DataSight can be configured to interface with the free version of MS SQL Server Express as a standalone database on a single computer. MS SQL Server Express is available in 32-bit and 64-bit editions and is an entry-level, free database that is ideal for learning and building desktop and small server data-driven applications of up to 10 GB. The free download of MS SQL Server Express requires a Microsoft account.

All instances of MS SQL Server are the responsibility of the client to install and manage as per their organisation's guidelines. Please ensure that the licensing of all MS SQL Server installations are appropriate to your usage.

2.1.4.1 Install MS SQL Server Express 2019

A new instance of MS SQL Server Express 2019 can be installed using the MS SQL Server setup installation wizard. The links provided on this page will direct you to Microsoft web pages.

The MS SQL Server installation wizard provides a single feature tree for installation of all MS SQL Server components so that you do not have to install them individually:

- Database Engine
- Analysis Services
- Reporting Services
- Integration Services
- Master Data Services
- Data Quality Services

- Management tools
- Connectivity components

You can install each component individually or select a combination of the components listed above. Refer to Express Resources for detailed assistance with this product.

Note	Microsoft has identified a problem with the Microsoft Visual C++ 2013 runtime binaries that are installed as a prerequisite by SQL Server 2016 and 2017. An update is available to fix this problem. If this update to the Visual C++ runtime binaries isn't installed, SQL Server may experience stability issues in certain scenarios. Before you install SQL Server, follow the instructions in the SQL Server release notes to see if your computer requires a patch for the Visual C++ runtime binaries. This is not applicable to SQL Server 2019 (15.x).

Prerequisites

For local installations, you must run Setup as an administrator. If you install MS SQL Server from a remote share, you must use a domain account that has read and execute permissions on the remote share.

To install SQL Server 2019

1. Insert the SQL Server installation media. From the root folder, double-click **Setup.exe**. To install from a network share, locate the root folder on the share, and then double-click Setup.exe.
2. The Installation Wizard runs the SQL Server Installation Center. To create a new installation of SQL Server, select **Installation** in the left navigation area, and then select **New SQL Server standalone installation or add features to an existing installation**.
3. On the Product Key page, select an option to indicate whether you're installing a free edition of SQL Server or a production version that has a PID key. For more information, see Editions and supported features of SQL Server 2019. To continue, select **Next**.
4. On the License Terms page, review the license agreement. If you agree, select the **I accept the license terms and privacy statement check box**, and then select **Next**.
5. In the Global Rules page, Setup will automatically advance to the Product Updates page if there are no rule errors.
6. The Microsoft Update page will appear next if the Microsoft Update check box in Control Panel > All Control Panel Items > Windows Update > Change settings isn't selected. Selecting the Microsoft Update check box changes the computer settings to include the latest updates for all Microsoft products when you scan for Windows updates.
7. On the Product Updates page, the latest available SQL Server product updates are displayed. If no product updates are discovered, Setup doesn't display this page and automatically advances to the Install Setup Files page.
8. On the Install Setup Files page, Setup provides the progress of downloading, extracting, and installing the Setup files. If an update for Setup is found and you specify to include it, that update will also be installed. If no update is found, Setup will automatically advance.
9. On the Install Rules page, Setup checks for potential problems that might occur while running Setup. If failures occur, select an item in the Status column for more information. Otherwise, select **Next**.
10. If this is the first installation of SQL Server on the machine, Setup skips the Installation Type page and goes directly to the Feature Selection page. If SQL Server is already installed on the system, you can use the Installation Type page to select either to perform a new installation or to add features to an existing installation.

    To continue, select **Next**.
11. On the Feature Selection page, select the **components** for your installation. For example, to install a new instance of SQL Server Database Engine, select **Database Engine Services**.

A description for each component group appears in the Feature description pane after you select the feature name. You can select any combination of check boxes.

The prerequisites for the selected features are displayed in the Prerequisites for selected features pane. Setup installs the prerequisites that aren't already installed during the installation step described later in this procedure.

You can also specify a custom directory for shared components by using the field at the bottom of the Feature Selection page. To change the installation path for shared components, either update the path in the field at the bottom of the dialog box or select Browse to go to an installation directory. The default installation path is C:\Program Files\Microsoft SQL Server\nnn\. SQL Server uses two directories for shared features:

a. Shared feature directory

b. Shared feature directory (x86)

Note	The path specified for each of the above options must be different.

12. The Feature Rules page automatically advances if all rules pass.

13. On the Instance Configuration page, **specify whether to install a default instance or a named instance**. For more information, see Instance configuration.

    a. Instance ID: By default, the instance name is used as the instance ID. This ID is used to identify the installation directories and registry keys for your instance of SQL Server. The same behavior occurs for default instances and named instances. For a default instance, the instance name and instance ID are MSSQLSERVER. To use a nondefault instance ID, specify a different value in the Instance ID text box.

Note	Typical stand-alone instances of SQL Server 2014, whether default or named instances, do not use a non-default value for the **Instance ID**.

All SQL Server service packs and upgrades apply to every component of an instance of SQL Server.

b. Installed instances: The grid shows the instances of SQL Server that are on the computer where Setup is running. If a default instance is already installed on the computer, you must install a named instance of SQL Server.

The workflow for the rest of the installation depends on the features that you've specified for your installation. Depending on your selections, you might not see all the pages.

14. Starting with SQL Server 2019 (15.x), Polybase no longer requires that Oracle JRE 7 Update 51 (at least) be pre-installed on the computer prior to installing the feature. Selecting to install the Polybase feature will add the Java Install Location page to the SQL Server setup displayed after the Instance Configuration page. On the Java Install Location page, you can choose to install the Azul Zulu Open JRE included with the SQL Server 2019 (15.x) installation, or provide a location of a different JRE or JDK that has already been installed on the computer.

15. Starting with SQL Server 2019 (15.x), Java has been added with Language Extensions. Selecting to install the Java feature will add the Java Install Location page to the SQL Server setup dialog window, displayed after the Instance Configuration page. On the Java Install Location page, you can choose to install the Zulu Open JRE included with the SQL Server 2019 (15.x) installation, or provide a location of a different JRE or JDK that has already been installed on the computer.

16. Use the Server Configuration - Service Accounts page to **specify the logon accounts** for SQL Server services. The actual services that you configure on this page depend on the features that you selected to install. For more information about configuration settings, see Installation Wizard help.

    You can assign the same logon account to all SQL Server services, or you can configure each service account individually. You can also specify whether services start automatically, start manually, or are disabled. We recommend you configure service accounts individually to provide the least privileges for each service. Make sure SQL Server services are granted the minimum permissions they must have to complete their tasks. For more information, see Configure Windows service accounts and permissions.

To specify the same logon account for all service accounts in this instance of SQL Server, provide the credentials in the fields at the bottom of the page. Use the Server Configuration - Collation page to specify nondefault collations for the Database Engine and Analysis Services. For more information, see Collations and Unicode support.

Note	Do not use a blank password. Use a strong password.

17. Use the Database Engine Configuration - Server Configuration page to specify the following options:
    a. Security Mode: Select **Mixed Mode Authentication** for your instance of SQL Server. You must **provide a strong password** for the built-in SQL Server system administrator account (sa). After a device establishes a successful connection to SQL Server, the security mechanism is the same for both Windows authentication and mixed mode authentication. For more information, see Database Engine Configuration - Server Configuration page.
    b. SQL Server Administrators: You must **specify at least one system administrator** for the instance of SQL Server. To add the account under which SQL Server Setup is running, select **Add Current User**. To add or remove accounts from the list of system administrators, select Add or Remove, and then edit the list of users, groups, or computers that have administrator privileges for the instance of SQL Server. You can also add a Windows Domain Group, to establish a shared SQL Administrator Group in Active Directory with sysadmin Access to SQL Server. To install to the default directories, select **Next**.
18. Use the Analysis Services Configuration - Account Provisioning page to specify the server mode and the users or accounts that have administrator permissions for Analysis Services. The server mode determines which memory and storage subsystems are used on the server. Different solution types run in different server modes. If you plan to run multidimensional cube databases on the server, select the default server mode option, Multidimensional and Data Mining.
    a. You must specify at least one system administrator for Analysis Services:
        i. To add the account under which SQL Server Setup is running, select **Add Current User**.
        ii. To add or remove accounts from the list of system administrators, select **Add or Remove**, and then edit the list of users, groups, or computers that have administrator privileges for Analysis Services.
    b. For more information about server mode and administrator permissions, see Analysis Services Configuration - Account Provisioning page.
    c. When you're finished editing the list, select **OK**. Verify the list of administrators in the configuration dialog box. After the list is complete, select **Next**.
    d. Use the Analysis Services Configuration - Data Directories page to specify nondefault installation directories. To install to the default directories, select **Next**.

Note	When installing SQL Server, if you specify the same directory path for INSTANCEDIR and SQLUSERDBDIR, SQL Server Agent and Full Text Search won't start due to missing permissions. If you specify nondefault installation directories, ensure that the installation folders are unique to this instance of SQL Server. None of the directories in this dialog box should be shared with directories from other instances of SQL Server.

19. Use the Distributed Replay Controller Configuration page to specify the users you want to grant administrative permissions to for the Distributed Replay controller service. Users that have administrative permissions have unlimited access to the Distributed Replay controller service.
    a. To grant access permissions for the Distributed Replay controller service to the user who's running SQL Server Setup, select the **Add Current User** button.
    b. To grant access permissions for the Distributed Replay controller service to other users, select the **Add** button.
    c. To remove access permissions from the Distributed Replay controller service, select the **Remove** button.
    d. To continue, select **Next**.

20. Use the Distributed Replay Client Configuration page to specify the users you want to grant administrative permissions to for the Distributed Replay client service. Users that have administrative permissions have unlimited access to the Distributed Replay client service.
    a. Controller Name is optional. The default value is <blank>. **Enter the name** of the controller that the client computer will communicate with for the Distributed Replay client service:
        i. If you've already set up a controller, enter the name of the controller while configuring each client.
        ii. If you haven't yet set up a controller, you can leave the controller name blank. However, you must manually enter the controller name in the client configuration file.
    b. Specify the Working Directory for the Distributed Replay client service. The default working directory is <drive letter>:\Program Files\MicrosoftSQL Server\DReplayClient\WorkingDir\.
    c. Specify the Result Directory for the Distributed Replay client service. The default result directory is <drive letter>:\Program Files\MicrosoftSQL Server\DReplayClient\ResultDir\.
    d. To continue, select **Next**.
21. The Ready to Install page shows a tree view of the installation options that you specified during Setup. On this page, Setup indicates whether the Product Update feature is enabled or disabled and the final update version. To continue, select **Install**. SQL Server Setup first installs the required prerequisites for the selected features, then it installs the selected features.
22. During installation, the Installation Progress page provides status updates so that you can monitor the installation progress as Setup continues.
23. After installation, the Complete page provides a link to the summary log file for the installation and other important notes. To complete the SQL Server installation process, select **Close**.

Note	Make sure you read the message from the Installation Wizard when you've finished with Setup.

24. If you're instructed to **restart the computer**, do so now.

Next Steps

Configure your new SQL Server installation.

To reduce the attackable surface area of a system, SQL Server selectively installs and enables key services and features. For more information, see Surface Area Configuration.

2.1.4.2 Setup Remote Connection

In the default configuration of new installations of SQL Server, many features are not enabled. SQL Server selectively installs and starts only key services and features, to Minimize the number of features that can be attacked by a malicious user. A system administrator can change these defaults at installation time and also selectively enable or disable features of a running instance of SQL Server. Additionally, some components may not be available when connecting from other computers until protocols are configured.

If the SQL Server Express Edition is installed using default setup options, access is only permitted from the local machine. This section explains how to enable remote access to databases via TCP/IP or named pipes to allow the creation of centralised data stores.

Protocols, Connection, and Startup Options

Use SQL Server Configuration Manager to start and stop services, configure the startup options, and enable protocols and other connection options.

To start SQL Server Configuration Manager:

- Find and run SQL Server Configuration Manager.
- Use the SQL Server Services area to start components and configure the automatic starting options.
- Use the SQL Server Network Configuration area to enable connection protocols, and connection options such as fixed TCP/IP ports, or forcing encryption.
- Remote connectivity can also depend upon the correct configuration of a firewall.

Enabling and Disabling Features

Enabling and disabling SQL Server features can be configured using facets in SQL Server Management Studio.

To configure surface area using facets:

1. In Management Studio connect to a component of SQL Server.
2. In Object Explorer, right-click on the server, and then click Facets.
3. In the View Facets dialogue box, expand the Facet list, and select the appropriate Surface Area Configuration facet (Surface Area Configuration, Surface Area Configuration for Analysis Services, or Surface Area Configuration for Reporting Services).
4. In the Facet properties area, select the values that you want for each property.
5. Click OK.

To periodically check the configuration of a facet, use Policy-Based Management.

You can also set Database Engine options using the sp_configure stored procedure.

To change the EnableIntegrated Security property of SSRS, use the property settings in SQL Server Management Studio. To change the Schedule events and report delivery property and the Web service and HTTP access property, edit the RSReportServer.config configuration file.

2.1.4.3 MS SQL Server Management Studio

Microsoft SQL Server Management Studio is a software application that is used for configuring, managing, and administering all components within MS SQL Server. The tool includes both script editors and graphical tools which work with objects and features of the server.

This tool is provided as an optional install during the MS SQL Express installation, but its use should be limited to those that are familiar with the product. Inadvertent problems may arise if the backend MS SQL database is modified inappropriately. The basic restore database procedure is documented here.

Connect to MS SQL Server

1. Choose SQL Server from the list. If the server is not in the list please type the SQL server name.
2. Choose SQL Server authentication method.
3. Click **Connect**.

Restore Database

1. Right-click on Databases.
2. Choose **Restore Database**.

3. Type in your Database name. It can be any name and it does not have to be same name you have in the backup file.
4. Choose from file.
5. Click **Select File**.
6. Click **Add**.
7. Choose the backup file.
8. Click **OK**.
9. Check the database you would like to restore.
10. Change Restore options (this part is optional).
    - Change the physical location of the database.
    - Choose the recovery state.
11. Click **OK** to start the restore process.

DataSight Components

The following DataSight components are available as a turn key solution with all on-premise DataSight installations. Usage of these components depends upon a user's role and the design of the DataSight system.

User who will enter, edit, QA/C and thoroughly interrogate and report on the data will be provided with:

- DataSight Client - licensed by either an individual user or on a concurrent licensing model. This component is installed to a user's computer.

When required, IT Administrators may need to install:

- DataSight License Service - this product is licensed for installation on a client's network server to allow concurrent DataSight usage across their network.

IT Professionals who will administer the backend MS SQL DataSight database(s) and ensure that automated tasks are running, should have access to:

- DataSight Administrator – this product is licensed but is free with the DataSight client software.
- DataSight Service Manager – this product is licensed but is free with the DataSight client software.

As an option, coordinators, directors, contractors, etc., who require data and report reading but not editing, and contractors that need to import to the database, we can provide:

- DSWeb – this product is licensed on installation to a Server. Please note, this is an optional web application for data access/reading via a standard web browser, and not critical to the functionality of DataSight per se.

2.1.5.1 DataSight Client Installation

Before installing DataSight to your computer, you should know:

- The DataSight installation requirements.
- The default installation directory for DataSight

  C:\Program Files (x86)\Seveno\DataSight
- Your permissions on the computer.

Install DataSight

1. Launch the product installer by double-clicking on the **.exe DataSight** file.
2. Click **Yes** to run the DataSight Setup Wizard.
3. After the Wizard begins, click **Next** to start DataSight installation.

4. Click **Browse** to change default installation directory, or do nothing to save installation to default installation directory. Then click **Next**.
5. Select a location for DataSight on the Startup Menu or keep default location. Then click **Next**.
6. To create a desktop icon for DataSight, click **Create a desktop icon**. Then click **Next**.
7. Review installation preferences.
8. (Optional) Click **Back** to make changes.
9. Then click **Install** to prepare installation.
10. Check **Launch DataSight** to start application immediately or un-check to use later.
11. Then click **Finish** to complete installation. You will find DataSight in your start menu.
12. (Optional) For added convenience, you can pin DataSight to your taskbar.
13. You can now launch DataSight.

After authenticating and installing your license, you can start working on your database. See License Key Authentications.

See also:

- DataSight On-Premise
- System Requirements
- Server Requirements
- User Requirements
- Launch DataSight

2.1.5.2 DataSight License Service

For the use of DataSight concurrent user licenses (floating network licenses), you will need to install the DataSight License Service.

Install DataSight License Service

1. Please locate and run the setup file **DSLicenseServiceSetup_3.0.0.msi** on the designated server. The license service will be installed in the C:\Seveno folder by default as running the service from Program files will need administrator permissions. If the user policy is to run from the Program Files folder for services or any other reason, the user will need to change the compatibility of the DataSightLicenseService.exe to run **As Administrator** as always.
2. Navigate to **Install DataSight Concurrent License**. This will appear as a shortcut on the desktop or can be found on the Programs Menu. Run the program.
3. The **Install DataSight License** window will appear. Authenticate your license.
4. Once you authenticate your License Service, you will see that the License Status will show as (XX) Floating license installed.
5. Click **Close** to return to the desktop. You are ready to use DataSight concurrently with other users in your network.

Note	The License Service will connect to our Authentication Server & License Database to authenticate the floating license key installed on the client's license service.

See also:

Launch DataSight

2.1.5.3 DataSight Administrator

DataSight Administrator provides **administrators** with access to Microsoft SQL Server (see Server Requirements) in a standalone program that provides a Windows-based interface between Microsoft SQL Server and DataSight.

It focuses solely on the DataSight-related features on the Microsoft SQL server and allows administrators to:

- Create, delete and manage DataSight and DSWeb databases.
- Set a database Time Zone.
- Carry out backups and consistent database checks.
- Generate the default DSApp configuration.
- Manage DataSight users and security groups.

Note	DataSight administrators must have administrative privileges on the Microsoft SQL Server to perform administrative actions, such as creating and backing-up databases, creating users and editing user permissions. Normal DataSight users will require read (db_datareader) and write (db_datawriter) permissions assigned to their User Accounts within the MS SQL Server the DataSight databased is located in. DataSight users who have been assigned the DataSight Import Security Permission will also require the 'db_owner' role assigned to their User Account.

Alternatively, standard Microsoft SQL Server management tools, such as SQL Server Management Studio, can be used for these tasks.

For further information regarding DataSight Administrator, and its **installation**, please refer to the **DataSight Administrator User Guide**.

2.1.5.4 DataSight Service Manager

After DataSight Service Manager is installed on the Microsoft SQL server, whether that be your computer or a server in the network, you can **schedule** your DataSight tasks. DataSight Service Manager's primary function is to:

- Enable you to perform automated DataSight tasks on your computer such as imports, reports and calculations.

Install Service Manager

1. Launch the DataSight Service Manager installer by double-clicking on the **DataSightServiceSetUp.msi** file.
2. After the Wizard begins, click **Next** to start the installation.
3. (Optional) Click **Browse** to change default installation directory, or do nothing to save installation to default installation directory C:\Program Files (x86)\Seveno\DataSight Service Manager.
4. (Optional) Click **Disk Cost** to analyse the disk space required for DataSight Service Manager.
5. Select the radio button to install DataSight Service Manager for **Everyone** or **Just Me**.
6. Click **Next** to continue.
7. To confirm installation, click **Next**. Otherwise click **Back** to make changes or **Cancel** to exit.
8. If prompted, click **Yes** on the User Account Control message to allow DataSight Service to install.
9. Click **Close** to exit wizard after the installation is complete. You will find DataSight Service Manager in your start menu.
10. (Optional) For added convenience, you can pin DataSight Service Manager to your taskbar.

For further information regarding DataSight Service Manager, and its **installation**, please refer to the **DataSight Service Manager User Guide**.

Launch DataSight

For DataSight On-Premise Installations, the DataSight client application can be launched either from the:

- **Start menu**

1. Click **Start** on your taskbar.
2. Then click **DataSight**.

or,

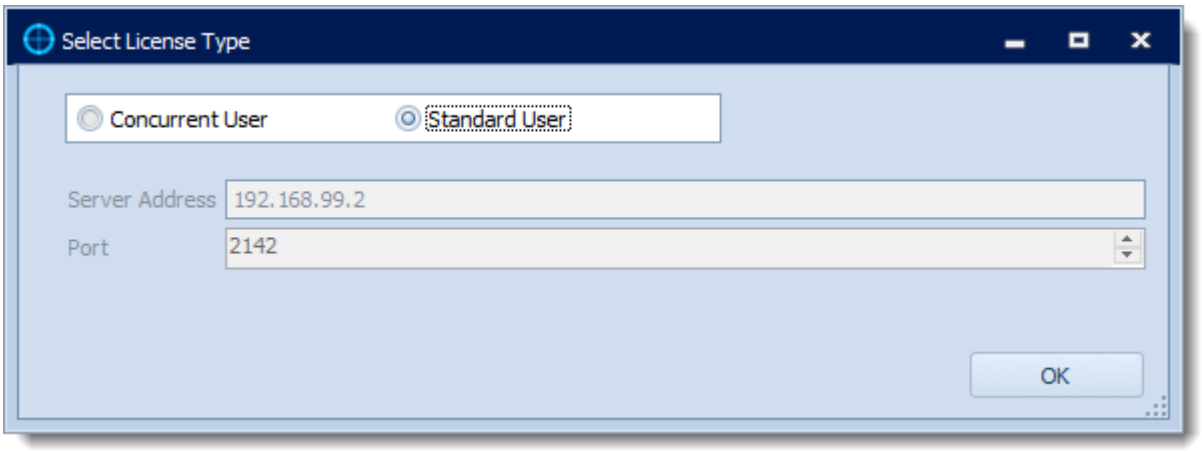
- **Desktop icon**

1. Go to your desktop.
2. Then double-click **DataSight**.

DataSight's opening window will appear.

Select your License Type

Upon launching DataSight *for the first time on a computer* , the **Select License Type** dialogue will appear after the opening window.



1. Depending upon your purchase, please select either the **Concurrent User** radio button or **Standard User** radio button.
2. For Concurrent user:
    a. You also need to enter the IP/**Server Address** of the server/client machine where the service was installed. Alternatively you can enter the server name.
    b. Please ensure port **2142** is open and the IP/Server address is reachable in the network.
    c. Click **OK**.
    d. You will continue to select **Concurrent User** each time you launch DataSight.
3. For Standard user:
    a. Click **OK**. The **Install DataSight License** window will appear.
    b. You will then authenticate your license key.
    c. Once a standard user license is authenticated, a DataSight will open without requiring license selection.

You are now ready to connect to your database.

Note	You can pin the DataSight program to your Taskbar for added convenience. You can also change your license type as required.

See also:

- DataSight On-Premise
- DataSight User Interface
- Connect to a Database
- DataSight Client Installation
- DataSight License Service

License Key Authentications

After purchasing DataSight, you are issued with DataSight license keys that will be required to license and authenticate your DataSight component installations. **Authentication** is the process of verifying the DataSight license key, and licensing it to run on your specific computer or server.

When you launch DataSight for the first time after installation of a DataSight Client (or the DataSight License Service), you need to install your license key to authenticate your installation.

Authentication cannot be completed if the license key is invalid, or if the computer is disconnected from the Internet, in which case the license key fails to install and you cannot begin work on DataSight. In this event, an offline authentication is possible via email where we authenticate the license on your behalf. This may take longer processing times.

In order to authenticate your license key, you must have **Administrator Rights** on the local computer or server (Refer to User Requirements for more).

Note	If you are required to re-authenticate your license please ensure you do have Administrator Rights. Overtyping a license key, or trying to re-authenticate without this right, may cause an installation error.

Before attempting to authenticate your license, please make sure that:

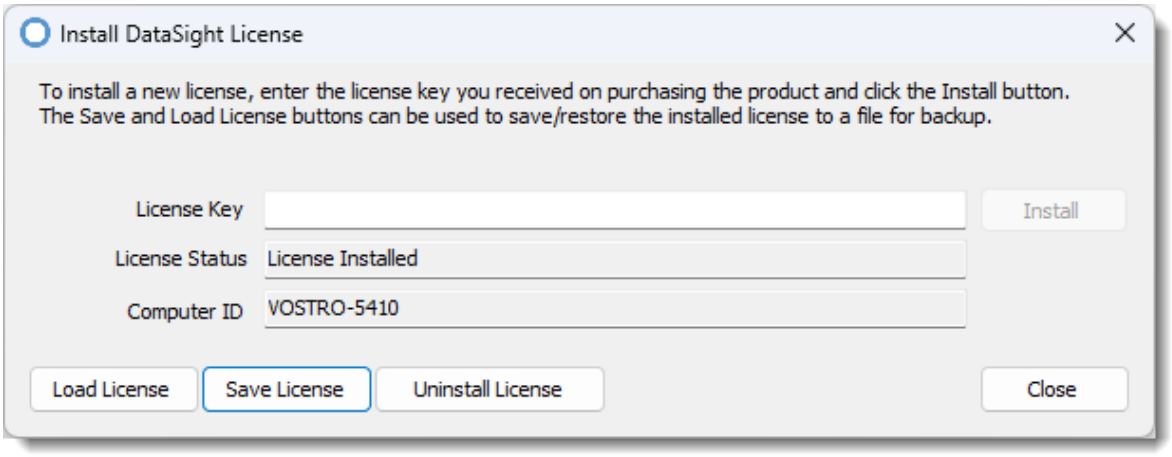
- the License key is valid.
- the License key has not been previously installed on another system.
- the System is connected to the internet during authentication process.
- the System grants you administrator rights.

Follow one of the methods below based on your needs:

Method 1: Authenticate a DataSight license key via the internet

1. Once you have launched the DataSight client, and selected your License type, the **Install DataSight License** window will appear.
2. To install a license, type or paste in your DataSight License Key.

   Then click **Install**. DataSight will authenticate the license key first. This may take some time depending on your internet speed, during which the status flashes "authenticating".



3. The license status will be updated if authentication is successful.

Note	If your internet connectivity is interrupted at any point during the authentication, you will be given the choice to save the license to a file to allow offline authentication. Then follow **Method 2**. New DataSight user licenses have a 90 day expiry until such time that payment in received in full. Once payment is fully received, the license expiry will be removed and you will simply need to re-authenticate your license.

Method 2: Authenticate a DataSight license key using offline authentication

1. When you are not connected to the internet, you will be prompted to save your license file during your attempt to install DataSight's license key. It can then be sent for offline authentication.
2. Click **Yes** when the Authentication Error Window appears to save a copy of your license file (*.Lic).
3. Please email support@datasight.cloud with this license file, for the license file to be authenticated and emailed back to you.
4. When you receive your authenticated license file back, access the Install DataSight License Window either via the DataSight Evaluation Window upon launching DataSight, or from the File/License/Register Menu.
5. Register the authenticated license using the **Load License** button.
6. Select your license file from the browser.
7. Then click **Install**.
8. Your license key is now installed and you may start working on DataSight.

Save your authenticated license

Once a license has been installed it can be saved to an external file using the **Save License** button. This enables you to backup licenses to enable re-installation (for instance after an OS reinstall) without having to re-authenticate the license.

See also:

- DataSight On-Premise
- DataSight Client Installation
- DataSight License Service
- DataSight User Interface
- Launch DataSight

- License Re-Authentications and Changes
- Connect to a Database

License Re-Authentications and Changes

When you upgrade or reinstall DataSight, you may need to reauthenticate your license, or change license type. Depending upon the circumstances, you may need to contact Seveno for assistance with the release of your license key.

Re-authenticate a DataSight license key

1. Launch your DataSight component.
2. Select the **Application Tab**  .
3. Select **License**, then **Register**.
4. Type or paste in your DataSight component License Key and click **Install**.
5. DataSight will then authenticate the license key. This may take some time depending on your internet speed, during which the status flashes "authenticating".

Transfer a license to the new computer or server

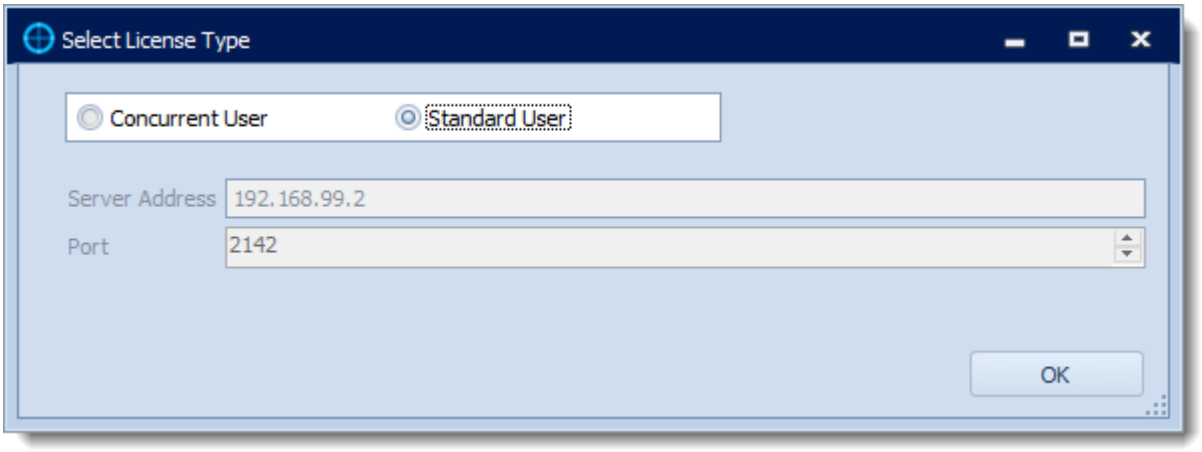
1. Launch the DataSight Component on your old computer or server.
2. Select the **Application Tab**  .
3. Select **License**, then **Register**.
4. From the **Install DataSight License** window click **Uninstall License**. The license key will be released from the Seveno licensing server and is now re-usable.
5. Install the DataSight Component to your new computer or server.
6. Launch DataSight and select the license type as required.

6. Select the **Application Tab**  .
7. Select **License**, then **Register**.
8. Type or paste in your DataSight component License Key and click **Install**.
9. DataSight will then authenticate the license key. This may take some time depending on your internet speed, during which the status flashes "authenticating".
7. Click **OK**.

Change your license type

You may wish to change your DataSight licensing from a Standard User License to a Concurrent User License (or vice versa). To do this;

1. Launch your DataSight component.
2. Select the **Application Tab**  .
3. Select **License**, then **Select License**.



4. Depending upon your purchase, please select either the **Concurrent User** radio button or **Standard User** radio button.
5. For Concurrent user:
    a. You also need to enter the IP**/Server Address** of the server/client machine where the service was installed. Alternatively you can enter the server name.
    b. Please ensure port **2142** is open and the IP/Server address is reachable in the network.
    c. Click **OK**.
6. For Standard user:
    a. Click **OK**. The **Install DataSight License Key** window will appear.
    b. Type or paste in your DataSight component License Key and click **Install**.
    c. DataSight will then authenticate the license key. This may take some time depending on your internet speed, during which the status flashes "authenticating".
    d. Once a standard user license is authenticated, a DataSight will open without requiring license selection.

Known Issues

If a DataSight license (either standard or concurrent) has been previously installed on a computer, you are unable to change the license type. This is an issue even if the license is uninstalled, prior to attempting to install the new type of license.

We recommend you change the license user type from within the DataSight application, prior to uninstalling DataSight, as follows.

1. Click on the DataSight **Application Tab**.
2. Select **License**, then **Select License**.
3. Choose the license type (Standard User or Concurrent User) that you wish to re-install for DataSight next time.
4. Then click **OK**.
5. Uninstall DataSight from your computer, then re-install DataSight.
6. DataSight should now prompt you to select a user type for your license at launch.

Overtyping a license key, or trying to re-authenticate without Administrator rights to the system or computer, may cause an installation error. If you are required to re-authenticate your license please ensure you do have Administrator Rights.

See also:

- Launch DataSight

- License Key Authentications

DataSight Cloud

DataSight is traditionally offered as an in-house client-server application, however since 2017 we have also offered DataSight in the Cloud subscription. DataSight has been published within a virtual environment on DataSight.Cloud using the Parallels **Remote Application Server** or RAS. As a cloud solution, users can utilise DataSight and all of its functionalities without installing the client on a local computer or allocating an in-house MS SQL server.

Users benefit from the following advantages of using DataSight Cloud:

- Securely access DataSight on any device
- Access data from many locations (internet required)
- Cut deployment costs of on-premise installation
- Cut additional IT costs for administration
- Cut additional IT software costs (no on site MS SQL licenses required)
- Disaster recovery procedures are implemented and scheduled to protect data
- Lower start up costs

DataSight Cloud seats provide for concurrent usage, allowing a given number of users at any one time to access the subscribed number of seat(s). One seat can have multiple SQL user authentications, to allow more than one user profile access to that DataSight seat while still recording the correct DataSight Processing History.

You can connect to the DataSight.Cloud RAS and access DataSight Cloud either with:

- a platform-specific client such as from Parallels,

or,

- via a Web Browser.

Parallels Client

The Parallels Client grants your device the ability to access DataSight from the Parallels RAS on any operating system including Macintosh, Linux, Android and iOS, which do not otherwise offer a platform to run DataSight. To do this, simply install your platform-specific Parallels Client and connect to DataSight through it. Use the following guide to run DataSight through Parallels Client for a Windows Desktop.

Meet System Requirements

Before installing DataSight Cloud Client for Windows, ensure that your system meets the following software and hardware requirements:

- Windows XP SP3, Vista, Windows 7, Windows 8, Windows 10.
- The same hardware requirements as specified by Microsoft for the above versions of Windows.
- Some features (high colour graphics, sound, etc.) will only be available if your Windows computer has the appropriate hardware installed and is properly configured.

Install the Parallels Client for Windows

1. Download an appropriate 32 bit or 64 bit Parallels Client MSI installer for your Windows system from http://www.parallels.com/au/products/ras/download/client/ to a location on your device.
2. Run the installation file. The **Setup Wizard** should now appear.
3. Click **Next** to proceed with the installation.

4. **Accept** the terms in the License Agreement to proceed. Then click **Next**.
5. Click **Change** to install at a different location. Otherwise click **Next**.
6. Select to **Install Single Sign-On component** or **Do not install Single Sign-On component**. If unsure, select Do not install Single Sign-On component.
7. Click **Next** to proceed.
8. Click **Install** to begin installation. Please wait for the installation to complete. You may need to grant the application User Account Control. Click **Yes** when prompted.
9. Click **Finish** to exit the Setup Wizard after successful installation of Parallels Client. The Parallels Client should launch shortly. Otherwise launch Parallels Client from your applications.

Login via Parallels Client

1. Launch Parallels Client
2. In the Parallels Client, click **File**. Then select **New Connection**.
3. Select **Parallels Remote Application Server**. Then click **OK**.
4. Enter **Server** *datasight.cloud*
   a. Enter **Connection Mode** *Gateway SSL Mode* .
   b. Click **Advanced Settings** and enter Port as **8080** under Connections Tab, then click **OK**.
   c. If there are security issues, you may need to contact your IT Administrator.
5. (Optional) You may enter a **Friendly Name** if you wish.
6. Click **OK**.
7. Select **Authentication Type** *Credentials*
   a. Enter **User Name**.
   b. Enter **Password**.
   c. Click **Connect**.
8. Upon successful connection, you will see the main Parallels Client window where a DataSight application short cut will be displayed. Double-click **DataSight** to launch the program.
9. Click **Yes** in the Security Alert to proceed with the server security certificate information. DataSight will attempt to connect to the DataSight database, during which time it flashes connecting.
10. Upon successful connection, DataSight's login window should appear. You can then connect to your database.

Web Browser

DataSight Cloud can also be accessed by browsing a web link on any device connected to the internet. This opens a user connection page to the RAS where DataSight can be launched from.

1. Click on the web link http://aws.datasight.cloud/ to connect to DataSight Cloud.
2. In the browser, a DSCloud Login page will appear.
   a. Enter **User Name** in the user@domain field.
   b. Enter **Password**.
   c. Click **Login**. This should take you to the main Resources page where a DataSight shortcut is visible.
3. Double click on the **DataSight Icon**.
4. DataSight's login window will appear in your browser tab. You can then connect to your database.

DSWeb

DSWeb is a web application that provides secure online access to Seveno DataSight environmental databases. DSWeb is primarily for the viewing and dissemination of data in DataSight databases, and does not possess the full DataSight functionality. Using DSWeb, you can deliver up-to-the-minute environmental data and the latest reports via standard web browsers, for multiple databases, and with specific data visibility for all stakeholders.

DSWeb provides you with:

- Preconfigured graphs for up-to-the-minute reporting
- Tabular and graphical views
- Integration with Google Maps
- Data entry and file upload
- Data export
- News and report links
- Document upload and viewing
- Multi-level access security

DSWeb installations can be on-premise or offered as SaaS with DataSight Cloud. Your access to DSWeb will be designed to your specific circumstances and should be conducted either by Seveno or by the appropriate IT personnel in your organisation.

For further information regarding DSWeb, and its **installation**, please refer to the **DSWeb User Guide**.

DSApp

Seveno's DSApp is a smart-device based application designed to assist with capturing and viewing DataSight data. Using DSapp and DataSight's file based systems, data flows seamlessly between your mobile device and your DataSight database.

DSApp's fully responsive and platform agnostic electronic forms allow you to collect safety, asset management and manual measurements while in the field, with the particular advantage of being able to work both online and off-line. This data is automatically ingested into your database once reconnected to the internet.

You are also able to quickly view the most recent data available within your database while remote from the office.

To be able to use DSApp, you will need the following:

- A device capable of running DSApp.
- A DataSight or DataSight.Cloud database.
- A DSApp Report, exported from DataSight.
- An FTP server for receiving .DSI data files uploaded from DSApp.

For further information regarding DSApp, and its **installation**, please refer to the **DSApp User Guide**.

See also:

- DSApp
- DSApp Import
- Link DSApp

Getting Ready for DSApp

Linking DSApp to your DataSight database requires you to configure several DataSight components, most likely requiring Administrator level access when using DataSight Administrator. You will also need to refer to DataSight Administrator and DSApp Help Guides.

As DSApp utilises an FTP Server for downloading and uploading data, you will need:

- FTP Server's URL or IP address;
- The username and password of an account on the FTP Server; and
- The folder name and path for archiving DSApp DSI files after import.

Note	It is suggested that your administrator binds the FTP user account's root folder to the location of the exported DSApp Report (.csv) files.

Organisations with an on-premise installation of DataSight will need to:

1. Contact Seveno when you purchase your first DSApp subscription so that we can upgrade your DataSight Administrator license.
2. Using DataSight Administrator:
    a. Re-Authenticate your DataSight Administrator license once Seveno has confirmed that it has been upgraded.
    b. Run all upgrades released in DataSight Administrator Version 3.0.38 on your database. The upgrades will create the 'GetDataSightAppData' SQL view which is used by the 'DSAppReport' saved view report, as well as creating the default Variable Groups and Variables used by DSApp.
    c. Generate DSApp data, creating the default DSApp Variable Groups and Variables, as well as to add the following Saved Views and Tasks to your database:
        i. 'DSAppReport' Report - used by the 'Generate DSApp Report' automated Task for providing DSApp with information about your database's Levels, Variables, Equipment, Flags, People, Standards and MDE Templates.
        ii. 'DSAppDatasheet' Datasheet - used by the 'Generate DSApp Datasheet' automated Task for providing DSApp with data from your database.
        iii. 'Generate DSApp Report' Task - used to generate the 'DSAppReport' report file and upload it to your FTP Server.
        iv. 'Generate DSApp Datasheet' Task - used to generate the 'DSAppDatasheet' data file and upload it to your FTP Server.
        v. 'Import DSApp Data' Task - used to import DSI files generated by DSApp that have been uploaded to your FTP Server
    d. DataSight Administrator will also generate a DSApp Configuration File containing all the settings required to link DSApp to your database and allow it to communicate with your FTP Server. Please ensure to make the DSApp Configuration File available to your DSApp users via either email, file share or other method (such as saving it in the Documents section in DataSight).

Organisations with a DataSight Cloud subscription will need to:

1. Contact Seveno when you purchase your first DSApp subscription so that our IT team can upgrade your database with DSApp functionality.

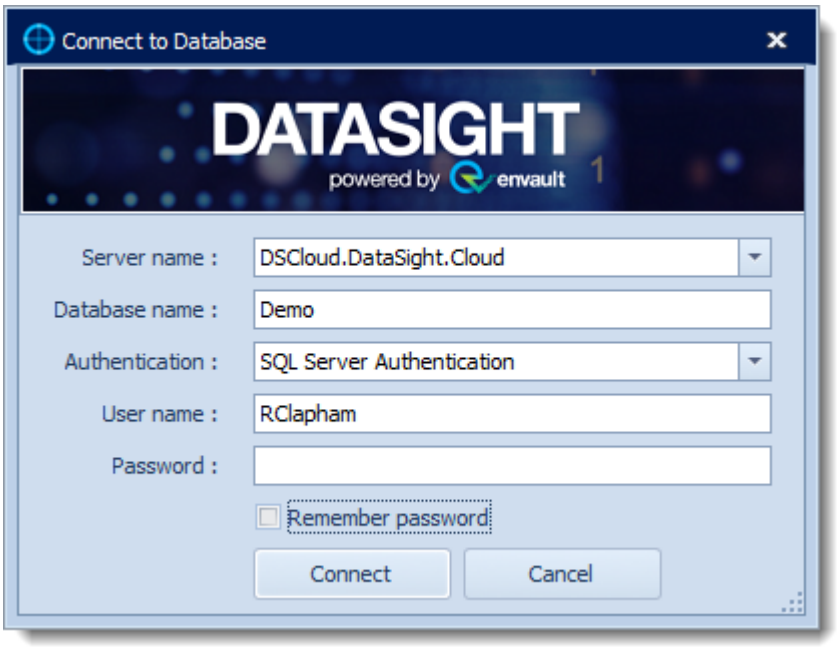
2. Provide Seveno with information about your FTP Server (URL/IP address, FTP user account and archive folder name).
3. Save the DSApp Configuration File received from Seveno which contains all the settings required to link DSApp to your database and allow it to communicate with your FTP Server. Please ensure the DSApp Configuration File is made available to your DSApp users via email, file share or other method (such as saving it in the Documents section in DataSight).

Connect to a Database

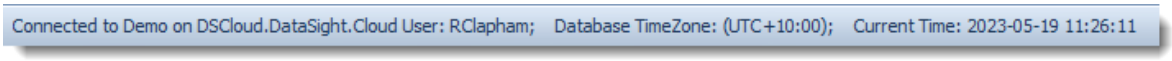
Connect to a database

1. After launching DataSight, either On-Premise, or via the Cloud, the **Connect to Database** window will appear.
2. Enter the following information as required (see your IT administrator to obtain these details and then keep a personal record):
   - **Server name**: Enter the qualified name of your database server (for example, *TishaPC|TishaSQL* in the figure).
   - **Database name**: Enter the qualified name of your database (for example, *DEMO* in the figure).
   - **Authentication**: Select your authentication type (For example, *SQL Server Authentication* in the figure). For details, see Modes of User Authentication.
   - **User name**: Enter the name of a user with access to database on the server (This is required only for *SQL Server Authentication*).
   - **Password**: Enter the password of the specified user (This is required only for *SQL Server Authentication*).
3. Then click **Connect**.

Note	To take the most advantage of DataSight's advanced functionalities and latest fixes, it is pivotal that the DataSight SQL Server databases are kept up to date. To this end, database upgrades are now also run from the DataSight client upon initial connection to a database on the SQL Server. Users with sysadmin rights on the SQL Server can click **OK** to run the upgrade, before proceeding to the DataSight user interface. Users without sysadmin rights cannot perform database upgrades and will continue to access the current database version until the upgrade is run by an administrator. In the latter case, a user may experience difficulties with some DataSight features. Your IT Administrator is also able to run these upgrades from the DataSight Administrator console. Please contact your IT Administrator for assistance.



1. Once you have entered your details correctly and DataSight opens, your connection status (Connected to [database name] on [SQL server name]) will be displayed in the Status Bar of DataSight, at the bottom left of the window.



Exit current database and connect to a new database

1. Click Application Tab.
2. Then click **Connect to Database**.
3. Repeat steps 2 through 4 in **Connect to a database**

Note	It is the responsibility of the database administrator to edit database Security, Accounts and Permissions using the Security Features in DataSight and Microsoft SQL Server (refer to DataSight Administrator and Security).

See also:

- User Authentication

3 DataSight User Interface

The DataSight user interface provides for intuitive data importation, review, manipulation and reporting functions within a familiar Microsoft Windows environment. This chapter provides an overview of the interface layout, commonly used mouse functions, and DataSight settings. A pointing device such as mouse, is required by DataSight to make selections (by clicking on an item). With the following simple examples, you can try the DataSight interface for yourself.

Example 1: Change the position of the DataSight window

1. Drag your mouse pointer to the top of DataSight.
2. Click and hold.
3. Drag your mouse to a desired position and drop to place the DataSight window there.

Example 2: Display the contents of a Minimized window

- Click the **Maximize** button.

On the DataSight window, you will find the following:

- **Menu Panel**

  All functions of DataSight can be accessed from the Menu Panel. Based on your permissions some functionality may be unavailable. See your IT Administrator to resolve the issue.

  See Menu Panel.

- **Other Panels**

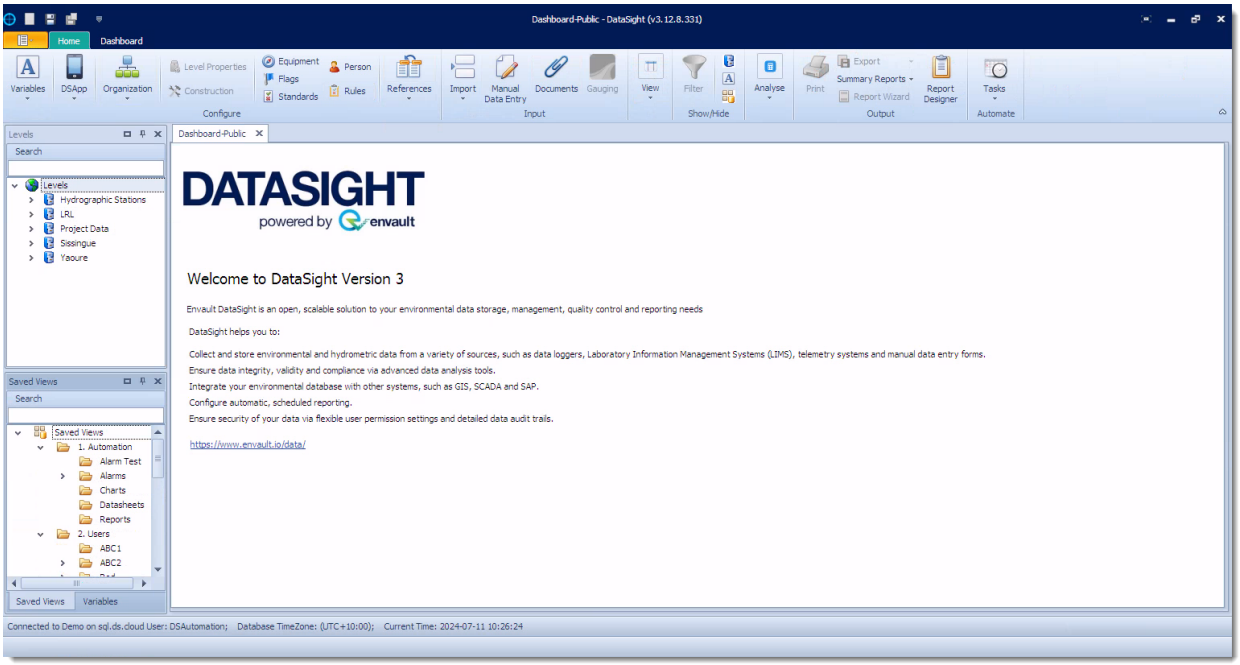
  Several rectangular panels are used to provide access to all components of your database, including levels, variables, saved views and filters.

  Other panels also include *Main Panel* which displays a default Welcome tab but is the position in which datasheets, charts and other tables will also be displayed.

  See Panels.

- **Status Bar**

  The status bar displays name of the database, server and user that DataSight is currently connected to, as well as the databases' time zone and current time at the bottom of the DataSight window.



See also:

- Navigation
- Set Date and Time

Menu Panel

The Menu Panel groups DataSight functions by category and consists of:

- A customisable Quick Access Toolbar, which contains the most often used functions in DataSight.
- The DataSight Ribbon, which contains all DataSight functions.
- The DataSight Application Tab

Note	Functions may be also accessed using the context menus.

Quick Access Toolbar

The Quick Access Toolbar contains the most commonly used functions in DataSight, and changes depending upon the DataSight feature being used. The toolbar appears at the top of the screen when you first open DataSight, but it can be moved to sit below the ribbon.

Button	Function
	Opens a new object depending upon what panel/command is selected
	Opens a saved template or form (e.g. Calculation)
	Saves the current Main Panel data element, be it datasheet, chart, analysis or property
	Allows the naming and saving of the current Main Panel data element
	Saves and closes the current data element (e.g. Gauging) and creates a new data element
	Deletes the selected data element, be it a datasheet or property row, chart element

 Allows the user to change the position of the Quick Access Toolbar to be above or below the ribbon

Add Commands to the Quick Access Toolbar

You can move the cursor over any of the buttons shown on the Quick Access Toolbar to display its function.

To add any ribbon command to the Quick Access Toolbar, right-click on the command and select **Add to Quick Access Toolbar**.

To add a group of commands to the Quick Access Toolbar, right-click on the group's caption and select **Add to Quick Access Toolbar**.

To remove any command from the Quick Access Toolbar, right-click on the command and select **Remove from Quick Access Toolbar**.

Show Quick Access Toolbar below/above the ribbon

1. Click the Quick Access Toolbar arrow  button.
2. Click **Show Quick Access Toolbar Below the Ribbon** to show it below the ribbon or click **Show Quick Access Toolbar Above the Ribbon** to show it above the ribbon.

See also:

- DataSight Ribbon

DataSight Ribbon

DataSight Ribbon is a rectangular panel that fits at the top of the Menu Panel. It is divided into tabs that have different groups of commands to carry out subsets of DataSight functionality.

The **groups** are as follows:

- Configure
- Input
- View
- Show/Hide
- Analyse
- Output
- Automate

Note	When nothing is within the Main Panel, the Automate Group will swap position with the Output Group on the DataSight Ribbon

Minimize the Ribbon

- Right-click on any command or page. Then click **Minimize the Ribbon**.
- You can also do one of the following:
  - Double-click any tab page header.
  - Press CTRL+F1.

Restore the Ribbon

- Right-click on any command or page. Then click **Minimize the Ribbon** again to un-check it.
- You can also do one of the following:
  - Double-click any tab page header.
  - Press CTRL+F1.

Note	A greyed out icon on the ribbon indicates that the function is not active for that panel.

See also:

- Tabs on the Ribbon
- Panels
- Navigation
- Invoke a Command

3.1.2.1 Tabs on the Ribbon

Invoking certain DataSight features will activate Tabs on the DataSight Ribbon.

Context specific grouped tabs that appear next to the Home ribbon tab include Datasheet, Calculation, Chart, Reference, Dashboard and Gauging.

To see commands associated with a tab, click on it.

Show/Hide tabs and commands

It is possible to hide the tab commands from view until their tab is clicked on. To do this:

1. Click **Ribbon Display Options** button near the window Minimize, Maximize and Close buttons.
2. Select the following as required:

   Auto-hide Ribbon: Hide the ribbon unless clicked at the top of the application to show it. To cancel this setting, double click on the title bar of the window.

   Show Tabs: Show only ribbon tabs and hide commands unless their respective tab is clicked on.

   Show Tabs and Commands: Show ribbon tabs and their commands at all times.

DataSight Application Tab

The DataSight Application Tab  presents a menu of commands that involve doing something to or with the DataSight workspace.

Feature	Function
Connect to Database	Ability to change between your different Microsoft SQL Server databases. Please note that data comparison is not possible BETWEEN databases as yet.
Options	Customise your DataSight user interface and default settings.
Security	Set user and group accounts for your database, and manage user permissions.
Help	Access help guide.
About	Information about your license and version number of DataSight as well as the last database update.

License	License management including registration of your DataSight license.
Exit	Exit the DataSight application.

See also:

- Connect to Database
- Options
- Security
- Help
- License

Invoke a Command

To invoke a specific toolbar, ribbon or menu command, do **one** of the following:

- Click the command with the mouse.
- Press the shortcut assigned to the command.

If a command is displayed within a menu, its shortcut can be displayed next to the command's name (if assigned).

Shortcuts are associated with each page and command on the ribbon.

See shortcuts

1. Press ALT or F10. Shortcuts are displayed for commands within the Quick Access Toolbar (at the top of the ribbon) and for tab pages.
2. To see shortcuts for commands within a specific tab page, first press the shortcut associated with this tab page.
3. Then press ALT or F10. Shortcuts will appear next to the corresponding tab pages and commands.

If a shortcut is represented by **one symbol**, you can invoke the command by pressing this symbol.

If a shortcut is represented by **two** or **three symbols**, you can invoke the command by pressing the symbols one after another.

Other Panels

The DataSight window can be divided into several panels. When you first open DataSight, the default layout consists of two panels to the left-hand side of the window and a main window. These contain the levels, variables and saved views. The Main Panel by default contains the Welcome page, but is the position in which datasheets, charts and other grid views will later be displayed. The filter panel is directly underneath the Main Panel.

Panel	Controlled by	Function	Panel Header Commands
Levels Panel	 Click on the header to open and close the panel	Displays a tree list view of your data in Levels 1, 2, 3 and date/time Levels 4, 5 and 6	Maximize/Minimize Autohide (Pin) Close
Variables Panel	 Click on the header to open and close the panel	Displays the available variables in your DataSight database	Maximize/Minimize Autohide (Pin) Close
Saved Views Panel	 Click on the header to open and close the panel	Displays a tree list view of the saved datasheets, charts and reports	Maximize/Minimize Autohide (Pin) Close
Main Panel	 Click tabs to toggle between different datasheets, charts, or other grid views	Displays selected data in a datasheet, chart, or defined data properties	Close
Filter Panel	 Click on the header to open and close the panel	Displays the current Filters (conditions) applied to the selected data	Autohide (Pin) Close

Levels Panel

The Levels Panel shows the user-defined structure of the database. Levels are best defined in consultation with all stakeholders prior to construction of a database, as the Level definition allows you to pre-filter your data according to broad groupings.

Example structures that capture natural resource data are provided in the following table.

Data Types	Level 1	Level 2	Level 3
Scientific Discipline	Mining project	Water Chemistry, Surface Water Flow, Meteorology, Biota	Site Location
Geography	Government Body	Region 1, Region 2, Region 3	Site Location
Division	Agricultural Venture	Dairy, Cropping, Cattle, Plant Produce	Site Location

See also:

- Levels
- Navigation

Variables Panel

The Variables Panel displays variables in the DataSight database.

The **All Variables** group contains all the available variables in DataSight sorted **alphabetically**, which can be categorised into user-defined subgroups.

Variable Groups that have been assigned to a DSApp Variable Group Type are represented by the following symbols:

 DSApp_Safety

 DSApp_Hazard

 DSApp_On Arrival

 DSApp_On Departure

See also:

- Navigation
- Variables
- DSApp Variable Groups

Saved Views Panel

The Saved Views Panel displays a tree list view of any saved charts, datasheets and reports for the current database.

These can be arranged into manually created folders (groups) and easily opened and edited. User level access can also be applied to a Saved View group, restricting or enabling access to the group's contents on a per-user basis.

See also:

- Saved Views

Main Panel

The Main Panel of DataSight is where all activity is displayed when you invoke a command or click an item. It is here that you can view your data in a datasheet or chart, as selected from the Levels Panel or the Filter panel. For datasheets and charts, the Main Panel is linked with the Filter panel to enable users to define filter conditions. The Main Panel is also where detailed tabular information is displayed for variables, and other data properties.

To close any tab in the Main Panel, click on the **Close** Icon  on the focussed tab.

You can also right click on any Menu Panel Tab and select:

- **Close All Tabs**
- **Close Other Tabs**

Note	A Main Panel tab will show an (*) to indicate there are modifications in that panel that can be saved.

See also:

- Navigation

- DataSight User Interface

Filter Panel

In DataSight, you can define conditions and **filter** data by them. The Filter panel displays the current filters, or "conditions", applied to the dataset.

Filters have 3 parts:

- **Field** - selected from a list of possible options
- **Descriptor** - a description of the relationship between Field and Value
- **Value** (this can be text, date or numerical)

For example, in the statement "x Is Less Than 8":

x is the Field

'Is Less Than' is the Descriptor

8 is the Value

See also:

- Filter Your Data

Navigation

Navigation throughout the DataSight interface is done primarily with the combination of **mouse** and **keyboard** actions.

Depending upon the focus of the mouse upon a datasheet, data property grid, or tree list for example, a variety of actions can be undertaken. Focusing may also be accompanied by a change in cell or node highlight.

Note	Charts, Analyse Your Data, and Reports detail specific usage of these more complex DataSight features.

See also:

- Shortcuts

Tree List Navigation

To navigate in the Levels, Saved Views or Variables Panels, use the following set of commands.

Action	Description
Clicking a folder or level	Moves focus to the clicked folder or level.
ARROW keys	Moves focus to the next folder or level.
HOME/END	Moves focus to the first/last folder or level.
PAGE UP PAGE DOWN	Moves focus one page up or down.
CTRL+HOME	Moves focus to the first folder or level within the first node.
CTRL+END	Moves focus to the last folder or level within the last node.
CTRL+RIGHT ARROW	Expands the focused node.
CTRL+LEFT ARROW	Collapses the focused node.

Note	You can also click node indicator cells to move focus to the corresponding row.

Form Navigation

To navigate certain windows in the Main Panel, including pop-up data entry windows, use the following set of commands.

Action	Description
Clicking a data cell or element	Moves focus to the clicked cell or element.
Clicking a row header	Moves focus to the corresponding row while preserving column focus.
ARROW keys	Moves focus within the cell in the corresponding direction.
TAB/SHIFT+TAB	Moves focus to the next/previous cell.
HOME/END	Moves focus within the cell to the start or end of the cell.
PAGE UP/PAGE DOWN	Moves focus within the cell to the start or end of the cell.
CTRL+TAB	Moves focus away from the active tab to the next tab, in tab order. Only for forms within the Main Panel.

Grid Navigation

To navigate within data grids, such as that of a datasheets, select and move the focus between cells and rows using the ARROW, TAB, HOME, END, PAGE UP and PAGE DOWN keys. Detailed descriptions are given below.

Action	Description
TAB	Move focus to the next cell.
RIGHT ARROW	Move focus to the next cell. If a cell editor is active, pressing RIGHT ARROW moves focus to the next cell if the caret is positioned at the end of the current cell's text, or if the cell's text is selected in its entirety.
SHIFT+TAB	Moves focus to the previous cell.
LEFT ARROW	Moves focus to the previous cell. If a cell editor is active, pressing LEFT ARROW moves focus to the previous cell if the caret is positioned at the beginning of the current cell's text, or if the cell's text is selected in its entirety.
HOME	Moves focus to the first cell within the current row.
END	Moves focus to the last cell within the current row.
CTRL+HOME	Moves focus to the first row.
CTRL+END	Moves focus to the last row.
Click the row indicator cell or any of its data cells	Select a row and clear the existing selection.
Click the row indicator cell or any of its data cells, while holding the CTRL key down	Select a row while preserving the current selection.
CTRL+SPACE and click the row while holding the CTRL key down	Toggle the focused row selected state.

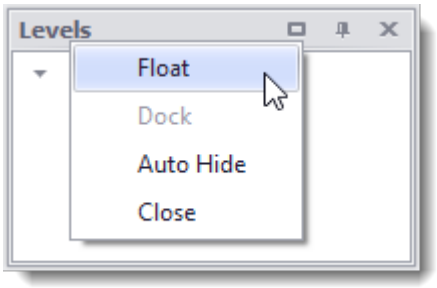
CTRL+ARROW	Move focus between rows while preserving the current selection.
CTRL+A	Select all rows. Before pressing this shortcut, ensure that the focused cell is not being edited.
Use ARROW, PAGE UP, PAGE DOWN keys while holding the SHIFT key down	Select a continuous range of rows.
Click the target row while holding the SHIFT key down	Select all rows between the currently focused row and another one.
CTRL+TAB	Moves focus from the active tab in the Main Panel to the next tab.

Note	The ARROW, HOME and END keys are used for navigation between rows only when the focused cell is not being edited. Otherwise, these keys affect focus movement within the currently edited cell. If the SHIFT key is combined with CTRL, the previously selected rows, if there are any, are not unselected. If you use the SHIFT key alone, the previously selected rows/cards are unselected.

Context Menus

DataSight provides **right-click** context menus for accomplishing your most common and frequently used tasks. The options displayed on the right-click menu vary depending on where you are when you click.

For example, options for changing the layout of various panels can be accessed by a right-click on the panel header. A right-click on the Levels Panel header gives the options of Float, Dock, Autohide (Pin), or Close.



Keyboard Navigation in Context Menus

The following shortcuts allow you to navigate through menus and menu items. They are in effect when a menu is focused.

Action	Description
ARROW keys	Moves focus to the next command in the corresponding direction.
TAB/SHIFT+TAB	Moves focus to the next/previous command.
ESC	Moves focus away from the currently focused menu.

Open a menu displayed within another menu

- Focus the sub-menu and press the RIGHT ARROW on your keyboard.
- To close the current menu, press ESC.

Changing the Layout

You can customise the appearance of the DataSight window by changing the appearance, size and position of the panels. Using these functions, you can free up window space by hiding or reducing those features that are not in use. DataSight also retains the layout of the panels when closed, keeping everything where you left it the next time you open DataSight.

Remove a Panel from View

- Click the panel name in the Show/Hide group on the Ribbon.

Resize a Panel

1. Drag the cursor over the panel border. The cursor will change to  .
2. Now hold the left mouse button down to drag and drop the border of the panel.

Float a Panel

- Drag the header of the panel and drop at a new location where it will float.

Dock a Panel

1. Drag the header of the panel and drop to a selected part of the screen where it will dock.
2. If the panel is floating, double-clicking the panel header will restore it to its previous docked location.

Note	As you drag the panel, docking hints appear. Use these hints to dock the panel to the desired position. Docking hints are semi-transparent square elements that allow you to dock a panel to edges, or to an existing container as a tab, or between other docking elements. These hints are displayed separately or grouped in a docking guide. Finally, a docking zone is a semi-transparent preview of exactly where your panel will be docked. This zone is displayed when you drag a panel into a docking hint, but before you drop it.

Maximize or Restore a Floating Panel

1. In the top right corner of each panel are the multiple state change buttons. Click the **Maximize** button to change the panel to full-screen size.
2. Click the **Restore** button to restore it back to its original size.

Autohide (or Pin) a Panel

1. Click on the pin in the header of the panel. The panel will then be pinned to the nearest window frame.
2. To view the panel, drag the mouse over the panel label.
3. To dock the panel back to its initial position, click on the pin in the panel header.

Set Date and Time

You can set the date and time within DataSight by either overtyping or by using the calendar tool.

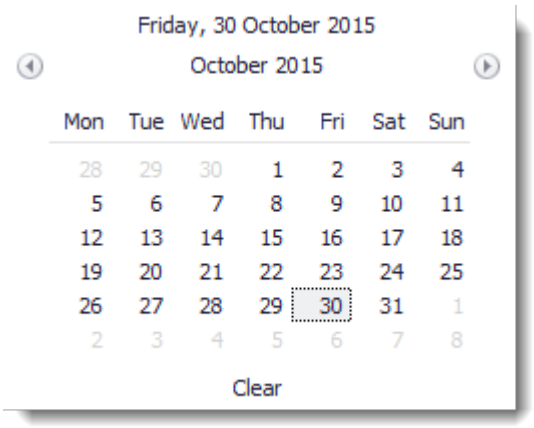
Overtyping

1. Click the day to highlight and overtype new day.

2. Click the month to highlight and overtype new month.
3. Click the year to highlight and overtype new year.
4. Click the hours to highlight and overtype new hour.
5. Click the minutes to highlight and overtype new minute.
6. Click the seconds to highlight and overtype new second.
7. Click on AM:PM to overtype as required.

Change the Date using the Calendar Tool

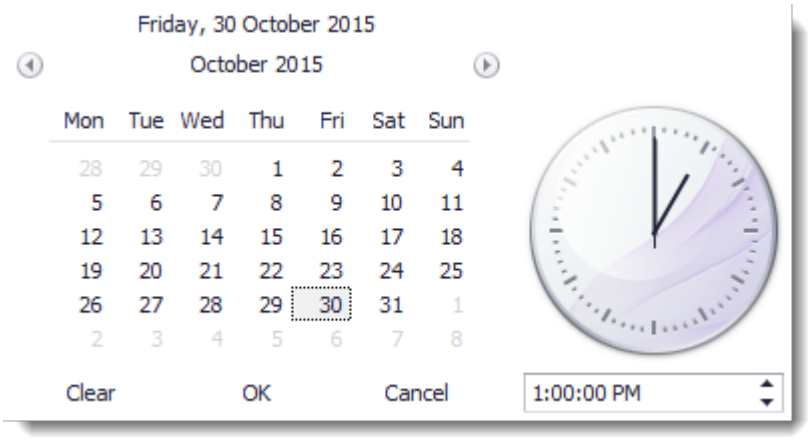
1. Where applicable, select from the dropdown box to open the Calendar Tool. By default, the calendar displays the month containing today's date.



2. To select the date do one or more of the following:
   - Position the cursor on the date selection and click.
   - To increment the values press CTRL+UP ARROW. To decrement the value, press CTRL+DOWN ARROW.
   - Use the and buttons in the title bar of the calendar to navigate by different time increments.
   - Click the current month/year in the title bar to zoom in and out of the month/year selection.
   - Use Clear to reset the date selection.

Change the Date and Time using the Calendar Tool

1. Where applicable, select from the dropdown box to open the Calendar Tool.



2. To select the date do one or more of the following:
   - Position the cursor on the date selection and click.
   - To increment the values press CTRL+UP ARROW. To decrement the value, press CTRL+DOWN ARROW.
   - Use the and buttons in the title bar of the calendar to navigate by different time increments.
   - Click the current month/year in the title bar to zoom in and out of the month/year selection.
   - Use Clear to reset the date selection.
3. Click the hours to highlight and either overtype the new hour or increment using the navigation keys.
4. Click the minutes to highlight and either overtype new minute or increment using the navigation keys.
5. Click the seconds to highlight and either overtype new second or increment using the navigation keys.
6. Overtype or increment AM or PM as required.

File Dialog Windows

A File Dialog window allows you to choose a file from a file directory. Other names for this type of window are File Selector/Chooser, file requester, or open and save dialogs.

In DataSight you will use a File Dialog for a number of reasons. These include:

- Selecting a file to import data
- Selecting a file to import as a document
- Adding a document to Documents
- Saving a document from Documents
- Adding a document to a gauging
- Attaching an image in Construction
- Saving an image from Construction
- Exporting data from Calculation Results
- Saving your document to file when printing
- Exporting a datasheet or chart to a file
- Saving a Summary Report, Datasheet Report using the Report Wizard, or Query Report using the Report Designer
- Picture Box and Rich Text controls in the Report Designer
- Automating data import, data export, and the publication of charts and reports from the Tasks
- Loading a License

You should note that File Name fields have a limit of 250 Characters.

DataSight Options

The DataSight Options allow you to tailor the DataSight interface and personal usage on your individual PC, providing options to specify the look and feel of the interface, import defaults, datasheet and chart viewing and interaction options, together with the default saving locations.

Open the DataSight Options

1. Click the DataSight **Application Tab**.
2. Then click **Options**.

Category	Setting	Description
Calculation	Decimal Points	Define the default number of decimal places to use when saving or updating resultant data to the database in Calculations.
Chart	3D	Select 3D viewing for charts. The default setting is 2D.
Chart	Panel Colour	Set the colour of the background panel in new charts.
Dashboard	Enable Auto Refresh	Choose to enable the automatic refresh of the Dashboard Panel (applies to both Public and User Dashboards).
Dashboard	Minutes to Refresh	Enter the time in minutes to set the frequency of which the Dashboard Panel is automatically refreshed (minimum frequency is 15 minutes, applies to both Public and User Dashboard).
Datasheet	Create SQL View	DataSight creates Microsoft SQL views for datasheets saved after this preference is selected which can be referenced and integrated with other software.
Datasheet	Show Variable Units on Pivoted Datasheets	Choose to show units for the variables displayed in pivoted datasheets.
Datasheet	Use Variable Default Display Format	Choose to use display format specified in the Variables list.
Gauging	Decimal Points	Choose the number of decimal points to display for the calculated discharge.
General	Disable Browsing Websites	Choose to disable web browsing in DataSight that require internet access including Web Browser and and maps from the Ribbon and Levels.
General	Map Server	Allows you to select either "Raster Tiles" (default setting) or "MapBox". The Raster Tiles option allows you to enter a Map Tile Server URL as well as configuring several options relating to caching of downloaded map raster tile files. The MapBox option allows you to enter your MapBox Access / API Key for using MapBox map tile servers, you must have an account with MapBox in order to use this option. Raster Tiles: • Map Server Cache Expiry - enter the length of time after which downloaded map raster files should be re-downloaded from the Map Tile Server. Format should be in DD.hh:mm:ss where DD is the number of days, hh is the number of hours, mm is the number of minutes and ss is the number of seconds. Default is thirty-one days entered as "31.00:00:00". • Map Server Cache File - enter the name of the file within which the downloaded map raster tile files will be saved within. Default value is "DataSightMapCache". • Map Server Cache Limit - enter the maximum size the Map Server Cache File is allowed to grow to. Default is -1MB which represents unlimited file growth. • Map Server Cache Memory Limit - enter the maximum size of memory which the cache is allowed to use at any one point in time. Default value is "128 MB". • Map Server Cache Path - enter the folder location where the Map Server Cache File will be saved. Default value is "C:\Program Files (x86)\Seveno\DataSight".

- Map Tile Server URL - allows you to enter a valid Map Tile Server URL which will be used to load the map image tiles. A Map Tile Server URL consists of the server's host name and three place holder fields in the URL string, which are usually represented by:
  - {Z} represents the tile's zoom level,
  - {X} represents the index of the tile along the map's x axis according to Spherical Mercator projection, and
  - {Y} represents the index of the tile along the map's y axis according to Spherical Mercator projection.

  DataSight Maps fills in and sends the Z, X & Y values to the Map Tile Server when it accesses the URL. This enables Maps to zoom, pan and rotate the Map Tile Server's image tiles. To enable Maps to load the images correctly, simply replace the {Z}, {X} & {Y} place holder fields of the Map Tile Server URL string with {1}, {2} & {3} respectively.

  For example, the OpenStreetMaps Map Tile Server URL https://tile.openstreetmap.org/${z}/${x}/${y}.png would be entered as https://tile.openstreetmap.org/{1}/{2}/{3}.png in DataSight Options.

MapBox:

- MapBox Access Key - field to enter your MapBox Access / API Key as provided to you by MapBox when you register and create an account with them.

General	Map Tile Server URL	You can enter a valid Map Tile Server URL which will be used to load the map image tiles. A Map Tile Server URL consists of the server's host name and three place holder fields in the URL string, which are usually represented by: • {Z} represents the tile's zoom level, • {X} represents the index of the tile along the map's x axis according to Spherical Mercator projection, and • {Y} represents the index of the tile along the map's y axis according to Spherical Mercator projection. DataSight Maps fills in and sends the Z, X & Y values to the Map Tile Server when it accesses the URL. This enables Maps to zoom, pan and rotate the Map Tile Server's image tiles. To enable Maps to load the images correctly, simply replace the {Z}, {X} & {Y} place holder fields of the Map Tile Server URL string with {1}, {2} & {3} respectively. For example, the OpenStreetMaps Map Tile Server URL https://tile.openstreetmap.org/${z}/${x}/${y}.png would be entered as https://tile.openstreetmap.org/{1}/{2}/{3}.png in DataSight Options.
General	Skin Name	Choose from a number of different skins (or themes) to change the look and feel of the DataSight user interface. The default skin is the Seveno Style.
General	Temp Folder	DataSight automatically recognises when you are attempting to import a large file (in excess of 10,000 lines) and assigns a temporary data location in order to make the importation process faster and more efficient. The default location is C:\TEMP but you can set a new temp data path at any time or if the C Drive is low on space. It is essential that you have access rights to the drive and folders nominated.

General	Website 1	Specify first saved website.
General	Website 2	Specify second saved website.
General	Website 3	Specify third saved website.
General	Website (Default)	Default website loaded when the Web Browser is launched.
Import	Date Delimiter	Default is "/".
Import	Date Format	Default is DMY.
Import	Decimal Symbol	Default is "."
Import	Default File Extension	The default file type to search for when importing files. The default is set to *.txt. Note this does not limit the type of files for import, simply the type of files DataSight will see first.
Import	Default Import Dialog Type	The default option is Standard, which uses Windows' Open File Dialog. Alternate uses DevExpress Open File Dialog.
Import	Default Import Folder	Set an import data path for which you have access rights to the drive and folders nominated.
Import	Field Delimiter	Default is ","
Import	Text Qualifier	Symbol that lets DataSight know where text begins and ends.
Import	Time Delimiter	Default is ":"
Standards	Goal Colour	Change the colour of the cell background in a datasheet to highlight data that is within the Maximum and Minimum values listed for that variable. The default colour is Green.
Standards	Maximum colour	Change the colour of the cell background in a datasheet to highlight data that is greater than the Maximum Value listed for that variable. The default colour is Red.
Standards	Minimum colour	Change the colour of the cell background in a datasheet to highlight data that is less than the Minimum Value listed for that variable. The default colour is Blue.

Note	Sometimes DataSight may need to be restarted for the preferences to take effect, especially for non-Admin users.

See also:

- DataSight Application Tab

4 DataSight Security

DataSight database security is a combination of Microsoft SQL Server security coupled with DataSight application security. **Both** forms of security need to be implemented.

Within DataSight Security, you can:

- Create and manage new users using the database or operating system. These users can be assigned to application security groups.

  See Accounts.
- Application administrators may enable and disable modules in DataSight for existing accounts.

  See Permissions.

When a User Account is added to a DataSight database, they are automatically assigned to the 'db_datareader' and 'db_datawriter' Fixed-Database Roles for that database within the MS SQL Server. When a User Account or Group has been granted the Import Security Permission within DataSight, the User Account(s) are also assigned to the 'db_owner' Fixed-Database Role for that database within the MS SQL Server. Subsequently, when the Import Security Permission has been removed from a User Account or Group, the 'db_owner' Fixed-Database Role for the User Account(s) is also removed from that database.

DataSight will display a warning message if the User Account being used to grant or deny the Import Security Permission has insufficient security privileges within the MS SQL Server to do so, advising the user to escalate the issue with their IT Administrator.

Note	The same DataSight Security features are duplicated within DataSight Administrator.

Refer to Install and Register DataSight for further information regarding Microsoft SQL Server Security.

Open Security

1. Click **Application Tab** (next to Home Ribbon).
2. Then click **Security**.

See also:

- Modes of User Authentication
- Application Tab

Modes of User Authentication

DataSight offers two types of user authentication:

- **SQL Server Authentication**: SQL Server Authentication authenticates a user to the database using a database user name and password. These are assigned by a Database or IT Administrator. To be authenticated on SQL Server, obtain your user name and password on the database from your Administrator and maintain a personal record. If required, encryption can be added over all data travelling to and from the application and network. But this will require users to have SSL Certificates installed into the SQL Database server and also add the certificate into the DataSight user's computer.

- **Windows/Active Directory Authentication**: This is the recommended authentication mode. In this mode, your account is allowed to use DataSight by the operating system or the local computer. It is highly secure and security issues are handled by the operating system. If you are granted permission to use DataSight, then to be authenticated on Windows, you do not need a user name or password. If you are logged in to the local computer and cannot access a database on DataSight, please see your IT Administrator for access rights.

See also:

- DataSight On-Premise

Accounts

DataSight application accounts may be either a user or a group. A DataSight account is created for each user in DataSight and then users can be assigned to different groups. Both users and groups can have a distinct set of application permissions.

All users should ideally be allocated to groups.

Permission priorities according to Accounts

The following priority rules apply:

- Deny anywhere for any user or group overrides all other granted permissions or permissions that have not been set.
- If a user is neither granted nor denied permission then the default setting for that permission is denied until set.
- If a user is granted permission to use a module or feature in DataSight, then they are granted that permission everywhere whether a permission for the group that the user belongs to has not been granted.
- Users will retain the last group privileges that they have been allocated even if the group has been deleted.

Admin Security Group

DataSight has one built-in security group called **Admin**. When a user is assigned to this group, they will have full administrative rights to manage accounts and their permissions, as the **Admin** group is granted full permission by default.

It is likely that at least one DataSight user will be the same as the IT systems administrator, and as such will have full privileges for the Microsoft SQL Server instance. When a database is created by an administrator, that user is automatically assigned to the Admin group. However, using application security other users can be created that are granted full application security within DataSight without having full access to the suite of functions for the MS SQL Server.

The IT Systems Administrator should *never* release the Admin group user name and password as the Admin user Name and Password are identical for Microsoft SQL Server. All other users should be provided separate passwords.

See also:

- Permissions
- DataSight Administrator
- View Security History

Set Accounts

Add a new User

Windows Authenticated

1. Check that the user to be added exists on Active Directory. See your IT Administrator for details.

2. Launch DataSight and connect to database.
3. Click **Application Tab**.
4. Click **Security**. The Security window will open.
5. Click the **Users** radio button.
6. Click **Add**. The Create User window will open.
7. Select **Windows Authentication**.
8. Enter the appropriate user name.
9. Click **OK**.
10. Click **Save**.

SQL Server Authenticated

1. Check that you have sufficient rights on the server. See your IT Administrator for details.
2. Launch DataSight and connect to database.
3. Click **Application Tab**.
4. Click **Security**. The Security window will open.
5. Click the **Users** radio button.
6. Click **Add**. The Create User window will open.
7. Enter a new user name and select **SQL Server Authentication**.
8. Enter a user name and password.
9. Click **OK**.
10. Click **Save**.

Add a new Group

1. Launch DataSight and connect to database.
2. Click **Application Tab**.
3. Click **Security**. The Security window will open.
4. Click the **Groups** radio button.
5. **Add** a new group. The Create Group window will open.
6. Enter the new Group Name and click **Save**.

Assign a User to a Group

1. Launch DataSight and connect to a database.
2. Click **Application Tab**.
3. Click **Security**. The Security window will open.
4. Select the **Users** radio button.
5. Select your user from the list of users.
6. Click the check-box next to the group or groups to which this user will become a member.
7. Click **Apply**.

8. Click **Save**.

Delete a User or Group

1. Launch DataSight and connect to a database.
2. Click **Application Tab**.
3. Click **Security**. The Security window will open.
4. Click the **Users** or **Groups** radio button.
5. Select the User or Group and click **Delete**.
6. You will be asked to confirm the delete. Click **Yes**.
7. Click **Save**.

See also:

- Modes of User Authentication
- Permissions
- View Security History

Permissions

DataSight security allows administrators to enable and disable modules in DataSight for different accounts, as well as configuring Row Level security to enable and disable access to data based on Levels and Flags.

If a user is granted permission to use a module or feature in DataSight, then they are granted that permission everywhere whether a group they belong to has not been granted that permission. Row Level permissions allow you to limit access to data for specific Levels and Flags, Equipment, Persons, Import Templates, Calculation Templates, and Tasks. In order for a User or Group to be able to view data, they must be given permission to at least one Level and one Flag entry. User or Group permissions are denied access by default (unless they are a member of the Admin group) for all Levels and Flags, Equipment, Persons, Import Templates, Calculation Templates, and Tasks, in your DataSight database. See Set Permissions to learn more.

The users will retain the last group privileges that they have been allocated even if the group has been deleted. It is recommended that all Users be allocated to a Group.

See also:

- Accounts
- DataSight Administrator

Set Permissions

Assign application permissions to a user or group

1. Click **Security**. The Security window will open.
2. Select the **Users** or **Groups** radio button.
3. Select the User or Group and click **Permissions**. The Permissions window will open.
4. Click the **User Access and Operations** tab to access the application permissions.
5. Checkboxes can be ticked to *(grant)* or *(deny)* to View/Use, Create, Modify and Delete various user generated files or data. If a box is not checked, then the user or group is neither granted nor denied permission.
6. Click **OK** to save.

Note	1. If a permission is **neither granted nor denied**, then the default setting for that permission is denied. 2. **Deny** anywhere for any user or group overrides all other granted permissions. For example, consider *DemoUser* who is a part of group *Admin*. a. *DemoUser* is denied permission to execute charts, then regardless of the group permission of *Admin* to execute charts, *DemoUser's* permission remains denied to execute charts. b. Likewise *Admin* is denied permission to execute calculations, then regardless *DemoUser's* user permission to execute calculations, *DemoUser's* permission remains denied to execute calculations.

Assign row level permissions to a user or group

1. Click **Security**. The Security window will open.
2. Select the **Users** or **Groups** radio button.
3. Select the User or Group and click **Permissions**. The Permissions window will open.
4. Click the **User Restrictions**, **Equipment**, **Persons**, **Import Templates, Calculations**, or **Tasks** tab to access the row level permissions for the item selected.
5. Assign **permissions** by clicking within the check box associated with the item. Check-boxes can be ticked to grant, or cleared to deny, permissions for viewing, creating, modifying or deleting data associated with the specified item or Level. If a box is not checked, then the user or group is not granted permission to the corresponding data.
6. Click **OK** to save.

Note	1. If a permission is **neither granted nor denied**, then the default setting for that permission is denied. 2. **Deny** anywhere for any user or group overrides all other granted permissions. For example, consider *DemoUser* who is a part of group *Admin*. a. *DemoUser* is denied permission to the Flag 'Raw Telemetry Data', then regardless of the group permission *Admin* for accessing data flagged with 'Raw Telemetry Data', *DemoUser's* permission remains denied and cannot access that data.. b. Likewise *Admin* is denied permission to the Flag 'Raw Telemetry Data', then regardless of *DemoUser's* user permission, *DemoUser's* permission remains denied for accessing data flagged with 'Raw Telemetry Data'.

Modify a user or group permissions

1. Click **Security**. The Security window will open.
2. Select the **Users** or **Groups** radio button.
3. Select the User or Group and click **Permission**. The Permissions window will open.
4. Modify the permissions and click **OK**.

See also:

- Modes of User Authentication
- Accounts

- View Security History

Application Permissions

The table below details what permissions are able to be granted or denied in DataSight. Functional modules have an Execute permission, and the permission to View/Use, Create, Modify and Delete different user generated data and settings can be assigned.

Y=Granted; N=Denied; Empty cell means neither a grant nor a deny permission has been selected.

Permission	Execute	View/Use	Create	Modify	Delete
Activity Tree		Y/N	Y/N	Y/N	Y/N
Branch		Y/N	Y/N	Y/N	Y/N
Calculation	Y/N				
Calculation Templates		Y/N	Y/N	Y/N	Y/N
Charts	Y/N				
Conversion Tables		Y/N	Y/N	Y/N	Y/N
Datasheets		Y/N	Y/N	Y/N	Y/N
Documents		Y/N	Y/N	Y/N	Y/N
Equipment		Y/N	Y/N	Y/N	Y/N
Export/Print	Y/N				
Flags		Y/N	Y/N	Y/N	Y/N
Gaugings		Y/N	Y/N	Y/N	Y/N
Graphical Flags	Y/N				
Import	Y/N				
Import Templates		Y/N	Y/N	Y/N	Y/N
Level 3 Properties		Y/N	Y/N	Y/N	Y/N
Level Construction		Y/N	Y/N	Y/N	Y/N
Level Histories		Y/N			
Levels			Y/N	Y/N	Y/N
Lock Data	Y/N				
Manual Data Entry	Y/N				
Manual Data Entry Templates		Y/N	Y/N	Y/N	Y/N
Maps	Y/N				
Organisation		Y/N	Y/N	Y/N	Y/N
Person		Y/N	Y/N	Y/N	Y/N

Project		Y/N	Y/N	Y/N	Y/N
Public Dashboard		Y/N	Y/N	Y/N	Y/N
Reference		Y/N	Y/N	Y/N	Y/N
Regressions	Y/N				
Report Designer	Y/N				
Saved Views		Y/N	Y/N	Y/N	Y/N
Security		Y/N	Y/N	Y/N	Y/N
Standards		Y/N	Y/N	Y/N	Y/N
Tasks		Y/N	Y/N	Y/N	Y/N
Unlock Data	Y/N				
User Dashboard		Y/N	Y/N	Y/N	Y/N
Variable Groups		Y/N	Y/N	Y/N	Y/N
Variables		Y/N	Y/N	Y/N	Y/N
WQX Domain List		Y/N	Y/N	Y/N	Y/N
WQX Rules		Y/N	Y/N	Y/N	Y/N

See also:

- Accounts
- DataSight Administrator

5 Configure Your Database

This chapter describes how the components of your database can be managed in DataSight. Initially, you will need to configure DataSight to suit your environmental data set.

DataSight databases are relational and manage your environmental data using a primary key. Every primary data point in DataSight is a combination of a Level (location), datetime stamp, and variable. Every secondary data point is a combination of Level, datetime stamp, variable and metadata variable, and is generally used to add context to its corresponding primary data point.

In consultation with all database users, you must;

- Define your Level 1, Level 2, and Level 3 hierarchy, with Level 3 typically being the location of the sample event.
- Define your Variables, which are the qualitative or quantitative parameters.
- Define your Metadata Variables, which are qualitative or quantitative parameters for a specific data point.

It should be noted that a timestamp is required for each data point, and date and time are stored **to the second**.

While the combination of location, date, time, and variable defines a unique data point in DataSight, other data can be recorded against or linked to that data point for further information. In other words, DataSight can also manage the **metadata** relevant to your projects, as follows:

- Information about each location and its surroundings can be stored,
  - including a **site description** with **images**,
  - the **physical coordinates** and **projections**,
  - the **construction** details,
- DataSight can store the data collection information, specifically;
  - the **personnel** involved,
  - the **equipment** and **methods** used, and
  - the
- DataSight can be used to assign and visually identify data for quality coding or quality assurance purposes; specifically;
  - Flags,
  - Standards, and
  - References can be set up prior to import of data for this purpose.

Metadata entered into DataSight can be used to answer questions such as why the primary dataset was created, where, when and how the data was created, who created the data, and was the data assessed against any standards and so on. Metadata in DataSight enables you to understand your data in detail and will enable other DataSight users to find, use and properly understand your data.

See also:

- Levels
- Variables
- DSApp
- Person

- Equipment
- Standards
- Flags
- References

Levels

In DataSight, information is stored in nodes that help locate data to the exact second it was recorded. These nodes are called **Levels**.

Levels in DataSight are maintained in a hierarchical manner. Several lower levels combine to form a higher level. Before importing or entering data into DataSight database, it is important to decide on your Level 1, 2 and 3 node hierarchy. Level nodes are accessed and defined in the Levels Panel.

DataSight databases are configured in nodes consisting of:

Level 1	An appropriate Level 1 may be a geographic area, project name, client, catchment area, etc.	Answering questions such as "what, how or why are you monitoring"
Level 2	In the case of Level 2, a region within the geographic area, or type of data collected such as water quality data, weather station data, or a specific project under the Level 1 hierarchy.	Answering questions such as "what, how or why are you monitoring"
Level 3	The name or identification code relating to a particular monitoring site or location. For example, the monitoring station name. This Level is locked to the x,y,z properties or site locality in 3D.	Answering questions such as "where your data set comes from"
Date Levels	**Level 4** is automatically created by DataSight and is the year of a sample event. A sample event is an occurrence of sampling on a particular day, hence there is also a **Level 5**, which is the month of a sample event and is also automatically created; and a **Level 6**, for the exact date of the sample event and is also automatically created. Each sample event consists of a timestamp and data relating to each variable measured.	Automatically created. See Time Dependent Levels.

The DataSight Levels allow you to pre-filter your data according to broad groupings. This is helpful because:

- You can click in the Levels Panel on a level 1, 2 or 3 or date and time,
- You can **quickly** filter your data without having to go into the filter window to manually set this up each time.

This ability to quickly jump from one constructed filter to another is useful when visually comparing data, and when you perform relatively quick checks.

The decision on how to structure or group your data into Level 1 and 2 groupings often relates to an organisation's work-flow. You may wish to interrogate these grouped data sets often during your daily work routine by simply clicking on them. However the list must also broadly communicate the relationships between your data set to anyone new to your database.

Whatever broad groupings you make for Level 1 and 2, you can still make Saved Views that allow finer groupings that are easily retrieved. You can use Saved Views to group and show data based on the type of variable monitored or specific methodology used.

While it is possible to identify a Level 3 as that other than a site locality, if you wish to undertake any spatial analysis of your data, then it is recommended that you choose to define the position of measurement of your field or sample data as a Level 3. Remember 3D = Level 3!

Most importantly, during your database setup, involve *as many* database stakeholders as possible, as you are then more likely to design a database structure that will survive the test of time.

Levels Panel Icons

Different icons are used to denote nodes in the Levels Panel.

 represents a Level 1

 represents a Level 2

 represents a Level 3

 represents a Level 3 with a time zone set different to the Database Time Zone

 represents a Level 4

 represents a Level 5

 represents a Level 6

See also:

- DataSight User Interface
- Levels Panel
- Level

Set Levels

Levels are easily created in the Levels Panel and each level can be named using alpha numeric text.

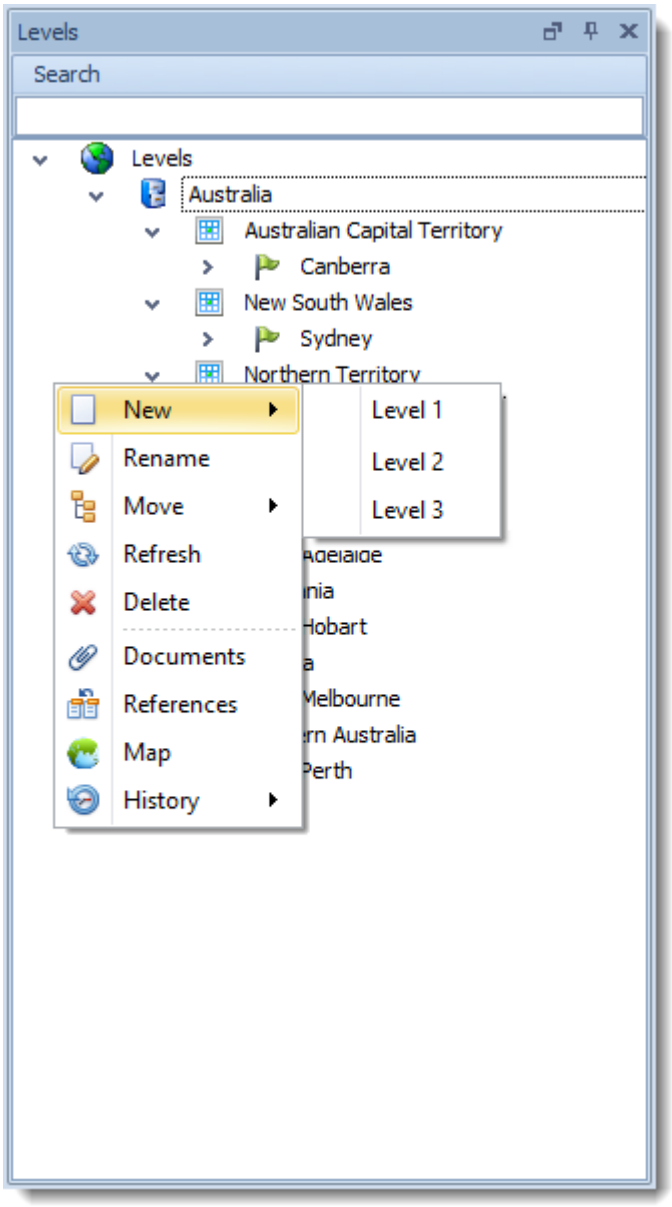
Select or Highlight a Level

- Select a Level in the Levels Panel by clicking on the Level name. The Level will be highlighted in a box.

Note	If you click on a Level name when the Filter panel is open, you will be asked if you wish to load the data from that Level. To easily build new levels without this interruption, ensure that you do not have a chart or datasheet open.

Add a New Level 1

1. Right-click in the Levels Panel.
2. Select **New**.



3. Select **Level 1.**
4. Enter a name for your Level 1.

Add a new Level 2

1. Right-click on an existing Level 1.
2. Select **New.**
3. Then select **Level 2**.
4. Enter a name for your Level 2.

Add a new Level 3

1. Right-click on an existing Level 2.
2. Select **New.**
3. Then select **Level 3**.

4. Enter a name for your Level 3.

Rename a Level

1. Right-click on the level you want to rename.
2. Select **Rename**.
3. Enter new level name.
4. Press ENTER.

See also Level

Refresh Levels

1. Right-click in the Levels Panel.
2. Select **Refresh**. The Levels listing will be refreshed. This is sometimes necessary for new changes in data to be reflected in the Levels Panel.

Delete a Level

1. Right-click on the level you want to delete.
2. Select **Delete**.
3. Click **OK** to confirm

   or

   click **Cancel** to escape.

Note	Apostrophes (') are special characters used in SQL and therefore cannot be included in your preferred name for a level 1, 2 or 3.

Time Dependent Levels

Levels 4 to 6 are called Time Dependent Levels and cannot be manually set in the Levels Panel.

These time dependent levels are **automatically** created by DataSight when a sample event or record is **entered** in your database. The list is constructed in this manner to help you quickly build your time dependent filters in the filter panel by simply clicking on different years, months or dates within the data list. Filtering of your data by smaller time increments than the day of record capture can be conducted in the Filter Panel.

Note	You should note that your version of DataSight can only store data that was acquired at least 1 second apart. Data captured that is less than 1 second apart cannot be saved with a unique timestamp in DataSight.

See also

- DataSight User Interface
- Levels Panel

Search for Levels

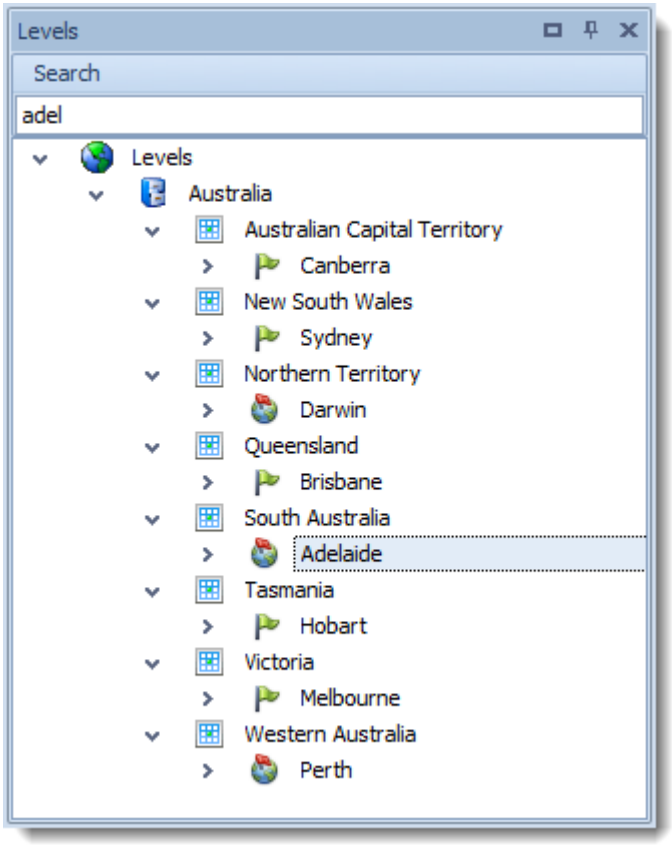
A search functionality is now embedded at the top of the Levels Panel to help you quickly find Levels in your growing list.

Collapse/Expand Search

To collapse or expand the search field, double click on the Search Header.

Use Search

1. Enter the desired Level name, or part name, in the **Search** field and click Enter (or Return). The tree list opens to and highlights the first search result.



2. If there is more than one search result, repeatedly press enter to navigate from the current search result to the next result.
3. If there are no Levels matching the given criteria, all nodes will be collapsed (to **Levels**).
4. If you wish to clear the search, clear the **Search** field and click Enter. This will bring the Levels tree to its default state, that is with **Levels** expanded to show all Level 1. Level 1 remain collapsed.

Note	• Searching can be undertaken on partial text and is not case sensitive. • Searching is limited to Level 1, Level 2 and Level 3. Searching for date nodes is not supported.

Reposition Levels

Over time, you may wish to reorganise your Levels in your Level List. From the Levels Panel, you can move Level 2 nodes (and all Level 3s under it) and Level 3 nodes to different positions in the Level List.

Use the Right-Click Menu (Level 2 or 3)

1. Right-click the **Level 2** or **Level 3** you wish to relocate, expand the **Move** context menu and select **Move From**.
2. Right-click the appropriate **Level 1** or the **Level 2** to which you would like to relocate or reposition the selected Level underneath, expand the **Move** context menu and select **Move To**.

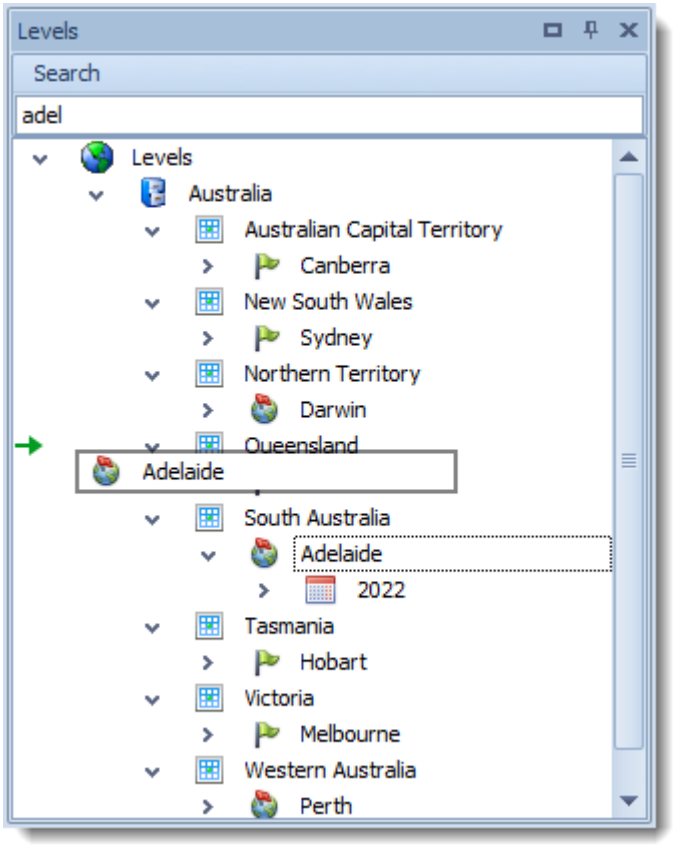
3. The **Move To** sub-menu item will display the name of the selected Level 2 or Level 3 which is to be moved, and will be greyed out.
4. Click **Yes** on the confirmation dialog to move the selected Level, or click Cancel.
5. The Levels List will refresh. Your Level 2 (and all Level 3s under it) or Level 3 has now been repositioned.

Note	The **Move To** sub-menu item is only available when you right-click on a Level 1 when moving a Level 2 (and all Level 3s under it) or when you right-click on a Level 2 when moving a Level 3.

Use Drag and Drop (Level 3 only)

1. Ensure that the selected Level 3, and the relevant Level 2s are visible in the Level List.
2. Using the mouse, left-click on the selected **Level 3** and hold the mouse button down. The Indicator will appear next to the Level name and a warning symbol will appear showing that the Level can be dragged

e.g.



3. While holding down the mouse button, **drag the Level 3** to hover over the new Level 2. If the move is permitted, the indicator will change to .
4. Release the **mouse button** to drop the Level 3 to its new position.

See Also:

- Permissions

Level 3 Properties

Using Level as a locality, DataSight can be used to manage data about each location and its surroundings. Stored properties can be the physical coordinates, location geographic information such as state, country and location type, and projections for a Level 3, the time zone the site is located in, together with detailed commentary and the construction details and images.

Open Level 3 Properties

- With an existing Level 3 selected, click **Level Properties** in the Configure group on the DataSight Ribbon. The Level Properties window for the selected Level 3 appears in the Main Panel.

  You can also right-click on a level 3 site and select **Properties**.

5.1.5.1 Level

The Level section in Level 3 Properties displays the name of the Level 3 as well as its time zone.

The **Time Zone** relates to the timestamps of data as written to the database *datetime* data type. When creating a new DataSight database, a DataSight Administrator must set the Database Time Zone. By default, this Database Time Zone is displayed and used for each Level 3.

However, it is possible to define a different time zone, than that of the database, for any given Level 3. This may be useful when your Level 3 sites are physically in different time zones, and you need to standardise the data sets into one. For these sites, DataSight will convert the timestamps into the Database Time Zone during import. DataSight allows for data filters to then correctly convert the timestamps into alternative time zones for display and export as required.

Change Level 3 Name

1. In the Levels Panel, highlight the Level 3 you wish to rename by clicking on it.
2. Click the **Level Properties** button from the Configure tab in the DataSight Ribbon Menu.
3. Navigate to the **Level Name** text box in the Level section.
4. Change the name as required.
5. Click **Save** in the Quick Access Toolbar at any point to save the changes and continue, otherwise when you **Close** the Level Properties window you will be prompted to save your changes.
6. **Refresh** the Levels List in the Levels Panel by right-clicking on the Levels Panel and selecting **Refresh**, to see your renamed Level 3.

Set Level 3 Time Zone

1. In the Levels Panel, highlight the Level 3 you wish to change the time zone by clicking on it.
2. Click the **Level Properties** button from the Configure tab in the DataSight Ribbon Menu.
3. Navigate to and click the **Time zone at Site** drop-down field to display a list of available time zones.
4. Click to select the desired time zone to be applied to the site.
5. Click **Save** in the Quick Access Toolbar at any point to save the changes and continue, otherwise when you **Close** the Level Properties window you will be prompted to save your changes.
6. A Level 3 that has a **Time Zone** set to a value which differs from the Database Time Zone will be denoted by the  icon in the Level Panel.

See also:

- Levels
- Level Projections and Map
- Level Comments
- Monitoring Location Properties (WQX)
- DataSight Administrator

5.1.5.2 Level Projections and Map

To display spatial information in Maps, details must be entered in the Level Properties tab of a specific Level 3. This spatial information can be linked to GIS software for use in mapping and spatial analysis. More than one projection can be saved, however only one should be selected for viewing in DataSight Maps. Along with the spatial information, you can record a state, country and location type and collection method for each projection entry. The Location Type drop-down is populated with the list of the monitoring location types as per the Water Quality Exchange (WQX) for the United States Environmental Protection Agency's (EPA) Central Data Exchange (CDX). The Collection Method field is typically used to record how the latitude and longitude values were derived. For example, if the longitude and latitude coordinates were derived from a GPS, you would record 'GPS-Unspecified' as the Collection Method.

Add a Projection

1. Select the **Level Properties** tab in the Main Panel. You can also right-click on a level 3 site and select **Properties**.
2. Select the **Level Projections and Map** tab in the Level Properties of the main panel.
3. To add a projection, after focusing your mouse on the Projections grid view, click **New** in the Quick Access Toolbar. A new row will be added to the Projection grid view.
4. Navigate to the text boxes under Projection for entry of **Longitude** and **Latitude**. In DataSight all coordinates are displayed in decimal degrees.
5. If your coordinates are given in decimalised fractions, click within the respective text box and type the value.

   If your coordinates are given in degrees, minutes and seconds, click in the text box and then click on the ... button to access a pop-up window.
6. Enter your Latitude **Degrees**, **Minutes** and **Seconds** and select the **North** or **South** Radio Button. Click **OK**.
7. Enter your Longitude **Degrees**, **Minutes** and **Seconds** and select the **East** or **West** Radio Button. Click **OK**.
8. (Optional) Enter your altitude value in the **Altitude** text box. No specific units of measurement are required at present, and the entry of this data is to ensure that all spatial elements are stored together for use.
9. Enter the unique **Projection Information** to clearly identify the projection relevant to these coordinates. This mandatory column is required to be able to identify unique projection rows when data is exported to a third party software.
10. (Optional) Enter a **Collection Method** for the projection record.
11. You can choose which of your projections will be used to display the locality of your Level 3 site in OpenStreetMaps (if using the default Map Tile Server URI). Click the **Display in Map** check-box for the chosen projection.
12. Click **Save** in the **Quick Access Toolbar** at any point to save changes and continue, otherwise when you **Close** the Level Properties window you will be prompted to save your changes.

Note	In order to display projections on a Map, the latitude and longitude values must be valid. The valid range of latitude in degrees is -90 and +90 for the southern and northern hemisphere respectively. Longitude is in the range -180 and +180 specifying coordinates west and east of the Prime Meridian, respectively.

Modify Projections in the Projection Grid View

1. Select the Level Properties tab in the Main Panel. You can also right-click on a level 3 site and select **Properties**.
2. Select the **Level Projections and Map** tab in the Level Properties of the main panel.
3. Modify the projections as required. Any changes will appear in italics.
4. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Level Properties window you will be prompted to save your changes.

Delete a Coordinate

1. Select the Level Properties tab in the Main Panel. You can also right-click on a level 3 site and select **Properties**.
2. Select the **Level Projections and Map** tab in the Level Properties of the main panel.
3. Click to check the **Delete** check-box(es) against any projection(s) that you wish to delete.
4. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Level Properties window you will be prompted to save your changes.

5.1.5.3 Level Comments

In the Level Properties Comments you can type any information or copy and paste text relevant to a Level 3. You can manage your commentary by adding several different comments (preferable), or typing into the one comments field. A Processing Date and Time column displays the datetime stamp of the last edit made to a comment row.

Add a Comment

1. Select the **Level Properties** tab in the Main Panel. You can also right-click on a level 3 site and select **Properties**.
2. Select the **Level Comments** tab in the **Level Properties** of the main panel.
3. To add a comment, after focusing your mouse on the Comments table, click **New** in the Quick Access Toolbar. A new Comments window will appear.
4. Give your comment a **Name**.
5. Enter or paste any text into the main body of the comment.
6. Click **OK**. The Comment window will close and the new comment will appear in the Comment table.
7. To save your comment(s) as change in the Level Properties table, click **Save** in the Quick Access Toolbar. Otherwise when you **Close** the Level Properties tab you will be prompted to save your changes.

Note	The Comment window in DataSight level properties is modeless. Modeless windows can be minimised or hidden from view behind other windows without closing them. This means that the Comment form stays active until dismissed, which allows you to write comments on the go as you work in DataSight.

Modify Comments

1. Select the Edit button  in the comment row you wish to change. The comment window will appear.
2. Change the text for that comment as needed. Click **OK** or you can also keep the modeless comment window open while working on your database to continue to add comments as and when you wish and then save.
3. You will also be prompted to save the level comments when you close the Level Properties tab.

Delete a Comment

1. Select the **Level Properties** tab in the Main Panel. You can also right-click on a level 3 site and select **Properties**.
2. Select the **Level Comments** tab in the **Level Properties** of the main panel.
3. In the comments section, click to check the **Delete** checkbox(es) against any comment(s) that you wish to delete.
4. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Level Properties tab you will be prompted to save your changes.

Note	Find text in the comments window using the right-click menu on the group header. The Standard Filters and Filter Editors are available for your text search.

5.1.5.4 Monitoring Location Properties (WQX)

Monitoring locations are where monitoring occurs. All data concerning field work or sample collection is tied to the specific location at which these types of activities are conducted, linking water quality measurements to the place they represent. Each monitoring location within WQX has a location, whose latitude and longitude are fully defined, including the method by which latitude and longitude were obtained. Other locational information includes the Hydrologic Unit Code (or HUC), state and county within which the station lies. Each monitoring location has a unique identifier, assigned at the discretion of the organisation that "owns" the data. Monitoring locations may have alternate identifiers, for example, if two or more organisations sample at the same place, the monitoring location may have different ways of being identified. Finally, the monitoring location defines the water body type it occurs on, such as a river, stream, lake or well.

The Monitoring Location Properties tab of the Level Properties panel allows you to enter any and all information relating to the monitoring location as allowed by WQX. As there is a large amount of fields and data which can be captured, please refer the the WQX website for further information on what to enter in this section for your requirements.

Further information can be found at WQX website https://exchangenetwork.net/data-exchange/wqx/

5.1.5.5 Construction

The Construction Details grid view allows descriptions, dates, images, and site activities related to the initial construction of a monitoring site to be recorded. The construction data records in DataSight are extensible, meaning that an infinite number of customised construction parameters can be added. Construction data is viewed in a tabular format to allow for filtering.

Open Construction

- With an existing Level 3 selected, click **Construction** in the Configure group on the ribbon.
- You can also right-click on a Level 3 site and select **Construction**.
- The Construction Details grid view for the selected Level 3 appears in the Main Panel.

Add Construction Data

1. Select the **Construction Details** tab in the Main Panel. You can also right-click on a level 3 site and select **Construction**.
2. To add a construction, click **New** in the Quick Access Toolbar. You can also right-click in the Construction table and select **Add New Construction Details**.
3. Click on the **Field Name** cell to assign a name to your construction parameter.
4. (Optional) Enter a value in the **Field Value** cell for that construction parameter (can be text or numeric).

5. (Optional) You can choose to specify a period over which this construction data applies. Enter a **Start Date** and **Finish Date**.
6. Click  to enter a full **Description** about your construction parameter. A comment window should appear. Enter your description. Click **OK**.
7. You can choose to attach a photo, picture or any other image file against this record. Right-click in the **Image** cell and select **Attach Image**.
8. Navigate to your file and once selected, click **Open**. A thumbnail of the saved image appears in the Image cell.
9. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Construction Details tab you will be prompted to save your changes.

Modify Construction Data

1. Click in the relevant cell(s) and change the text. Any changes will appear in italics.
2. Right-click to bring up the image context menu. You can select from several options:
   - **Add New Construction Details**: Add new construction data in a new row.
   - **Attach Image**: Attach a different image while deleting the current image from the record.
   - **Open Image**: View construction image attached with the record.
   - **Save Image As**: Download construction image to your computer.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Construction Details grid view you will be prompted to save your changes.

Delete Construction Data

1. Select the **Construction Details** tab in the Main Panel.
2. Click to check the **Delete** checkbox(es) against any construction data that you wish to delete.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Construction Details tab you will be prompted to save your changes.

Variables

DataSight can be used to record data for all types of measured parameters. In DataSight, we refer to these measured parameters as Variables. The combination of location, date, time and variable defines a unique **datum**. Additional information relating to the datum can be recorded in Metadata Variables. The combination of a datum and metedata variable(s) can be used as a qualitative or quantitative parameter of a datum, for example recording the minimum detection level of a measured parameter.

The Variables system in DataSight is extensible, meaning that an infinite number of variables or metadata variables can be added. DataSight accepts both SI and English units and data can be converted from one to the other without loss of precision.

The **All Variables** list in the Variables Panel displays all the variables in the DataSight database. These are sorted alphabetically and are applicable only to the database that is currently open.

In addition to the variable's name, other information about a variable can be captured, such as:

- Description - additional information about the variable
- Units - the unit of measurement for the variable

- CAS Number - a unique and unambiguous identifier for a specific substance that allows clear communication and, with the help of CAS scientists, links together all available data and research about that substance
- Characteristic - allow you to map a WQX characteristic to a specific Variable in DataSight
- Method Speciation - used to identify the chemical species, for example Ammonium may be measured as N or as NH_4
- Sample Fraction - a description of the portion of the characteristic being analysed

Open Data Variables from the DataSight Ribbon

- Click **Variables** in the Configure group of the DataSight Ribbon. The Variables grid view appears in the Main Panel, listing all the database data Variables.
- Alternatively, click the Variables drop-down button in the Configure group of the DataSight Ribbon, and click Variables - Data.

Open Metadata Variables from the DataSight Ribbon

- Click the **Variables drop-down** button in the Configure group of the DataSight Ribbon, and click Variables - Metadata. The Variables grid view appears in the Main Panel, listing all the database metadata Variables.

Open Data Variables from the Variables Panel

1. Click **All Variables** in the Variables Panel to highlight selection.
2. With the cursor over the highlighted box, right-click and select **Variables**. The Variables grid view appears, listing all the database data Variables.

Note	A date and time stamp is essential to the management of data within DataSight, and is given a built in variable, Datetime. This variable is not displayed in the All Variables list, but can be found in the Variables Panel. You may add additional custom datetime variables that may be deleted and edited as you wish.

See Also:

- Set Variables
- Variable Groups
- Variables Ribbon Tab

Set Variables

To create, modify or delete variables and/or metadata variables, select **Variables** in the Configure Group on the DataSight Ribbon. The Variables grid view appears listing the existing database variables.

Add a Data Variable

1. Open **data Variables** and select the **Variables** tab in the Main Panel.
1. Click **New** in the Quick Access Toolbar and a new row at the bottom of the Variable grid view will be added.
2. Click in the **Variable Name** cell to enter the variable name. This cannot be empty.
3. Click in the **Description** cell to enter a description.
4. Click in the **Units** cell to enter the unit of measurement.

5. Click in the **Characteristic** drop-down and select a characteristic from the list provided.
6. Click in the **Method Speciation** drop-down and select a method speciation from the list provided.
7. Click in the **Sample Fraction** drop-down and select a sample fraction from the list provided.
8. Click in the **CAS Number** cell to enter the CAS Registry Number identifier.
9. Select either **Data** or **Metadata** from the **Type** drop-down list.
10. Click in the **Display Format** cell to specify the format of your data.

    When a number is formatted, it is always rounded to as many decimal places as there are digit place-holders ("0") to the right of the decimal point. If the number contains no decimal point or the format is not specified, the value being formatted is rounded to the nearest whole number. Example number formats are:

    0.0 will display 3 as 3.0, 30 as 30.0

    0.00 will display 3 as 3.00, 30 as 30.00

    It is also possible to display numeric data in scientific notation.

Note	There are currently limitations on applying Display Format on very large sets of data. Scientific notation is a method of writing or displaying numbers in terms of a decimal number between 1 and 10, multiplied to the power of 10. In scientific notation, the letter E is used to mean "10 to the power of." For example, 1.314E+1 means 1.314 * 10^1 which is 13.14 . When the variable display format is set, this format is preferentially used in the Summary Reports.

11. Click **Save** in the Quick Access Toolbar or press CTRL + S at any point to save changes and continue, otherwise when you **Close** the Variables grid view you will be prompted to save your changes. Variables will appear under the **All Variables** list in the Variables Panel.

Add a Metadata Variable

1. Open **metadata Variables** and select the **Variables** tab in the Main Panel.
2. Click **New** in the Quick Access Toolbar and a new row at the bottom of the Variable grid view will be added.
3. Click in the **Variable Name** cell to enter the variable name. This cannot be empty.
4. Click in the **Description** cell to enter a description.
5. (Optional) Click the **WQX Element Tree** button () under the **WQX Element** column to display the **Select WQX Element for Metadata Variable** window.
    a. Expand the element **tree list** and click the **element** you wish to link the metadata variable to.
    b. Click **OK** to save your selection and close the **Select WQX Element for Metadata Variable** window.

    The **WQX Element Parent** and/or **Branch** columns will be filled based on your selection. These fields cannot be updated manually.
6. Click in the **Units** cell to enter the unit of measurement.
7. Click in the **Display Format** cell to specify the format of your data.
8. Click **Save** in the Quick Access Toolbar or press CTRL + S at any point to save changes and continue, otherwise when you **Close** the Variables grid view you will be prompted to save your changes. Variables will appear under the **All Variables** list in the Variables Panel.

Modify a Variable

1. Select the **Variables** tab in the Main Panel.

2. Modify the Variables as required. Any changes will appear in italics.
3. Click **Save** in the Quick Access Toolbar or press CTRL + S at any point to save changes and continue, otherwise when you **Close** the Variables grid view you will be prompted to save your changes.

Delete a Variable

1. Select the **Variables** tab in the Main Panel.
2. Click to check the **Delete** check-box(es) against any variable(s) that you wish to delete.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Variables grid view you will be prompted to save your changes.
4. Click **OK** on the **Confirm Delete/Save** window which is displayed. This displays the number of data points and which Level 3 they reside under advising you that this and related data will be deleted.

Note	If the variable that you intend to delete has associated data, a window will be displayed showing you the data which will be removed from the database.

Variable Groups

You can create a Variable Group with a **subset** of some of the Variables in the database. Variable Groups are useful in restricting the number of variables shown in the Variables Panel when you expand the group. Additionally, the Filter panel uses the Variable Groups to assist with Variable selection. This provides for quick filtering to access and review applicable data.

Note	A Variable may be allocated to only one Variable Group. DSApp Variable Groups can be easily identified in the Variables Panel.

Create a Variable Group

1. With the cursor anywhere in the Variables Panel, right-click and select **New Group**. A new Variable Group grid view will open in the Main Panel listing all Variables.
2. Tick the check box against the Variables that you wish to appear in the group. The newly selected Variables will appear in bold.
3. Click **Save** or **Save As** on the Quick Access Toolbar.
4. A Save As dialogue box appears with the name **New Variable Group**. Rename the group and click **OK**. The Variable Group will now appear in the Variables Panel.
5. **Close** the Variable Group grid view.

Rename a Variable Group

1. Right-click on a Variable Group name in the Variables Panel and select **Rename**.
2. Enter the new Variable Group name.
3. Click out of the highlighted box to save.

Modify the Variables in a Variable Group using the Variable Group grid view

1. Right-click on a Variable Group name in the Variables Panel and select **Assign Variables**. The Variable Group grid view will open in the Main Panel.
2. Select or deselect the Variables that will or will not be associated with the group. Any changes will appear in bold.

3. Click **Save**. A Save As dialogue box appears with the Variable Group name. Click **OK** to save to the same Variable Group, or you can enter a new Variable Group name and click **OK**.

Refresh Variables

- Right-click in the Variables Panel and select **Refresh**. The Variables listing will be refreshed.

Exclude from Calculation Audit

- Right-click on a Variable Group and select **Exclude from Calculation Audit**.

  Then, when the associated Variables are used in Calculations, the Collection and Processing Histories are not logged.

  This can help reduce the size of the Processing and Data Tracking back end tables in DataSight and is useful when testing data transformations and you do not wish to retain an auditable history.

  See also Perform a Calculation.

Note	Any Variables in a Variable Group excluded from Calculation Audit cannot be Locked. The locking mechanism requires access to a Process History record.

Add Variables to an existing Variable Group within the Variables Panel

1. Open the **All Variables** tree list in the Variables Panel.
2. With the cursor over a Variable, right-click and select **Add Into**.
3. Select the Variable Group to which this Variable will be added.
4. Right-click on the Variables Panel and select **Refresh**.
5. Open the Variable Group to see the newly added Variable.

Delete Variables from a Variable Group within the Variables Panel

1. Open the Variable Group tree list in the Variables Panel.
2. With the cursor over a Variable, right-click and select **Delete**.
3. Right-click on the Variables Panel and select **Refresh**.
4. Open the Variable Group to see the deletion. The deleted Variable will still be available in the **All Variables** listing.

Delete a Variable Group

1. Right-click on a Variable Group name in the Variables Panel and select **Delete**.
2. A confirm delete dialogue box will appear. Click **OK** to continue. The Variable Group will be removed from the Variable panel.

See also:

- Variables Panel

Variables Ribbon Tab

When the Variables panel is open, the Variables Ribbon Tab can be found next to the Home tab in the DataSight Menu Panel.

Several commonly used Variable functions are given on the grouped ribbon tab when the Variable panel is focused in the Main Panel.

Group	Property	Function
Show/Hide	Show Indicator	Show or Hide the Variable indicator column.
	Show Group Panel	Show or Hide the Group Panel.
Filtering	Filter by Variable Group	Filters the displayed Variables to show only the Variables assigned to the selected Variable Group.
Variable Type	Data	Filters the displayed Variables to show only the Variables assigned to the Data Variable Type.
	Metadata	Filters the displayed Variables to show only the Variables assigned to the Metadata Variable Type.

See also:

- Set Variables
- Variable Groups
- Tabs on the Ribbon

DSApp

DSApp pages are customizable and flexible in design. Using existing DataSight functionality, you are able to configure all parts of the data flow between DSApp on your mobile device and your DataSight database.

To use DSApp, you need to configure the following elements within DataSight.

1. Create or update your Manual Data Entry Templates to assign the Variable(s) and Level(s) you wish available within DSApp.
2. Set Variable Groups and Variables used with DSApp, or use the default configuration.
3. Set Standards used with DSApp.
4. Update the schedule of the 'Generate DSApp Report' automated report task used to publish and upload the DSApp Report file to your FTP Server. The default schedule is set to run once per hour.
5. Update the filter on your 'DSAppDatasheet' datasheet saved view to define what data you would like available to view within DSApp. The default filter exports the last seven days of data.
6. Update the schedule of the 'Generate DSApp Datasheet' automated datasheet task used to export data for viewing in DSApp. The default schedule is set to run once per hour.
7. Update the schedule of the 'Import DSApp Data' automated import task used to import DSApp files. The default schedule is set to run once per hour.
8. Run the 'Generate DSApp Report' and 'Generate DSApp Datasheet' Tasks to generate the 'DSAppReport' and 'DSAppDatasheet' data files required by DSApp.

Note	The default settings for the Saved Views and automated Tasks used to link DSApp to your DataSight database can be found in the Link DSApp topic.

	The 'DSAppReport' saved view report and the 'Generate DSApp Report' automated Task are required by DSApp and should not be renamed or modified (except for updating the schedule on the automated task). Other Tasks and Saved Views generated in the default set can be customised once linkages are understood.

To be able to configure all DSApp elements in DataSight, users would require the following DataSight application permissions.

Permission	Execute	View/Use	Create	Modify	Delete
Datasheets		Y	Y	Y	As required
Manual Data Entry	Y				As required
Manual Data Entry Templates		Y	Y	Y	As required
Saved Views		Y	Y	Y	As required
Standards		Y	Y	Y	As required
Tasks		Y	Y	Y	As required
Variable Groups		Y	Y	Y	As required
Variables		Y	Y	Y	As required

The simplest permissions that a user could be given to modify DSApp pages include:

- Modify Saved Views - to update the default filter on the linked datasheet used to View Data in DSApp.
- Modify MDE Templates - to restrict the Levels and Variables in an MDE Template created for DSApp Collect Data pages.

See also:

- DSApp
- Getting Ready for DSApp
- Collect Data
- DSApp Import
- MDE Templates and DSApp
- Link DSApp
- Report Designer
- Automatically Import DSApp Files
- Automatically Publish Reports

Collect Data

Once the Default DSApp Configuration has been created for your database, then you can then begin to further customize your configuration(s).

From the Configure Group on the DataSight Ribbon, you can make changes to the default settings for Data Collection in DSApp.

DSApp data collection is organized into the following pages.

- Safety
- Sampling

- Variable Data
- Equipment Calibration
- Construction
- On Departure

Excluding the mandatory Safety page, these pages are viewable or not when using DSApp, as customized within DSApp itself.

Elements of each DSApp page can be controlled and customized within DataSight itself, as Variable Groups and MDE templates.

- Safety page - allows the user to enter data into customisable fields, with the Variables displayed defined by the Safety and Hazard DSApp Variable Groups, and the type of response allowed defined by the Variable's Response Type. Data entered is recorded as Variable values within the primary data table in DataSight, and is viewable in a datasheet.
- Sampling page - allows the user to capture information relating to samples being collected. Data entered is recorded as Variable values within the primary data table in DataSight, and is viewable in a datasheet.
- Data Entry page - is broken into the On Arrival and Manual Data Entry (MDE) sections, with the data entered recorded as Variable values within the primary data table in DataSight, and is viewable in a datasheet.
    - On Arrival section - allows the user to enter data into customisable fields, with the Variables displayed defined by the On Arrival DSApp Variable Group and the type of response allowed defined by the Variable's Response Type.
    - MDE section - allows the user to enter data into alphanumeric text fields, with the Variables displayed defined by the MDE Template selected. If a Standard has also been selected in DSApp, data entered in the MDE section is validated against the Standard and highlighted accordingly.
- Equipment Calibration page - allows the user to record information relating to calibrating equipment, such as the results of the calibration and when the next calibration is due. Data entered is saved as a Calibration Record in the Equipment section within DataSight.
- Construction page - allows the user to record information relating to the level's construction, such as when the site was installed, and can include a photo. Data entered is saved in the Level 3 Construction Details section within DataSight.
- On Departure page - allows the user to enter data into customisable fields, with the Variables displayed defined by the On Departure DSApp Variable Group, and the type of response allowed defined by the Variable's Response Type. Data entered is recorded as Variable values within the primary data table in DataSight, and is viewable in a datasheet.

Open DSApp from the DataSight Ribbon

- Click **DSApp** in the Configure group of the DataSight Ribbon. The DSApp Variables view appears in the Main Panel, displaying the DSApp Variables Groups at the top, and the Variables assigned to the selected Variable Group below.
- Alternatively, Click **DSApp** in the Configure Group of the DataSight Ribbon, and select **DSApp Variables Groups** from the drop down list. The DSApp Variables view appears in the Main Panel view appears in the Main Panel.

See Also:

- DSApp Variable Groups
- DSApp Variable Mapping
- DSApp Variable Response Types
- MDE Templates and DSApp

5.3.1.1 DSApp Variable Groups

DSApp Variable Groups have been designed as follows:

- Each DSApp Variable Group corresponds to a similarly named section within DSApp.
- For Variables to be available within these sections in DSApp, they must be assigned to one of the Safety, Hazard, On Arrival or On Departure DSApp Variable Groups.
- The top-down order that Variables appear in a DSApp Variable Group is the order in which they will be displayed in DSApp.
- The Safety, Hazard, On Arrival and On Departure sections are populated by responses relating to generic tasks being performed while capturing data in the field.
- You can choose from a range of responses such as alphanumeric text entry, Yes/No responses or even selection from a pre-defined list.
- The Variables and Response Types available in these sections within DSApp can be completely tailored to your organisational needs.

Note	Changes made to DSApp Variables, Variable Groups or Manual Data Entry Templates will not be reflected within DSApp until the 'Generate DSApp Report' automated Task has been run and the report file updated in DSApp. Prior to implementing DSApp functionality within your database, ensure that you have run all of the database upgrades available. See the Database Upgrades topic in DataSight Administrator.

Rename a Variable Group or Group Header Text

To make changes to a Variable Group or Variable Name, Header Text or Units, perform the following steps:

1. Select the **DSApp Variables** tab in the Main Panel.
2. Click within any of the **Name** or **Group Header Text** fields in the Variable Group grid-view and **make changes** as required.
3. Click within **another cell** in the grid-view to save any changes made.

Note	The Variable Group Type is set and cannot be changed by the user. It is used to map the Group to the correct pages in DSApp. Please keep this is mind when you customize names. DSApp Variable Groups can be easily identified in the Variables Panel.

5.3.1.2 DSApp Variable Mapping

Making and saving changes made to Variables mapped to a Variable Group is performed using the record navigation bar located at the bottom of the Variables grid-view.

The buttons available on the record navigation bar consist of:

- ⏮ First Record.
- ⏪ Previous Page.
- ◀ Previous Record.
- ▶ Next Record.
- ⏩ Next Page.
- ⏭ Last Record.

- + Append.
- − Delete.
- Edit.
- ✓ End Edit.
- ✖ Cancel Edit.

Add or Remove Variable

1. Select the **DSApp Variables** tab in the Main Panel.
2. To add a Variable:
   a. Click the **Append** button on the record navigation bar in the Variables grid-view.
   b. **Enter** the Name, Variable Header Text and Units for the Variable.
   c. Click the **Response** drop-down list and **select** a Response Type.
      i. If you selected PICKER, the Choose Picker Items window will appear.
      ii. Click the Items field and **enter** the text to be displayed to the user for selection. This is also the text which will be recorded as the Variable's value in DataSight.
      iii. (Optional) Click the **Append** button on the record navigation bar to add another Item to the list.
   d. Click **OK** to save your responses and close the Choose Picker Items window.
2. To remove a Variable:
   a. Click to select the **Variable** to be removed. Alternatively, click the **Next** or **Previous** record navigation button until the Variable to be removed is selected.
   b. Click the **Delete** button on record navigation bar.
3. Click **OK** on the confirm dialog box to remove the selected Variable, or click Cancel.

Modify Variable Text

1. Click within any of the **Name**, **Variable Header Text** or **Units** fields in the Variables grid-view and **make changes** as required.
   a. Click within **another cell** in the grid-view to save any changes made, or click the **End Edit** button on the record navigation bar.

5.3.1.3 DSApp Variable Response Types

Response Types allow you to define how data is recorded in DSApp by the user.

The Response Types available include:

- PICKER - allows the user to select a response from a customised list. This is displayed as a drop-down list labelled with the Variable's Description.
- Y/N - allows the user to select a response recorded as 'Yes' or 'No'. This is displayed as a button labelled with the Variable's Name. If a Description is entered, it will be displayed as a label above the button.
- TEXT - allows the user to enter alphanumeric text. This is displayed as an alphanumeric text entry field labelled with the Variable's Name, or if set, its Description.

- CONDITION-YES and CONDITION-NO - allows the user to select a response recorded as 'Yes' or 'No', and determines whether the Variables listed below it are visible to the user based on their response. This is displayed as a drop-down list labelled with the Variable's Description.
  - If CONDITION-YES is used and the user selects 'Yes', then the Variables below this Response Type in the Variables for 'GROUP NAME' grid-view will be displayed to the user, down to the next CONDITION-YES or CONDITION-NO Response Type. If the user selects 'No', then the Variables below this Response Type remain hidden to the user.
  - If CONDITION-NO is used and the user selects 'No', then the Variables below this Response Type in the Variables for 'GROUP NAME' grid-view will be displayed to the user, down to the next CONDITION-YES or CONDITION-NO Response Type. If the user selects 'Yes', then the Variables below this Response Type remain hidden to the user.
- LABEL - allows you to display information to the user in the form of a label. The Variable's Description is displayed as the text for the label.

Set a Variable's Response Type

To set a Variables Response Type, or update the PICKER items:

1. Select the **DSApp Variables** tab in the Main Panel.
2. Click the Variable's Response Type drop-down list and **select** a response as required.
   a. If you selected PICKER, the Choose Picker Items window will appear. If PICKER was already selected, click **...** to open the Choose Picker Items window.
      i. Click the Items field and **enter** the text to be displayed to the user for selection. This is also the text which will be recorded as the Variable's value in DataSight.
      ii. (Optional) Click the **Append** button on the record navigation bar to add another Item to the list.
   b. Click **OK** to save your responses and close the Choose Picker Items window.
3. Click within **another cell** in the grid-view to save any changes made, or click the **End Edit** button on the record navigation bar.

5.3.1.4 Open MDE Templates

Manual Data Entry Templates are used to dynamically push level and variable lists to DSApp via the DSApp Report.

When MDE Templates have assigned Levels and Variables, they appear in the DSApp MDE Templates sub menu.

Open DSApp MDE Templates from the DataSight Ribbon

1. Click **DSApp** in the Configure Group of the DataSight Ribbon, and navigate to **MDE Templates**.
2. Select an MDE Template from the sub-menu MDE Template listing.
3. The Manual Data Entry form appears.

See Also:

- MDE Templates and DSApp

Organisation

The Organisation drop-down menu allows you to configure and enter information about your organisation, the projects you undertake, the activities conducted for those projects, as well as allowing you to view and update elements relating to the WQX for your organisation. The majority of the information captured in these areas has been designed in relation to the United States Water Quality Exchange (WQX) network requirements, but can be customised as required.

The Water Quality Exchange (WQX) is a framework that allows states, tribes and other data partners in the United States to submit and share water quality monitoring data via the web to the Water Quality Portal. WQX uses the technology, standards and protocols of the National Environmental Information Exchange Network, or Exchange Network, to provide a means for data partners to share water quality monitoring data to the Water Quality Portal. WQX is not a distributed database, but rather a standard set of data elements that all data partners map to in order to share data.

Data loaded into WQX Web must be properly formatted in order to be able to submit data to the WQX. DataSight has been designed to allow you to correlate the data within your DataSight database with the WQX's Schema and Domain Lists, which will enable you to prepare your data in DataSight and then export data files which are ready to be submitted to the WQX. States, tribes and others who store water quality data in DataSight can now submit data directly to the publicly accessible Water Quality Portal using the WQX framework. Further information about the WQX can be found at https://www.epa.gov/waterdata/frequent-questions-water-quality-exchange-wqx

You can visit the Water Quality Exchange Template Files page to identify the correct template for your data, providing guidance on how data is to be formatted.

To open the **Organisation Details**, **Projects**, **Allowable Values**, or **Activity Tree** windows in the main panel, simply click the **Organisation** drop-down button from the **Configure** group on the Main Ribbon Menu. Clicking the **Organisation** button itself will open the **Organisation Details** window in the main panel.

See also:

- Organisation Details
- Projects
- Allowable Values
- Activity Tree

Organisation Details

Organisation Details allows you to enter information relating to your organisation. The information you can record includes:

- Identifier - used to uniquely identify your organisation (please ensure you liaise with WQX to ensure that your identifier is unique within WQX)
- Formal Name - the legal designation of your organisation
- Description - further information about your organisation or used to describe your organisation
- Tribal Code - a code that represents the American Indian tribe or Alaskan Native entity relevant for your organisation
- Contact details in the form of :
  - Electronic Address - email contact, internet, or other file addresses accessible online via the world wide web
  - Telephone Contact - contact telephone numbers for your organisation
  - Address Contact - the physical address of your organisation

Open Organisation Details

1. Click the **Organisation drop-down** button on the **Configure** group of the main ribbon menu, then click on **Organisation Details**. The **Organisation Details** grid-view will open in the main panel.

Enter or change Identifier, Formal Name, or Description

1. Click within any of the **Identifier**, **Formal Name**, or **Description** input field within the **Organisation Details** grid-view in the main panel.
2. Make **changes** as required.
3. Click the **Save** button from the **Quick Access Toolbar**.

Enter or change Tribal Code

1. Click within the **Tribal Code drop-down** to open the list of available options.
2. Find and **click to select** the desired Tribal Code from the list. Your Tribal Code has been updated as per your selection.
3. Click the **Save** button from the **Quick Access Toolbar**.

Add an Electronic Address, Telephone Contact, or Address Contact

1. Click either the **Electronic Address**, **Telephone Contact**, or **Address Contacts** tabs to select the desired item.
2. Click the **New** button from the Quick Access Toolbar, or alternatively, click the **New** button located directly right of the tab buttons. A new row is added to the relevant grid-view.
3. Click within each **field** for the new row and **enter or select** the contents as required.
4. Click the **Save** button from the **Quick Access Toolbar** to save the information entered.

Change or update an Electronic Address, Telephone Contact, or Address Contact

1. Click either the **Electronic Address**, **Telephone Contact**, or **Address Contacts** tabs to select the desired item.
2. Click within each **field** for the row requiring changes to be made, and **update** the contents as required.
3. Click the **Save** button from the **Quick Access Toolbar** to save the information entered.

Remove an Electronic Address, Telephone Contact, or Address Contact

1. Click either the **Electronic Address**, **Telephone Contact**, or **Address Contacts** tabs to select the desired item.
2. Click the check box under the **Delete** column for the row(s) required to be removed.
3. Click the **Save** button from the **Quick Access Toolbar** to delete the selected row(s) and save any other changes entered.

Projects

A project is generally an environmental data collection effort that has a stated purpose and puts a series of samples and results into a meaningful context, or typically refers to a water monitoring project with specific objectives and procedures. Within the context of WQX, a project is an entity created to group monitoring data for a variety of reasons. A project may represent an actual monitoring project, a source of funding (or program), or a department or group within the organisation who is interested in a specific set of data.

Each project within DataSight consists of:

- Project Identifier - used to uniquely a project within the context of the organisation
- Project Name - name of the project as assigned by the organisation
- Project Description - additional information about the project, such as its purpose, summary of objectives, or a brief summary of the results of the project

- Sampling Design Code - a code used to identify the type of sampling design employed for the project to ensure that sampling activities can support project objectives
- QAPP Approved Indicator - indicated whether a Quality Assurance Project Plan (QAPP) has been approved for the submitted project
- QAPP Approval Agency Name - an outside approval authority identifier for the QAPP, such as the United Stated EPA or other State Organisation
- File Attachment - a reference document or file relating to the project as well as information used to describe the object
- Project Monitoring Locations - describes the probability weighting information for a given Project / Monitoring Location Assignment

Open Projects

1. Click the **Organisation drop-down** button on the **Configure** group of the main ribbon menu, then click on **Projects**. The **Projects** grid-view will open in the main panel.

Add a Project

1. Click the **New** button from the **Quick Access Toolbar** to add a new row to the Project grid-view.
2. Click within the **Identifier** field and type in a Project Identifier.
3. Click the **Save** button from the Quick Access Toolbar to save the information entered.
4. Click the **Open Details** button to display the **Edit Project** window.
5. In the **Edit Project** window:
    a. (Optional) Click within the **Description** field in the Project Details section and type in a Project Description.
    b. (Optional) Click the **Sampling Design Type** drop-down menu in the **Project Details** section and **click to select** an option from the list available.
    c. (Optional) Click the **Open** button in the **Project Binary Object** section to display the **File Open** dialog and **select** a file to be added to the project, such as an approved QAPP.
    d. (Optional) Click the **QAPP Approved** check-box in the **QAPP Approval Status** section if the project has an approved Quality Assurance Project Plan.
    e. (Optional) Click within the **Agency** field in the **QAPP Approval Status** section and type in the QAPP Approval Agency Name.
    f. (Optional) Within the **Monitoring Locations** section, **click the check-boxes** next to the Level 1, Level 2, or Level 3 locations where monitoring for this project will be taking place.
    g. Once you have entered all your desired information, click the **OK** button to close the **Edit Project** window.
6. Click the **Save** button from the **Quick Access Toolbar** to save the information entered.

Edit a Project

1. Click the **Open Details** button to display the **Edit Project** window.
2. Within the **Edit Project** window, **make changes** as you would when adding a project.
3. Click the **OK** button to close the **Edit Project** window.
4. Click the **Save** button from the **Quick Access Toolbar** to save the changes made.

Delete a Project

1. Click the **check-box** under the **Delete** column for the row(s) you would like to delete.
2. Click the **Save** button from the **Quick Access Toolbar**.
3. Click **Yes** on the **confirmation dialog** displayed asking you to confirm deletion of the row(s).
4. Alternatively, click **No** to cancel deletion of the row(s).

Allowable Values

The WQX Schema defines the structure of data that can be submitted to the WQX, and is used in combination with the Domain Lists to define lists of allowable values which can be entered where data must be a specific value or selected from a list of pre-defined values. The WQX provides the domain lists for download in ZIP, XML, or CSV format. They can be downloaded either in full, or individually as required. Using DataSight Administrator, you can automatically download the full domain lists (or manually download individual domains) and import these into your DataSight database. Steps on how to perform these actions are listed in the DataSight Administrator help guides. While the schema and domain lists have been designed and provided by the United States EPA and WQX, DataSight has been designed to allow customisation of this information to allow organisations to enter and record information relevant to the projects and activities they are undertaking. The level of customisation is limited to adding, changing, or removing, allowed values from domain lists. You cannot alter the WQX schema itself.

The United States EPA makes available domains of WQX data elements for both submission and retrievals. Domains are publicly accessible to assist others in conforming to a consistent nomenclature, and consist of:

- Characteristic domain values use the USEPA's Substance Registry System (SRS)
- Taxon domain use the Integrated Taxonomic Information System (ITIS) and the ITIS Catalogue of Life as the credible source for regulating taxa names
- Analytical Method domain values use the National Environmental Methods Index (NEMI) as the credible source for regulating Analytical Method IDs

The Allowable Values panel shows an expandable tree-list of the WQX Schema on the left-hand side, with a Properties and Domain Value List section on the right-hand side. When selecting an item from the tree-list, its properties will be displayed in the Properties section, which include its name, its data type (Text Field or Domain List), and the list of allowed Domain Values if it is a Domain List data type.

Open Allowable Values

1. Click the **Organisation drop-down** button on the **Configure** group of the main ribbon menu, then click on **Allowable Values**. The **Allowable Values** window will open in the main panel.

Add an Allowable Value to a Domain List

1. Using the tree-list, **navigate to and select** an item which is of a **Domain List** data type.
2. In the **Domain Values List** section, click the **New** button (or click **New** from the **Quick Access Toolbar**). A new row will be added to the Domain Value List.
3. Click within each **cell** for the newly added row in the **Domain Value List** grid-view and **enter details** as required.
4. Click the **Save** button (or click **Save** from the **Quick Access Toolbar**).

Alter an Allowable Value in a Domain List

1. Using the tree-list, **navigate to and select** an item which is of a **Domain List** data type.
2. In the **Domain Values List** section, **find the Domain Value(s)** you wish to alter.
3. Click within each **cell** and **update details** as required.
4. Click the **Save** button (or click **Save** from the **Quick Access Toolbar**).

Delete an Allowable Value from a Domain List

1. Using the tree-list, **navigate to and select** an item which is of a **Domain List** data type.
2. In the **Domain Values List** section, **find the Domain Value(s)** you wish to remove.
3. Click the **check-box(es)** under the In the **Domain Values List** section, **find the record(s)** you wish to alter. column for Domain Value you wish to remove.
4. Click the **Save** button (or click **Save** from the **Quick Access Toolbar**).

Activity Tree

The Activity Tree allows you to view your Projects and Activities. An activity is a general term for a field sampling event that produces one or more results or metrics. In the context of WQX, an activity tracks the location, date, and time of the sample or field measurement, as well as the equipment and methods used to collect, transport and store the sample.

The Activity Collection Tree displays a tree list on the left-hand side and a properties section on the right-hand side. Selecting an item from the tree list will display its properties and other related information. Properties and information displayed can be edited as required, allowing you to directly update information about activities conducted. The root element of the tree list is your organisation, with child elements being each project. Under each project are the Levels where activities for the project have been recorded. Similar to the Levels Panel, each Level has year, month, and date children underneath to help group activities by the date on which they occurred. Activities are are listed under the date on which they occurred, and are represented by their Activity ID.

Each activity must have its own Activity ID, which is used to identify it in the WQX, and must be unique within your organisation. Accidentally re-using an Activity ID when uploading data to the WQX will result in existing data being overwritten. Generally organisations have defined an Activity ID as being a combination of the location, date, and type of activity. For example, a lab sample collected on 4th May 2023 at "BearRiver1" for lab data might have an ID of "BearRiver1-20230504-L". A field measurement and observation at the same location and date might have an ID of "BearRiver1-20230504-FM" where FM represents field measurement data.

DataSight automatically generates an Activity ID for you using the Level 3 ID, Level 3 Name, date, time, and type of activity. For the above example if the Level 3 ID for BearRiver1 was 1234 and the lab sample was collected at 14:25pm, the ID would be generated as "L1234-BearRiver1-20230504-142500-L". Underneath each Activity ID are the elements containing information about the activities description, location, date, time, equipment, results, and methods used to collect, transport and store the sample. Each element may also have elements underneath them, within which you can capture additional metadata about the element and activity being conducted.

Activities are created during the Import Routine when importing data files manually, using an automated import Task, or when using the Manual Data Entry tool.

Open Activity Collection Tree

1. Click the **Organisation drop-down** button on the **Configure** group of the main ribbon menu, then click on **Activity Tree**. The **Activity Collection Tree** will open in the main panel.

Edit an Activity

1. Expand the **Activity Collection Tree** and find the **activity** you wish to edit.
2. Expand the **activity**, and then find and click the **element** you wish to update. The elements properties are displayed in the properties section on the right, along with any Metadata elements available.
3. Click within the **properties' cell** on the right you wish to update, and **make changes** as required.
4. (Optional) Depending on which element you have selected, you may also add Metadata information to the element.
   a. In the Metadata section underneath the elements properties, click the **Add** () button next to the **Metadata element** you would like to add. The activity tree will expand and the selected Metadata element will be added to the tree and selected for you.
   b. Alternatively, in the activity tree underneath an element there is an **'Add Metadata Element'** item which you can **click** to also add a Metadata element to the selected element.
   c. Click within the **properties' cell** on the right you wish to update, and **make changes** as required.
5. (Optional) Metadata elements you have added manually, or which are not required by the WQX can be removed from an activity.
   a. Click the **element** in the activity tree to select it.
   b. Click the **Delete** button located in the **Metadata** section underneath the element's properties.
   c. Click **Yes** on the delete **confirmation dialog** to remove the element or Metadata element from the activity.
6. Once you have updated, added, or removed the information and elements required for the activity, click the **Save** button to save your changes (or click **Save** from the **Quick Access Toolbar**).

Person

Any person who has been involved in the collection of data can be entered into your database using the Person grid view.

The association of personnel and equipment upon import with your data records will allow you to identify who captured your data, what hardware has been used to obtain your data, and then to filter your dataset by these properties.

Open Person from the DataSight Ribbon

- Click **Person** in the Configure Group of the DataSight Ribbon. The Person grid view appears in the Main Panel listing all the personnel recorded.

See also:

- DataSight User Interface
- System Defined Collection

Set Personnel

Add a Person

1. Select the **Person** tab in the Main Panel.
2. To add a person, click **New** in the Quick Access Toolbar and a new row at the bottom of the Person table will be added.
3. Click the **Active** checkbox to identify whether a Person is currently active. When inactive, this record will not display in drop-down menus during Import and Manual Data Entry (MDE).

4. Click in the **Name** cell and enter the person's name.
5. Click in the **Organisation** cell and add their organisation name.
6. Click in the **Role** cell and add the person's role.
7. Click **Save** in the Quick Access Toolbar.

Modify a Person

1. Select the **Person** tab in the Main Panel.
2. Modify the person(s) as required. Any changes will appear in italics.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Person tab you will be prompted to save your changes.

Delete a Person

1. Click anywhere in the row for that person.
2. Click to check the **Delete** checkbox(es) against any person(s) that you wish to delete.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Person tab you will be prompted to save your changes.

Note	Personnel information is able to be attached to data when it is being imported and when data is being entered into a datasheet using Manual Data Entry. You are not able to delete a person if they are attached to data in the database. You will need to remove that data to remove this person from the Person grid view.

Equipment

The type of equipment used to capture the data can be entered into the Equipment grid view in your database.

The association of personnel and equipment upon import with your data records will allow you to identify who captured your data, what hardware has been used to obtain your data, and then to filter your dataset by these properties.

Open Equipment from the DataSight Ribbon

- Click **Equipment** in the Configure Group of the DataSight Ribbon. The Equipment grid view appears in the Main Panel listing all the equipment recorded.

See also:

- DataSight User Interface
- System Defined Collection

Set Equipment

Add a Piece of Equipment

1. Select the **Equipment** tab in the Main Panel.
2. To add equipment, click **New** in the Quick Access Toolbar and a new row at the bottom of the Equipment table will be added.
3. Click the **Active** checkbox to identify whether the Equipment is currently active. When inactive, this record will not display in drop-down menus during Import and Manual Data Entry (MDE).

4. Click in the **Equipment Name** cell and enter the name of the equipment.
5. Click in the **Serial Number** cell and enter the details.
6. Click **Description** and enter your text.
7. Click **Save** in the Quick Access Toolbar.

Modify your Equipment

1. Select the **Equipment** tab in the Main Panel.
2. Modify one or more rows of the equipment data as required. Any changes will appear in italics.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Equipment tab you will be prompted to save your changes.

Delete a Piece of Equipment

1. Click anywhere in the row of the piece of equipment you wish to delete.
2. Click to check the **Delete** checkbox(es) against any equipment(s) that you wish to delete.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Equipment tab you will be prompted to save your changes.

Note	Equipment information is able to be attached to data when it is being imported and when data is being entered into a datasheet using Manual Data Entry. You are not able to delete equipment if it is attached to data in the database. You will need to remove that data to delete the equipment from the Equipment grid view.

See also:

- Equipment Calibration

Equipment Calibration

The Equipment Calibration window can be used to add calibration details required for the equipment, such as calibration dates, together with comments.

Open the Calibration window

- Select the Edit Calibration button  in the equipment row against which you wish to enter calibration data. The Calibration window appears.

Add a Calibration

1. Select the Edit Calibration button  in the equipment row for entry of its calibration details. The Calibration window will appear.
2. Click the **Add** button to insert a new calibration row.
3. Click in the **Calibration Date** cell and enter the date of the equipment calibration (required).
4. Click in the **Next Calibration Date** cell and enter the date of the next calibration for this piece of equipment (optional).
5. Click  against the Comment cell. This will open up a Detail window. Enter any commentary about your calibration here.

6. Then click **OK**.
7. To save and continue editing the Calibrations, click **Save** in the Quick Access Toolbar. Then click **Close** when you are done.
8. To save and close the Calibrations window, click **Save**.

Modify a Calibration

Method 1

1. Within the Calibrations window, modify the calibration details as required. Any changes will appear in italics.
2. To save and continue editing the Calibrations, click **Save** in the Quick Access Toolbar. Then click **Close** when you are done.
3. To save and close the Calibrations window, click **Save**.

Method 2

1. Click  against the Comment cell of a calibration row. A comment window will open.
2. Modify the calibration details as required. To save your changes, click **OK** in the comment window.
3. To save and close the Calibrations window, click **Save**. Then click **Close** when you are done.

Delete a Calibration

1. Click to check the **Delete** checkbox(es) against any calibration(s) that you wish to delete.
2. To save and continue editing the Calibrations, click **Save** in the Quick Access Toolbar. Then click **Close** when you are done.
3. To save and close the Calibrations window, click **Save**.

Note	If you have made any changes to your calibration data, before selecting **Close**, you will be prompted to save your changes.

Standards

DataSight's Standards feature can be used to generate certain user-defined guidelines, standards or criteria against which **data can be checked**. DataSight's Standards assumes that you have a range of permissible data values, and that data outside this range needs your attention.

Standards can be used in several places in DataSight including:

- Import, where raw data can be checked against the user-defined limits.
- When viewing data in the datasheet.
- During reporting.

You can associate any number of Variables with a Standard and the minimum and maximum limits can be defined for each Variable.

It is also possible to grant or deny **permission** to modify standards.

Open Standards

- Click **Standards** in the Configure Group on the DataSight Ribbon. The Standards grid view appears in the Main Panel.

See also:

- Permissions
- Set Standards
- Apply Standards

Set Standards

To create, modify or delete standards, select **Standards** on the DataSight Ribbon. The Standards grid view appears listing existing Standards, and the Standards you have created or modified.

Add a Standard

1. Select the **Standards** tab in the Main Panel.
2. To add a standard, click **New** in the Quick Access Toolbar and a new row at the bottom of the Standards list will be added.
3. Click in the **Standard Name** cell and enter the name of the standard.
4. If you wish to apply a range of dates over which the standard is active, enter the **Start Date** and **End Date**. Without Start and End Dates, the Standard can be applied over any date range.
5. Click the **Visible** check box to indicate whether the Standard should be Visible for application to datasheets.
6. Click **Save** in the Quick Access Toolbar. You must save the row to set the standard variables and limits.

Set the Standard Variables and Limits

1. Select the Edit Variables button  in the standard row to set the standard variables and their limits. The Standards window will appear.
2. Enter further information about the standard in **Details**.
3. Click **Add** to add a Variable to the standard.
4. Use the drop down Variable list to select your Variable.
5. Enter the appropriate **Maximum** and **Minimum** values.
6. Repeat the process for additional variables.
7. Click **Save**.

Modify a Standard

1. Select the **Standards** tab in the Main Panel.
2. Modify the standard name or period of applicability as required. Any changes will appear in italics.
3. Select the Edit Variables button  in the standard row to set the standard variables and their limits. The Standards window will appear.
4. Change the Standard details, variables and their minimums and maximums as required.
5. Click **Save** to save and close the Standards window.
6. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Standards tab you will be prompted to save your changes.

Delete a Standard

1. Click on the Standard row you would like to delete.
2. Click to check the **Delete** checkbox against the row.
3. Repeat for any number of Standard rows you wish to delete.
4. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Standard tab you will be prompted to save your changes.

Note	Standard Variable minimums and maximums can be left blank. After creating or deleting a standard, please close your datasheets and re-open them to apply from an updated list of standards.

See also:

- Apply Standards

Flags

DataSight Flags can be used to assign and **visually identify** data for quality coding or quality assurance purposes. Flags are user-defined **subjective** categories, that are database specific and can be used to:

- Communicate to multiple stakeholders the quality of data, or the progression of the data through a customised work-flow.
- Highlight datasets by colour-coding particular data entries.
- Filter data to refine datasets on predetermined values or conditions by applying the flags.

DataSight flags have two components. This allows you to have qualified subsets of a general flag category. For example:

Flag Name	Quality
Archived	
Historical External	
Raw Data	
Requires Review	
Reviewed	Poor Quality
Reviewed	Good Quality

The categories should be developed in conjunction with all database stakeholders.

It is also possible to grant or deny **permission** to modify flags.

Flags can be assigned to data:

- Within the Datasheet.
- With the Graphical Flagging interface.
- During calculations in the Calculation Tool.

You can apply flags through visual inspection, via calculations and with formal search criteria, and then include or exclude the flagged data from calculations, charts, and export files.

Open Flags

- Click **Flags** in the Configure Group on the DataSight Ribbon. The Flags grid view appears in the Main Panel.

See more

- Permissions
- Set Flags
- Flag Data
- Graphical Flagging

Set Flags

To create, modify or delete Flags, select **Flags** on the DataSight Ribbon. The Flags grid view appears listing the existing database flags.

Add a Flag

1. Select **Flags** tab in the Main Panel.
2. Click **New** on the Quick Access Toolbar. The Flag window appears.
3. Enter the **Flag Name** in the text box.
4. Enter the **Index** number to assign to this flag. The Index number must be a value between 1 and 32,767 and must be unique. Once set, the Index number cannot be changed.

   The Index is used to number flags and is useful when filtering data according to flag indices in the datasheet or flagging data during a calculation (See Flag During a Calculation for more details).
5. Enter a more detailed description of the Flag in **Purpose**.
6. Assign a Flag **Colour**. This colour is used to colour the cell of the flagged data in the Datasheet.
7. When you are satisfied with the selection, click **Save**. The new flag will be added to the Flags grid view.

Modify a Flag

1. Select the Edit button  in the flag row to be modified. The Flag window appears.
2. Within the Flag window, modify the flag as required.
3. Click **OK**.

Delete a Flag

1. Select the flag you wish to delete and click the **Delete** checkbox.
2. Click **Save** on the Quick Access Toolbar. The flag will be removed from the Flags grid view.

Add Quality to a Flag

1. Select the flag you wish to associate a quality control code or method with.
2. Select the Edit button  in the flag row to be modified or double-click in the quality field.
3. Enter the **Quality** information.
4. Click **OK**.

See also:

- Flag Data

References

DataSight References are used to encode a relationship between a Variable and a specified Value. These Values can be referred to by different modules of DataSight.

The Variable assigned within the Reference is typically used to define the purpose of the Reference. You may create Variables for use only within References which are not specifically related to your primary data set e.g. Pi.

Level, Equipment and Period can be assigned to a Reference to further refine its use and applicability.

At present, References will be used for one of two purposes:

- To apply a Reference value in a Calculation. Examples of the latter include:
  - Record and apply equipment calibration (or Variable) offsets in complex formulae
  - Compare data against reference values in a Calculation and assign Flags according to the outcome
  - Record Global constant values that can be referenced in complex formulae
- To provide alternate Variable names in a datasheet or upon data export.

By assigning values to References, you only need to update the Reference's value for the change to be easily updated across templates and reports.

Note	Future improvements will further facilitate the use of References in lieu of Standards as well as allow for alternate Level names.

A Reference consists of the following fields:

- ID (required) - A sequentially allocated unique identification number for the Reference.
  - Populated automatically by DataSight when creating a Reference, and cannot be altered by the user.
- Reference Name (required) - User defined name for the Reference.
- Level 1, Level 2 or Level 3 (optional) - The Level(s) that the Reference is/are assigned to.
  - Populated automatically when creating a Level-Specific Reference, otherwise these are empty (Global Reference) and cannot be altered.
- Variable (optional) - The Variable that is assigned to the Reference.
- Equipment (optional) - The Equipment that is assigned to the Reference.
- Comment (optional) - User entered comments for the Reference.
- Start Date (optional) - The indicative date the Reference is applicable from, inclusive. Reference Start and End Dates are indicative only and are not used elsewhere in DataSight.
- End Date (optional) - The indicative date the Reference is applicable until, inclusive.
- Criteria (required) - The Criteria for the Reference, and is selected from one of the following:
  - Is equals to (=).
  - Is greater than (>).
  - Is greater than or equals to (>=).
  - Is less than (<).
  - Is less than or equals to (<=).
- Value (required) - user defined alphanumeric Value for the Reference.

Open All References

- Click **References** in the Configure Group of the DataSight Ribbon, and select **Reference** from the drop down list. The References grid view appears in the Main Panel, listing all the database References.

Open A Reference Group

- Click **References** in the Configure Group of the DataSight Ribbon,and select **Reference Group** from the drop down list. The References grid view appears in the Main Panel, with References in the group identified.

Open Level-Specific References

- In the Levels Panel, right-click on any Level and then select **References** from the right click menu.
- The References grid view for the selected Level appears in the Main Panel.
- The References listed will only be applicable to the selected Level, including References from any sub-level(s) of the selected Level.

See also:

- Set References
- Reference Groups
- Apply Variable Alias
- Add References
- Reference Group
- Automate Calculations with References

Set References

Add a Reference

To assist with creating References which are to be used as Variable Aliases, a **Variable Alias View** button is available from the Reference Ribbon. This will hide the Level 1, Level 2, Level 3, Equipment, Start Date, End Date and Criteria columns from the Reference panel. Selecting the **Detailed View** button from the Reference Ribbon will display all columns in the Reference panel, and is selected by default when References are first displayed.

1. Select the applicable **Reference** grid view in the Main Panel (All References or Level-Specific References).
2. Click **New** in the Quick Access Toolbar and a new row at the bottom of the Reference grid view will be added.
3. Click in the **Reference Name** cell and type in a name for your Reference.
4. (Optional) Click in the **Variable** cell and select a Variable from the drop-down list.

   If you already know the name of the DataSight Variable, simply type in the name in the drop-down list to limit the choice and speed up the mapping.
5. (Optional) Click in the **Equipment** cell and select a piece of Equipment from the drop-down list.

   If you already know the name of the DataSight Equipment, simply type in the name in the drop-down list to limit the choice and speed up the mapping.
6. (Optional) Click within the **Comments** cell and enter in any comments as required.
7. (Optional) Click within the **Start Date** cell and select a date.
8. (Optional) Click within the **End Date** cell and select a date.

9. Click in the **Criteria** cell and select the desired Criteria. Options include:
   - Is equals to (=).
   - Is greater than (>).
   - Is greater than or equals to (>=).
   - Is less than (<).
   - Is less than or equals to (<=).
10. Click in the **Value** cell and type in the Value for your Reference. This can be alphanumeric.
11. Click **Save** in the Quick Access Toolbar or press CTRL + S at any point to save changes and continue, otherwise when you **Close** the References grid view you will be prompted to save your changes.

Note	When creating References with the **Variable Alias View** turned on, the Criteria is automatically set to the "Is equals to (=)" option.

Modify a Reference

1. Select the applicable **Reference** grid view in the Main Panel.
2. Modify the References as required (excluding the Level 1 2 or 3 assignment). Any changes will appear in italics.
3. Click **Save** in the Quick Access Toolbar or press CTRL + S at any point to save changes and continue, otherwise when you **Close** the References grid view you will be prompted to save your changes.

Delete a Reference

1. Select the applicable **Reference** grid view in the Main Panel.
2. Click to check the **Delete** checkbox(es) against any Reference(s) that you wish to delete.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the References grid view you will be prompted to save your changes.
4. DataSight will display a confirmation dialogue box asking you to confirm the deletion of the selected Reference; click **Yes** to confirm or **No** to cancel.

Note	The Level 1, Level 2 & Level 3 assignments cannot be changed as these are set when creating a Level-Specific Reference. For a Reference to be available within Calculations (and subsequently within automated calculation Tasks), a Variable must be assigned, the Criteria must be set to **Is equals to (=)**, and the Value must be numeric.

See also:

- Set Variables
- References
- Reference Groups
- Apply Variable Alias
- Add References
- Reference Group

Reference Groups

You can create a Reference Group to:

- change the displayed name of Variables in the datasheet, or
- print / export data with alternate Variable names from the datasheet or the Summary Report - Reference Group.

Note	Each unique DataSight Variable may appear only once in any Reference Group, but may equally appear in multiple Reference Groups.

Create a Reference Group

1. Click **References** in the Configure Group of the DataSight Ribbon, and select **Reference Group** from the drop down list. The References Group grid view appears in the Main Panel.
2. To add a Reference Group, click **New** in the Quick Access Toolbar and a new row at the bottom of the Reference Group list will be added.
3. Click in the **Group Name** cell and enter the name of the Reference Group.
4. Enter a more detailed description of the Reference Group in **Description**.
5. Click **Save** on the Quick Access Toolbar.

Assign References to a Reference Group

Once a Reference Group has been created you can then assign References to the Group.

While a given Variable can be mapped to multiple Reference records, allowing for the constant Variable values to change over time, or between Level or Equipment, Variables must appear only once in each Reference Group.

1. Select the Edit References button  in the Reference Group row to reassign the References to the Group. The References Group grid view will open in the Main Panel.
2. Select or deselect the References that will or will not be associated with the group. Any changes will appear in bold.
3. Click **Save** to save and close the Reference Group grid view.

View References assigned to a Reference Group

1. Select the applicable **Reference** grid view in the Main Panel.
2. Click the **expand list** button located to the left of the Reference Group's name.

Modify a Reference Group

4. Select the **Reference Group** tab in the Main Panel.
5. Modify the Reference Group Name or Description as required. Any changes will appear in italics.
6. Select the Edit References button  in the Reference Group row to reassign the References to the Group. The References Group grid view will open separately in the Main Panel.
7. Select or deselect the References that will or will not be associated with the group. Any changes will appear in bold.
8. Click **Save** to save and close the Reference Group assignment grid view.
9. Click **Save** in the Quick Access Toolbar at any point to save changes to Reference Groups and continue, otherwise when you **Close** the Reference Group window you will be prompted to save your changes.

Delete a Reference Group

1. Click on the Reference Group row you would like to delete.
2. Click to check the **Delete** checkbox against the row.
3. Repeat for any number of Reference Group rows you wish to delete.
4. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Reference Group tab you will be prompted to save your changes.

See also:

- References
- Set References
- Apply Variable Alias
- Reference Group

Reference Ribbon Tab

When the Reference panel is open, the Reference Ribbon Tab can be found next to the Home tab in the DataSight Menu Panel.

Several commonly used reference functions are given on the grouped ribbon tab when the Reference panel is focused in the Main Panel.

Group	Property	Function
Show/Hide	Show Indicator	Show or Hide the reference indicator column.
	Show Group Panel	Show or Hide the Group Panel.
Reference Views	Detailed View	Shows all columns in the Reference panel.
	Variable Alias View	Shows only the columns required, or which are useful, when working with Variable Alias References (ID, Reference Name, Variable, Comment, Alias and Delete).
	Alpha-Numeric Filter	Applies a filter to the Reference panel to show only the reference aliases which contain at least one alpha character in the Alias column. This option is made available and enabled by default when **Variable Alias View** is selected.

See also:

- Set References
- Reference Groups
- Tabs on the Ribbon

Rules

WQX business rules need to be defined for data where rules may dictate that if one type of metadata element being present it then require that another type of metadata element also needs to be populated or may have a restriction as to its value. The

WQX Schema does not define the business rules defining relationships between related elements. This information is provided in the Excel definition and Flow Configuration documents, but this is presented in a human readable manner and not one which can be imported into a database system such as DataSight. To accommodate these rules within DataSight, a Rules tool has been developed allowing you to define rules provided by WQX or even rules relating to your own organisational requirements. Rules are made up of:

- Rule Conditions - how the required WQX element, test WQX element, and test value are related to each other
- Required WQX Elements - the WQX element that is affected by the rule, i.e. it is Required if a given condition is satisfied
- Test WQX Elements - the WQX element that is tested when a Metadata entry is created that is linked to a WQX element
- Test Values - the value the Required WQX Element or Test WQX Element is validated against

Depending on the Rule Condition selected for a rule, the selection of a Test WQX Element or entry of a Test Value may not be required. Depending on your selections and values entered for the above rule fields, the below fields are automatically populated for you and cannot be altered manually:

- Required WQX Element Parent - this is pre-filled based on the selected Required WQX Element with the parent WQX element's name
- Test WQX Element Parent - this is pre-filled based on the selected Test WQX Element with the parent WQX element's name
- Rule Description - this is pre-filled with a human readable description of the rule based on the selections made

The Rule Conditions available for selection include:

- Required - the Required WQX Element and its value must be included
  - i.e. if the Required WQX Element selected was 'Result Status Identifier' would define a rule that when creating or entering an activity for your results, then the 'Results Description' must have a value for metadata element 'Result Status Identifier'
- Required if B is Present - the Required WQX Element and its value must be included if the Test WQX Element has been included and has a value
  - i.e. if the Required WQX Element selected was 'Measure Unit Code', and the Test WQX Element selected was 'Measure Value', this would define a rule that if a value for 'Measure Value' has been included under 'Detection Quantity Limit Measure' then a value for 'Measure Unit' must also be included under 'Detection Quantity Limit Measure'
- Required if B has Value Of - if the Test WQX Element has a value matching that in the Test Value field, then a value for the Required WQX Element must also be recorded
  - i.e. if the Test WQX Element selected was 'Biological Intent Name' and the Test Value entered was 'Tissue', then the element 'Sample Tissue Anatomy Name' selected in Required WQX Element must be included and have a value recorded
- Required if B contains Value - works in the same way that 'Required if B has Value of' does, except that the validation for the Test Value field checks if the value recorded for Test WQX Element contains the value in the Test Value field
- Required if B is Not Present or Blank - works in the opposite way that 'Required if B is Present' does, such that if there is no value for the element selected for Test WQX Element or if the element has not been included, then the element in Required WQX Element must be included and have a value
- Value of A Equals B - if the element selected for Required WQX Element has a value recorded matching the Test Value field, then the element for Test WQX Element must also be included and have a value matching the Test Value field
- Null Value of A if B has Value Of - if the Test WQX Element has a value matching the Test Value field, then the Required WQX Element must have a null value or not be present
- Required if B > Value - if the Test WQX Element's value is greater than the Test Value, then the Required WQX Element must have a value recorded

- Required if B < Value - if the Test WQX Element's value is less than the Test Value, then the Required WQX Element must have a value recorded

See also:

- Allowable Values
- Activity Tree

6 Input Your Data

Importing or entering data in to DataSight is the first step in managing your data.

Data input functions are highly configurable and as such allow you to:

- Collect and store data from a variety of sources, such as **data loggers, LIMS** and **manual data entry forms**.
- Import **XLS, CSV, TXT, JSON** and a large number of data logger **.DAT** and other files.
- Import **any** file and save it to Documents.
- Save an import template, and use DataSight's **auto-import** capability to undertake automatic import routines.
- Check data against a **standard** to identify any exceeding data prior to committing the data to the database.
- Record every modification of the data in the **process history**, maintaining detail on all alterations that are later undertaken.
- Store raw data files imported into DataSight in Documents. This ensures that no matter what modifications are later applied to the data, the original data remains secure.
- Enter data manually into user-configurable forms. In the **Manual Data Entry form** you can select the variables required and the order in which they are entered.

Methods of Data Input

You can input data into DataSight using the Import Routine, Manual Data Entry or Automated Import.

You can also input files into DataSight using the Import Routine, via Automated Import or manually from within Documents.

Gauging data is entered from within the Gauging Form.

DataSight also links to DSApp. Using MDE templates, responsive electronic forms can be designed which capture field data on a mobile device. The data can be downloaded from the device and imported directly into DataSight, either automatically or manually, if required.

See also:

- Data Migration

Import Routine

DataSight's Import Routine is a simple and flexible import wizard that steps you through the import process. It is simple to use and designed for non-IT personnel to set up and configure, thus allowing any DataSight user to become self-sufficient.

DataSight's import routine allows for:

- Import of human readable data files in many formats including XLSX, XLS, CSV, TXT, JSON, a large number of data logger .DAT data files as well as many LIMS data exports.
- Optional automated review against a selected standard, with little or no pre-processing.
- Both manual and automated reception of monitoring data or files.
- Modification of import templates to meet changing needs with new instrumentation or electronic formats.
- Easy migration of historical data by using the "wild card" option with an automated import task.

Start Import Routine

- Click **Import** in the Input group on the DataSight Ribbon.

Manage Import Templates

1. Click the **Import drop-down** button from the **Input** group on the **DataSight Ribbon**. The **Import Templates** grid-view opens in the main panel.
2. Click within the **Name or Comments** fields and enter or change values as required, clicking the **Save** button from the **Quick Access Toolbar** once done to save your changes.

Import file using an Import Template

1. Click the **Import drop-down** button from the **Input** group on the **DataSight Ribbon**. The **Import Templates** grid-view opens in the main panel.
2. Click the **Import** button under the **Import with** column to begin a manual import with the corresponding Import Template.
3. Continue with the steps in Select Your File.

Delete an Import Template

1. Click the **Import drop-down** button from the Input **group** on the **DataSight Ribbon**. The **Import Templates** grid-view opens in the main panel.
2. Click the **check-box** under the **Delete** column to select the template(s) for deletion.
3. Click the **Save** button from the **Quick Access Toolbar** to remove the selected template(s).

See also:

- Manual Data Entry
- Data Migration
- Automated Import

Select Your File

1. Click **Import**. The Open window appears.
2. Navigate to the folder containing the data file that you wish to import.
3. In the Files of type drop-down menu, click to select the file type (.xls, .csv, .txt, .dat, .prn, .hcs etc).
4. Select the file name and click **Open**.
5. The Import Type Window appears.

Note	When creating an import template for data from a web service or ftp, type the full connection string into the File Name field. Please note the File Name field has a limit of 250 Characters.

See also:

- Select Import Type
- Automate Imports
- File Dialog Windows

Define Your Import

1. Select your **Import Type** from the drop down menu.
2. (Optional) If you have already saved an Import Template for this type of file and want to use it, click **Load Template** now. The Load Import Template window will appear (See Import Templates for more details)
3. Select the appropriate template and click **OK**. This will load the parameters (including the mapping decisions) that have been saved for that import specification.
4. Click **OK** to move through each subsequent import step.

See also:

- Data Import
- Document Import
- DSApp Import
- Variables and Metadata Variables Import

6.1.2.1 Data Import

Data Import Checklist

Before importing data, you should be able to answer the following questions about the current format of your file.

1. What type of file are you importing?
2. Is the data normalised or pivoted?
3. Do the data variables you wish to import already exist in the DataSight database? If not, you can choose to add them before you begin, or you can choose to add them in Step 2 of the Import process.
4. To assist with mapping your data, check that your file contains a Title Row for all the data fields you wish to import. If not, you may wish to add header rows with title names for all your columns of data prior to import.
5. Are there standards entered against which your data can be compared?
6. Before starting the import process, make sure you have closed the import file.
7. It is advisable to only import blocks of data that have the same collection information. If this collection information changes within a data file, you may need to undertake separate imports for subsets of the data to vary the collection information assigned to each record.

The data import routine takes you through five steps to prepare your data for import into DataSight.

- Step 1: Define and Format Data
- Step 2: Filter and Map your Data
- Step 3: Preview Data
- Step 4: Finalise your import
- Step 5: Commit your Data

Pivoted data layout for data importation from a file

This format will allow you to import the entire spreadsheet including stations and data into DataSight. A pivoted table allows you to extract the significance from a large, detailed data set. In DataSight Version 1 or 2, this was the most efficient file format for manual data importation.

Geographic location, mapped as type 'Level'	Date & time information, mapped as type 'Date Time'	Measured parameters with data, mapped as type 'Variable Data'	Additional columns containing metadata, mapped as type 'Metadata'

Area	Monitoring Site	Date	Time	Var 1	Var 2	Var 3	Var 4	Var 5	Var 6	Var 7	Var 8	Var 9	Var 10 etc

In the above spreadsheet, Area is mapped to Level 2 and could be a geographic area or a type of monitoring that is undertaken. The Monitoring Site is the actual physical monitoring station or Level 3 where data is captured. You also need the date when the data was captured and the actual time on the specific date that the data was captured. Var 1 to Var 4 columns are mapped to each DataSight variable and the values in each cell imported to each respective DataSight variable. Var 5 to Var 10 columns are mapped to each DataSight metadata variable and the values in each cell imported to their respective DataSight metadata variable for each measured parameter Var 1 to Var 4.

See Map Variables in a Pivoted Dataset to map pivoted imports.

Normalised data layout for data importation from a file

DataSight version 3 can be used to manually and automatically import normalised data. Normalised data occurs when each row in a spreadsheet contains only one parameter value. For environmental data we might expect to see columns for locality, datetime, a parameter name and its measured value. For water quality data we might also expect additional columns containing metadata relating to the measured parameter, such as the minimum detection level.

Project	Area	Monitoring Site	Date	Time	Parameter	Value	Metadata 1	Metadata 2

In the above spreadsheet, Project is mapped to Level 1, Area is mapped to Level 2, the Monitoring Site is Level 3, date and time are mapped accordingly. Parameters are mapped using a Variable Mapping template, with metadata columns mapped to a metadata variable in the same way as mapping variables and metadata variables is performed in a pivoted data layout.

See Map Variables in a Normalised Dataset to map normalised imports.

Data migration issues

In DataSight, each entry or record **MUST** have a unique location and datetime. When capturing environmental data you may collect many records for the same date at one specific location. For example, if you are monitoring changes in water temperature at one site, but at various depths, the location and date will remain constant. This is fine, but each record must have a unique timestamp. In this instance it is imperative that the time changes for each of the depth entries. This can be as simple as varying each entry (depth) by one second, such as 19:50:00, 19:50:01, 19:50:02, and so on...

There are two options when you are faced with data such as this. Data

Option 1 . Ensure time values are assigned correctly before importing. This may involve adjusting equipment settings to record separate timestamps for each sample, or editing the data manually before importing in DataSight.

Option 2 . DataSight can assign time values during import (see Map Levels).

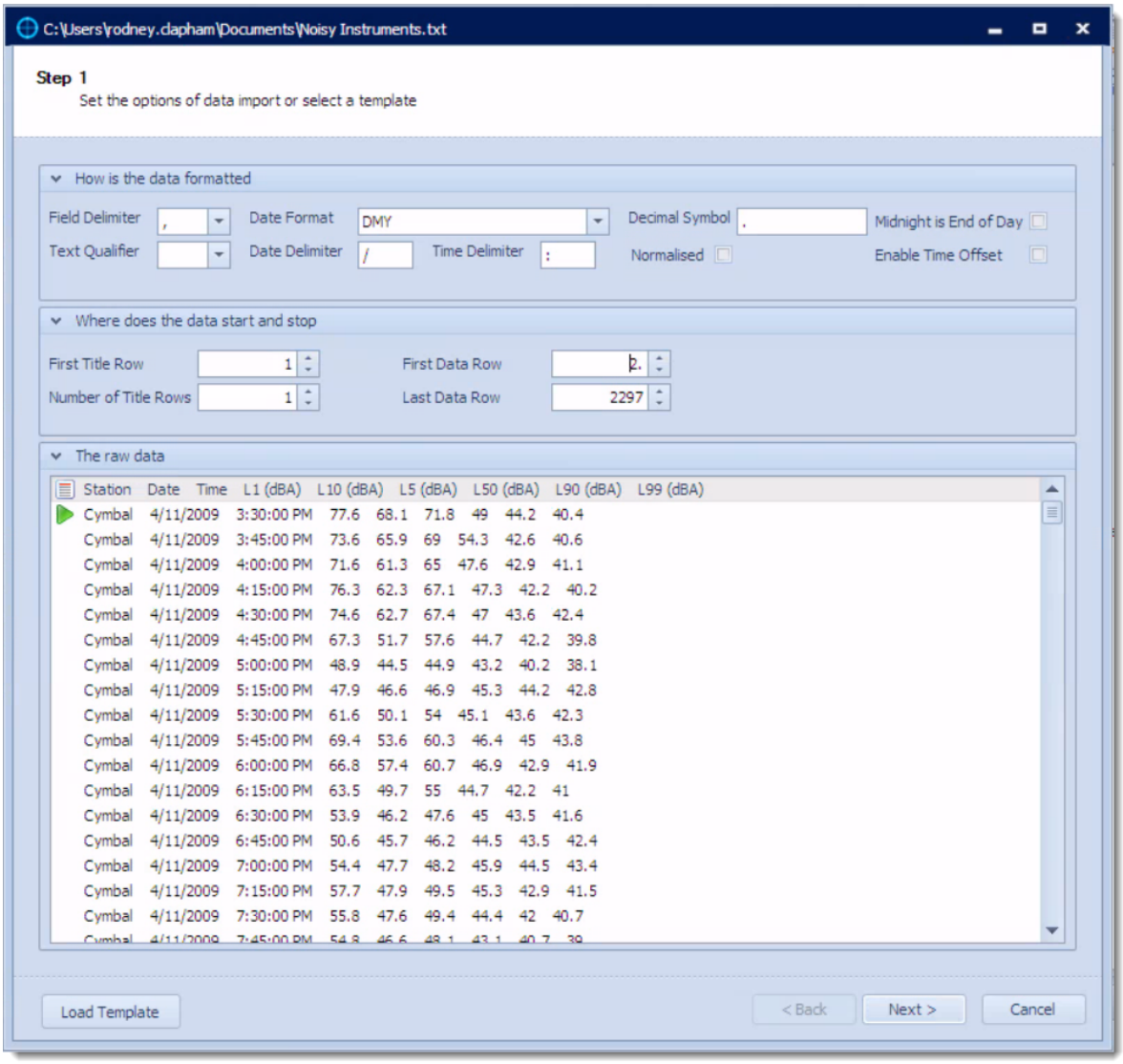
Refer to Data Migration for further issues concerning data importation and database structure within DataSight.

6.1.2.1.1 Step 1: Define and Format Data

In Step 1 of the Data Import Routine, you will identify how the data is formatted and define where the data values start and stop.

Define and format data

1. Step 1 of the Data Import Routine appears as follows:



2. (Optional) If you have already saved an Import Template for this type of file and want to use it, click **Load Template** now. The Load Import Template window will appear (See Import Templates for more details).

   Select the appropriate template and click **OK**. This will load the parameters (including the mapping decisions) that have been saved for that import specification.

3. Review and set the appropriate **Field Delimiter**, **Text Qualifier**, **Date Format**, **Date Delimiter**, **Time Delimiter** and the **Decimal Symbol** formats.

   a. The options available for **Date Format** use the letters 'D', 'M' and 'Y' to represent the Day, Month and Year of a date and the order in which they appear in the date or datetime column of your data file.

   b. For datasets which have a datetime stamp in an ISO 8601 format, use the **YMD TZ** option.

i. The International Standard ISO 8601 Date and Time Format defines international datetimes with the below format, where Y is Year, M is Month, D is Day, T is the Date/Time separator, H is the Hour, m is the Minute, S is the second, V is the time zone hours, X is the time zone minutes and Z is the time zone suffix indicating UTC.

1. YYYY-MM-DDTHH:mm:SS+VV:XX e.g. 2022-02-23T23:46:00+00:00
2. YYYY-MM-DDTHH:mm:SSZ e.g. 2022-02-23T23:46:00Z
3. YYYYMMDDTHHmmSSZ e.g. 20220223T234600Z

4. (Optional) Check **Normalised** if your data is in a normalised format. Otherwise leave it unchecked (See Data Import for more details).
5. (Optional) Check **Midnight is End of Day** if you wish to write any raw data records showing timestamps of 24:00 to 23:59:59. Ticking the checkbox for Midnight is End of Day ensures that data reading as 24 hours in the raw data file is recorded in DataSight as 23:59:59 and is grouped within that day's and hour's filters. When the box is not checked, a 24:00 hour reading will write to the DataSight database as 00:00:00 or 12:00:00 AM, and subsequently be grouped within the next day of data.
6. (Optional) Check **Enable Time Offset** to automatically increment the datetime stamp by five seconds when replicate records are written to the DataSight database. This feature is useful when importing replicate laboratory analyses, which have the same level, timestamp and variable. The subtle change in datetime ensures both replicates for the same variable are preserved. This feature is only available during import and for data found within the confines of one singular data file.
7. Use the scroll arrows to set the **First Title Row** and **Number of Title Rows**.  will appear next to the first and last Title Row lines in the data panel.
8. Scroll down the data panel and identify where the data starts. Position the cursor on the appropriate line number in the data panel and left-click. This will set the position of the **First Data Row** and  will appear next to that line in the data panel. Any values above this row (apart from any set Title rows) will be ignored in the Import process. Continue to scroll down the data panel and identify where the data stops. Right-click on the appropriate line number in the data panel to set the position of the **Last Data Row** and  will appear next to that line in the data panel. Any values below this line will be ignored in the Import process.
9. Click **Next**. The Step 2 Data Import Routine window appears.

Note	
	• When importing a worksheet from a workbook you must import and parse each worksheet separately. Use the Sheet drop-down menu to select any worksheet. • When importing data, if the first line in the file is data and not a column header leave "First Title Row" as "0". • Date and Time Delimiters must be precisely identified. Data validation is strictly enforced and any change in date or time formatting from record to record within a raw data file will result in the partial transfer of your data to the database. • Time zone specific files are imported and automatically converted to the current database time zone.

See also:

- Step 2: Filter and Map Your Data

6.1.2.1.2 Step 2: Filter and Map Your Data

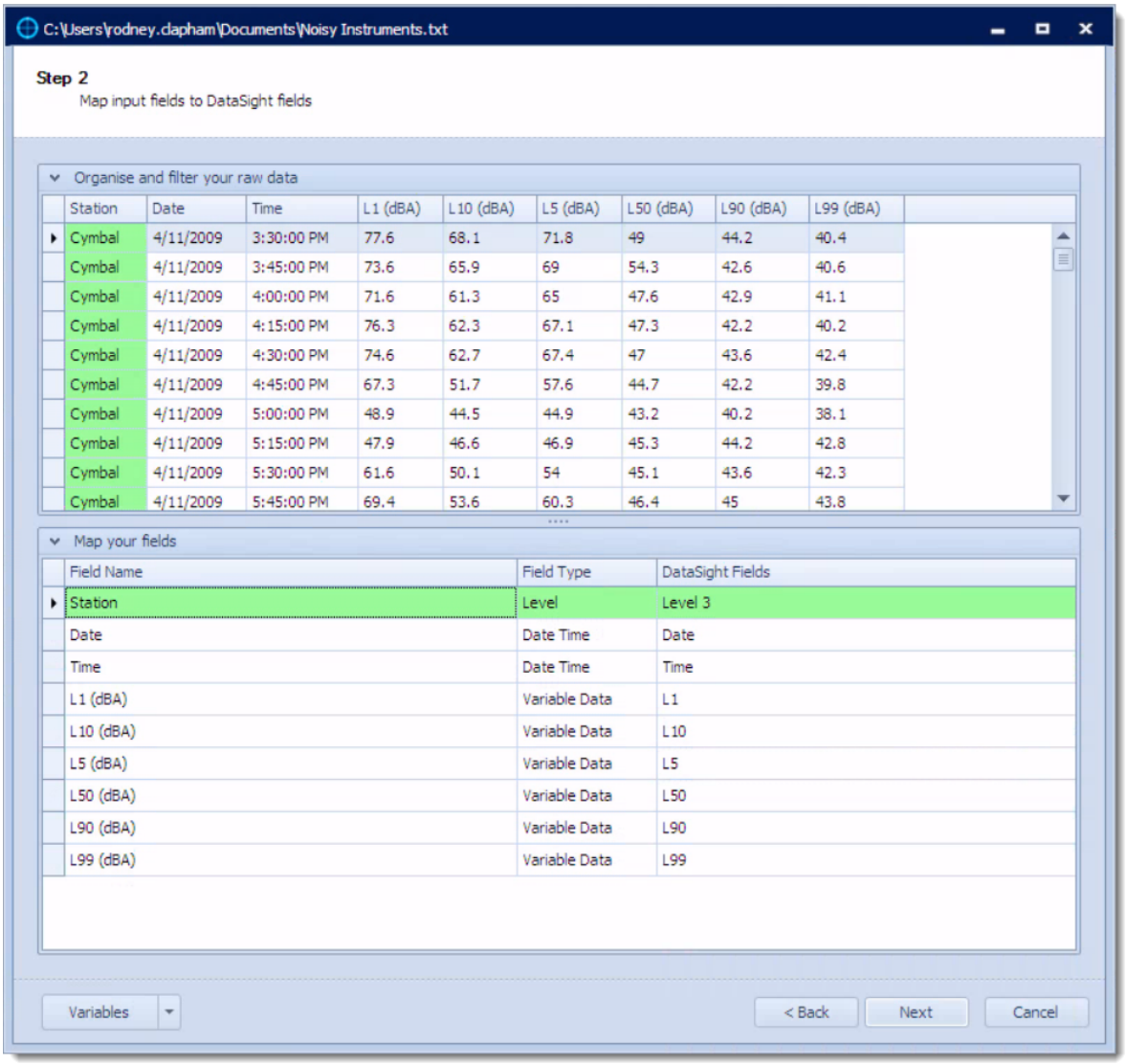
Step 2 of the Data Import Routine is divided into upper and lower panels.

- In the upper panel you can view and filter your existing data fields.
- In the lower panel you map those input fields to your DataSight database variables. Mapping variables will depend on the type of data being imported.

- Refer to Map Variables in a Pivoted Dataset if importing a pivoted dataset.
- Refer to Map Variables in a Normalised Dataset if importing a normalised dataset.

- Clicking on a row in the lower panel will highlight the selected row and the corresponding column in the upper panel to assist with mapping your data.

This combination of filtering and mapping functionality means that you can accurately define and import all, or a subset of, the raw data values.



Note	If your data has no column headers, then map each field to a DataSight Variable for import. The fields are arranged from left to right starting with Field0, Field1, Field2, and so on.

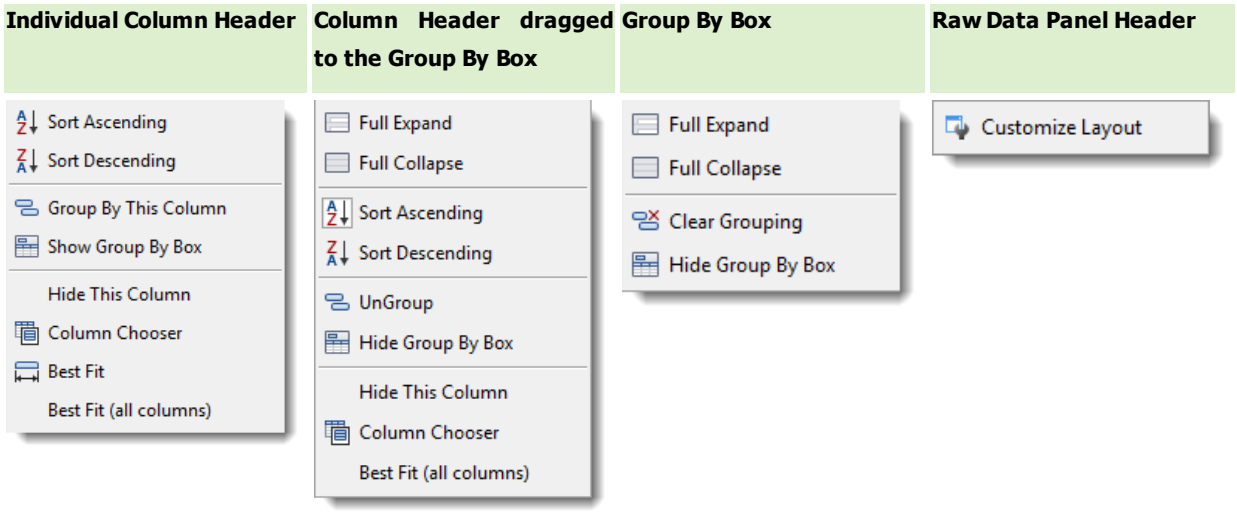
See also:

- Step 3: Preview Data
- Organise and Filter Data
- Map Fields

6.1.2.1.2.1 Organise and Filter Data

The **Raw Data** panel shows your input data in what is termed a grid view (See also Grid Views). There are several tools within the grid view to assist you in viewing and organising this data in the grid, all of which are accessible via right-click menus. Different right-click menus are available depending upon where you click in the Raw Data panel. For the most part, the functions are applicable only a specific column of data. Many of these functions can also be performed using mouse clicks. By default, the Group By Box is hidden from view.

Right-click on the…



Organise Your Data

Maximize view	The Step 2 Window of the Import Routine has been sized to fit within a standard laptop screen. To increase the size of this window: • Click **Maximize** in the top right hand corner of the Step 2 window. • Hover the cursor over the splitter bar between the Raw Data panel and the Field Mappings panel. The cursor will appear as  at which time you can drag the position of the splitter bar down to increase the size of the Raw Data panel.
Heading order	Field names are presented as headers taken in order from the raw data file. To change your heading order: • Click on a column header then drag and drop it sideways to its new position. • Alternatively select **Column Chooser**, to reorder your column headers. This is particularly useful when you have a large number of input fields, and wish to change their order of appearance in the datasheet. Drag and drop the column headers into the **Customise Window**, then when ready, drop the columns back onto the datasheet in the desired order.
Column width	The column widths are set to Best Fit (all columns) by default. To alter the column widths: • Hover the cursor over the join between column headers. The cursor will change to a  upon which you can drag the cursor left or right to change the column width. • Select **Best Fit** to adjust the width of the column to accommodate the maximum width of the field's data. • Select **Best Fit (all columns)** to adjust the width of all columns to that which best accommodates the data.
Sort data	Data order is that of the raw data file. To sort your data:

- Left-click a column header to sort the data by the ascending order  (first click) and the descending order  (second click). Toggle between the two choices.
- Alternatively select **Sort Ascending** or **Sort Descending** from the right-click menu.
- Select **Clear Sorting** from the right-click menu to restore the column of data to its original order.
- Order by more than one column of data, with the data sorted in order from first column selected through to the last. This can only be accomplished by selecting the sort order from the right-click menu of each column of data in order of preference.

Group data

Data grouping can be used to sort the data into groups with the same input field value, whether this be a variable value, a date or a time. By default, the Group By Box is hidden from view. To group your data:

- Right-click on a column header and select **Group By This Column**. The column header will appear in the Group By Box above the datasheet and the data will be sorted into groups of the same data value. These groups are shown in bold.
- Once the **Group By Box** is displayed, your can drag and drop a column header into the box to sort the data into groups.
- Multiple groupings can be made, with data sorted in the order in which you drag or select the column headers. Drag headers about to change the ordering.
- Right-click in either the column header within the Group By Box or the Group By Box itself to remove the column header.

Groupings can be expanded or collapsed to further interrogate the data.

- Within the datasheet, click to expand a group and to collapse a group.
- To fully expand or collapse the data, right-click in the Group By Box and select Full Expand or Full Collapse.

Remove data

All raw data from Step 1 is shown by default. To remove data:

- Click on the Column header and drag and drop it from the raw data panel.
- Alternatively select **Remove this Column** from the right-click menu.
- If you mistakenly remove a column of data, click **Column Chooser**. Columns that you have removed appear in the customisation window. Double click the column name to return the panel.

Filter Data

Filtering is a quick and easy way to define and then import a subset of data. You can use standard filtering to import only the rows that meet the criteria you specify for a particular column or columns.

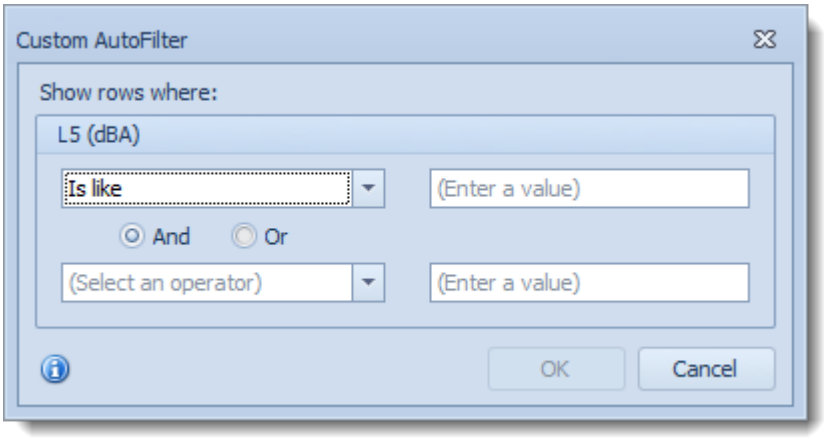
Use the Standard Filters

1. Hover the mouse over a column header to show the filter icon .
2. Hover the cursor directly over the icon and click on it to open a drop-down list of filter options.
3. The standard options are **Custom**, **Blanks**, and **Non Blanks**. The other options are any of the unique data values within that column. The option of All appears after the first filter is applied.

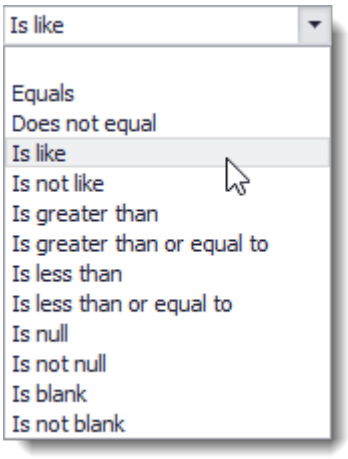
Use	To return
All	all rows

Custom	all rows meeting the criteria you specify for that column
Blanks	only the rows containing blank data values in that column
Non-Blanks	only the rows containing non-blank data values in that column
Unique data value	all the rows containing the specified data value in that column

4. The filter icon will be greyed out to show that filter conditions have been applied.
5. When you select **Custom** from the drop down filter menu, the Custom Auto Filter Window appears.



7. Click the first arrow to display the drop down menu options for filtering either numeric and text values.
8. Select a filter descriptor from the drop down list.



9. Enter an appropriate value in the box on the right.
10. If you need to find values that share some characters (whether text or numeric) use the like or not like options in conjunction with either " _ " or "%":

Use	To stand in for
_ (underscore)	any single character • eg, " 8_ " will find "81", "82", "83", "8B" etc • eg, "8_ _" will find "845", "87A" etc • eg, "T_" will find "TP", "TN", "T3" etc
% (percent)	any number of character

- eg "8%" will find "81", "82456", "8B" etc
- eg "fish%" will find "fish", "fished" "fishing", "fishA1" etc

11. To add another criteria, click AND or OR, and repeat the previous step.
12. The top of drop-down list of filter options is subsequently populated with the most recent values selected. Click to remove these searches.
13. Click on the greyed out filter icon and select **All** from the drop down list to remove the filter condition.

Note	Blanks and Non Blanks options are available only if the column you want to filter contains a blank cell

6.1.2.1.2.2 Map Fields

In Step 2 of the Data Import Routine in the lower panel under Map Fields, you will map your input fields to your DataSight fields.

The method of field mapping for Variables / Metadata Variables depends upon whether your data is a pivoted data set or a normalised data set.

Mapping involves matching the left hand column **Input Field Name** with the right hand column **DataSight Field Name**. You will need to have modified or added your Variables into the database prior to field mapping.

Add or modify a Variable

1. Select the **Variables** button at the bottom of the Step 2 Window. A Variables window will appear showing the database variables.
2. To add a variable, click **New** in the Quick Access Toolbar and a new row at the bottom of the Variable table will be added.
3. Enter the **Variable Name**, **Units**, **Description**, **Display Format** as required.
4. To modify a variable, click in the variable row and edit as required. Any changes will appear in italics.
5. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Variables table you will be prompted to save your changes.

Map Levels

If you wish to use or match the exact names as they appear in your raw data to DataSight Levels, you can map your site names to a Level 2 or Level 3 DataSight Field. DataSight does not let you map across different Level 1 sites on import. Where a data file contains multiple Level 1s, you will need to undertake multiple imports of that data file.

To map to Levels:

1. Click on **row** which corresponds to the Level 2 names, Level 3 names or Level 3 IDs. The row and corresponding column in your data file is highlighted in green.
2. Click in the **Field Type** cell to the right to display the drop-down list of available Field Types and select **Level**.
3. Click in the adjacent line in the DataSight Fields column to access the drop-down list of DataSight Fields and select either **Level 2**, **Level 3** or **Level 3 ID**.

Map Date and Time

You are able to map date and time fields in Step 2. Where Date or Time are not selected, you will be required to select Date and Time in Step 4 of the Import Routine. In DataSight, each entry or record MUST have a datetime.

To map to Date and/or Time:

1. Click on the **row** which corresponds to the datetime column of your data file. The row and corresponding column in your data file is highlighted in green.
2. Click in the **Field Type** cell to the right to display the drop-down list of available Field Types and select **Date Time**.
3. Click in the adjacent line in the **DataSight Fields** column to access the drop-down list of DataSight Fields and select any of the following as required:

   Date

   Time

   Date&Time

   Year

   Month

   Day of the Month or Year

Note	Unmapped fields will not be imported. If you have made changes to the Variable table during import, after import you will need to refresh the Variable list in the Variable panel.

Map Activity or Activity Metadata

You are able to map columns, whether your dataset is normalised or pivoted, to Activity or Activity Metadata fields within DataSight.

1. Click on the **row** which corresponds to the activity or activity metadata column of your data file. The row and corresponding column in your data file is highlighted in green.
2. Click the **Field Type** cell to the right to display the drop-down list of available Field Types and select either **Activity** or **Activity Metadata** as required.
3. Click in the adjacent line in the **DataSight Fields** column to access the drop-down list based on your Field Type selection and select either:
   a. Activity Field Type:
      i. The available DataSight Fields for an Activity Field Type are **Activity ID**, **Activity Type Code**, or **Activity Type Abbrev**.
   b. Activity Metadata Field Type:
      i. The available DataSight Fields for an Activity Metadata Field Type are your metadata Variables which have been mapped to a WQX element.

After mapping your levels and datetime fields, in a pivoted data file you will need to map your measured values to a DataSight variable. To do this:

1. Ensure that **Normalised** box is unchecked in Step 1 of your import to allow pivoted data field mapping.
2. Click on the **row** which corresponds to the Variable or Metadata Variable column of your data file. The row and corresponding column in your data file is highlighted in green.
3. Click in the **Field Type** cell to the right to display the drop-down list of available Field Types and select either **Variable Data** or **Metadata**.
4. Click in each adjacent line in the right hand column to access the drop-down list of DataSight Fields and select an existing **DataSight Variable Name** or **DataSight Metadata Variable Name** to map each Input field to. At least one DataSight Variable must be mapped.

5. If you already know the name of the Variable or Metadata Variable, simply type in the name to limit the choices in the drop-down list, and speed up the mapping.
6. When you have mapped all the fields, click **Next**. The Step 3 Window appears.

In a normalised data set you need to create a variable mapping template to correctly import your measured values to a DataSight Variable.

A Variable Map consists of selection criteria which need to match in order for a DataSight Variable to be populated with data. DataSight requires you to identify the column containing the names of the measured parameters, and optionally the column containing the units of the measured parameters. When the entry in each of these columns matches exactly that specified, data can be imported to the DataSight variable selected.

Create a Variable Mapping template

1. Ensure that the **Normalised** box is checked in Step 1 of your import to allow Variable Mapping.
2. Click **Variable Mapper** in Step 2 of the Import Routine. The Map Variables window appears.
3. To add a template, click **New** in the Quick Access Toolbar. The Column Selection window appears. Column selections will be highlighted in green to help assist with mapping selections
4. Click on the column header or within the column that contains the variable names. The **Selected Column** will display the column header name and relative position within the data set. Click **OK**.
5. You will be asked if you wish to map the Variable Units. This is optional. If you click **Yes** another column selection window appears. Disregard Step 6 if you select **No**.
6. Click on the column header or within the column that contains the variable units. The **Selected Column** will display the column header name and relative position within the data set. Click **OK**.
7. You will be asked if you wish to map the CAS Number. This is optional. If you click **Yes** another column selection window appears. Disregard Step 8 if you select **No**.
8. Click on the column header that contains the CAS Number. The **Selected Column** will display the column header name and relative position within the data set. Click **OK**.
9. The next window shows the repeating field entries in the selected column for your normalised datasheet. DataSight will identify all repeating entries in the raw data file for possible selection. You are also able to set your own field names.
10. Enter a **Name** for your Variable Mapping template.
11. Highlight a row and select an existing DataSight Variable from the drop-down list of DataSight Variables to map the entry to. Repeat as necessary.
    a. You may also begin typing the name of the DataSight Variable if known, this will allow you to quickly select the Variable from the drop-down list.
12. If you wish to set your own field names, click **New** in the Quick Access Toolbar.
13. A new mapping row will appear. Type your specific criteria for the selected column name (and unit if applicable).
14. Select the DataSight Variable from the drop-down list of DataSight Variables to map the entry to.
15. Click **Save**. The Variable Mapping window will close.

Modify a Variable Mapping

1. Click **Variable Mapper** in Step 2 of the Import Routine. The Map Variables window appears.
2. Click in the template name to change the name as required. The changes will appear in italics.
3. Click the Edit Variables button  to access the specific variable mappings. Amend as required.

4. Click **Save** button at any point to save changes and continue, otherwise when you **Close** any of the Variable Mapping windows you will be prompted to save your changes.

Import a Variable Mapper

When there are a large number of import variables that need to be mapped to DataSight variables, creating (or modifying the mapping of) a Variable Mapper can be very time consuming. To assist with this process, a Variable Mapper template may also be imported from an Excel file. The file must contain two columns of data, the first column being the Import Variables as they would be entered in your data files and second column being the mapped DataSight Variable name as it appears in DataSight. Users must have the Import execute and Import Template modify permissions.

1. Ensure that the **Normalised** box is checked in Step 1 of your import to allow Variable Mapping.
2. Click **Variable Mapper** in Step 2 of the Import Routine. The Map Variables window appears.
3. You can click the Edit Variables button  to access the specific variable mappings of an existing Variable Mapping template and proceed to step 9 below, or continue with step 4 to create a new Variable Mapping template.
4. Click **New** in the Quick Access Toolbar. The Column Selection window appears.
5. Click on the column header that contains the variable names. The **Selected Column** will display the column header name and relative position within the data set. Click **OK**.
6. You will be asked if you wish to map the Variable Units. This is optional. If you click **Yes** another column selection window appears. Disregard Step 6 if you select **No**.
7. Click on the column header that contains the variable units. The **Selected Column** will display the column header name and relative position within the data set. Click **OK**.
8. The next window shows the repeating field entries in the selected column for your normalised datasheet. DataSight will identify all repeating entries in the raw data file for possible selection. You are also able to set your own field names.
9. Click **Import Variable Mapping** to display the File Open dialog.
10. Navigate to and select the **file** containing your Variable Mapper template and then click **Open**.
11. DataSight will display a confirmation dialog for validating the contents of the your file. Click **Yes** to confirm that your Variable Mapper template file format matches the below, otherwise click No to cancel the import:
    a. Column A - must contain the Variable names as they will appear in your data files; and
    b. Column B - must contain the DataSight Variable Name to be mapped to the respective Variable in Column A.
12. DataSight will import the Variable Mapper template, adding or updating rows as per the Variable Mapper template file, and will display an information dialog detailing the changes made. Review the information provided and then click **OK**.
13. Review your updated Variable Mapper template, giving it a **name** and then click **Save**.
14. You can now use your imported Variable Mapper for other import tasks.

Delete a Variable Mapping template

1. Click to check the **Delete** checkbox(es) against any template(s) that you wish to delete.
2. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Variable Mapping table you will be prompted to save your changes.

Duplicate a Variable Mapping template

1. Click **Variable Mapper** in Step 2 of the Import Routine. The Map Variables window appears.
2. Click the template name to select it.

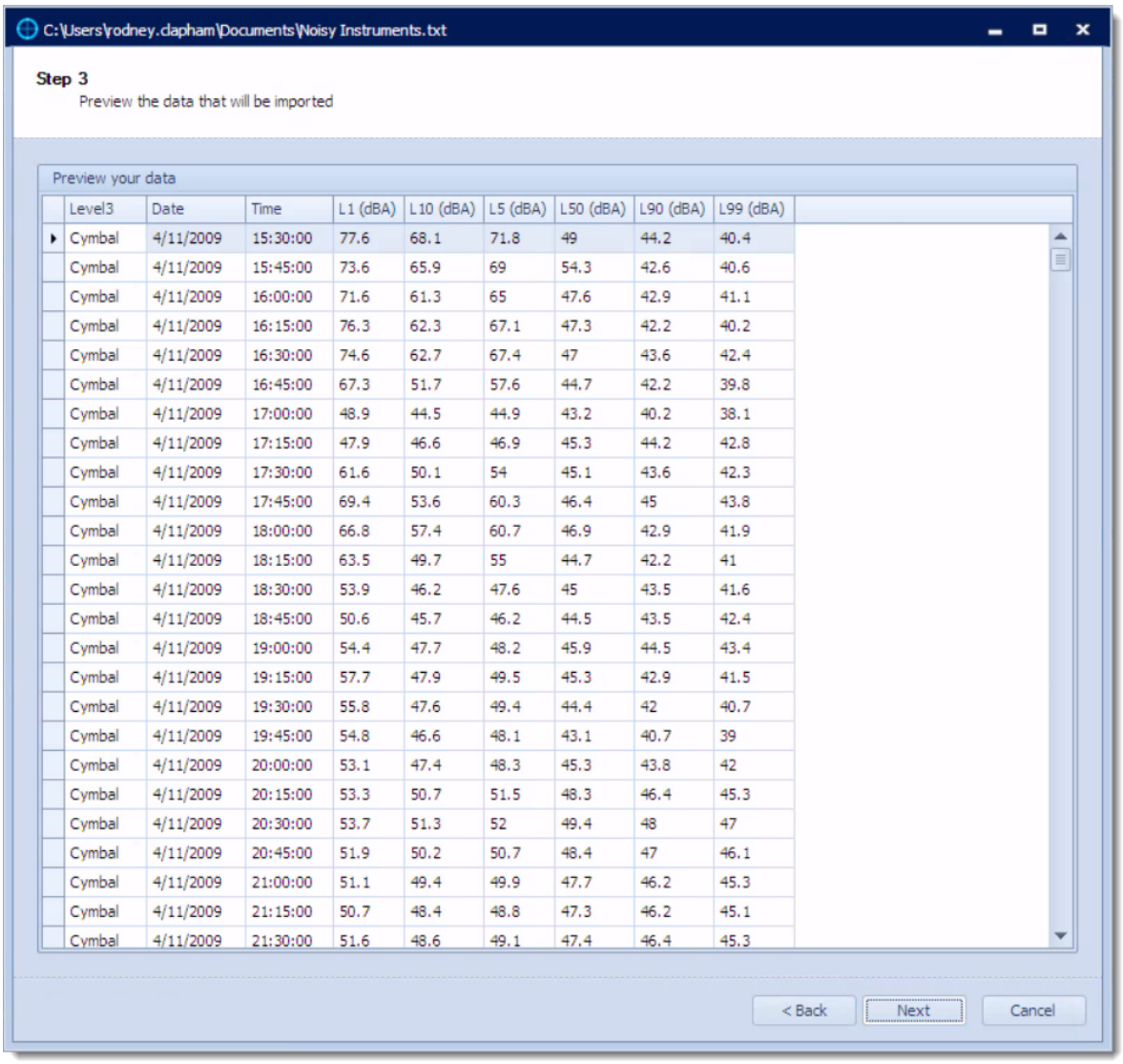
3. Click the Edit Variables button  to access the specific variable mappings.
4. Click the **Save As** button in the Quick Access Toolbar to duplicate the template.
5. Enter a **Name** for your Variable Mapping template.
6. Click **Save** button at any point to save changes and continue, otherwise when you **Close** any of the Variable Mapping windows you will be prompted to save your changes.

Applying a Variable Mapping

1. Click on the **row** which corresponds to the Variable Name column of your data file. The row and corresponding column in your data file is highlighted in green.
2. Click in the **Field Type** cell to the right to display the drop-down list of available Field Types and select **Variable Map**.
3. Click in the adjacent line in the right hand column to select the **VariableMapping template name**.
4. Click on the **row** which corresponds to the Variable Value column of your data file.
5. Click in the **Field Type** cell to the right to display the drop-down list of available Field Types and select **Variable Map**.
6. Click in the adjacent line in the right hand column to select **VariableMapping - Value**.
7. Click on the **row** which corresponds to the Variable Units column of your data file.
8. Click in the **Field Type** cell to the right to display the drop-down list of available Field Types and select **Variable Map**.
9. Click in the adjacent line in the right hand column to select **VariableMapping - Unit**.
10. Click on the **row** which corresponds to the Variable CAS Number column of your data file.
11. Click in the **Field Type** cell to the right to display the drop-down list of available Field Types and select **Variable Map**.
12. Click in the adjacent line in the right hand column to select **VariableMapping - CAS Number**.
13. Click on a **row** which corresponds to a Metadata Variable column of your data file.
14. Click in the **Field Type** cell to the right to display the drop-down list of available Metadata Variables and select the **Metadata Variable**.
15. Click in the adjacent line in the right hand column to access the drop-down list and select a **Metadata Variable**.
16. When you have mapped all the fields, click **Next**. Window for Step 3 of the Import Routine appears.

6.1.2.1.3 Step 3: Preview Data

In Step 3 of the Data Import Routine, preview the data you are about to import.



Level3	Date	Time	L1 (dBA)	L10 (dBA)	L5 (dBA)	L50 (dBA)	L90 (dBA)	L99 (dBA)
Cymbal	4/11/2009	15:30:00	77.6	68.1	71.8	49	44.2	40.4
Cymbal	4/11/2009	15:45:00	73.6	65.9	69	54.3	42.6	40.6
Cymbal	4/11/2009	16:00:00	71.6	61.3	65	47.6	42.9	41.1
Cymbal	4/11/2009	16:15:00	76.3	62.3	67.1	47.3	42.2	40.2
Cymbal	4/11/2009	16:30:00	74.6	62.7	67.4	47	43.6	42.4
Cymbal	4/11/2009	16:45:00	67.3	51.7	57.6	44.7	42.2	39.8
Cymbal	4/11/2009	17:00:00	48.9	44.5	44.9	43.2	40.2	38.1
Cymbal	4/11/2009	17:15:00	47.9	46.6	46.9	45.3	44.2	42.8
Cymbal	4/11/2009	17:30:00	61.6	50.1	54	45.1	43.6	42.3
Cymbal	4/11/2009	17:45:00	69.4	53.6	60.3	46.4	45	43.8
Cymbal	4/11/2009	18:00:00	66.8	57.4	60.7	46.9	42.9	41.9
Cymbal	4/11/2009	18:15:00	63.5	49.7	55	44.7	42.2	41
Cymbal	4/11/2009	18:30:00	53.9	46.2	47.6	45	43.5	41.6
Cymbal	4/11/2009	18:45:00	50.6	45.7	46.2	44.5	43.5	42.4
Cymbal	4/11/2009	19:00:00	54.4	47.7	48.2	45.9	44.5	43.4
Cymbal	4/11/2009	19:15:00	57.7	47.9	49.5	45.3	42.9	41.5
Cymbal	4/11/2009	19:30:00	55.8	47.6	49.4	44.4	42	40.7
Cymbal	4/11/2009	19:45:00	54.8	46.6	48.1	43.1	40.7	39
Cymbal	4/11/2009	20:00:00	53.1	47.4	48.3	45.3	43.8	42
Cymbal	4/11/2009	20:15:00	53.3	50.7	51.5	48.3	46.4	45.3
Cymbal	4/11/2009	20:30:00	53.7	51.3	52	49.4	48	47
Cymbal	4/11/2009	20:45:00	51.9	50.2	50.7	48.4	47	46.1
Cymbal	4/11/2009	21:00:00	51.1	49.4	49.9	47.7	46.2	45.3
Cymbal	4/11/2009	21:15:00	50.7	48.4	48.8	47.3	46.2	45.1
Cymbal	4/11/2009	21:30:00	51.6	48.6	49.1	47.4	46.4	45.3

Click **Back** to step backwards through the Import Routine to change any formatting, filtering or mapping as required.

Click **Next** if you are satisfied with the data set.

See also:

- Step 4: Finalise Your Import

6.1.2.1.4 Step 4 & 5: Relate Your Data

In Steps 4 and 5 of the Data Import Routine, you will associate your data set with information required to complete the import. You will map your data to one or potentially many Levels, set the date and time if still required, and optionally enter collection information and check the data against a standard, or flag your data. You can also save your import template for future use.

Note	Clicking **Next** to proceed from Step 5 will instruct the Import Routine to conduct data validation steps before displaying Step 6 for committing your import. Depending on how many records you are importing, and whether you have selected a Standard to check against in Step 4, you may experience a delay while your data is being validated.

Step 4)

Map your Levels

Select the appropriate Level 1, Level 2 and Level 3 from the drop-down boxes, as required.

If you have not already set these Levels up you may type a name directly into the blank field. In this case, you will be asked to confirm that you wish to add the new Level 1, Level 2, Level 3. Click **Yes**.

Assign Time or Date values

The fields marked Date, Time and Increment are only used if you have **not mapped** your Date and Time values in Step 2. In this case, you can use this section of the dialogue box to set a default level 4 Date and Start Time together with the increment at which the time values will be added for each imported data record.

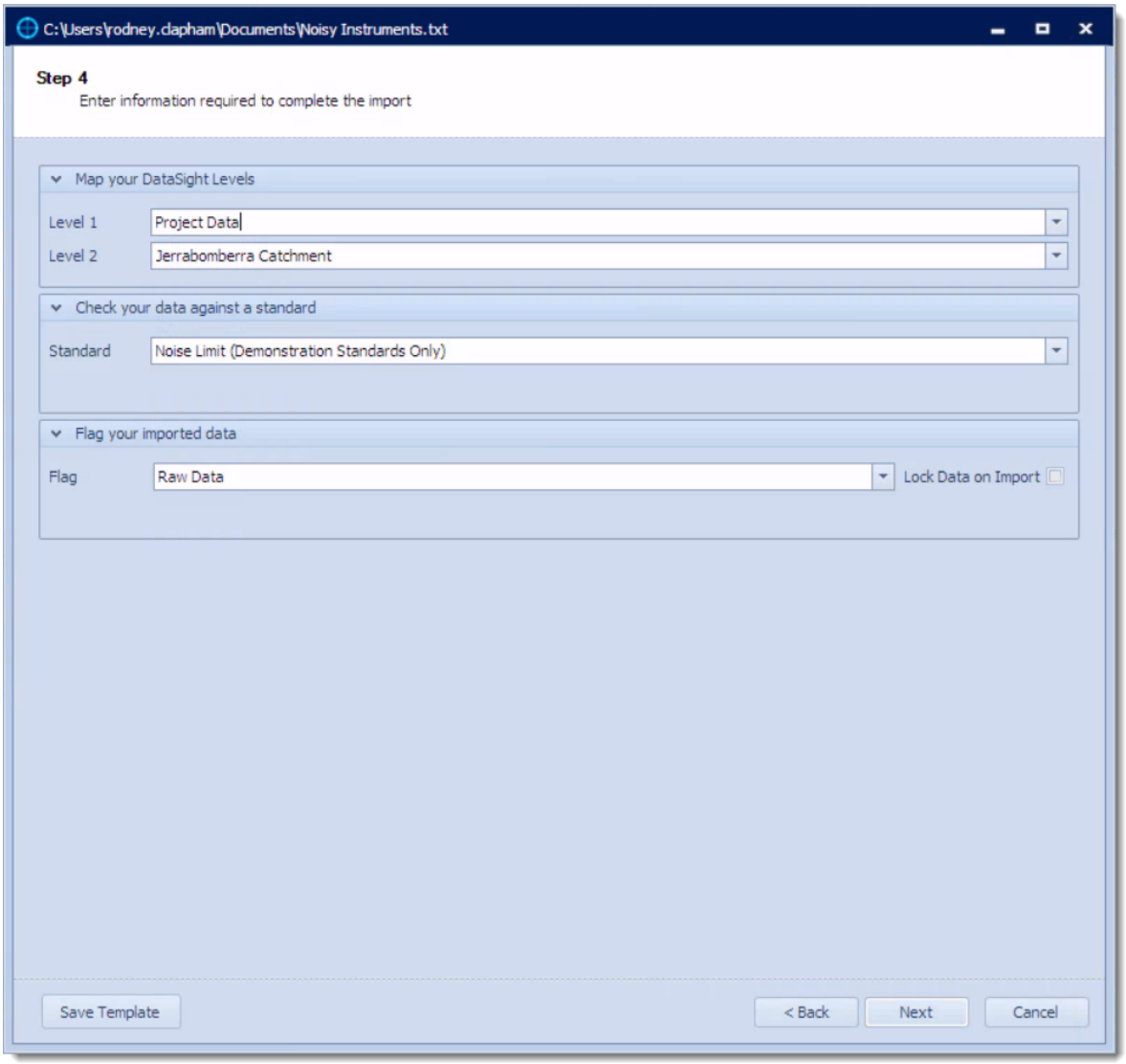
Perform a Standard Check

To check your data against a predefined Standard prior to committing your data to the database, select the appropriate standard from the drop-down box as required.

Flag Data

To flag your data, select the appropriate flag from the drop-down box as required.

To lock the data after it has been imported, select the **Lock Data on Import** option.

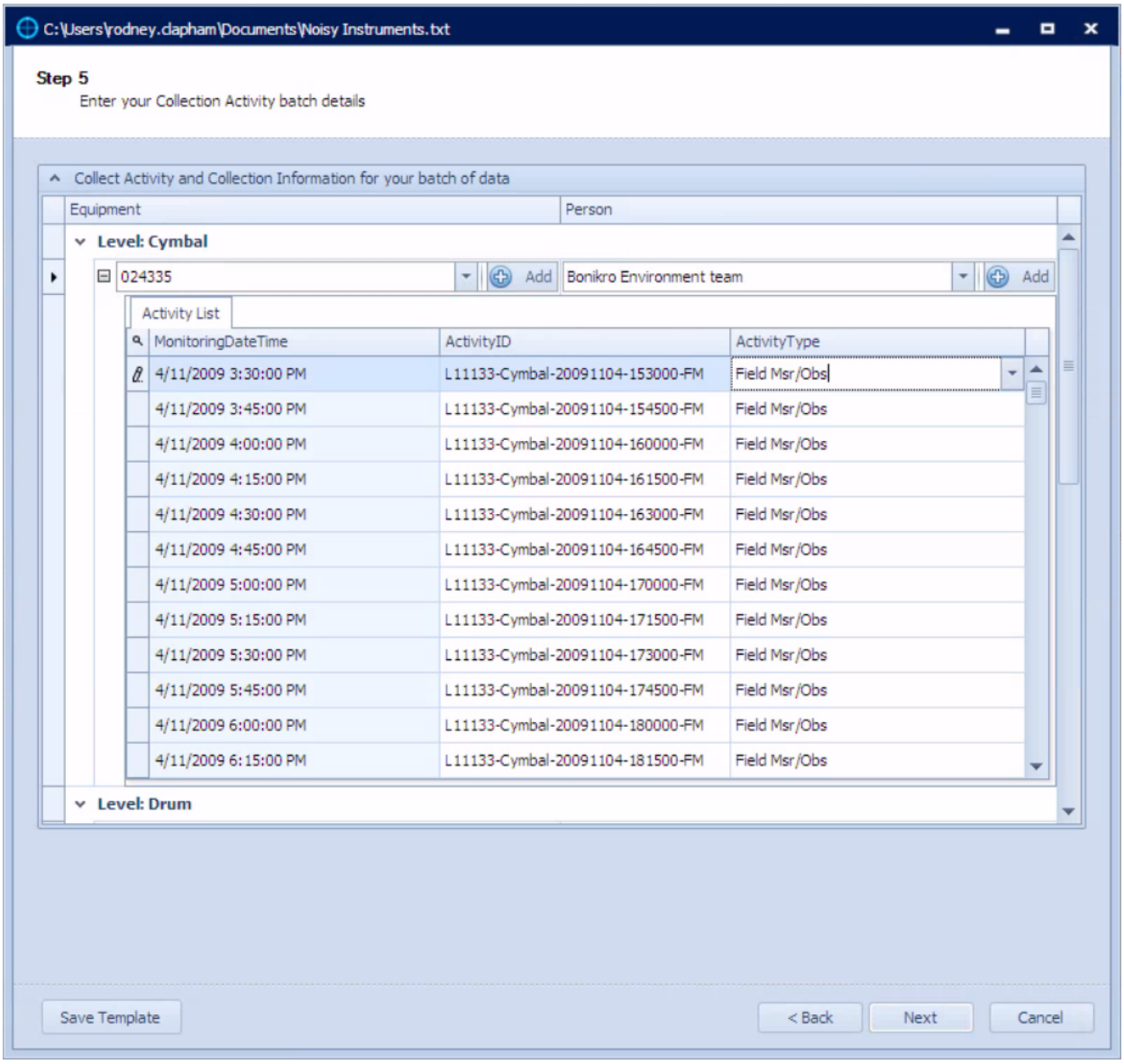


Step 5)

Add Collection Information

If you wish to add Collection information, click the drop-down boxes for Person and Equipment to make a selection for each Level 3 location. The recording of collection information is optional in DataSight. You can then expand each Level 3 location and define an Activity Type for each record of data to be imported from the drop-down menu. The Activity ID has been pre-filled with a unique value based on the Level 3 ID and Name, as well as the datetime and Activity Type, but can be edited if required.

Once you have selected the required fields, click **Next**. Otherwise you can click **Back** to make any necessary changes. You can also save your selection as an Import Template to pre-fill fields for similar imports (See Import Templates for more details).



See also:

- Commit Your Data

6.1.2.2 Document Import

In the Document Import Routine, you will identify the level under which the file will be saved.

1. (Optional) If you have already saved an Import Template for this type of file and want to use it, click **Load Template** now. The Load Import Template window will appear (See Import Templates for more details)
2. Select the appropriate template and click **OK**. This will load the parameters (including the mapping decisions) that have been saved for that import specification.
3. If you have not loaded an Import Template, then set the appropriate Level 1, Level 2, Level 3 to which you are importing.
4. If you have not already set these Levels up you may type a name directly into the blank field. In this case, you will be asked to confirm that you wish to add the new Level 1, Level 2, Level 3. Click **Yes**.
5. Once you have selected the Levels, click **Next**. Otherwise you can click **Back** to make any necessary changes.
6. You can also save your selection as an Import Template to pre-fill fields for similar imports.

See also:

- Import Templates
- Commit Your Document

6.1.2.3 DSApp Import

DSApp creates a specific, human-readable DSI (DataSight Input) file that can be directly ingested into DataSight.

In selecting a DSApp Import Type during the import routine, you will be using pre-configured import specifications.

Do not alter the format or structure of any .DSI file.

Alterations to a .DSI file will likely cause a DSApp import to fail.

Data from DSApp is imported to the following DataSight tables, and viewed therein.

DSApp Page	DSApp Field(s) Exported	DataSight Table	DataSight View
Safety	Each Variable is exported.	Data	Creates a new data record with the selected Level, Date and Time and Variable Name. View in a datasheet.
Sampling	Each "sample" entered is exported, with the date, time of sampling and their Flag.	Data	Creates a new data record with the selected Level, Date and Time, Variable Name, and Flag. View in a datasheet.
Data Entry (Including On Arrival)	Each Variable and Flag are exported with the selected Person and Equipment.	Data	Variables in the On Arrival section are created as a new data record with the selected Level, Date and Time and Variable Name. View in a datasheet. Creates a new data record with the selected Level, Date and Time, Variable Name, Flag*, Person* and Equipment*. View in a datasheet.
Equipment Calibration	All	Equipment	Creates a new Calibration record for the selected Equipment. The Variables, Site Values, Calc Values and % Diff are imported as the Comment for the record. View in Equipment, Calibrations.
Construction Details	All	Level 3 Construction Details	Creates a new Level Construction record, with the Field Name*, Field Value*, Start Date, Description* and Photo* as entered into the corresponding fields within DSApp. View in Level 3 Construction Details.
On Departure	Each Variable is exported.	Data	Creates a new data record with the selected Level, Date and Time and Variable Name. View in a datasheet.

* If selected on that DSApp Page.

If DSApp has been selected as the Import Type, DataSight will move straight to Commit Your Import to finalise the Import process.

See also:

- Commit Your Import
- Automatically Import DSApp Files
- Link DSApp

6.1.2.4 Variables and Metadata Variables Import

To help populate your Variables and Metadata Variables within DataSight, **Variables** and **Metadata Variables** import options have been provided allowing you to import a human readable file containing your Variable or Metadata Variable information.

A Variable file should contain the following columns:

- (Required) Variable Name;
- (Optional) Description;
- (Optional) Units; and
- (Optional) CAS Number.

A Metadata Variable file should contain the following columns:

- (Required) Metadata Variable Name; and
- (Optional) Description.

Import Variables or Metadata Variables

1. Click **Import**. The Open window appears.
2. Navigate to the folder containing the data file that you wish to import.
3. In the Files of type drop-down menu, click to select the file type (.xls, .csv, .txt, .dat, .prn, .hcs etc).
4. Select the file name and click **Open**. The Import Type Window appears.
5. Select either Variables or Metadata Variables from the Import type drop-down. Click OK. THe Step 1 Variable Import Routine window appears.
6. Use the scroll arrows to set the **First Title Row** and **Number of Title Rows**.  will appear next to the first and last Title Row lines in the data panel.
7. Scroll down the data panel and identify where the data starts. Position the cursor on the appropriate line number in the data panel and left-click. This will set the position of the **First Data Row** and  will appear next to that line in the data panel. Any values above this row (apart from any set Title rows) will be ignored in the Import process. Continue to scroll down the data panel and identify where the data stops. Right-click on the appropriate line number in the data panel to set the position of the **Last Data Row** and  will appear next to that line in the data panel. Any values below this line will be ignored in the Import process.
8. Click **Next**. The Step 2 Variable Import Routine window appears.
9. Click on the **row** which corresponds to the Variable Name or Metadata Variable Name column of your data file. The row and corresponding column in your data file is highlighted in green.
10. Click in the **Field Type** cell to the right to display the drop-down list of available Field Types and select either **Variable Fields** if importing Data Variables, or **Metadata Fields** if importing Metadata Variables.
11. Click in the adjacent line in the DataSight Fields column to access the drop-down list of DataSight Fields and select either **Variable Name** or **Metadata Variable Name** as required.

12. Repeat steps 10 to 12 above to map any of the following DataSight Fields as required, keeping in mind that Units and CAS Number are only available for Data Variable imports:
    a. Description;
    b. Units; or
    c. CAS Number.
13. When you have mapped all the fields, click **Next**. The Step 3 Preview window appears.
14. In Step 3 of the Variable Import Routine, preview the data you are about to import.
    a. Click **Back** to step backwards through the Import Routine to change any formatting, filtering or mapping as required.
    b. Click **Next** if you are satisfied with the data set to proceed to Step 4 Commit Your Import.
15. In the last step of the Variable Import Routine, you will be able to view a summary of your import specifications prior to committing your data to the database.
16. Click **Import** to import the Variables or Metadata Variables to your database. When the Import Routine has completed, click **Finish**.

Import Templates

During the Import Routine, you can save the current Import Routine specifications to use again with the same type of file. This will save time during subsequent imports, particularly when there are many data fields to map. Import Templates are also necessary when autoimporting data into DataSight.

Save an Import Template

1. Step through the Import Routine until you have observed Save Template at the bottom of an Import Routine window.
2. Click **Save Template**. The Import Template window appears.
3. To overwrite an existing template, select it from the drop down men and click **OK**. Click **OK** again to confirm overwrite.
4. Alternatively, you can create a new template by entering a unique name. Click **OK**.
5. You will be returned to the Import Routine window. Your template will be available for use in the Import Routine.

To learn how to load an Import Template, proceed to Select Import Type.

Modify an Import Template

1. Step through the Import Routine until you reach the Select Import Type Window.
2. Click **Load Template**. The Load Import Template window will appear.
3. Select the appropriate template and click **OK**. This will load the parameters (including the mapping decisions) that have been saved for that import specification.
4. Step through the import routine making changes as required.
5. When you have observed Save Template at the bottom of an Import Routine window, click **Save Template**. The Save Import Template window appears.
6. Either type in a new template name and click **OK.** You are returned to the Import Routine window.

   Or select an existing template to overwrite from the drop-down list. A confirmation dialogue window will appear. Click **Yes** to overwrite and return to the Import Routine window. The modified import template will be available for use in the Import Routine.

Delete an Import Template

1. Step through the Import Routine until you reach the Select Import Type Window.
2. Click **Load Template**. The Load Import Template window will appear.
3. Click to check the **Delete** checkbox(es) against any templates(s) that you wish to delete.
4. Click **OK** and you will be prompted to save your changes.

Note	When creating an import template for data from a web service or ftp, type the full connection string into the File Name field. Please note the File Name field has a limit of 250 Characters.

See also:

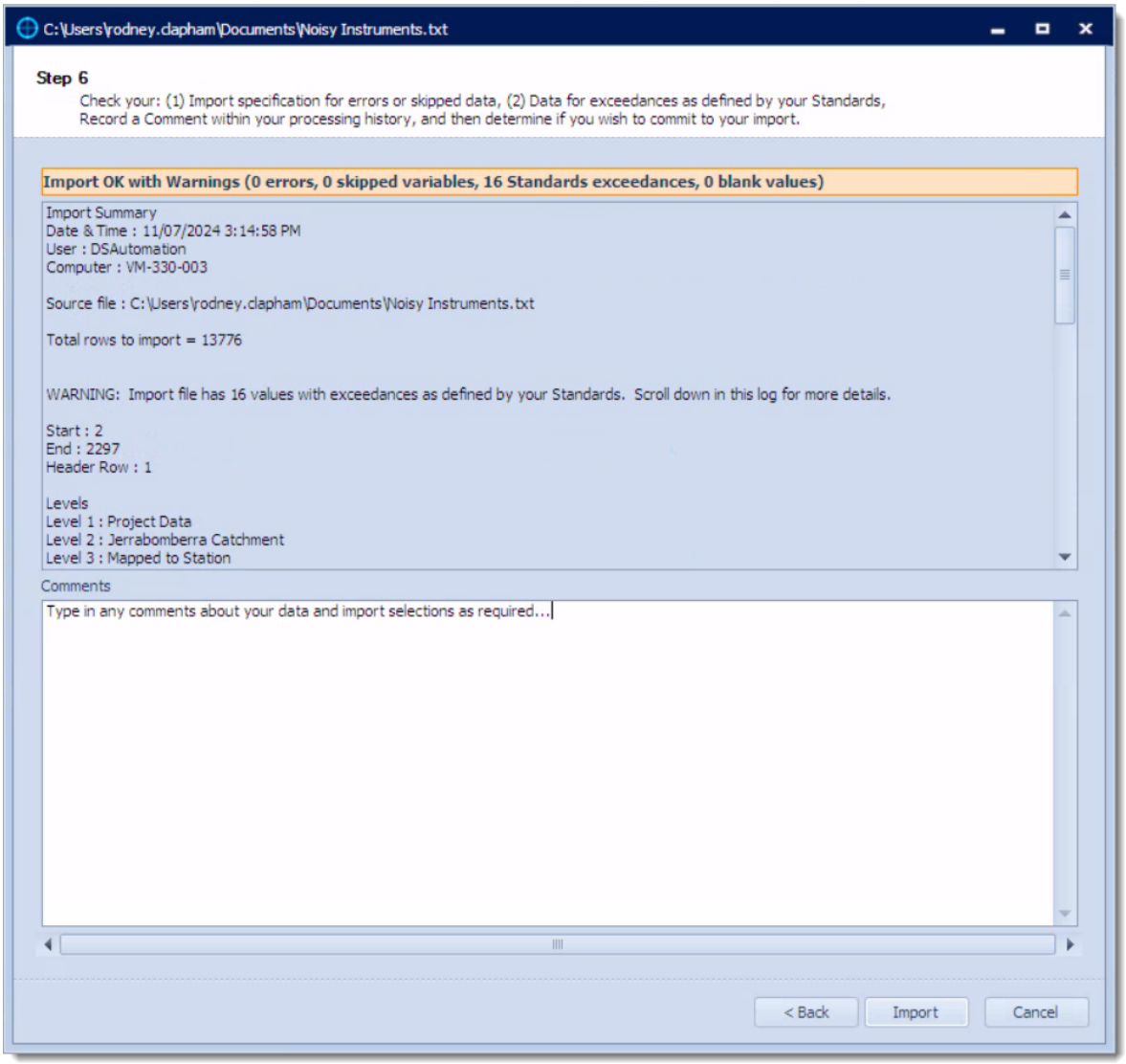
- Automate Imports
- File Dialog Windows

Commit Your Import

In the last step of the Import Routine, you will be able to view a summary of your import specifications prior to committing your data or document to the database.

At the top of the Import Summary section, DataSight will display a coloured text box summarising the outcome of the checks completed prior to committing the data to your database:

- (Green) Import OK - no issues were identified and the import will proceed without errors or omissions in the data to be imported.
- (Orange) Import OK with warnings (## errors, ## skipped variables, ## Standards exceedances, ## blank values) - issues were identified and some data may not be imported.
- (Red) Import Failed. No records to import - issues were identified and no data will be imported.



Import Summary Checks

1. Check the Import datetime stamp, user and computer are showing correctly.
2. Check the original path of the raw data file is correctly displayed.
3. Ensure the data row selection is that which you intended.
4. Most importantly, ensure you have selected the correct levels and the field mappings are correct. Levels added and variables skipped will be shown at this point.
5. Check to see if you have any exceeding data which will be imported into the database.
6. Click **Back** at any stage to revise any import specifications that are not correct, or **Cancel** if you wish to cancel and close the Import Routine without importing.
7. Type in any commentary about the import as required. This comment will be saved with in the processing history.
8. When satisfied with the import summary, click **Import**. A Completing the Import window will appear showing the import progress.

Data Validation

- During the final stage of a data import when you commit your data to the database, DataSight runs a validation check to ensure that the date and time is correctly formatted before import.

- If the date and time is incorrectly formatted, or missing, an Error List will appear detailing the lines and fields affected in the import.
- You are able to either **Cancel** or select **OK** to continue the import with the nominated lines being excluded.
- You can right-click on the lines of data to Select All and create a Copy of the Error List.

Stop Import

- Click **Finish** to stop the Import at any point of progress.
- The number of rows imported at this stage will be indicated and any remaining rows will not be imported.
- Details of the number of imported rows is added to the Level 3 Processing History.

After Successful Import

- Once your import is successfully completed, click **Finish** to close the Import Routine.

Specialised Imports

The topics in this section provide you the preliminary step-by-step instructions on how to create specialised Import Templates using the Import Routine.

- Converting Timestamps
- LoRaWAN Device Import Routine

6.1.5.1 Timestamp Offsets

When creating your DataSight database, a DataSight Administrator must set the Database Time Zone. By default, this Database Time Zone is displayed and used for each Level 3. Furthermore, when data is imported in a DataSight database, the timestamps are automatically related to the database Time Zone.

However, DataSight does allow you to specify a different time zone for a Level 3 than that of the database. This may be useful when your Level 3 sites are physically in different time zones, and you need to standardise the data sets into one for comparative purposes.

It must be noted that when Level Time Zones are offset from the Database Time Zone, during import, DataSight will convert the timestamps into the Database Time Zone. This is conducted using the difference in hours between the Level 3 Time Zone and the Database Time Zone (a forwards or backwards offset in time).

Datetime conversion applied during import will be displayed in the Import Summary text prior to committing your data. The summary is saved with the Processing History.

See also:

- DataSight Administrator
- Levels

6.1.5.2 LoRaWAN Device Import Template

DataSight supports ingesting data for LoRaWAN devices using NNN Co. Australia's LoRa Network. An API key is required to connect to their Web API in order to request the data.

Detailed below are the pre-requisites and step-by-step instructions for creating an Import Template for a LoRaWAN device using NNN Co. Australia's LoRa Network.

Pre-requisites

A data file for the LoRaWAN device in JSON format. Third-party products, such as Postman®, can connect to the LoRaWAN device using your API key and a Web API URL string to request and save data. This is useful for creating an Import Template if you do not already have a data file in the required format available.

Creating the Import Template

Detailed below are the recommended options to use during the Import Routine.

1. Select your file for import.
2. Import Step 1:
   a. **Field Delimiter** set to comma.
   b. **Text Qualifier** should be set to double quotes.
   c. **Normalised** option checked.
   d. **First Title Row** set to 1.
   e. **First Data Row** set to 2.
   f. Check and update the other options as required for your Import.
3. Import Step 2:
   a. Create a Variable Mapping Template to map both the Variable Name and Units using:
      i. The column 'type' as the **Selected Column** containing the Variable Names.
      ii. The column 'unit' as the **Selected Column** containing the Variable Units.

Note	It is recommended that the column 'type' be used as the Variable Name, and the column 'unit' be used as the Variable Units in order to uniquely identify a Variable. This is because the 'channel_id' may not remain constant, and the 'type' field can contain duplicate entries for different sensors (e.g. the "pressure" type may be used for different sensors).

   b. **Map the measured parameters** to your DataSight Variables, **save** your Variable Mapping Template and return to the Import Step 2 window.
   c. Map input fields to DataSight fields as follows:
      i. timestamp as **Date&Time**.
      ii. label leave blank.
      iii. type as **VariableMapping - Template Name**.
      iv. unit as **VariableMapping - Unit**.
      v. channel_id leave blank.
      vi. value as **VariableMapping - Value**.
4. Import Step 3:
   a. Preview the data you are about to import before continuing.
5. Import Step 4:
   a. Associate your data set with information required to complete the import (DataSight Level, Collection Information, Standard & Flag).
   b. **Save** your Import Template.

Note	As devices deliver the data in UTC +/- 00:00 time zone, DataSight will convert this to the local time zone of your database during the import process.

Manual Data Entry

Data can be manually entered record by record into DataSight. Manual data entry is most useful where paper records are the source of your data, or you have discrete data for a rare event. This type of entry requires existing Levels and Collection information.

Manual Data Entry templates, which can replicate your field datasheets, can be saved so data records can be keyed in quickly.

Note	On the DataSight user interface, Manual Data Entry may be referred to as **MDE**.

Open Manual Data Entry from the DataSight Ribbon

- Click **Manual Data Entry** in the Input Group of the DataSight Ribbon. The Manual Data Entry form appears.

See also:

- Import Routine
- Automated Import
- Data Migration

Create Records

1. Click **Manual Data Entry** in the Input Group of the DataSight Ribbon. The Manual Data Entry form appears.
2. Select a **Level 3** you want to add data to from the drop down tree list.
3. Enter the **Date** and **Time** by over typing the current timestamp or using the Calendar Tool. The Time Zone of the selected Level 3 will be displayed to the right of the Datetime field.
4. In the section below you have two buttons, one for **Data** and one for **Activity**. The Data button is selected by default, and displays that data entry fields below.
5. In the Data section:
   a. (Optional) Select the **Person** and **Equipment** from the drop-down lists.
   b. (Optional) Select the **Flag** from the drop-down list. The selected flag will be applied to all variables being entered. You can then alter individual flags for each record when entering its value.
   c. Select the **Variables** to be entered from the drop-down list of variables. The Variable Names will appear in the left hand column of the form.
   d. Select the **Metadata** variables to be entered from the drop-down list of metadata variables. The metadata variable's Name will appear as another column of the form.
   e. Define the order of the variables on the form using the up  and down  arrows.
   f. Click in a variable name **row**.
   g. Enter the measured or **Input Value** in the corresponding cell in the right hand column.
   h. (Optional) You can also change the **Flag** against individual variable(s) here.
   i. (Optional) Enter any **Metadata variables** in their corresponding cells to the right of the variable row.
   j. Selection check-boxes located to the left of each variable name row allow you to select which individual records are to have their changes saved.

6. (Optional) You can click the **Activity** button to switch from the data entry to the activity entry fields for capturing information relating to the activity conducted for the data being entered.
   a. (Optional) Enter or change the value of **Input Value** - this is the Activity ID.
   b. (Optional) In the **Metadata drop-down** list, select additional **activity metadata variables** you wish to record values against. Once selected, these will be added to the **Activity Metadata** section
   c. (Optional) Enter the **Activity Metadata** values.
7. Click **Save** to commit the data to the database.
8. Once your data is successfully created, a confirmation box will be displayed.

See also:

- Edit Data using MDE
- Manual Data Entry Templates
- Using MDE Templates with DSApp

Manual Data Entry Templates

When entering data with Manual Data Entry, templates can replicate your field datasheets, and be saved so data records can be keyed in quickly. These are called Manual Data Entry templates.

Save a Manual Data Entry Template

1. To save the current Manual Data Entry form specifications as a template, click the down arrow in the **Templates** button and select **Save**. The Save Manual Data Entry Template window appears.
2. Type in a new template name.
3. (Optional) If you will be using this Manual Data Entry Template with DSApp, in the **Associated Level(s) for DSApp** section below, check the Level checkbox(es) against the Levels you would like available from within DSApp.
4. Click **OK.** You are returned to the Manual Data Entry window.

   You can also select an existing template to overwrite from the drop-down list. A confirmation dialogue window will appear. Click **Yes** to overwrite and return to the Manual Data Entry window.

Load a Manual Data Entry Template

1. Click the down arrow in the **Templates** button, and select **Load**. The Manual Data Entry Templates table appears.
2. Select the template you wish to use. Click **OK**. The template will populate the Manual data Entry form.

Modify a Manual Data Entry Template

1. Load a Manual Data Entry Template as described above.
2. Modify the Manual Data Entry specifications as required.
3. Click the down arrow in the **Templates** button, and select **Save**. The Save Manual Data Entry Template window appears.
4. (Optional) If you are using this Manual Data Entry Template with DSApp, review the Level(s) selected in the **Associated Level(s) for DSApp** section.
5. Type in a new template name and click **OK.** You are returned to the Manual Data Entry window.

You can also select an existing template to overwrite from the drop-down list. A confirmation dialogue window will appear. Click **Yes** to overwrite and return to the Manual Data Entry window.

Delete a Manual Data Entry Template

1. Click the down arrow in the **Templates** button, and select **Load**. The Load template window will appear.
2. Click to check the **Delete** checkbox(es) against any templates(s) that you wish to delete.
3. Click **OK** and you will be prompted to save your changes.

See also:

- Create Records
- Edit Data
- MDE Templates and DSApp

MDE Templates and DSApp

DSApp data entry pages change dynamically depending on the linked MDE templates created in DataSight. MDE templates are used to dynamically push level and variable lists to DSApp via the DSApp Report.

DSApp users update their DSApp Report by connecting to the configured FTP Server while they have connectivity, before heading to the field.

This ensures that DSApp is updated with the most current Templates, Levels, Variables, Person and Equipment available for selection and recording of data within DSApp.

Consider when creating your Manual Data Entry Templates:

- The tasks the DSApp user will be completing in the field.
- What Variables they will need available.
- The Levels that they will need available.

Each MDE Template for DSApp MUST have assigned Variables AND Levels. MDE Templates without Levels assigned to them will **NOT** be available within DSApp.

Also ensure the DSApp user is aware of the MDE Template name, to enable them to select it from within DSApp.

See also:

- DSApp
- DSApp Import
- Link DSApp

Automated Import

As outlined in the Import Routine, DataSight has the capability to Save an Import Template. The ability to save an import template not only reduces the manual editing steps during repetitive imports, it also allows you to set up automated imports using DataSight's Service Manager.

Using the Service Manager with DataSight, you can set tasks to automatically import data according to a defined schedule and the saved import template. DataSight supports real-time applications involving the integration of real-time data feeds.

For detailed information on this process please refer to Automate Imports.

See also:

- Automate Your Tasks

Documents

Accessible by every DataSight user, Documents provide an area for document management within your DataSight database. Documents can be used to capture files that relate to the purpose of a project, and as such it is well worth populating this area of DataSight from the outset.

- Documents can store raw data files, reports, PDF files, site documentation, hyperlinks, images, videos, maps and much more.
- Any document loaded to your database can be linked to a specific level.
- While importing data, the raw data file is attached to the specific Level 3 the data is being imported to. This ensures that no matter what modifications are later applied to the data, the original raw data file remains secure.

Open All Documents

- Click **Documents** in the Input group on the DataSight Ribbon. The Documents window appears in the Main Panel.

Open Documents Associated with a Level

- In the Levels Panel, right-click on any level and then select **Documents** to view all the documents for that level.

Manage Documents

All database documents appear in the main Documents list accessed from the ribbon. If you have a large number of documents stored in the database this panel may take some time to open.

Add a new Document manually to the database

1. Click **Documents** in the Input group on the DataSight Ribbon. The Documents table appears in the Main Panel.
2. To add a document, click **New** in the Quick Access Toolbar and an empty record row will be added at the bottom of the Documents list.
3. Enter the **Document Name** for the document record.
4. (Optional) Enter a link to an external document or website in the **Link** field. This is a hyper link and can be a link to any local or network file, or can be used as an internet link.
5. To attach a new file to the document record, right-click on the row and select **Add File**.
6. Navigate to your file and once selected, click **Open**. The full document name complete with extension will now appear in the **File Name** cell.
7. (Optional) If you wish to specify a period of applicability for a document, enter the **Start Date** and **End Date**.
8. (Optional) Enter further **Comments** about the Document as required. These details are stored as RTF documents, which allow for further text, images and hyper links to be linked to that record.
9. Click **Save** in the Quick Access Toolbar to save the record.

Add a new Document manually to a specific Level

1. Click the **Level Name** in the Levels Panel to select the Level to which the document will be linked.
2. Then right-click and select **Documents**. The Documents table for that Level appears in the Main Panel.
3. To add a document, click **New** in the Quick Access Toolbar and a new record row will be added at the bottom of the Documents list. The Level name will be pre-filled in this new row.
4. Enter the **Document Name** for the document record.
5. (Optional) Enter a **Link** to an external document or website. This is a hyperlink and can be a link to any local or network file, or can be used as an internet link.
6. To attach a new file to the document record, right-click on the row and select **Add File**.
7. Navigate to your file and once selected, click **Open**. The full document name complete with extension will now appear in the **File Name** cell.
8. (Optional) If you wish to specify a period of applicability for a document, enter the **Start Date** and **End Date**.
9. (Optional) Enter further Comments about the Document as required. These details are stored as RTF documents, which allow for further text, images and hyperlinks to be linked to that record.
10. Click **Save** in the Quick Access Toolbar to save the record.

Note	You may wish to import use the Document Import Routine to import a new document and assign it to a Level.

Manage the File

1. Select the document in the Document list by clicking on the relevant row. The row will be highlighted.
2. With the cursor over the highlighted row, right-click and select from the options presented in the drop down list.
   - **Add File** removes the attached file to be replaced with a new one.
   - **Open File** opens the attached file.
   - **Save File As** saves the file to a selected directory.
   - **Open Details** provides the import summary information saved when a file was attached during the Import Routine.
3. Modify the document record by clicking in the chosen cell and making changes as necessary.
4. Click **Save** in the Quick Access Toolbar to save any modifications.

Delete a Document

1. Click to check the **Delete** checkbox(es) against any document(s) that you wish to delete.
2. Click **Save** in the Quick Access Toolbar at any point to save the deletion and continue, otherwise when you **Close** the Document panel you will be prompted to save your changes.

Note	**Historical Updates of Documents** Documents pre-existing to Version 2.9 were migrated from Version 2.8 as a single record. That is, DataSight 2.9 automatically created a single Document record containing all pre-existing documents. This singular record will exist only when the original database was created with DataSight 2.8 or an earlier version.

See also:

- Automate Imports

Fixed Data Types

DataSight is inherently flexible and can be used to store data for all types of measured parameters. However, DataSight also provides for certain records concerning the storage and manipulation of hydrographic data. These records have a fixed format and/or relate to each other in specific ways that can not be easily catered for by the use of user-defined DataSight Variables. These modules are accessible from specific areas of the user interface and their calculation routines are preset in DataSight.

Hydrographic Data

Environmental scientists such as hydrologists or hydrograhers locate hydrometric stations on water bodies in order to monitor and understand the movement of water through a terrestrial environment. These constructed hydrometric stations, also known as gauging stations, stream gauge or gage, are used to systemically obtain measurements of water quantity. The data captured at a hydrometric station often consists of the water surface elevation (sometimes referred to as the Stage or Gauge Height) and/or the volumetric flow (known as Discharge), together with other observations perhaps relating to biota or water chemistry. These measurements can be highly automated and for the most part are readily imported into DataSight.

Hydrologists will use measurements of Gauge Height and Discharge to produce what is know as a Rating Table or Curve. The Rating Table is a mathematically modeled relationship between the water surface elevation and the quantity of water moving through that location. These rating tables are typically derived from both hydraulic theory and actual field measurements of discharge taken at various water elevations, and they can be applied to the time series of water level record to determine a time series of discharge. Subsequent field measurements of water height and velocity across the water body (Stream Gaugings) are used to calibrate these Rating Curves. Both types of data, the Rating Table and the Stream Gaugings can be entered into DataSight using Conversion Tables and Gaugings.

6.5.1.1 Gaugings

DataSight provides a complete Gauging module under each Level 3. The Gauging module allows you to store all aspects of a manual gauging, including:

- Summary site information,
- Vertical observations (depth, depth of observation, point velocity, mean vertical observation, panel area and panel discharge),
- Generation of stream gauging records, using either the mid-section or mean-section methods following International standards, and
- Manual Override that allows you to enter summary information provided from Acoustic Doppler Current Meters, if required. The electronic file generated by Acoustic Doppler Current Meters can also be stored and linked to the specific gauging and Level 3.

Open Gaugings

1. Navigate to the chosen Level 3 in the Levels Panel and click on a **Level 3** to highlight it.
2. Then right-click and select **Gaugings**. You can also click **Gauging** in the Input group of the DataSight Ribbon.

   The Gaugings table appears in the Main Panel. This table lists all Gauging data entered for the specific Level 3 and some cursory details for each gauging.

6.5.1.1.1 Enter Gaugings

Add a new Gauging

1. Select the **Gaugings** tab in the Main Panel.
2. Click **New** in the Quick Access Toolbar.

   You can also click on the **Gaugings** grouped tab on the ribbon and click **New Gauging**.

The New Gauging window appears.

3. Enter a meaningful title for the gauging in the **Description** text box.
4. Enter the **Start Date & Time** and **Gauge Height**.
5. Enter the **Finish Date & Time** and **Gauge Height**.
6. Identify the **Method of Gauging** you will use for subsequent calculations (either Mid-Section or Mean-Section).
7. Identify the starting stream bank for the gauging as either **WELB** (Water Edge Left Bank) or **WERB** (Water Edge Right Bank).
8. Select your **Measurement Quality** using the drop-down list (Excellent, Good, Poor, Fair).
9. Select the **Units of Measurements** from the drop-down list (Metric, Imperial).
10. (Optional) Identify the **Collector/Gauging Personnel** who collected the data.
11. (Optional) Enter the **Equipment** Serial Number.
12. Click **Comments** to open a Gauging Comments window.
13. Enter comments as required. Click **OK** to save.
14. (Optional) Add a Gauging document by clicking  on the toolbar. This will open the level document form. Attach your Gauging document with a level using this form.
15. To add a new Gauging form immediately after saving the current form, click **Save and New**. Otherwise, click **Save** in the Quick Access Toolbar. The saved gauging will appear in the Gaugings list.

Note	Entries must be made in each of the Start and Finish Gauge Height, Method of Gauging, Water Edge Bank, Measurement Quality and Unit of Measurement for a Gauging to be saved. Calculated gauging parameters require this information.

Modify a Gauging

1. Select the **Gaugings** tab in the Main Panel.
2. Double-click on the relevant Gauging row.

   You can also highlight the relevant Gauging row by clicking on it. Then click on the **Gaugings** ribbon tab and select **Edit Gauging**. The New Gauging window appears.
3. Modify the Gauging properties as desired.
4. Click **Save**.

Select Multiple Gaugings

- Hold down CTRL and click on all the multiple Gauging rows you wish to select. You can also hold SHIFT and click to select a range of Gauging rows.

Delete a Gauging

1. With the appropriate gauging(s) highlighted, click the **Gaugings** grouped tab on the ribbon and select **Delete Gauging**.
2. You will be asked to confirm that you wish to delete the selected gauging. Click **Yes**. The gauging and all chainages are deleted from the Gauging list.

6.5.1.1.2 Enter Chainages and Observations

Add Chainages and Observations

1. Select the **Gaugings** tab in the Main Panel.
2. Either double click on the relevant Gauging row or once the selected gauging is highlighted, click on the **Gaugings** ribbon tab and then select **New Chainage**. The Chainage Window appears.
3. Enter the **Chainage Value**.
4. Enter the **River Depth**.
5. Enter the **Depth** and **Velocity** of an observation. Click **Add**. The observation will be saved in the Observation section.
6. Enter as many observations as required.
7. Click **Save**. The Chainage will now appear under the Gauging in the Gauging List.

Edit a Chainage

1. Either double click on a relevant Chainage row or once a Chainage is selected, click on the **Gaugings** ribbon tab and then select **Edit Chainage**. The Chainage window appears.
8. Modify the **Chainage** as desired.
9. Add or delete an **Observation** if required.
10. Click **Save**.

Delete a Chainage

1. Either double click on a relevant Chainage row or once a Chainage is selected, click on the **Gaugings** grouped tab on the ribbon and then select **Delete Chainage**.
2. You will be asked to confirm that you wish to delete the selected Gauging. Click **Yes**. The Chainage will be deleted from the Gauging.

6.5.1.1.3 Manual Override of Gauging Parameters

In DataSight, the calculated results are continuously and automatically refreshed after adding or editing Chainage measurements and are displayed in the same measurement units as the data being entered.

However, there is also an option to override these calculations and enter the values manually.

Manually enter gauging parameters

1. Select the **Gaugings** tab in the Main Panel.
2. Either double click on the relevant Gauging row or once the selected gauging is highlighted, click on the **Gaugings** ribbon tab and select **Edit Gauging**. The New Gauging window appears.
3. Click the **Manual Override** checkbox in the Calculated Properties section.
4. Enter the **Total Area**, **Mean Velocity** and **Total Discharge**.
5. Click **Save**. Any associated Chainages will no longer be displayed with the Gauging in the Gauging list.

Revert to DataSight generated values

1. In the New Gauging window, click the **Manual Override** checkbox off in the Calculated Properties section.
2. Click **Save**. The associated Chainages are again available within the Gaugings list.

3. Either double click on a relevant Chainage row or once a Chainage is selected, click on the Gaugings ribbon tab and select **Edit Chainage**. The Chainage window appears.
4. Click **Save**. Calculated gauging properties are now displayed in the Gaugings List, and within the Gauging window.

Refer to Gauging Calculations for further information on the usage and derivation of gauging parameters.

6.5.1.1.4 Gaugings Ribbon Tab

When a gaugings is open, the Gaugings Ribbon Tab can be found next to the Home tab in the DataSight Menu Panel.

Several commonly used gauging functions are given on the grouped ribbon tab when Gaugings is focused in the Main Panel.

Group	Property	Function
Gauging	New Gauging	Shows the New Gauging window to allow entry of gauging data.
	Edit Gauging	Opens the currently selected gauging in the Gauging window for editing.
	Delete Gauging	Deletes the currently selected gauging.
Chainage	New Chainage	Shows the New Chainage window to allow entry of chainage data.
	Edit Chainage	Opens and currently selected chainage in the Chainage window for editing.
	Delete Chainage	Deletes the currently selected chainage.
Reports	Gauging Details	Opens the Gauging Details Report for the currently selected gauging.
	Gauging List	Opens the Gauging List Report for the currently selected gauging(s).

See also:

- Tabs on the Ribbon
- Gaugings

Biological Data

The Biological Data Module in Version 2 was based on the principal that a sample might not relate to a specific site but may be, for example, an area or a net. The data structure may require species types, species counts, specimen tissue samples and tissue analyses, to cascade from such samples. Including such biological data in DataSight Version 2 allowed its management within the same database as other laboratory analyses and time series environmental data.

Currently Version 3 does not yet provide this capacity, but is scheduled for development. Please contact Seveno if you would like more information about our intended upgrade of Biological.

Note	If your biological data consists of a simple species count for a particular site, such as an E Coli count, a single field in the Variables Table is all that would be required.

Data Migration

Data migration is the process of transferring data between storage types, formats, or computer systems.

When is data migration performed

- Every time you import newly acquired data into DataSight you are migrating data from one format to another.
- The process of gathering your historical data into DataSight is also data migration.

Challenges in migrating historical data into DataSight

To get the maximum benefit from DataSight, you need to be certain that the information in your database is reliable, complete and has a consistent set of definitions. This may not be easily achieved for historical data sets. As you need to standardise your data definitions to give each piece of information the same meaning, combining multiple data sources and migrating data across systems (data migration and database migration) requires sufficient time and effort.

The following may pose challenges during the migration of your data into DataSight:

- You have had many different staff using a historical database over time. Data entry may have been inconsistent over time and the database has duplicate entries or gaps.
- You have acquired other systems that were merged with your own database. Data has often been loaded as-is, rather than being accurately translated and imported.
- You operate more than one database systems, exacerbating the issues raised above.
- Old operational systems have been migrated into new, with new data definitions put in place at the time of implementation. However, data from legacy systems still remain in the same format.

You need to be aware of the limitations of your historical data sets and be realistic about the time that may be required to move this set into DataSight. Please refer to the Seveno website and the Knowledge Base for help with known data migration issues.

Migrate your historical data into DataSight

To successfully migrate data into DataSight, you need to design a process for data extraction and data loading, which relates your old data formats to DataSight's formats and requirements. The process of data migration will consist of firstly auditing your files, then developing the rules to standardise data definitions.

1. Standardise your data:

   You may wish to ensure your data fields line up with your DataSight levels and variables, particularly if data is taken from spreadsheets, and that the variables are uniform, with any value ranges standardised across all records. This prevents data misinterpretation, enables more accurate selection from lists and helps identify gaps in your data. You may need to remove duplication within the database. Data migration phases (design, extraction, cleansing, load, verification) are commonly repeated several times before you can be confident in the integrity of your historical data set.

2. Streamline your migration:

   Certain functions in DataSight can and should be used to help streamline data migration. The importation process allows for a pre-load 'data validation' step, where you interrogate the data to be transferred to ensure that it fully complies with your database structure. Any issues with the data importation occurring at the point of loading are automatically reported in the import log.

3. Verify your data:

   After loading into DataSight, your results can be subjected to data verification procedures such as flagging to determine whether data was accurately translated and is complete.

For time series data, DataSight offers resolution as low as one second. Learn more about Time Limitation, Raw Data File Formats, Depth in Water Bodies and Duplicates.

See also:

- Input Your Data
- Import Routine
- Manual Data Entry
- Automated Import

Time Limitation

In DataSight Version 3, the minimum time increment has been set to 1 second.

While the Microsoft SQL can currently store data captured to less than 3 milliseconds apart, DataSight is not currently designed to take this data. If you require sub second data to be stored in DataSight, please contact us.

See also:

- Contact Seveno

Raw Data File Formats

At present DataSight cannot import multiple data records which are stored as one continuous row of data. You may need to preprocess the data using Excel to break the data into rows.

Sometimes Excel may also contain hidden formats, which are not able to be correctly read within DataSight. For instance, when importing XLS or XLSX data files, records with a midnight timestamp are sometimes missing from the Date Time field in Step 3: Preview Data. This occurs because Excel has previously applied its own formatting on the date/time field in the data file, and the midnight data record is then not parsed correctly through the DataSight import wizard. Affected rows will not be imported. To resolve, you will need to save your data file in a comma delimited CSV file format, and import the CSV file.

Depth in Water Bodies

Certain types of environmental data may have records for seemingly the same date/time at one specific location. For example, if you are monitoring changes in water temperature at one site, but at various depths, the location and date will remain constant. This is fine, but each record must have a unique timestamp. In this instance it is imperative that the time changes for each of the depth entries. This can be as simple as varying each entry (depth) by minute, such as 19:50:00, 19:51:00, 19:52:00, and so on...

There are two options when you are faced with data such as this:

Option 1. Ensure time values are assigned correctly before importing. This may involve adjusting equipment settings to record separate timestamps for each sample, or editing the data manually before importing in DataSight.

Option 2. DataSight can assign time values during import (see Map Levels).

Note	DataSight is designed for each measurement to have a unique timestamp, as we believe that even when a replicate measurements for a sample, that measurement have been CONDUCTED at a different time and can

	be differentiated by this. Think about how you are recording your measurements with respect to time, to help resolve issues as described above.

Duplicates

In DataSight, data for the same variable at a given site are stored with unique date and time stamps on DataSight. But when capturing environmental data, you may take duplicate measurements from a given locality or analyse a sample multiple times to obtain a statistically representative value for your measurement. At present, to save these records on DataSight for scientific interrogation, you may enter such duplicate data with differing or unique time stamps. We recommend using a small time increment between each entry (e.g. one second). This can be done during Import in Step 4, Map Fields. It is also recommended that you enter the sample name or code against the timestamps in a sample number variable to be able to filter and identify data for a given sample number or event.

7 View Your Data

Once your data has been imported into DataSight, you can use the intuitive functionality of the DataSight User Interface to view your data sets.

The main interface has been designed so that you can view large datasets from different perspectives with relative ease and without inadvertently altering the data in your database:

- **Levels** and **Variables**, linked with **Filters**, can be used to quickly interrogate your data sets using tabular datasheets and more importantly charts.
- The **Main Panel** of the DataSight window contains a Welcome tab by default, and is where datasheets, charts and other metadata views are displayed.
- Mouse click functions allow you to rapidly build charts and datasheets containing your data, which you can further refine using the Filters.

See also:

- Main Panel
- Filter Panel
- Datasheets
- Charts
- Saved Views
- Grid Views
- Maps
- Web Browser
- Data History

Filter Panel

The Filter Panel is used to display the filter conditions imposed on the data shown in a datasheet or chart in the Main Panel. These filters can be edited to further refine a dataset and rapidly pinpoint specific data. As the filters are edited and applied, the corresponding datasheet or chart automatically updates, and the filter conditions are saved together with the datasheet or chart when the datasheet or chart is saved.

It is important to note that the filter conditions define a **connected** SQL Query that extracts your data from the database every time the filter is applied. This customised querying, built on demand, allows you to return appropriately sized data sets for viewing.

The Filter Panel is by default placed *below the Main Panel* in DataSight when a datasheet or chart is open. Locality and Time filters within the Filter Panel can be automatically built by clicking on a level in the Levels Panel. See Filtering by Levels for more details on automatically building filters.

Filters can also be manually constructed within the Filter Panel. Filters consist of a Field, Descriptor and a Value.

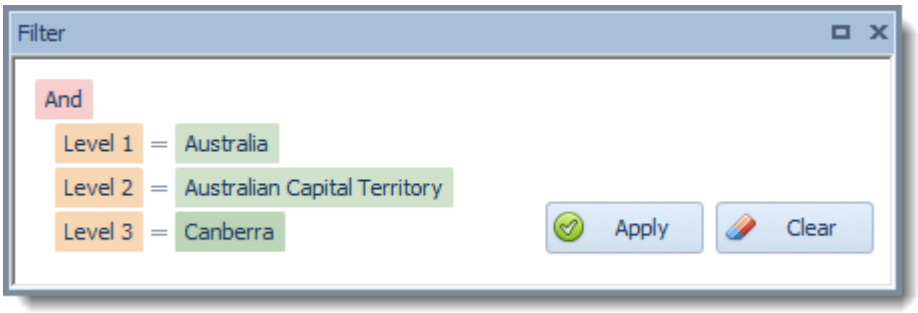
For example, in the statement *x* is less than 3:

" " is the Field,

"is less than" is the Descriptor, and

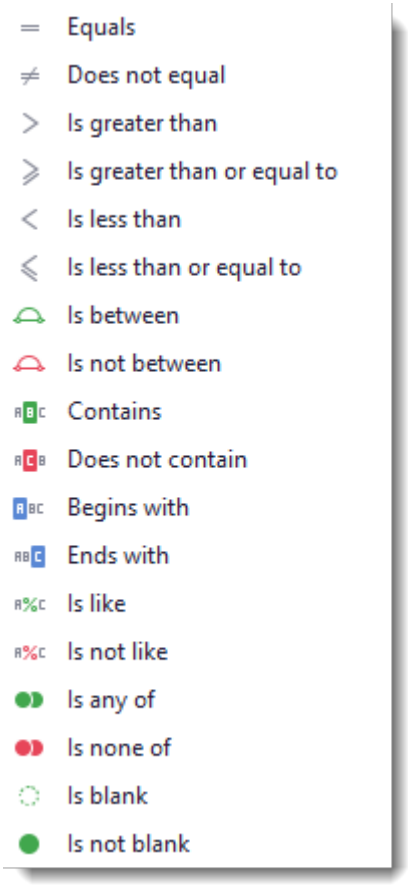
"3" is the Value.

In the example below, the Fields are set to the Level selected in the Levels Panel, the descriptor is set to "Equals", and the Values are the names of the specific Levels chosen.



Impose new filter conditions

1. Click the ⊕ button (next to **And**) in the Filter Panel, to add new filter conditions.
2. Click the 1st part and select a Field from the drop down list of all fields.
3. Click the 2nd part and select a Descriptor. The list of possible descriptors is as follows:



4. Click the 3rd part and select or type a value.
   a. When using the Descriptors 'Is any of' or 'Is none of', you can add multiple Value fields by clicking the ⊕ button (next to the Value field). To remove a Value simply click the Value next to it, press either the left or right arrow keys on your keyboard to select and highlight the Value to be removed and then press the Delete key.
5. You can repeat this process to add more conditions.
6. You can delete the criteria at any time using the ⊗ button.

Note	There is a known issue with filter descriptors 'Is between', 'Is not between', 'Is less than', 'Is less than or equal to', 'Is greater than' and 'Is greater than or equal to' when used with a variable field. To work around this issue, click on the variable field and choose another variable or add a new condition row. This will re-activate the descriptor to be selected or changed.

See also:

- Datasheet
- Charts
- Filter Panel Fields
- Filtering using Level List
- Filtering by Date and Time
- Searching by Find Panel
- Datasheet Analysis
- DataSight User Interface
- Menu Panel
- Levels

Filter Panel Fields

In DataSight datasheets and charts, the following fields are available for querying.

Category	Fields	Purpose
Location	Level 1 Level 2 Level 3	Return data for a specific level (site). This may also be a grouping (see Levels). You can set the Levels required by filtering using the Level List.
Time	Time Zone Offset	Converts the dates and times of the returned data to the specified time zone.
	DateTime Date Time Year Month Day Hour Minute	Return data for a specified time period (see also Filtering by Date and Time). You can set the Time dependent Levels required by filtering using the Level List.
Variable	Variable Variable Group	Return data available for the specified Variable(s) or Variable Group(s).
Metadata	Metadata	Return data available for the specified Metadata Variable(s)
Variable Value	Variable Group listing	Return variable values that meet the specified criteria. Variables are organised in the Field selection drop-down menu in either their Variable Group, or if without a variable grouping,

	Alphabetised listing of non-grouped variables	then alphabetically in the Non-Grouped Variables.
Metadata Value	Metadata Variable	Return metadata variable values that meet the specified criteria. Metadata variables are organised in the Field selection drop-down menu alphabetically by name.
Flagging	Flag Quality	Return data for the specified Flag(s) or Flag Quality (see also Flags).
Collection	Person Equipment Name Equipment Serial Number	Return data relating to it's collection information (see also Person and Equipment).
Process	Process Type	Return data that has a specified process type (see also Processing History). Available selections for datasheet and chart are: Calculation Import Locked Data Unlocked Data

Filtering using Levels List

When you click on a level in the Levels Panel, filters within the filter panel and the data in the Main Panel are automatically updated.

Filter data using the Levels list

1. Ensure that a datasheet or chart is open in the Main Panel.
2. Within the Levels Panel, click the ▸ icon next to each Level to expand the tree list view. Alternatively, use the Search function to quickly find the desired Level.
3. When you reach the desired Level, click on the **Level Name** to return the data within that Level.
4. The datasheet or chart will be populated with the associated data.
5. As datasets can be large for Levels 1, 2 or 3, you will be prompted to confirm the loading of these data sets. At the Confirm dialogue window either;
   - Click **OK** to load the data, or
   - Click **Cancel** if you do not want to load the data.
6. The Filter panel will be automatically populated with the filter conditions for the selected Level.
7. Repeat steps 2 to 5 to quickly change your filter conditions.

Note	If the Level 3 has a different Time Zone to that of the database, the Time Zone Offset filter condition will automatically be added to the Filter Panel. Simply remove the Time Zone Offset in the Filter Panel to view the timestamps in the Database Time Zone. Click ▾ to collapse a level, to help navigate through your data list.

Cancel data loading

- At the bottom right of your DataSight window, a progress bar starts running to indicate that your data is loading. Click on the **Progress bar** to cancel loading your data.

See also:

- Level
- Search for Levels
- Datasheet Analysis

Filtering by Date and Time

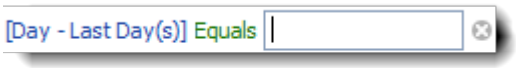
There are additional Date and Time descriptors available for use in the Filter Panel as detailed below.

Year, **Month**, **Day**, **Hour** and **Minute** fields have additional descriptors as follows:

Field	Descriptor	Definition
Year	Year - Last Year(s)	Last 'x' years of 365 days, filtered immediately from the current date and time on your SQL Server.
Month	Month - Last Month(s)	Last 'x' months of 30 days, filtered immediately from the current date and time on your SQL Server.
Day	Day - Last Day(s)	Last 'x' days of 24 hour periods, filtered immediately from the current date and time on your SQL Server.
Hour	Hour - Last Hour(s)	Last 'x' hours of 60 minutes, filtered immediately from the current date and time on your SQL Server.
Minute	Minute - Last Minute(s)	Last 'x' minutes of 60 seconds, filtered immediately from the current date and time on your SQL Server.

These conditions enable you to customise your filter to view data for the last period of data as defined. When you select the descriptor, the condition is bound to 'Equals'. You can then enter the number of years, months, days, hours or minutes that you wish to look in the past.

For example,



The data is filtered immediately from the current date and time.

The **DateTime** field also has additional descriptors available.

Field	Descriptor	Definition
DateTime	Is beyond this year	Any data that occurs at a monitoring timestamp later than the current year.
	Is next week	Any data that occurs at a monitoring timestamp within the next seven 24 hour days starting immediately from the current time.

Is tomorrow	Any data that occurs at a monitoring timestamp up to 24 hours from the end of the present day.
Is today	Any data that occurs at a monitoring timestamp at or before 23:59:59 of the present day.
Is yesterday	Any data that occurs at a monitoring timestamp up to 24 hours since the start of the previous day.
Is last week	Any data that occurs at a monitoring timestamp within the last seven 24 hour days starting immediately from the current time.

The **DateTime** field also has additional advanced descriptors available.

Field	Descriptor	Definition
DateTime	Is same day	Any data that occurs at a monitoring timestamp at or before 23:59:59 of the defined day.
	Is this month	Any data that occurs at a monitoring timestamp within the current month.
	Is this week	Any data that occurs at a monitoring timestamp within the current week starting from Sunday.
	Is this year	Any data that occurs at a monitoring timestamp within the current year.
	Is last month	Any data that occurs at a monitoring timestamp within the previous month.
	Is last year	Any data that occurs at a monitoring timestamp within the previous year.
	Is the year-to-date period	Any data that occurs at a monitoring timestamp from the beginning of the year to the current datetime.
	Is January ~ Is December	Any data that occurs at a monitoring timestamp within the selected month across all years of data.

Time Zone Offsets can also be applied. By default, the timestamps shown in any data sheet or chart are relative to the Database Time Zone, but specific Level 3 Time Zone Offsets can be applied.

A Time Zone offset simply moves data forwards or backwards in time, viewing the measurements from the perspective of another's location or time zone. Please take care when interpreting this data within DataSight, in terms of daily trends.

If the Level 3 has a different Time Zone to that of the database, the Time Zone Offset filter condition will automatically be added to the Filter Panel.

As an example of how this functionality may be useful is that by setting the Time Zone Offset to UTC+00:00, you can convert the datetime of the returned data from its recorded Time Zone to UTC time. This might be useful if you have to export data to UTC.

See also:

- Filter Panel

Searching by Find Panel

The Find Panel is available for use within the data sheet, and can be used to perform a global search across all columns of data.

The Find Panel is **not** connected to the Filter Panel and will not update your data set. It is used to help quickly identify data records within the returned data.

The Find Panel can be opened by clicking on the **magnifying glass** icon located on the right-hand side of the Group By Box.

Use the Find Panel

1. Enter an appropriate value in the find box and click **Find**. Data values that meet this criteria are highlighted yellow in the datasheet.
2. Click for the drop down list of previous searches. Click to remove each search.
3. Click the close button when you are finished.

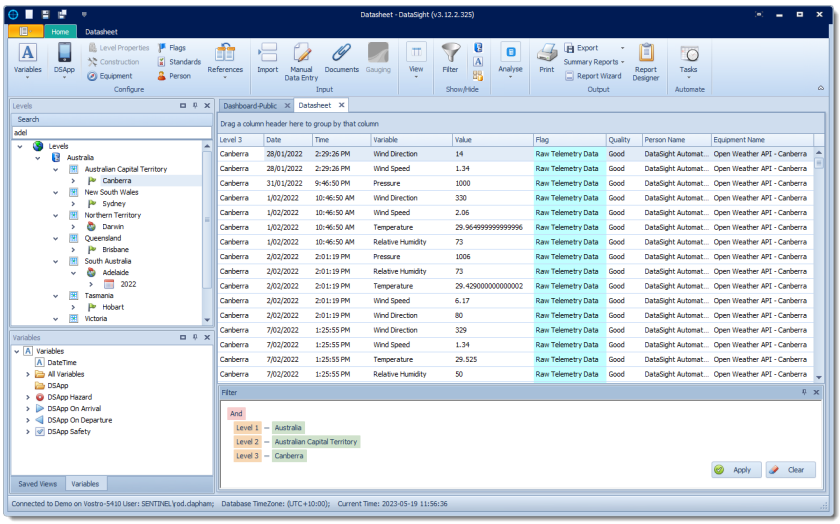
Datasheets

The Datasheet panel displays data from the database in a tabular normalised format.

Every row of data is a unique record in the database defined by its;

- Level 3 name
- Datetime stamp
- Variable, and
- Value

Metadata consisting of Person Name, Equipment Name, Flag and Quality are also shown by default. Metadata variables are hidden by default, but can be displayed using the Column Chooser.



The datasheet is linked with the Filter Panel to enable you to define filter conditions, which determine the data displayed in the datasheet. Filters can also be set using the Levels panel (See Filtering by Levels for more details).

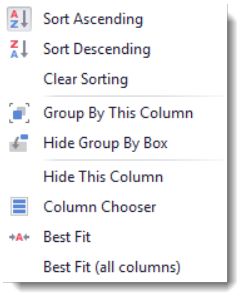
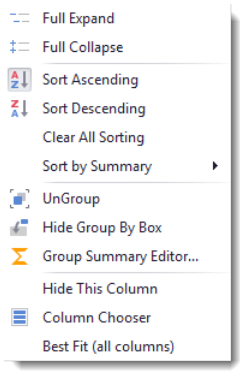
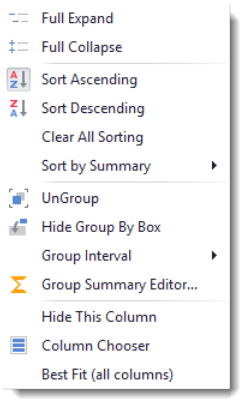
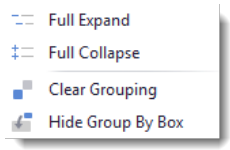
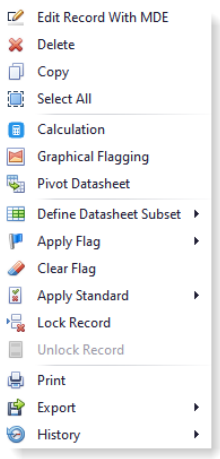
See also:

- Filter Panel
- Filtering by Levels

Organise Data

There are several tools within a datasheet to assist you in viewing and organising your data, all of which are accessible via Context Menus. Different context menus are available depending upon where you click in the datasheet. For the most part, the functions are applicable only to a specific column of data. Many of these functions can also be performed using mouse clicks.

Right-click on the following to access different tools.

Individual Column Header	Column Header dragged to the Group By Box	Date/Time Header dragged to the Group By Box	Group By Box	Individual Data Record
				

Organise Your Data

Maximize view

The DataSight User Interface has been sized to fit within a standard laptop screen. To increase the size of this window:

- Click the **Maximize** button in the top right hand corner of the DataSight datasheet window.
- Customise your layout (see Changing the Layout).

Heading order

To change your heading order:

- Click on a column header then drag and drop it sideways to its new position.
- Alternatively right-click on a column header and select **Column Chooser**, to reorder your column headers. This is particularly useful when you have a large number of input fields, and wish to change their order of appearance in the datasheet. Drag and drop the column headers into the Customise Window, then when ready, drop the columns back onto the datasheet in the desired order. The default datasheet display includes Level 3, Date, Time, Variable, Value, Flag, Quality, Person and Equipment. Other fields available within Column Chooser are Level 1, Level 2, Level ID, Numeric Value, Person Organisation, Equipment Serial Number and Units.

Column width

The column widths are set to **Best Fit (all columns)** by default. To alter the column widths:

- Hover the cursor over the join between column headers. The cursor will change to a  upon which you can drag the cursor left or right to change the column width.
- Select **Best Fit** to adjust the width of the column to accommodate the maximum width of the field's data.
- Select **Best Fit (all columns)** to adjust the width of all column's to that which best accommodates the data.

Sort data

To sort your data:

- Left-click a column header to sort the data by the ascending order  (first click) and the descending order  (second click). Toggle between the two choices.
- Alternatively select **Sort Ascending** or **Sort Descending** from the right-click menu.
- Select **Clear Sorting** from the right-click menu to restore the column of data to its original order.
- Order by more than one column of data, with the data sorted in order from first column selected through to the last. This can only be accomplished by selecting the sort order from the right-click menu of each column of data in order of preference.

Group data

Data grouping can be used to sort the data into groups with the same value, whether this be a variable value, a date, time or any other column of data. By default, the **Group By Box** appears above the column headers in a new datasheet.

To group your data:

- Right-click on a column header and select **Group By This Column**. The column header will appear in the **Group By Box** above the datasheet and the data will be sorted into groups of the same data value. These groups are shown in bold.
- Once the Group By Box is displayed, your can drag and drop a column header into the box to sort the data into groups.
- Multiple groupings can be made, with data sorted in the order in which you drag or select the column headers. Drag headers about to change the ordering.
- To merge groupings, drag a column header(s) to the group panel and arrange them across a line while pressing the CTRL key. Drag column headers below or above this line to break merged grouping.
- Right-click in either the column header within the Group By Box or the Group By Box itself to remove the column header.

Groupings can be expanded or collapsed to further interrogate the data.

- Within the datasheet, click to expand a group and to collapse a group.
- To fully expand or collapse the data, right-click in the Group By Box and select **Full Expand** or **Full Collapse**.

Data can also be **Sorted by Summary** when grouped (See also Summary Statistics and Date and Time Group Interval).

Remove columns

All data for a given Level is shown by default. To remove data:

- Click on the Column header and drag and drop it from the raw data panel.
- Alternatively select **Remove this Column** from the right-click menu.
- If you mistakenly remove a column of data, you will need to close the datasheet and open a new datasheet. The data will be shown again in its original format with the missing column of data, but all layouts will have been lost.

Filter data

Refer to Filter Panel.

Save a Datasheet

DataSight helps you save datasheets for reference later without needing to re-construct the filters.

Save a datasheet

1. With the datasheet tab selected, click **Save** or **Save As** in the Quick Access Toolbar and the Save As dialogue window appears.
2. Click on your desired folder in the **Saved Views** folders list. This may be the master Saved Views folder, or an existing folder. The selection will be highlighted.
3. You can also add a new folder. Highlight the folder under which the new folder will be created, and select **New Folder**. **Name** the new folder.
4. If you wish to overwrite an existing datasheet click on the datasheet name. Otherwise, **Name** the datasheet.
5. Click **Save**. The datasheet, together with its filters and column configuration will be saved, and appear in the Saved Views Panel.

Note	Saving the datasheet will save the: • Filter conditions used within the Filter Panel • Column Visibility (hidden/shown) and the order in which they appear (left-to-right) • Sort preferences (ascending/descending) Data grouping utilising the Group By Box, or find parameters entered into the Find Panel are not saved with the datasheet. Column Headers used within the Group By Box revert back to the datasheet.

See also:

- DataSight User Interface
- Datasheets
- Pivoted Datasheets
- Saved Views

Data Subset

From within a datasheet, you are able to define a subset of data and have this displayed either in the current datasheet or within a new one. This may be useful when you wish to perform further data analysis (e.g. Calculations or Graphical Flagging) on the data subset.

Select a data subset

You can set the Start of Subset and End of Subset datetime values of data as follows:

1. Right-click a record in the datasheet and select **Start of Subset** under the Define Datasheet Subset context menu.
   a. The start of the subset will be set to the datetime of the selected record.
   b. The Start of Subset context menu option is updated with the datetime value of the selected record.
2. Right-click a record in the datasheet and select **End of Subset** under the Define Datasheet Subset context menu.
   a. The end of the subset will be set to the datetime of the selected record.
   b. The End of Subset context menu option is updated with the datetime value of the selected record.

You can use the above steps to re-define the start and/or end datetime values for your data subset.

Apply subset to a datasheet

Once you have defined your data subset you can apply the subset filters to the current datasheet; or create a new datasheet with the subset filters applied.

1. Right-click a record in the datasheet and select either **Apply Subset to Current Datasheet** or **Apply Subset to New Datasheet** under the Define Datasheet Subset context menu.

Clear data subset

You can remove both the start and end datetime values for your data subset as follows:

1. Right-click a record in the datasheet and select **Clear Subset** under the Define Datasheet Subset context menu.

See also:

- Calculations
- Graphical Flagging

Datasheet Ribbon Tab

When a datasheet is open, the Datasheet Ribbon Tab can be found next to the Home tab in the DataSight Menu Panel.

Several commonly used datasheet functions are given on the grouped ribbon tab when a Datasheet is focused in the Main Panel.

Group	Property	Function
Show/Hide	Show Activity Headers	Show or Hide the datasheet Activity Headers column.
	Show Indicator	Show or Hide the datasheet indicator column.
	Show Group Panel	Show or Hide the Group Panel
Analyse	Apply Standard	Select a standard to apply to the selected data on the datasheet (see Apply a Standard).
	Apply Flag	Select a flag to apply to the selected data on the datasheet (see Flag Data).
Aliasing	Apply Variable Alias by Reference	Select a reference group to apply alternate variable names to the selected variables (see Apply Variable Alias)
	Show All Variables	Once a reference group is applied, show all records in the datasheet, including aliased variables.
	Show Aliased Variables	Once a reference group is applied, show only aliased variables.
Operations	Refresh Datasheet	Refreshes the datasheet with any selections made on the grouped tab.

See also:

- Tabs on the Ribbon

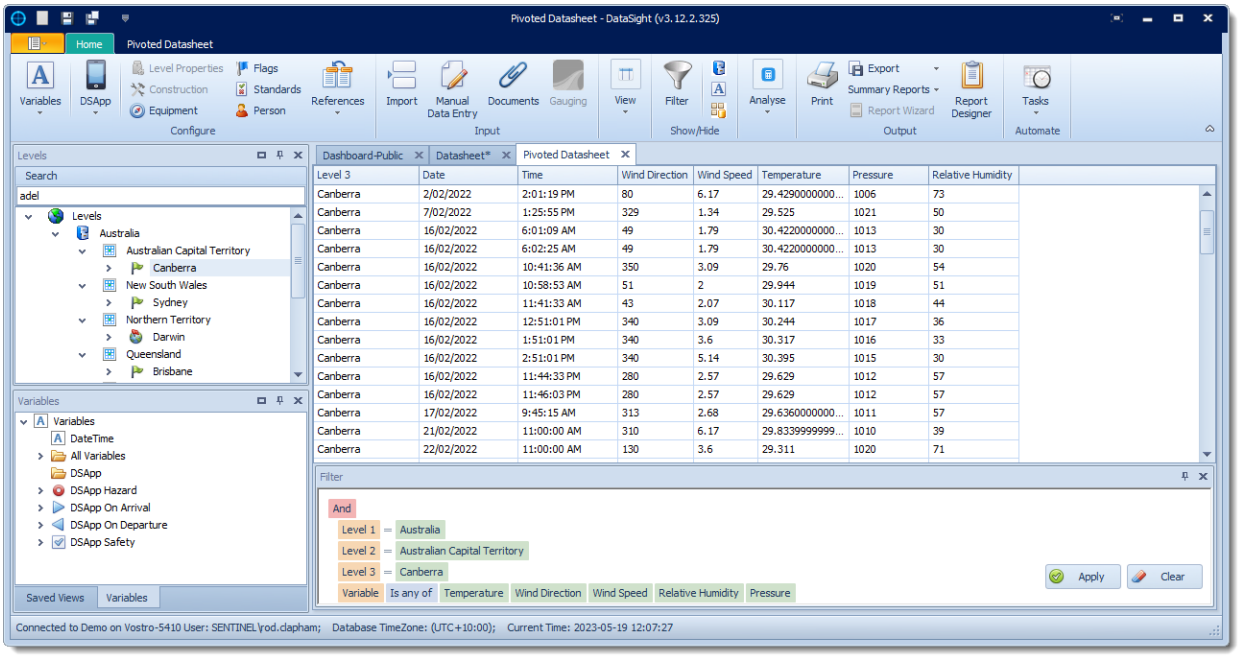
Pivoted Datasheets

Pivoted datasheets allow you to view data in a spreadsheet or grid layout, with the **variable headings at the top** of the spreadsheet and the data for each site and datetime stamp below in rows.

You may be familiar with this grid layout from Version 1 or 2 of DataSight. In DataSight Version 3, the back end data set has been normalised. This means that each data record consists of a singular site, date, time, variable name and value, together with other data properties such as Flags and Equipment. This means that the pivoted datasheet is no longer the only, nor default, view of your data.

Pivot your data

1. Load a datasheet and filter it as desired.
2. Right-click in the datasheet and select **Pivot Datasheet**.



In the above image, the same data set is displayed as that shown in the Datasheets image.

Note	You cannot Filter By Level to change the filter conditions in a pivoted datasheet. To change the filter conditions, please impose new filter conditions from within the Filter Panel. Saving the pivoted datasheet will save the: • Filter conditions used within the Filter Panel • Column Visibility (hidden/shown) and the order in which they appear (left-to-right) • Sort preferences (ascending/descending) Data grouping utilising the Group By Box, or find parameters entered into the Find Panel are not saved with the pivoted datasheet. Column Headers used within the Group By Box revert back to the pivoted datasheet.

Saving pivoted datasheets

1. Click **Save** or **Save As**. A Save As dialogue box appears entitled Pivoted Datasheet.
2. Select the folder into which you wish to save the pivoted datasheet, then **Name** the pivoted datasheet and click **OK**. The pivoted datasheet can now be found in the Saved Views Panel.

Charts

Once your data is imported into DataSight, you can quickly start to **visualise your data** using mouse driven functions.

The default chart in DataSight is a **bivariate** plot; namely you plot two variables on the x and y axes.

DataSight features an intuitive **drag-and-drop** charting interface, allowing you to quickly create clear, understandable, report-style charts. With relative ease, you should be able to graphically:

- overlay historical data,
- overlay data from adjoining monitoring stations, or
- overlay data for different variables.

You can create and save tailored charts and develop multiple site/series charts displaying real-time information.

All charts within DataSight are *"live"* and you can:

- Zoom in, zoom out, and modify their appearance as required.
- Create and save numerous chart types including line, bar, area, wind rose and box whisker.
- Customise the charts by applying trend lines, averages and other functions and add images and annotations.

In addition, each axis is customisable, where you can define time and date formats and ranges along with their format and increment.

See also:

- Create a Chart
- Zoom and Scroll
- Save a Chart
- Data Subset
- Chart Editor
- Example Charts

Create a Chart

1. Click **Chart** in the View group on the DataSight Ribbon to open a blank chart template in the Main Panel.
2. Set your filter conditions. You can either;
   - In the Levels Panel, click next to Levels to expand your list of levels. Continue to expand the tree list until you reach the desired level, and then click on the Level name to set the filter conditions.
   - Construct a new filter.
   - Copy the filter conditions from another datasheet or chart and paste them in the Filter Panel provided below the current chart.
3. Drop down the arrow against Variables in the Variables Panel to display Variable lists, if not already displayed.
4. DateTime is pre-selected as the default independent axis on the Chart. To add a different independent axis variable, click on the variable in the Variables Panel, drag and drop it close to the outside of the x axis on the Chart in the Main Panel. As it moves, the cursor will change to indicating a drop on the x axis. Your mouse must be below the axis for the "nail" to appear.

5. Add a y-axis by clicking on the variable in the Variables Panel. Then drag and drop it close to the outside of the y axis on the Chart in the Main Panel. As it moves, the cursor will change to  indicating a drop on the y axis. Repeating the process with a different y variable or to a different axis will overwrite your original independent variable selection, as you can only have one independent variable axis active at a time on the same chart.
6. As soon as your independent variable has been dropped onto the chart, the name of the Variable appears as an axis label.
7. Click to select your first dependent variable (series) and drag it onto the chart. If your independent axis is x, the cursor will change to  or  indicating that you are about to plot the dependent data series on left or right axis. Alternatively, if your independent axis is y, the cursor will change to  or  indicating that you are about to plot the dependent data series on the upper or lower axis. You can continue to plot any number of dependent variables by dragging and dropping.
8. Once, plotted, the Filter panel shows the **Main Filter** conditions, together with a single series tab labelled with the dependent variable.

Note	If dependent variables differ markedly in their scale you should use different dependent variable axes to cater for this (e.g. the 2 x axes (Top and Bottom) or the 2 y axes (Left and Right). See Different Variables, Same Site If you are plotting Date as a series value (i.e. on the y-axis), you will need to format it by right-clicking on the Chart and selecting Chart Editor. Then, select the Series tab and use the drop-down menu to select the Date series. Select the General tab. Select the appropriate axis and check the Date Time checkbox. When building a chart, DataSight only draws the numeric value, extracted from the value string. For example, <0.1 is treated as 0.1 for the purposes of generating the chart. Records whose data values are non-numeric will be ignored.

Zoom and Scroll

DataSight charts are enabled with zoom and scroll functions to help interrogate your data.

Zoom with mouse

1. Hold down the left mouse button and drag the mouse down/right. You will see a rectangle around the selected zoom area.
2. Release the left mouse button.
3. Repeat the action to continue zooming.
4. To undo zoom, hold down the left mouse button and drag the rectangle in the opposite direction (up/left). This will undo your last zoom action.

Scroll with mouse

1. To scroll a chart across, press the right mouse button and while holding the mouse button down, drag the mouse in the direction you wish to scroll the chart. When you release the mouse button the chart will remain at the new location.
2. To **undo** the scroll, press the left mouse button anywhere on the chart area and drag up and left with the mouse button pressed. Release the button and the chart will redraw to the originally defined chart area.

See also:

- Chart Ribbon Tab

Save a Chart

DataSight helps you save charts for presentations or reference later without needing to re-construct them.

Save a chart

1. With the chart tab selected, click **Save** or **Save As** in the Quick Access Toolbar and the Save As dialogue window appears.
2. Click on your desired folder in the **Saved Views** folders list. This may be the master Saved Views folder, or an existing folder. The selection will be highlighted.
3. Alternatively add a new folder. Highlight the folder under which the new folder will be created, and select **New Folder**.
4. **Name** the new folder.
5. If you wish to overwrite an existing chart, click on the chart name and enter a new name.
6. Otherwise, **Name** the chart.
7. Click **Save**. The chart, together with its filters and chart properties will be saved, and appear in the Saved Views panel.

See also:

- DataSight User Interface
- Quick Access Toolbar

Data Subset

From within a Chart, you are able to define a subset of data. You can then perform further data analysis on the data subset such as Calculations or Graphical Flagging. You may also create a datasheet containing only the data from the subset.

Select a data subset

You can set the start and end boundaries of a subset of data as follows:

1. Right-click a point of the series and select **Set Left Boundary**.
   a. The Left Boundary will be set to the Datetime of the selected series' point.
   b. The Datetime and Series Value of the Left Boundary will be displayed within the Subset Data group on the Chart tab of the DataSight Ribbon.
2. Right-click a point of a series and select **Set Right Boundary**.
   a. The Right Boundary will be set to the Datetime of the selected series' point.
   b. The Datetime and Series Value of the Right Boundary will be displayed within the Subset Data group on the Chart tab of the DataSight Ribbon.

Note	If a Left or Right Boundary was not set by right-clicking a series' point, the boundary will be set to the closest series' point to the left of where the boundary was set. To help with defining the boundaries of the data subset, it may be beneficial to turn on the series' Marks from the Series Properties.

Graphical Flagging with a data subset

It is possible to flag the subset of data. To do this, select your data subset and then either:

- Right-click in the chart and select **Graphical Flagging with Subset** to flag the data subset, or;

- Click and expand Graphical Flagging in the Analyse Group of the DataSight Ribbon and select **Graphical Flagging with Subset**.

Calculation with a data subset

It is possible to perform calculations on the subset of data. To do this, select your data subset and then either:

- Right-click in the chart and select **Calculation with Subset** to perform a calculation or;
- Click and expand Calculation in the Analyse Group of the DataSight Ribbon and select **Calculation with Subset**.

Datasheet with a data subset

It is possible to create a Datasheet containing only the data subset. To do this, select your data subset and then right-click in the chart and select **Datasheet with Subset**.

Chart Ribbon Tab

When a chart is focused on the main panel, the Chart Ribbon tab appears next to the **Home** tab in the DataSight Menu Panel.

Several commonly used chart properties are given on the grouped ribbon.

Group	Option	Function
Properties	**Chart Editor**	Refer to Chart Editor for detailed information.
	Panel colour	Use the Panel colour selection combobox to paint the whole Chart background with the chosen colour and/or pattern.
Legend	**Legend**	Toggle the Legend visibility On or Off.
	Text colour	Set the text colour for the Legend.
	Background colour	Set the colour of the Legend canvas.
	Position	Set the Position of the Legend relative to the chart. There are 4 positions available using the Alignment property, Top, Bottom, Left and Right. Right is the default position.
	Border	Toggle the Legend Border On or Off.
	Shadow	Toggle the Legend Shadow On or Off.
Axes	**Axes**	Select which axes (Left, Right, Top or Bottom) to display.
	Switch Axis	Switch x and y axes.
Zoom	**Zoom In**	Zoom in progressively on the chart centre.
	Zoom Out	Zoom out progressively from the chart centre.
	Undo Zoom	Resets the chart to show all data.
Series	**Scroll**	Add the scroll pager tool to a series.

	Symbol	Add or remove symbols (or points) from a line series.
	Marks	Add or remove marks from a series.
Series Function	**Series**	Select the series in the chart to apply a function to.
	Function	A selection of functions are available for application to the selected series. These are Min, Max, Average, Standard Deviation, Trend Line, Total, Cumulative, Exp. Average, Variance, and Moving Average.
	Duration	Select one of the following time increments (or period) from the Duration drop-down list over which the function will be applied. *e Minute* : Data is divided into increments of 1/1440th of a day (as defined by One Day). *e Hour* : Data is divided into increments of 1/24th of a day (as defined by One Day). *e Day* : A day is defined as starting at a given datetime of 12AM and finishing at 11:59:59PM. *e Week* : Every 7 days (as defined by One Day). *e Month* : Every 30 days (as defined by One Day). *Months* : Every 182 days (as defined by One Day). *e Year* : Every 365 days (as defined by One Day).
	Add	Adds the selected function with specified period of applicability to the chart as a new series.
Refresh Chart		Refreshes the chart with any selections made on the grouped tab.
Save As Theme		Saves the Chart's current formatting as a custom theme within the database. Enter a Name for the theme and click OK to save the theme or click Cancel. Once a Theme has been saved, simply re-connect to the database so that the theme file has saved to your local computer and the theme will then be available for selection in the Chart Editor Themes Section.

Note	DataSight creates a Registry REG_EXPAND_SZ entry under "\HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Steema Software\TeeChart.NET" named ThemeFolder with the default value set to "%USERPROFILE%\Documents\DataSight\Themes", this sets the folder location where theme XML files are saved on the local computer. If this folder location does not exist, DataSight will create it. The Charting tool requires theme files to be saved locally in order for the theme to be available within DataSight. Upon connection to a database, any custom Chart themes saved within the database are saved to the local theme folder, and are overwritten upon each subsequent connection to that database. This means that a custom theme made in one database will be available in DataSight when connecting to other databases.

See also:

- Chart Ribbon Zoom
- Use the Scroll Pager
- Set Chart Series Properties
- Set Chart Series Functions
- Chart Editor - Themes Section

7.4.5.1 Zoom

1. Click the **Chart** tab on the Menu Panel.
2. In the Zoom group on the ribbon, click **Zoom In** or **Zoom Out** as needed.
3. To undo your *last* zoom action, click on the chart in the Main Panel and drag the cursor in the opposite direction (up/left).
4. You can also click **Undo Zoom** in the Zoom group on the ribbon.

7.4.5.2 Use the Scroll Pager

The Scroll Pager tool creates a subchart showing a scrollable overview of a large dataset. Using this tool, it is possible to drill down into large data sets.

Add a Scroll Pager from the Chart Ribbon

1. Click the **Chart** tab on the Menu Panel.
2. To add a scroll tool to a series, select a series from the **Scroll** drop down combo box in the Series group.
3. To remove the scroll tool from the series, select an empty option from the **Scroll** drop down combo box.

Zoom and Scroll

Once you have added the Scroll Pager, you can Zoom and Scroll using the mouse on the subchart overview, or the original chart, to interrogate the data set.

See also:

- Scroll Pager Tool
- Perform a Calculation
- Graphical Flagging

7.4.5.3 Set Series Properties

You can adjust the chart series points and marks from the Chart Ribbon.

Symbol

1. Click the **Chart** tab on the Menu Panel.
2. To add points to a line series, select a series from the **Symbol** drop down combo box in the Series group.
3. Change the series with symbols using the **Symbol** drop down combo box in the Series group.
4. To remove the symbols, select the empty option from the **Symbol** drop down combo box.

Marks

1. Click the **Chart** tab on the Menu Panel.
2. To add marks to a series, select a series from the **Marks** drop down combo box in the Series group.
3. Change the series with marks using the **Marks** drop down combo box in the Series group.
4. To remove marks from a series, select the empty option from the **Marks** drop down combo box.

7.4.5.4 Set Series Functions

A limited number of functions can be added to the chart series from the Chart Ribbon.

Set a Series Function

1. Click the **Chart** tab on the Menu Panel.
2. In the Series Function group, select a **Series** from the drop down combo box.
3. Select the **Function** to apply to it from the drop-down combo box. The number of functions is limited relative to that given in the Chart Editor (See Set your Series Functions).
4. Select the time increment from the **Duration** drop-down combo box over which the function will be applied. A new function series is added to the Chart labelled with the series name, function type and function duration.
5. By default, the function series points are right aligned to the end of the time increment selected. You can alter this position as required using the Chart Editor, Series Section, Data Source alignment tab.

Chart Editor

You can control the look of any chart display, using the Chart Editor.

From within this window you can access the options to:

- change the chart style,
- edit each of the axes,
- create chart titles,
- alter the legend and
- perform many other customising functions.

Open the Chart Editor

- Click on the **Chart** grouped tab on the Ribbon and select **Chart Editor**. The Chart Editor window opens.
- You can also right-click anywhere in the chart and select **Chart Editor** which will open the Chart Editor window.

Tabbed Sections and Pages

The top level tabs in the Chart Editor are referred to as **Sections** throughout the following documentation, while all the associated lower level tabs are referred to as **Pages**. This will help to clearly differentiate similarly named Tabs without causing confusion.

The chart editor has the following Section categories:

- Chart
- Series
- Print
- Tools
- Themes

Navigate to a Section or Page

1. Go to the Chart Editor.
2. Click on the **Section**.

3. Click on the **Page**.
4. You may use the left and right arrows to explore all the tabbed sections and pages.

7.4.6.1 Chart Section

The Chart Section allows you to:

- Refine Chart display parameters including the type of chart and its display characteristics.
- Open the chart series window to apply functions and labels to the existing graphed data.
- Alter the chart type from the default of a bivariate plot.

Chart display features are those which affect the overall appearance of the chart. They include those properties and methods that define the colour of the chart **background**, **titles** and their position, **margins**, **borders** and **bevels**, **background images**, **frame** and **axis visible**, **pen colours** and **widths**, **3D**, **walls**, etc.

The Chart characteristics are grouped into the *tabbed* pages:

- Series
- Panel
- Axes
- General
- Titles
- Walls
- Paging
- Legend
- 3D

See also:

- Chart Editor

7.4.6.1.1 Chart Series

A chart series is the **style** (such as bar, points or line etc.) used to visualise data on the chart. Choosing a series for a chart will very much depend on your own requirements for the chart. There are occasions however, when due to the number of variables to plot, the choice of chart may depend on which series types support the number of input variables.

The Series Gallery window consists of five tabbed pages in the Series section as outlined in the table below.

Tab	Contents
Standard	Series likely to be called upon most frequently.
Extended	More specialised series types such as Arrow, Radar, Donut and Polar.
Other	Miscellaneous types including Wind Rose.
3D	Series that take three (X, Y, Z) rather than two (X, Y) variables.
Stats	More specialised Statistical series types.

The following table shows the Series types available and the number of variables allowed by each Series type.

Series Type	No. of Variables	Data Properties	Function
Standard			
Line	2	XValues, YValues, XLabel	Draws series data as a contiguous polyline between points.
Points	2	XValues, YValues, XLabel	Draws series data as points at vertical and horizontal axes positions.
Area	2	XValues, YValues, XLabel	Draws series data as filled mountain segments between points.
Fast Line	2	XValues, YValues, XLabel	Draw thin lines fast by simply connecting all points in your data.
Horizontal Line	2	XValues, YValues, XLabel	Draw series data as horizontal lines between points.
Bar	2	XValues, YValues, XLabel	Draws data as vertical bars.
Horizontal Bar	2	XValues, YValues, XLabel	Draws data as horizontal bars.
Pie	2	Angle, YValues, Label	Draws series data as slices of a circle.
Shape	4	X0 (Top), Y0 (Bottom), X1 (Left), Y1 (Right)	Draw series data by using your preferred shape.
Bubble	3	XValues, YValues, XLabel, RadiusValues	Draws data as points, each one with a different size or radius
Gantt	3	StartValues, EndValues, Y (Y axis level), YLabel	Draws Gantt chart of your series data with start and end values.
Point & Figure	2	XValues, OValues, Labels	Draws data in columns where each step in the column corresponds to a point in the underlying datasource series.
Stats			
Triangle Surface	3	XValues, YValues, ZValues, Label	Draws the best set of triangles that connect all specified points forming a surface.
Error	3	XValues, YValues, XLabel, StdErrorValues	Draws error in series values.
Error Bar	3	XValues, YValues, XLabel, StdErrorValues	Draws error in series values as bars.
Horizontal Box Plot	2	XValues, SamplesValues, Label	Draws outliers and compares distributions using a box plot in the horizontal.
Horizontal Area	2	XValues, YValues, Label	Draws series data as filled mountain segments between points in the horizontal.
Error Point 3D	3	XValues, YValues, StdErrorValues	Draws 3D error in series values.

Histogram	3	XValues, YValues, ZValues, Labels	Draws series values as proportionate rectangles and classes of interval width.
Darvas	2	XValues, YValues	Draws financial indicator based on OHLC (Candle) data.
Box Plot	2	XValues, SampleValues, Labels	Draws outliers and compares distributions using a box plot.

Extended

Arrow	4	StartXValues, StartYValues, XLabel, EndXValues, StartYValues	Draws data as arrows with fixed start and end points.
Donut	2	Angle, YValues, Labels	Draws series data as slices of a circle, with a centre hole.
Polar	2	XValues, YValues, Labels	Draws a polar plot of the series.
Polar Bar	2	XValues, YValues, Labels	Draws a polar plot of the series in bars.
Radar	2	XValues, YValues, Labels, (Angle and Radius)	Draws multivariate data in the form of a two-dimensional chart.
Pyramid	2	XValues, YValues	Draw values as sections in a triangle with lines dividing them according to hierarchy.
Smith	2	Resistance, Reactance, Labels	Draws multiple parameters such as impedances and admittances according to the Smith graphical aid.
Bezier	2	XValues, YValues, XLabel	Draws Bezier curves interpolation points on the series.
Volume Pipe	3	XValues, YValues, ZValues, Labels	Draws values as segments of a "pipe" with proportional volume based on their percentage of total data.
EquiVolume	3	XValues, YValues, ZValues, Labels	Draws rectangle-shaped bars at high and low prices defined by the volume traded during the aggregation period.

3D

Ternary	3	XValues, YValues, ZValues, Labels	Draws data to show demographic tendencies or the sensitive relationship between differing dimensions.
Point 3D	3	XValues, YValues, XLabel, ZValues	Draws points of three-dimensional data values.
Waterfall	3	XValues, YValues, ZValues	Draws vertical "slices", one for each Z row of the equivalent surface.

Contour	3	XValues, YValues, XLabel, ZValues,	Calculates and displays "isolines" from a custom array of XYZ points.
Funnel	3	XValues, QuoteValues, OpportunityValues, XLabel	Draws a funnel series.
Surface	3	XValues, YValues, ZValues, Labels	Draws a a surface
ColorGrid	3	XValues, YValues, ZValues, Labels	Draws a grid of colour cells.
Iso-Surface	3	XValues, YValues, ZValues, Labels	Draws surfaces of the constant form w = f(x, y, z).
Vector 3D	3	XValues, YValues, ZValues, Labels	Draws a 3D vector series.

Other

Candle	2	XValues, YValues, Labels	Draws Candlestick financial chart.
Volume	2	XValues, YValues, Labels	Draws the number of shares that have been traded over a given period as bars.
Bar Join	2	XValues, YValues, XLabel	Draws lines between each bar point.
High-low	3	XValues, YValues, LowValues, XLabel	Draws lines connecting high and low points at a given period.
Circular Gauge	2	XValues, YValues, Labels	Draws data points as values through value intervals.
Bubble Cloud	2	XValues, YValues, Labels	Plots data relatively, displaying bubbles of diminishing size, spiralling outwards to represent different Series values.
ImageBar	2	XValues, YValues, Labels	Draws data as bars with images.
Line Point	3	XValues, YValues, ZValues, Labels	Draws a line parallel to each axis according to coordinates of points.
Horizontal Histogram	2	XValues, YValues, Labels	Draws series values in a histogram of horizontal bars.
Wind Rose	2	Angle, YValues, Labels	Draws a succinct view of wind direction and speed at a particular location.
ImagePoint	2	XValues, YValues, Labels	Draw data as points with images.
PolarGrid	3	XValues, YValues, ZValues, Labels	Create a polar plot with grid rings.
Rose	2	Angle, YValues, Labels	Draws data values as areas on a polar chart.
Clock	2	Angle, YValues, Labels	Clock series.
Bar 3D	3	XValues, YValues, ZValues, Labels	Draws a 3D bar chart.
Error Point	3	XValues, YValues, StdErrorValues	Draws error values as points.

7.4.6.1.1.1 Set your Series

Change your Series type

1. On the Series page, click **Change**.
2. Select the different Series type from the Series Gallery and click **OK**. Note that there are a few exceptions where Series data content may be incompatible.
3. The modified Series is now displayed in the Series list.

Change your Series title

1. On the Series page, click **Title**. The Change Series Title dialogue box appears.
2. Enter the **New Series Title**.
3. Click **OK**.

Add a new Series type

1. On the Series page, click **Add**.
2. Select the Series type from the Series Gallery and click **OK**.
3. The new Series is now displayed in the Series list.
4. DataSight will choose one of up to 19 unique and as yet unused colours for each new Series.

Clone your Series

1. On the Series page, highlight the Series that you wish to clone.
2. Click **Clone**.
3. The cloned Series is now displayed in the Series list and will have the exact same properties as the parent.

Change your Series order

1. On the Series page, highlight the Series that you wish to move.
2. Use the arrow buttons on the right to move the Series up or down in the series order. Series order governs the relative display position of the Series in the chart with respect to other Series.

Delete a Series

1. On the Series page, highlight the Series that you wish to delete.
2. Click **Delete**. Confirm the deletion.

See also:

- Chart Editor

7.4.6.1.1.2 Chart Series Functions

A Series Function can be of almost any Series Type, to which an **algebraic** function is applied, and for which the source of the data is another Chart Series.

DataSight offers the following list of predefined functions:

Function Type	No. of Inputs	Description
Standard		
Add	Unlimited	Plots sums of inputs.
Subtract	Unlimited	Plots values of inputs subtracted in descending order of inclusion.
Multiply	Unlimited	The Multiply Function plots value of inputs multiplied.
Divide	Unlimited	The Divide Function plots inputs divided in descending order of inclusion.
High	Unlimited	The High Function plots high point of inputs.
Low	Unlimited	The Low Function plots low point of inputs.
Average	Unlimited	The Average Function will calculate the average of every group of Period points.
Count	Unlimited	Counts the number of Series Points in the Chart.
Y=F(X)	None	Draws a user defined function.
Median	1	Calculates the median value of the source series values.
Mode	1	The mode function returns the source series value that is repeated more times.
Percent Change	1	Calculates the percentage change of a variable over time.
Other		
Momentum	1	Each Y value is the current point's Y value less the last Period point's Y value.
Momentum Div.	1	Ratio of value compared to previous 'nth' value.
Moving Average	1	The Moving Average Function will calculate the simple or weighted average of every group of Period points.
Exp.Moving Average	1	It calculates the exponential moving average based on weight.
Volume Oscillator	1	Volume Oscillator is a financial indicator. It requires one source series (of any type) and 2 period values.
Bollinger	1	The Bollinger Function uses simple or exponential moving average to constructs Bollinger Trading Bands.
MACD	1	Moving Average Convergence Divergence.
Stochastic	1	Financial function. Calculates the highest and lowest value in a given period.
CompressOHLC	1	Calculates high and low values for a group of points. Results are plotted using a Candle Series. Suitable for displaying Candle OHLC data "weekly", "monthly", etc.
CLV	1	Calculates the"Accumulation / Distribution Line" function (CLV) is a financial indicator.

On Balance Volume	1	Calculates the "On Balance Volume" (OBV) financial indicator.
CCI	1	Calculates the CCI function (Commodity Channel Index). It is used to identify cyclical turns in commodities.
R.S.I.	1	RSI Function calculates a percent value based on financial data. Depending on TRSISyle type, different formula will be used to calculate RSI value.
ADX	1	A.D.X (Average Directional Change), is a commonly used indicator function in Financial charting applications.
S.A.R	1	SAR refers to "Stop-And-Reversal". It is designed to create exit points for both long and short positions in such a way that it allows for reactions or fluctuations at the beginning of the position, but accelerates upward (for long positions) or downward (for short positions) as the movement tops out.
Money Flow		
Slope	1	Slope indicates the steepness of a curve by plotting the change along one axis.
Awesome Oscillator	1	Awesome Oscillator is a financial indicator that plots as a histogram the periods fit for buying and selling.
Accelerator/Decelerator Oscillator	1	Accelerator/Decelerator Oscillator is a financial indicator used to detect whether the forces behind a price behaviour are accelerating or decelerating.
Kurtosis	1	Kurtosis is a measure of the "peakedness" of the probability distribution of a real-valued random variable.
Average True Range	1	ATR is a financial indicator that measures the change in price over a defined period.
Relative Vigor Index		Financial indicator. Measures the conviction of a recent price action and the likelihood that it will continue.
Alligator	1	It represents the relative change between an old value and the new one.
Gator		

Stats

Exp. Avrg.	1	Exponential average based on Weight.
Performance	1	Percentage change from one series point to the next.
Histogram	1	Histogram plotsthe variable graphically according to its frequency..
Std. Deviation	1	Maps the Standard Deviation (or Complete Standard Deviation) of every group of Period points.
Skewness	1	Skewness is a measure of the asymmetry of the probability distribution of a real-valued random variable.

Smoothed Average	Moving	1	Interpolates the moving average data.
Cumulative		1	Cumulative function sums the Series values starting from the first point.
Root Mean Sq.		1	Calculates the arithmetic mean of the squares of the variable values.

Extended

Cross Points	Unlimited	Highlights where two Line series cross over each other.
Smoothing	1	Interpolates points using an algorithm. Several properties control the calculation.
Downsampling	1	Downsampling reduces the number of points in series by using several different methods.
Trend	1	Draws best trend line through points of input Series.
Correlation	1	Calculates a coefficient value from -1 to 1 that indicates how well source X and Y values follow the same trend.
Variance	1	Calculates the variance of the source Series. This indicates how spread out a distribution is.
Perimeter	1	Calculates the subset of source points that configure the limits (the perimeter) of the source Series.
Curve Fitting	1	Draws fitted polynomial through data inputs using the TypeFitting formula.
Exp. Trend	1	Draws best exponential trend line through points in input Series.

Several Function types support only one input Series. However it is possible to chain link Functions, thus, for example, taking the average of several Series in your Chart to create an Average Function Series, then identify the Trend of the average by using the Average Function as the input to the Trend Function.

Add a Series Function from Chart Editor

1. Right-click in the Chart and select **Chart Editor**.
2. Within the Chart Editor, on the Chart/Series page, click **Add**.
3. In the Series Gallery, select the **Functions** tab to select the Function you require.
4. Each Function is presented as a Line Series, however you may change the Series Type associated with the Function later by choosing the **Change** button on the chart panel.
5. Function definitions are also easily changed afterwards on the **Data Source** page of the Function Series. Datasource shows you the list of available series for the function to be applied on.

Define Number of Points

1. Right-click in the Chart and select **Chart Editor**.
2. On the Chart page, double-click the relevant series.
3. Click **Data Source** page.
4. From the drop down menu select **Function.**
5. Select a function of your choice from the drop down list of functions.

6. Then select **Options** tab.
7. Enter **Number of Points** that each calculation will be performed over. This is very useful when using equidistant DateTime series and we want to express the Period of the function as a TimeStep.

You can also set functions from the Chart grouped tab on the DataSight ribbon where the period is specifically identifiable as One Day, One Hour, Six Months etc (See Set Series Functions from Chart Ribbon for more details).

See also:

- Chart Editor

7.4.6.1.2 Chart Panel

The *Panel* page allows you to set parameters which enhance the appearance of the DataSight chart. Panel properties and methods that may be accessed via the Panel tab are as follows.

Tab	Function
Borders	You may define your Border independently or in conjunction with the Bevel properties. Mixing Bevel and Border and manipulating Width gives almost any combination of 3D effects. e.g. Bevel Inner/Bevel Outer/Border Width These properties will produce a variety of 3D effects on the Border of the chart panel.
Background	**Colour** Panel colour and pattern will paint the whole chart background with the chosen colour and/or pattern. If you select to view a background Gradient or Image they will hide the Panel colour. If you set a Back colour it will replace the Panel colour within the Chart Frame only. **Background Image** You may select any picture file as a Background Image. Using the Hatch Brush Editor (from the Pattern Tab) there are four different Wrap Modes to choose from for the Background Image.
Margins	Margins are defined as the distance between the Chart Border and the Chart Frame and are expressed as a percentage of the overall dimensions of the chart panel.
Gradient	To define a Gradient you must select a Start colour and End colour (plus, optionally Middle colour) and enable as Visible the Gradient. The Gradient will cover the whole chart panel. Gradient direction defines the direction of colour change between Start, Middle and End colour.
Shadow	Defines the size, colour, pattern (Hatch Brush Editor) and transparency properties of the chart panel's shadow.

Note	Panel Gradient effects are best seen by monitors that support true colour.

See also:

- Chart Editor

7.4.6.1.3 Chart Axes

Axes are responsible for calculating pixel co-ordinates for Series points and to allow any valid range so scroll and zoom can be always performed. Control of the axes is quite a specialised area.

DataSight will automatically define all Chart Axis labelling and scaling for you, however there is plenty of flexibility to **customise** any specific requirements you may have.

Tab	Function
Scales	The principal axes are Left, Top, Right, Bottom, Depth Bottom and Depth Top. The Chart Frame displays as a surround to the chart's plottable area and has no data corresponding features. The Depth initialises by default as not Visible. All other Axes are visible from the moment that a Series is added to the chart and associated with those Axes (Left and Bottom as default). Custom Axes may be added/removed by using the + and - keys on the dialogue and they will copy the scales associated with their counterpart from the first 4 axes. For a Custom Axis to be visible (as for any other Axis) a Series must be associated with the Axis. More than 1 Series may be associated with each Axis. See also Axes Scales.
Visible	By default axes are set as Visible. If the Back Wall Frame is visible then the chart surround is still visible when the axes are hidden. The result will be the appearance of a larger chart as no area is reserved for the axis labels. The Visible property for each Axis (Scales tab) overrides the visible characteristic for each Axis. If you select the Depth Axis in the List then you will note that Depth Axis Scales is by default 'not visible'.
Behind	By default axes are set to Behind the plottable area.
Title	Titles are set in the Titles section of the Axis page. You may change the Title text for the Axis and its font and shadow properties. The angle and size of the Title text may also be specified.
Ticks	There are three tick types. The major **Ticks** are displayed at each Increment position, or at each Axis Label position and points outwards to the major label. **Inner** ticks project inwards onto the chart plottable area from the same point on the axis. Minor Ticks space between the "Major" Ticks (see Below). Similarly there are two types of Grid plotting on either the Increment position or the minor increment (see Below). You may change the length, width and colour of each Tick and Grid type.
Labels	There are several Axis labelling styles. Labels can display the Axis scales, the Series Point Marks, No Labels, etc. Axis labels can be displayed as multi-line text instead of a single line of text. You may apply all standard number and date formats to Axis labels. The Axis page, Labels section contains the field "Values format". If your data is datetime the field name changes to "Date time format". You can also control the Text Font and Fill properties from this tab.
Minor	You may change the length, width and colour of each Minor Tick and Minor Grid type.
Position	By default the Position for each axis is set to 0% and extends over the 100% of the default plottable area. Left and Top are 0 the 0 positions. Click on each Axis and then alter the position as necessary (refer also to Set your Axes).
SubAxes	If there are sub-axes in the Series, they may be customised using the SubAxes tab.

See also:

- Chart Editor

7.4.6.1.3.1 Modify your Axes

The following instructions detail the basic steps to modify your chart axes.

Manually adjust and format an axis

1. From the Chart Properties Window, select the **Chart** tab, then select the **Axes** tab.
2. Select the Axis from the Left hand side of the page.
3. **Un-check** the Automatic box.
4. Click the **Change** button and enter the desired axis increment.
5. Below, under the **Minimum** tab, press the **Change** button, enter the minimum value and click **OK**.
6. Select the **Maximum** tab, press the **Change** button, enter the maximum and click **OK**.
7. Now, select the **Title** tab on the Axes page.
8. Enter the axis Title.
9. Click **Close**.

Create a Custom Axis

1. From the Chart Editor, select the **Chart** section, then select the **Axes** tab.
2. Create a Custom axis by clicking the + button below the Axes list.
3. Select the **Title** tab and type in the required axis title for the new 'Custom 0' axis.
4. Select the Axis from your list that currently displays your data and un-check the Visible checkbox.
5. Select the **Series** section and the General tab below this. At the bottom right of the window, change the Vertical Axis from 'Left' to 'Custom 0'. These settings will be retained when you save the chart.

Create and Position Multiple Custom Axes

Together with the percentage position and stretching properties, it's possible to have unlimited axes floating anywhere on the chart. Scroll, zoom, and axis hit-detection also apply to custom-created axes. To achieve this:

1. From the Chart Editor, select the **Chart** section, then select the **Axes** tab.
2. Create a Custom axis by clicking the + button below the Axes list.
3. Select the Position tab making sure you have your new Custom Axis highlighted.
4. Check the **Horizontal** checkbox to define your new Custom Axis as an horizontal axis or to leave un-checked to remain as the default vertical axis.
5. Use other tabs in the Axes page to change the Scales, Increment, Titles, Labels, Ticks, and Minor Ticks of the Custom Axis.
6. To associate this new Custom Axis with the Data Series you desire, select the **Series** Section and go to the **General** page where the dropdown comboboxes **Horizontal Axis** and **Vertical Axis** will enable you to select your new Custom Axis depending on whether you previously defined it as vertical or horizontal.

7.4.6.1.3.2 Axes Scales

Tab	Function
Automatic	Axis scales are set automatically when you add series data to your chart. Automatic selects the best axis scale range to fit your data. If you turn Automatic off the scales section will ungrey options and you can

	change Axis values. It is important to remember to select the Axis that you wish to configure from the list of Axes on the left of the page.
Increment	You may tailor the intervals for the Axis. Click the **Change** button and add the increment you require.
Visible	The Visible property for each Axis overrides the visible characteristic for each Axis.
Inverted	An Axis can be Inverted so Axis Minimum and Maximum are swapped.
Logarithmic	An Axis can be set to Logarithmic only if Axis Minimum and Maximum are greater than or equal to zero. This is the only difference between setting linear and logarithmic scales.
Minimum/Maximum	As new series are inserted, or new points are added to the series, Axes recalculate, by default, their Minimum and Maximum values. The Axis Minimum and Axis Maximum values can optionally be independently automatic or not, and you can change Axis scales using the Minimum and Maximum **Change** button.

Note	When changing axis label frequency, bear in mind that DataSight will avoid label overlap. This means that if the label frequency is too high for the labels to fit, then DataSight will allocate 'best fit'. Changing the label angle and label separation are 2 options that may help you fit the labels you require.

7.4.6.1.4 Chart General

General options include the following three tabs:

Tab	Function
Zoom	Allow or disable zoom, animate the zoom and change other mouse settings.
Scroll	Allow or disable scroll and change the mouse command.
Cursor	Change the cursor image.

See also:

- Chart Editor
- Zoom and Scroll

7.4.6.1.5 Chart Titles

The Titles page of the Chart Section controls the characteristics of the Chart Titles, both Headers and Footers.

Tab	Function
Style	Use the drop down Combo box to select either the Title (Header), Subtitle (Sub Header), Footer or Sub Footer. Enter the required text in the Text box. You may type multi-line titles. Alignment refers to the Header (or Footer) alignment with respect to the chart area NOT the overall chart panel. The chart area is the plottable area of the chart plus Axis Labels and Legend.
Position	Use Position to override the Title or Footer default position and set a custom position (pixels relation to chart Top, Left).

Format	Contains the settings for the Title box, e.g. colour of the box, Pen properties of the Frame around the box, Brush properties [Pattern] of the box, etc. The default setting for the Title box is Transparent, meaning that the Title box is not visible until the Transparent check-box is un-checked.
Gradient	The Gradient Tab enables you to make visible and format a gradient for the selected Title box.
Shadow	Defines the size, colour, pattern (Hatch Brush Editor) and transparency properties of the Title box shadow.
Text	Contains the Title Text appearance formatting characteristics. The Font button will grant access to the Font dialogue window which allows selection of Windows Fonts and the definition of style (italic, bold, etc.) and colour.
Bevels	Properties for colour and size of inner and outer bevels on the Title box.

See also:

- Chart Editor

7.4.6.1.5.1 Set your Title

Basic steps to create and format titles

1. On the Titles page, select the **Title** type (e.g. Header) from the drop down Title list.
2. In the text box, enter a suitable name for the title type.
3. Adjust the **Position** of the title if required.
4. Select the **Text** tab. Press the **Font** button and change the text size and colour to suit your chart.
5. Select the **Format** tab. Press the Frame button and tick the check box Visible to show the Title Box Frame. Adjust the formatting using the colour, Pattern, Gradient, Shadow and Bevel tabs.
6. Repeat these steps for the next Title type.
7. Click **Close** to save changes and exit Chart Editor.

7.4.6.1.6 Chart Walls

The Chart Editor, Chart Section can be used to apply properties to the Chart Walls. There are four Walls that can be accessed on the **Left**, **Right**, **Bottom** and **Back** Tabs, that are not clearly identified in 2D but are visible for 3D charts.

Button	Function
Colour	The colour button takes you to the colour Editor which enables you to choose a colour for the selected wall.
Border	The Border button takes you to the Border Editor for the Walls. This is the same Editor available for many other chart objects. The visible property enables/disables display of the Border. In the case of the BackWall, where axes are Visible, the Wall Border will be hidden behind those axes so you will only see the result of enabling/disabling the Border if you hide some or all axes (e.g. Make axes Top and Right invisible to see the result of changing the colour of Wall Border).
Pattern	The Pattern button takes you to the Hatch Brush Editor. This is the same Brush available for many other chart objects.
Gradient	The gradient button takes you to the Gradient Editor which enables you to choose a gradient for the selected wall.

See also:

- Chart Editor

7.4.6.1.7 Chart Paging

If the data in your chart contains more data than can legibly displayed on one chart screen you may wish to divide the chart into pages that can be browsed through.

- Chart paging allows a chart to be subdivided into a set number of points per page.
- This helps visualisation of large data sets or may be useful for 'time dividing' screens of data.

Change your Chart Paging

1. On the Paging page, in the **Points per Page** box, type (or scroll to) the number of series points you wish to see on the chart page.
2. The last page is unlikely to have exactly the correct number of points to match the point quantity in the other chart pages. You may choose to **Scale Last Page** which will 'best fit' the remaining points to the page, adjusting the axis scale accordingly, or you may treat the page as previous pages with the same number of points which may leave the last page rather empty if there are not many points for the page.
3. You can elect to **Show Page Number** on the chart.
4. You can choose to **Auto Scale Axis** to spread the values over the required number of pages.

See also:

- Chart Editor

7.4.6.1.8 Chart Legend

In the Legend page of the Chart Section, you may define the appearance aspects of the Legend. The important first step is to control the Legend alignment followed by the visible properties of colour, font, frame, shadow, and so on.

Tab	Function
Style	Toggle On/Off Legend display and set Legend display content characteristics (inclusion of checkboxes, etc). Refer also to Legend Style.
Position	Sets the default display position or enables custom positioning of the Legend. DataSight will change the shape of the Legend to fit the location. If the Legend is set to the side (left or right) of the chart the contents of the Legend, by default, sit as a list from top to bottom. If the Legend sits below or above the chart then the Legend contents are placed side by side. The default behaviour may be overridden by using the Resize Chart option and/or by using Custom positioning. See Legend Position for more about custom positioning of the Legend.
Symbols	Size and formatting of the Legend symbols. Refer also to Legend Symbols. colour Width defines the width of the colour boxes within the Legend.
Title	Add a title to your legend in the Text box, and format.
Format	Contains the settings for the Legend box, e.g. colour, Frame (ChartPen properties), Pattern (ChartBrush properties), and checkboxes for Round Frame and Transparent. Refer also to Legend Format.
Gradient	Enable/disable a Background Gradient in the Legend box and select its direction and colours.

Shadow	Properties for display of the Legend box Shadow. You may define colour, pattern (ChartBrush) size and transparency.
Text	Gives access to properties which change the appearance of the Legend text's font, the font's fill properties [Hatch Brush properties] and shadow.
Bevels	Sets the colour, size and style of the Legend's inner and outer bevels.

See also:

- Chart Editor

7.4.6.1.8.1 Legend Style

Set the Legend Style properties

Tab	Function
Visible	This Visible checkbox enables/disables the display of the entire Legend.
Inverted	Inverting the Legend reverses the order of the Legend entries.
Check Boxes	Changes the Legend Style to "Series Names" and displays a check box next to each series allowing it to be made invisible or visible.
Font Series colour	Changes the colour of the font of the Legend text to the series colour.
Legend Style	The default Legend Style is Series Names, however other styles are possible. "Automatic" will put the Series point values in the Legend when there is only one Series in the Chart. When the Chart contains more than one Series, "automatic" will put Series names in the Legend. In the Editor use the Dropdown Combobox to obtain values other than the default. If you change the Legend Style to display values and there is more than one Series in your Chart, DataSight will display the values of the first Series. You may modify the display using custom options.
Text Style	Provides a list of possible Legend text styles.
Vertical Spacing	Allows you to modify the spacing between Legend entries.
Dividing Lines	The Dividing Lines button gives access to a Pen Editor window where you can make the lines between Legend entries Visible and change their colour, Style and Width.

7.4.6.1.8.2 Legend Position

Set the Legend Position properties

Tab	Function
Position	There are 4 positions available using the Alignment property, Top, Bottom, Left and Right. Right is the default position. The default positioning of the Legend will always be outside the Chart.
Resize Chart	Resize Chart defines whether or not the Chart will leave space for the Legend when it paints. The Resize Chart property, when disabled, will draw the legend within the Chart frame area. Whilst this may be satisfactory for some Legend positioning requirements, better control of Legend positioning in relation to the Chart frame can be achieved by using the Legend Margin property.

Margin	Changing the Margin property value will move the Chart frame in relation to the Legend, NOT vice versa. Thus, making a Margin value negative will move the Chart over the Legend (increasing the size of the Chart rectangle area). However, the properties are not intended for repositioning of the Legend over the Chart.
Position Offset %	0% is defined as a horizontal Legend touching the right Chart canvas border and a vertical Legend touching the top one. Legends are offset relative to these positions.
Custom	This check box will disable the Resize Chart property and will enable you to position the Legend in pixels anywhere on the Chart Canvas.

7.4.6.1.8.3 Legend Symbols

Set the Legend Symbols properties

Tab	Function
Visible	Symbols can be shown or hidden.
Width	Set Width property to define the width of the colour rectangles (symbols).
Width Units	Use the Width Units property to define how the width must be interpreted.
Position	Use the Position property to set the position of the colour rectangles.
Continuous	Use Continuous property to let the different legend colour rectangles flow into each other. When checked, the colour rectangles of the different items are drawn fixed to each other (no vertical spacing). When un-checked, the colour rectangles are drawn as separate rectangles.

7.4.6.1.8.4 Legend Title

Set the Legend Title properties

Tab	Function
Options	Add a title to your legend in the Text box, select text alignment and make text visible.
Format	Change the colour, frame, pattern of the legend title. Add/remove, increase/decrease transparency.
Gradient	Add gradient to your legend title. Edit format, colours and other options.
Shadow	Customise the shadow on your legend title by size, transparency, blur, or pattern.
Text	Customise the text of your legend title.
Bevels	Add bevels to your title.

7.4.6.1.8.5 Legend Format

Set the Legend Format properties

Tab	Function
Colour	The colour property sets the colour for the Legend canvas.
Frame	Sets Legend Frame properties: Visible, Style, colour and Width [Pen properties].
Pattern	Sets the pattern for the Legend canvas: Solid, Hatch, Gradient, Image [Hatch Brush properties].
Round Frame	Rounds the corners of the Legend Frame.

Transparent	Makes the legend canvas transparent leaving just the Legend text and symbols on display.
Transparency	Sets the % transparency of the Legend when Transparent is set to true.

7.4.6.1.8.6 Legend Gradient

Set the Legend Gradient properties

Tab	Function
Colours	Change the colours of your legend.
Format	Change the colour, frame, pattern of the legend title. Add/remove, increase/decrease transparency.
Options	Edit other options of Legend such as Sigma Focus.

7.4.6.1.8.7 Legend Shadow

Set the Legend Shadow properties

Tab	Function
Colour	Change the colour preferences on your entire Legend.
Pattern	Change the pattern of the colours and how they display on Legend.
Size	Resize the legend.
Transparency	Add transparency to your legend.
Smooth	Check smooth to add smoother features to your legend, and control this with Blur.
Visible	Make your settings visible.

7.4.6.1.8.8 Legend Text

Set the Legend Text properties

Tab	Function
Font	Change the Legend font, its size and style.
Fill	Add and edit colour and patterns in the Legend.
Font Quality	Select a desired font quality from the drop down menu.
Shadow	Add shadow properties and customise them.

7.4.6.1.8.9 Legend Bevels

Set the Legend Bevels properties

Tab	Function
Bevel Outer	Add Lowered, Raised or no outer Bevel to Legend. Edit Bevel colour.
Bevel Inner	Add Lowered, Raised or no inner Bevel to Legend. Edit Bevel colour.
Size	Edit the size of Bevels.

7.4.6.1.9 Chart 3D

3D gives you the option to display the chart as:

- 2D Flat Chart viewed from front
- 3D Orthogonal where 3D is represented by vectored Lines to indicate depth
- 3D Native Windows where 3D uses 3D Canvas with 180 degree chart rotation

Working with the 2D Chart presents no special issues. All object co-ordinates are positions relative to the chart panel or chart rectangle, and there is no need to make any allowance for a 3D offset.

Property	Functionality
3 Dimensions	Selecting this property (toggling) will change the chart from a 3D to a 2D chart.
3D %	Controls the depth of the 3D effect.
Orthogonal	3D Orthogonal mode is the default way to obtain a 3D 'effect'. You cannot rotate a 3D Orthogonal Chart, as the Bottom Axis is always horizontal. When Orthogonal is disabled, the Windows Native 3D mode is enabled allowing you to Rotate, Elevate and Offset the Chart.
Zoom	The Zoom option allows you to bring forward or move away the whole chart. Zoom internally is still available on the data.
Perspective	The Perspective property allows you to set a distance perspective as if looking into a room. Perspective offers a visual enhancement for charts used for presentation purposes.

See also:

- Chart Editor

7.4.6.2 Series Section

In the series section, you can make specific changes to a series of your choice from the chart.

The section contains parameters **dependent** on the type of the series that is selected.

For example:

Polar Series will show different parameters in the **Series** section than *Line* Series.

Every Series type has, **at least**, 2 values for each point. These values are designed as X and Y point co-ordinates. Extended Series types have more than 2 values, like BubbleSeries has X, Y and Radius values for each point.

The Series characteristics are grouped into tabbed categories which will **vary** depending on the chart series chosen.

All charts will however have the tabbed pages of General, Format, Data Source and Marks.

Note	Series formatting is chart dependent and there are a multitude of formatting parameters for each individual series style. You are advised to select an appropriate series style for your data and spend time testing the formatting features to customise the look of your series. A comprehensive listing of all formatting possibilities is beyond the scope of this help guide, however the formatting tools are, for the most part, similar to those used to customise the chart e.g. see Chart Legend.

See also:

- Chart Editor
- Chart Series

7.4.6.2.1 Series Format

Select a series you would like to edit from the drop down menu box.

You can then make changes to the border, colour and pattern of your series.

See also:

- Chart Editor
- Chart Series

7.4.6.2.2 Series General

In the Series General page:

- You may specify whether the series appears in the legend.
- If your data is datetime, you may set the data to datetime for your Series by ticking the Date Time checkbox.
- You may also specify the decimal places to be used for the values and percent for each series.

Series added to the chart will automatically take the Left and Bottom axes as their reference axes. You may change the reference axes in the Chart Editor by selecting the Series General Page for the relevant series. There are 4 axes available, Top, Left, Bottom and Right and Depth. You may repeat any one (or all) of the front 4 axes at any place on the chart by using the Axis Customdraw method.

Note that this method makes a copy of your Axis, it does **not** add a new Custom Axis.

See also:

- Chart Editor
- Chart Series

7.4.6.2.3 Series Data Source

Connecting Series

You may use a series as the data source for another series, and apply a function to that series. DataSight offers several basic functions such as Average and Curve Fit. Functions are added as Line Series type by default but may optionally be changed to a different visualisation such as a Bar Series or Point Series. This can be done with the Chart Editor by setting the data source for the 2nd series.

1. Go to the Series section, Data Source page. Select **Function** as the data source type. Two Listboxes will appear, available Series and Selected Series.
2. Select the Series you wish to use as the datasource for the present Series, then, in the **Functions** Combobox, select the function type and click **Apply**.

Note that any Series, in this way, may be defined as a function of any other Series and the Function Type may be any of the list available in the Function combobox.

Function definitions are also easily changed afterwards on the **Data Source** page of the Function Series. Here, just as easily, you may change the definition of a normal series that you have added to the chart, to that of a Function.

See also:

- Chart Editor
- Chart Series

7.4.6.2.4 Series Marks

In the Marks page of the Series Section, you may define the appearance aspects of labels with which you can mark data points.

Tab	Function
Style	Toggle On/Off visible display and set the Mark display content characteristics. Determines the text to display inside the mark.
Arrow	Displays a line from mark to corresponding series point.
Symbol	Show the Symbol in the Mark box, and format the symbol.
Format	Contains the settings for the Mark box, e.g. colour, Frame (ChartPen properties), Pattern (ChartBrush properties), and checkboxes for Round Frame and Transparent.
Gradient	Enable/disable a Background Gradient in the Mark box and select its direction and colours.
Shadow	Properties for display of the Mark box Shadow. You may define colour, pattern (ChartBrush) size and transparency.
Text	Gives access to properties which change the appearance of the Marks text's font, the font's fill properties [Hatch Brush properties] and shadow.
Bevels	Sets the colour, size and style of the Mark Box's inner and outer bevels.

You can also add Marks to a chart series directly from Chart Ribbon tab (See Set Series Properties on the Chart Ribbon for more details).

See also:

- Chart Editor
- Chart Series

7.4.6.3 Print Section

DataSight offers standard methods to print the on-screen chart 'as is' to the Printer.

Print your chart

1. Go to the Chart Editor.
2. Click the **Print** section.

This will print the chart to the Print Preview window as it appears on-screen.

You can change various print parameters, such as choosing Landscape or Portrait orientations, as required.

See also:

- Print Your Chart

7.4.6.4 Tools Section

The extensive range of tools in the Chart Editor can be used to annotate your chart with text, lines, symbols and so on.

The features in the Tools section can be very useful and it is advised to spend some time familiarising yourself with the different possibilities.

The settings in many tools are already replicated in various Chart and Series Sections, and their addition provides another means by which you can refine your chart display.

There are three main types of tools:

- Series Tools
- Axis Tools
- Other Tools

See also:

- Chart Editor
- Manage Tools
- Save a Chart

7.4.6.4.1 Manage Tools

Add a Tool

1. From the Chart Editor window, select the **Tools** section.
2. Insert a new tool by clicking the + button. The Chart Tools Gallery window opens.
3. Select the tool required from the lists available and click **Add**.
4. Enter any required information or settings.

Delete a Tool

1. From the Chart Editor window, select the **Tools** section.
2. Delete a tool by clicking the - button.
3. You will be required to confirm the deletion. Select **Yes**.

Clone a Tool

1. From the Chart Editor window, select the **Tools** section.
2. Add tool or click on the tool you would like to clone.
3. Click **Clone** to replicate tool immediately. Clone tool settings can be changed.

Deactivate a Tool

1. From the Chart Editor window, select the **Tools** section.
2. Click on the tool you would like to deactivate.
3. Uncheck the **Active** option on the right. Your tool is now deactivated.

Organise Tools

1. From the Chart Editor window, select the **Tools** section.
2. Click on a tool to change its position in the list.
3. Use the up and down arrow buttons to move tool.
4. (Optional) Repeat for other tools as desired.

See also:

- Chart Editor
- Tools Section
- List of Series Tools
- List of Axis Tools
- List of Other Tools

7.4.6.4.2 Series Tools

Listing of all Series tools.

Tool	Function
Image	Draws a picture (bitmap, jpeg, gif, png, pcx) behind a specified chart series.
Extra Legend	Displays a custom legend at any location inside the chart.
Mark Tips	Used to display default Hint windows when the mouse is over (or clicks) a series point.
Nearest Point	Moves a marker to the point nearest to the cursor. The tool may be associated with a series or applied globally to the chart.
Pie Slices	Highlights the pie slice under the mouse either by drawing a border around it or by exploding it away from the rest of the Pie Series.
Surface Nearest	Displays a visual indication of selecting a Surface cell when the user moves the mouse over a surface series.
Cursor	Adds cursors to the chart which can be associated with individual series or with the chart as a whole. Cursors may be horizontal, vertical or both (crosshair).
Drag Marks	Allows the mouse drag of Marks for the selected series.
Draw Line	Enables fully customisable lines to be drawn, selected, dragged and deleted on the chart with the mouse.
Drag Point	Allows the mouse drag of series points for the selected series.
Gantt Drag	Enables the bars of Gantt Series to be dragged and/or resized.
Fibonacci	Displays Fibonacci arcs or fans based on specified trendline.
Series Region	Paints an area under the series curve.
Legend Palette	Displays legend made with 3D series palette colours.
Series Statistics	Calculates a number of standard statistical measures for a given series.
Clip Series	Restricts series painting outside series associated axes boundaries.

Series Band Fills the region between two series.

Scroll Pager Creates a subchart showing a scrollable overview of a large dataset.

Refer to individual tool chapters for further detail.

See also:

- Tools Section
- Manage Tools

7.4.6.4.2.1 Image Tool

The Image tool draws a picture (bitmap, jpeg, gif, png, pcx) behind the chart or a specified chart series.

Design

1. Add the **Image** tool.
2. Associate the image with a specific series using the drop down menu. By default the image is not associated with a series (none).
3. Click **Browse** to select the Picture file.
4. In the **Mode** drop down box, select Normal, Stretch, Center or Tile.
5. **Clear** the image as required.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.2 Extra Legend Tool

The Extra Legend tool displays a **custom** legend *any* location inside the chart.

Design

1. Add the **Extra Legend** tool.
2. Associate the Extra Legend with a series using the **Series** dropdown combobox. The Extra Legend tool has to be associated with a series for it to appear.
3. The **Edit Legend** dialogue allows the legend to be fully configured.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Chart Legend
- Manage Tools
- Save a Chart

7.4.6.4.2.3 Mark Tips Tool

The Marks Tips tool is used to display default Hint windows when the mouse is over (or clicks) a series point.

The Mark Tips tool can be associated with a specific series or can be left at default associated with none of the chart series. Style defines the type of series data to be displayed in the Mark Tips while Mouse Action sets whether the Mark Tips appear on a Mouse click or move. Delay defines the lapse of time in milliseconds before the Mark Tips appear.

7.4.6.4.2.4 Nearest Point Tool

The Nearest Point tool moves a marker to the point *nearest to the cursor* and follows your cursor pointer.

Design

The Nearest Point tool needs to be associated with a specific chart series. Its appearance can be configured using:

- **Fill** (Hatch Brush Editor) to define the body of the Nearest Point Tool, it's colour, transparency, visibility, fill-style, fill-gradient or fill-image and
- **Border** (Pen Editor) to define the style, colour, width, ending, transparency and visibility of the Nearest Point Tool's border pen.
- **Draw Line** enables/disables the drawing of the connecting line between the cursor position and the Nearest Point Tool shape, Size defines the size of this shape while Style defines the type of shape used.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.5 Pie Slices Tool

The Pie Slices tool highlights the pie slice under the mouse either by drawing a border around it or by exploding it away from the rest of the Pie Series.

Design

The Pie Slices tool has to be associated with a specific Pie Series.

Style specifies whether the Pie Slice is highlighted:

- By a border around it (which can be edited by the Border button (Pen Editor)) or
- By exploding it away from the rest of the Pie Series.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.6 Surface Nearest Tool

The Surface Nearest tool displays a custom legend at any location inside the chart.

Design

Use the **Series** combobox to select the surface series you wish to associate with the tool. The cell, row and column colour characteristics can be edited by using the relevant colour editor.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.7 Cursor Tool

The Cursor tool adds cursors to the chart which can be associated with individual series or with the chart as a whole.

Design

Once added, Cursor tools may or may not be associated with a chart series and may be configured in **Style** as being horizontal, vertical or both (crosshair).

- If a Cursor tool is associated with a series then it can be set to **Snap** to the series YValues as the cursor is moved.
- **Follow Mouse** causes the Cursor tool to move with the mouse.
- **Pen** (Pen Editor) allows you to configure the style, colour, width, ending, transparency and visibility of the Cursor tool.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.8 Drag Marks Tool

The Drag Marks tool allows the mousedrag of Marks for the selected series.

Design

The Drag Marks tool can be set to a specific series or call be left associated with all chart series.

Reset Positions returns all moved marks back to their original default positions.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.9 Draw Line Tool

The Draw Line tool enables fully customisable lines to be drawn, selected, dragged and deleted on the chart with the mouse.

Design

The Draw Line tool can be set to a specific series or can be left associated with none of the chart series via the **Series ComboBox**.

- The **Button** ComboBox sets the Draw Line Tool to a specific mouse button.
- **Pen** (Pen Editor) allows you to configure the style, colour, width, ending, transparency and visibility of the Draw Lines.
- **Enable Drawing** and **Enable Select** respectively enable/disable the drawing and selection of the Lines.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.10 Drag Points Tool

The Drag Point tool allows the mousedrag of series points for the selected series.

Design

The Drag Point tool can be set to a specific series or call be left associated with all chart series.

- **Style** enables the Drag Point tool to either drag the points in the X orientation, the Y orientation or in both orientations,
- **Mouse Button** selects the active mouse button while
- **Cursor** selects the style of cursor shown when dragged over a Series point.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.11 Gantt Drag Tool

The Gantt Drag tool drags and resizes the bars of a Gantt Series.

Design

The Gantt Drag tool has to be associated with a specific *Gantt* Series.

- **Resize pixel tolerance** specifies the accuracy of dragging in pixels.
- **Allow Drag** enables dragging.
- **Cursor** specifies the cursor displayed while dragging.
- **Allow Resize** enables Gantt Bar resizing.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.12 Fibonacci Tool

The Fibonacci tool draws Fibonacci arcs or fans based on a specific trendline.

Design

Use the **Series** combobox to select the series you wish to associate with the tool.

Both the Fibonacci's drawing characteristics as well as it's algorithmic variables can be fully configured in the above editor.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.13 Series Region Tool

The Series Region tool paints an area underneath a series of points or lines.

Design

Use the **Series** combobox to select the series you wish to associate with the tool.

- The **Origin** specifies the YValue (horizontal) base value of the area while
- the **Bounds** specify the XValue (vertical) start and end point limits.
- Use the **Format** tab to define area pen and brush characteristics.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.14 Legend Palette Tool

The Legend Palette tool displays a custom legend made with 3D series palette colour.

Design

Use the **Series** combobox to select the 3D series you wish to associate with the tool. All elements of this tool are *fully configurable* .

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.15 Series Statistics Tool

The Series Statistics tool calculates a number of standard statistical measures for a given series.

Design

Use the **Series** combobox to select the series you wish to associate with the tool.

7.4.6.4.2.16 Clip Series Tool

The Clip Series tool restricts series painting to within the boundaries of the axes to which it is associated. This is particularly useful when working with custom axes.

Design

Use the **Series** combobox to select the series you wish to associate with the tool.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.17 Series Band Tool

The Series Band tool fills the region between two series.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.2.18 Scroll Pager Tool

The Scroll Pager tool creates a subchart showing a scrollable overview of a large dataset.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart
- Use the Scroll Pager

7.4.6.4.3 Axis Tools

Listing of all Axis tools.

Tool	Function
Grid Band	Displays coloured rectangles (bands) at the grid lines of the specified axis and position.
Axis Arrows	Displays configurable arrows at the beginning and end of axes. These arrows can be made to scroll the axes when clicked upon.
Colour Line	Adds coloured lines to the chart which can be set vertically or horizontally in line with the axis values.
Colour Band	Adds bands of configurable colour to the interior region enclosed by the chart axes. These bands may be set vertically or horizontally in line with the axis values.
Axis Scroll Tool	Allows the scrolling of axes by mouse dragging.
Axis Breaks	Allows for a break in scale on an axis.

Refer to individual tool chapters for further detail.

See also:

- Tools Section
- Manage Tools

7.4.6.4.3.1 Grid Band Tool

The Grid Band tool displays coloured rectangles (bands) at the grid lines of the specified axis and position.

Design

Use the **Axis** combobox to select the axis you wish to associate with the tool.

The bush and colour characteristics of each band can be specified using the **Band** and **Colour** buttons respectively.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.3.2 Axis Arrows Tool

The Axis Arrow tool displays configurable arrows at the beginning and end of axes. These arrows can be made to scroll the axes when clicked upon.

Once you have added an Arrow tool a number of options become open to you.

- **Axis** enables you to select the axis (top, bottom, left, right or custom) to which you want to associate the Axis tool.
- You may add more than one Axis tool and associate each one with different axes.
- **Border** (Pen Editor) allows you to configure the style, colour, width, ending, transparency and visibility of the pen outlining the arrow shape.
- **Fill** (Hatch Brush Editor) allows you to configure the body of the arrow, it's colour, transparency, visibility, fill-style, fill-gradient or fill-image.

- **Length** describes the length of the arrow in pixels.
- **Position** defines whether the arrows are drawn on the End, Start or at Both ends of the axis.
- **Scroll** defines the percentage of the axis length by which the axis will scroll when the arrows are clicked.
- **Inverted Scroll** defines in which direction the Arrows will scroll the chart.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.3.3 Colour Line Tool

The Colour Line tool adds coloured lines to the chart which can be set vertically or horizontally in line with the axis values. The line moves according to the values of the associated axis.

- Colour Lines can be associated with a specific **Axis**.
- You can start the line t a specific series **Value**.
- **Border** (Pen Editor) allows you to configure the style, colour, width, ending, transparency and visibility of the pen.
- **Allow Drag** enables dragging.
- **Drag Repaint** repaints the chart.
- **No Drag Limit** allows the colour Line to be dragged beyond the chart's axes.
- **Draw Behind** draws the colour Line behind the chart series.
- **Draw3D** draws the Colour Line in 3D.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.3.4 Colour Band Tool

The Colour Band tool adds bands of configurable colour to the interior region enclosed by the chart axes. These bands may be set vertically or horizontally in line with the axis values.

There are a number of options to be able to configure the Colour Band tool once it's been added to your chart.

- **Axis** enables to select the axis (top, bottom, left, or right) to which you want to associate the Colour Band.
- **Border** (Pen Editor) allows you to configure the style, colour, width, ending, transparency and visibility of the pen outlining the arrow shape.
- **Fill** (Hatch Brush Editor) allows you to configure the body of the arrow, it's colour, transparency, visibility, fill-style, fill-gradient or fill-image.
- **Gradient** defines the visibility, direction and start, middle and end colours of the Colour Band Gradient.
- **Colour**, in the absence of a gradient or an image, defines the colour.
- **Start** value sets the start value on the specified axis from which the Colour Band tool will begin.
- **End** value sets the end value.

- **Transparency** is a value from 0 to 100 which sets the transparency of the Colour Band tool.
- **Draw Behind** enables/disables the drawing of it behind the chart series.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.3.5 Axis Scroll Tool

The Axis Scroll tool allows the scrolling of Axes by mouse dragging.

Design

Use the **Axis** combobox to select the axis you wish to associate with the tool.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.3.6 Axis Breaks Tool

The Axis Breaks tool allows for a break in scale on an axis.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4 Other Tools

Listing of all other tools.

Tool	Function
Annotation	Allows text to be displayed on the chart.
3D Grid Transpose	Exchanges X and Z coordinates to rotate a Grid-based series through 90 degrees.
Page Number	Displays a fully configurable text box containing a chosen page numbering system.
Rotate	Changes the elevation and rotation of charts when dragging the mouse over a chart.
Legend Scrollbar	Allows the scrolling of Axes by mouse dragging.
2D Lighting	Displays a 2 dimensional "light" effect over the chart Canvas.
SubChart	Allows multiple charts inside a single chart.

Fader Tool	Effects a fade-in or fade-out chart animation.
Rectangle	An Annotation tool that can be dragged and resized.
Selector	Enables the end-user to click and drag chart elements like series, axes, legend, titles, etc.
Transpose Series	Swaps multiple series rows and columns.
Data Table	Displays an Excel-like table besides vertical or horizontal axes.
Banner Tool	Produces a scrolling and blinking text animation
Magnify Tool	Magnifies a portion of the chart

Refer to individual tool chapters for further detail.

See also:

- Tools Section
- Manage Tools

7.4.6.4.4.1 Annotation Tool

The Annotation tool allows text to be displayed on the chart.

Design

The Text of the Annotation tool and the box it sits in can both be fully configured.

- **Options** allows you to enter the text you wish and to specify its position either by default or custom values.
- **Format** configures the text box, allowing you to change its colour, frame, pattern, bevel, size, roundness and transparency.
- **Text** enables the setting of the text font, colour, outline and spacing and also the colour and size of the text shadow.
- **Gradient** configures the properties of the text-box gradient.
- **Shadow** configures the properties of the text-box shadow.
- **Bevel** configures the properties of the Annotation Tool bevels.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.2 3D Grid Transpose Tool

The 3D Grid Transpose tool exchanges X and Z coordinates to rotate a Grid-based series through 90 degrees.

Design

Use the **Grid3D Series** combobox to select the series to rotate.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.3 Page Number Tool

The Page Number tool displays a fully configurable text box containing a chosen page numbering system.

Design

The Text of the Page Number tool and the box it sits in can both be fully configured.

- **Options** allows you to enter the text you wish and to specify its position either by default or custom values.
- **Format** configures the text box, allowing you to change its colour (colour Editor), frame (Pen Editor), pattern (Hatch Brush Editor), roundness and transparency.
- **Text** enables the setting of the text font (Font Editor), fill (Hatch Brush Editor) and also the colour (colour Editor) and pattern (Hatch Brush Editor) of the text shadow.
- **Gradient** configures the properties of the text-box gradient.
- **Shadow** configures the properties of the text-box shadow.
- **Bevels** configures the properties of the text-box bevels.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.4 Legend Scrollbar Tool

The Legend ScrollBar tool allows the scrolling of Axes by mouse dragging.

Design

The various buttons within the Legend ScrollBar editor enable the different aspects of the tool to be fully configured graphically while the initial delay sets the amount of time between a click on the tool and the chart repaint.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.5 Rotate Tool

The Rotate tool changes the elevation and rotation of charts when dragging the mouse over a chart.

Design

The Rotate tool can be configured, using the the **Style** combobox, to rotate (turn the chart around a vertical axis), elevate (turn the chart around a horizontal axis) or to perform both actions at once.

The **Mouse Button** used to rotate the chart can also be selected.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.6 2D Lighting Tool

The 2D Lighting Tool displays a 2 dimensional "light" effect over the chart Canvas.

Design

The position of the light tool (left and top) can be specified or you can chose to have the tool follow the mouse.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.7 Subchart Tool

The SubChart tool allows multiple charts inside a single chart.

Design

SubCharts are added to the chart using the **Add** button and are configured using the nested chart editor.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.8 Fader Tool

The Fader tool effectuates a fade-in or fade-out chart animation.

Design

Use the Fader tool editor to set the speed, "empty" colour, style and initial delay of the animation.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.9 Rectangle Tool

The Rectangle tool is an Annotation tool that can be dragged and resized.

Design

The editor provides for the full configuration of text and its bounding area.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.10 Selector Tool

The Selector tool enables the end-user to click and drag chart elements like series, axes, legend, titles, etc..

Design

The Selector tool editor enables you to configure the size and brush characteristics of the handles that represent a selected object, as well as whether draggable objects (e.g. legend) can be dragged or not.

The cursor style displayed when the tool is active can also be defined.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.11 Transpose Series Tool

The Transpose Series tool swaps multiple series rows and columns. Click on the Transpose button to perform the operation.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.12 Data Table Tool

The Data Table tool displays an Excel-like table besides vertical or horizontal axes.

Design

Use the Data Table editor to configure the table's borders (rows and columns), position and text format.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.13 Banner Tool

The Banner tool produces a scrolling and blinking text animation.

Design

Use the Banner tool editor to configure the tool's text and bounding box.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.4.4.14 Magnify Tool

The Magnify tool magnifies a portion of the chart.

Design

Use the Magnify tool to fully configure its graphical and functional characteristics.

Note	The tool settings on a chart are retained when you save the chart.

See also:

- Manage Tools
- Save a Chart

7.4.6.5 Themes Section

Themes allow changing all visual formatting properties of charts with a single click. The Chart Editor includes a Theme section where you can choose and apply a Theme from those provided or one you have saved as a custom Theme previously.

Clicking the **Apply** button will change all necessary properties in the edited chart like fonts, colours, pens and brushes. Colours used to fill individual series points are chosen from the colour palette. A "Custom" colour palette is available which allows you to define the series colours used within the current chart.

Apply a Theme

1. **Open** the Chart Editor.
2. Select the **Themes** tab.
3. Select a **Theme** from the list and click **Apply**.
4. **Close** the Chart Editor.

Apply a Custom Colour Palette

1. **Open** the Chart Editor.
2. Select the **Themes** tab.
3. Click the **Custom Colors** drop-down and select one of the **custom palettes** available.
4. Click **Apply** and then click **Close** to view your chart with the selected Custom Colour palette.

Change a Custom Palette Colour

1. **Open** the Chart Editor.
2. Select the **Themes** tab.
3. Click the **Custom Colors** drop-down and select the **Custom** palette.
4. Click one of the custom colours **grid squares** from the Custom Colors grid to display the Colour selection window.
5. You can now either:
   a. Select one of the **Basic Colours**; or
   b. Click the **Define Custom Colours** button to expand the Colour window allowing you to select and define a specific colour.
6. Once you have made your selection, click the **OK** button to save your selection to the **Custom Colors grid** and close the Colour selection window.
7. Repeat steps 4 to 6 above to define further custom colours.
8. Click **Apply** and then click **Close** to view your chart with the selected custom colours.

Note	The "Custom" Custom Colour palette is global and is not specific to any theme and can only be saved with the Chart it was defined in. It is recommended that you create and save a Chart with a "Custom" Custom Colour palette for your requirements. When you would like to use that "Custom" Colour palette with another chart, simply open the saved Chart to load the "Custom" Custom Colour palette into the Chart Editor, after which you can now select that "Custom" Custom Colour palette for use with the new Chart.

See also:

- Chart Editor

Example Charts

This section outlines the construction of more complicated graphical displays of data. Some of these plots are typically used for meteorological and hydrographic charting.

Once these Charts have been saved, they can be reopened from the Saved Views Panel, and the data shown can be modified using the filter editor.

The instructions for the example charts assumes that you have created a blank chart ready for use.

7.4.7.1 Different Variables, Same Level

DataSight charts can be constructed to overlay different variables from the same Level. If the Variables differ markedly in scale then you will need to move each variable to a different axis to overlay them.

1. Click **Chart** in the View group on the DataSight Ribbon to open a blank chart template in the Main Panel.
2. In the **Levels** panel, highlight the Level whose data you wish to display.
3. From the **Variables** Panel, drag the dependent variable onto the y-axis of the chart the appropriate number of times for how many variables that will be compared. The chart will now display a number of identical series in different colours, and each series will have its own filter tab.
4. Right-click on the chart and select **Chart Editor**.
5. On the Series tab, click **Change**.
6. Select the different Series type from the Series Gallery and click **OK**.
7. The modified Series is now displayed in the Series list.
8. Select the **Axes** tab and press the + button below the list of available Axes at the left of the window. This will add a custom axis, repeating for each of the additional variables. You should now have several custom axes labelled 0, 1, 2... etc.
9. Select the Series tab at the very top header bar. This area is where you move the variables (as series) on to their dedicated axis.
10. Select the first series from the drop-down list and select the **General** tab.
11. From the Vertical Axis drop-down list, select the appropriate axis.
12. Repeat this procedure for the remaining variables and axes.
13. **Close** the Chart Editor.
14. (Optional) **Save** your chart.

See also:

- Create a Chart
- Save a Chart

7.4.7.2 Different Levels, Same Variable

DataSight charts can be constructed to compare data for the same variable across multiple locations.

1. Click **Chart** in the View group on the DataSight Ribbon to open a blank chart template in the Main Panel.
2. Identify the monitoring locations that you wish to review by selecting the Level under which ALL the monitoring locations can be found, and must include the Level 1 equals .... filter condition as a minimum. This selection will become the **Main Filter**. You may wish to select a time period also to remove as much irrelevant data as possible.
3. Drag the dependent variable onto the y-axis of the chart the appropriate number of times for how many sites that will be used in the comparison. The chart will now display a number of identical lines in different colours.
4. Right-click on the chart and select **Chart Editor**.
5. On the Series tab, select one of the series and click **Title**.
6. Rename the Series title to that of the Level.
7. Repeat with remaining series.
8. **Close** the Chart Editor.

9. In the Filter Panel click on the first series tab.
10. Add filter conditions specific to the Level (e.g. Level 3 equals ....). If only the Level 1 equals .... filter condition was applied in the Main Filter, then you must use Level 2 equals .... and Level 3 equals .... filter conditions for the series.
11. Select the next series tab, and change its filter conditions to specify the next site. Reiterate this process until all the filter conditions in the site tabs are specified.
12. In the filter panel click on the Main Filter.
13. (Optional) **Save** your chart.

Note	When you build the Main Filter you need to ensure that your monitoring locations are under the same Level otherwise you will not be able to see the data. If you wish to show another variable on the same chart, simply drag that variable to the right-hand axis, again, as many times as you have sites to display.

See also:

- Create a Chart
- Save a Chart

7.4.7.3 Plot Seasonal Trends

You can construct a DataSight chart that overlays historical data on a more recent event. Data can be overlaid from any combination of stations and variables and times. The simplest chart contains only two time scales (top and bottom horizontal axes), however using custom axes additional time periods can be plotted.

1. Click **Chart** in the View group on the DataSight Ribbon to open a blank chart template in the Main Panel.
2. Identify the monitoring sites that you wish to review by selecting the Level under which ALL the sites can be found. This selection will become the **Main Filter**. You may wish to select a time period also to remove as much irrelevant data as possible.
3. Drag your dependent variable to the y-axis, twice, so that there are two series now plotted on the chart.
4. Right-click on the chart and select **Chart Editor**.
5. Open the Series Section and select the **General** tab.
6. On the right hand side of the page there is an option to select the Horizontal axis. Assign one of the series to the top DateTime Axis and the other series to the bottom DateTime Axis.
7. Once you have nominated the link select Chart, **Axes**.
8. You can now highlight the axes and adjust the dates as required. The top and bottom axes are independent.
9. (Optional) **Save** your chart.

See also:

- Create a Chart
- Save a Chart

7.4.7.4 Distributed Multiple Variable Chart

Graphing multiple variables allows you to display large amounts of information for a given site within the one image. The following details one possible procedure for creating a multiple variable chart for a given time period, where the variables on the y-axis are distributed evenly over one A4 sheet. Such charts are routinely drawn for meteorological time-series data.

Create a new Chart

1. Click **Chart** in DataSight Ribbon to open a blank chart in the Main Panel.
2. In the **Levels** Panel, highlight the Level whose data you wish to display.
3. From the **Variables** Panel, left-click and drag the first independent variable to the y-axis.
4. Continue to drag additional independent variables to the y-axis, to plot your multiple series.

Modify the Chart Type

By default variables are added as line charts and you may wish to change the series type.

1. Right-click on the chart and select **Chart Editor**.
2. On the Series tab, click **Change**.
3. Select the different Series type from the Series Gallery and click **OK**.
4. The modified Series is now displayed in the Series list.

Adjust the Chart Axes

The chart may look crowded, so you will need to distribute the axes over the chart.

1. Select the **Axes** tab and press the + button below the list of available Axes at the left of the window. This will add a custom Axis for the additional variables. Press this button twice more, for the other additional variables. You should now have several custom axes labelled 0, 1, 2... etc.
2. To position these axes, select **Left Axis** in the list.
3. Select the **Position** tab.
4. Leave the Start % as 0, change the End % of the axis to the proportion of the chart it is to occupy. For example if you have four variables to display, then you may wish to end the first axis at 25%.
5. Select **Custom 0** axis from the list.
6. Change the Start % to where the first axis ended and change the End % accordingly. For example, where there are four variables to display, the second axis may start at 25% and end at 50%.
7. Repeat this procedure until the last axis to be positioned ends on 100%.

Label the Axes

1. Select the Axes **Title** tab.
2. Following the procedure of selecting the axis from the list and making changes to the right, title each axis.

Assign Variable to Axes

1. Select the **Series Section**. This area is where you move the variables (as series) on to their dedicated axis.
2. Select the first variable from the drop-down list and select the **General** tab.

3. From the Vertical Axis drop-down list, select the appropriate axis.
4. Repeat this procedure for the remaining variables and axes.

Separate the Axes

1. Select the **Tools** tab from the header bar.
2. Click the + button.
3. Select the **Axis** tab and Add a **Colour Line**.
4. The options for the newly added colour line are displayed on the right. Select Left Axis from the Axis drop-down list.
5. Press the **Clone** button. Select Custom 0 from the Axis drop-down list.
6. Press the **Clone** button. Select Custom 1 from the Axis drop-down list.

Give the chart a Title

1. Select the **Chart Section** from the header bar.
2. Select the **Titles** tab and enter an appropriate name for the Chart.
3. **Close** the Chart Editor.
4. Save the chart by clicking **Save** on the Quick Access Toolbar.

See also:

- Create a Chart
- Save a Chart

7.4.7.5 Wind Rose

Creating a wind rose from weather station data provides a succinct view of the predominant wind speeds and wind directions for a given location. The wind rose is presented in a circular format and the distribution of each point or line around the circle is related to the velocity that the wind blows from that particular direction.

Create a Wind Rose

1. Click **Chart** in DataSight Ribbon to open a blank chart in the Main Panel.
2. Drag and drop the Wind Direction variable on to the x-axis (horizontal axis).
3. Drag Wind Velocity on to the y-axis (vertical axis). You are now viewing Wind Direction vs. Wind Velocity as a Line Chart.
4. Right-click on the chart and select **Chart Editor**.
5. On the Series tab, click **Change**.
6. Select the Wind Rose from the Series Gallery (Other) and click **OK**.
7. The modified Series is now displayed in the Series list.
8. Open the Series Section and select the **Circled** tab. Click the **Circle** check box.
9. You can also change the layout of the wind rose from within the Chart Properties Window.
   - Turn points on / off by selecting the Visible checkbox in the **Series** > **Point** tab.
   - Turn the border on / off using the Pen and Pattern options in the **Series** > **Format** tab.

- Add a title in the **Chart** > **Titles** tab.
- Edit the Legend in the **Chart** > **Legend** tab.
- Mark wind direction points on a Wind Rose in the **Chart** > **Label** tab.

Note	It is also possible to create a Wind Direction Report in DataSight. This report displays a wind rose showing the frequency of winds blowing from any given direction. The length of each "spoke" around the circle is related to the frequency of time that the wind blows from a particular direction. See Wind Rose Reports for further details.

See also:

- Create a Chart
- Save a Chart

7.4.7.6 Charting Diatom Species Counts

DataSight Charts can be constructed to filter and display data for counts of different organisms, where one Variable contains the name of the organism in text and another Variable contains the count found for that organism.

More than likely, you will have captured the species name (either scientific or common) within a variable value, although the text could equally be that of the organism's taxon, family, genera etc.

This charting technique assumes that the Variables used have exactly matching monitoring datetime stamps.

Create a Count Bar Chart

The below example uses Diatom recording the Diatom Name and Count as two separate variables.

1. Click **Chart** in DataSight Ribbon to open a blank chart in the Main Panel.
2. Define your Level, datetime, Variables and other filter conditions in the Main Filter Panel as required. Make sure you include both Diatom Name and Diatom Count Variables; e.g.
    a. Variable Is any of Diatoms, Diatom Species Count.
3. **Drag and drop** the **Diatom Species Count** Variable onto the y-axis (vertical axis). The tab created in the Filter Panel will initially be named Diatom Species Count.
    a. Repeat the above step as required for each species to be charted.
4. Click the first **series tab** (next to the Main Filter tab).
    a. **Add a filter condition** for defining the value of the Diatom Species Count.
        i. E.g. Variable #123-Diatoms = Aulacoseira granulata.
        ii. The above filter condition will filter the Diatom Species Count to include only the values where the Diatoms Variable is equal to "Aulacoseira granulata".
    b. Repeat Step 4 for every different species to be charted.
5. Right-click your **Chart** and select **Chart Editor**, the Chart Editor window will be displayed.
    a. Click the first **series** to select it and then click the **Title...** button to edit the name of the series.
        i. Enter the name of the species, for this example this is **Aulacoseira granulata**.
        ii. Click **OK** to save the new series name.
    b. While the series is still selected, click the **Change...** button to change the type of chart for the series.

i. Click the **Bar** chart button, and then click **OK**.

c. Repeat step 5 for each species series to rename them and change their chart type.

6. Click **Close** to close the Chart Editor window and return to your chart, showing your diatom species and counts as a bar chart.

Note	This example can also be used to chart similarly recorded data where one Variable contains the name of something as text and another Variable contains the numerical values to be charted.

See also:

- Create a Chart
- Save a Chart

Saved Views

Datasheets, charts and reports may be created and then subsequently saved to the Saved Views Panel. This panel displays a tree list of all the saved views for the current database, each distinguished by a saved datasheet, saved chart or saved report icon. Saved Views can be arranged into manually created groups and are easily opened and edited. Saved View groups when created are available to all uses, but once created can be set with User Level access to restrict or provide access to Saved Views and groups within. Once a user has been has been added, the group becomes disabled in the Saved View panel with the contents hidden for all other users who have not also been provided access to the group (except members of the Admin security group who will always have access regardless of the User Level access settings applied).

Open a Saved View

- Double-click on any saved view item in the Saved View Panel. You can also right-click on the saved item in the Saved View Panel, and select **Open**. DataSight will generate the Saved View in the Main Panel using the filter conditions originally imposed.

Edit and save a new Saved View

1. You can change the filter conditions and/or properties of the datasheet, chart or report, and save the view.
2. To quickly save changes using the same Saved View name and within the same folder of the Saved View panel folder, click **Save** in the Quick Access Toolbar.
3. To save changes as a new Saved View, click **Save As** in the Quick Access Toolbar and the Save As dialogue window appears.
4. Click on your desired folder in the **Saved Views** folders list. This may be the master Saved Views folder, or an existing folder. The selection will be highlighted.
5. Alternatively add a new folder. Highlight the folder under which the new folder will be created, and select **New Folder**.
6. **Name** the new folder.
7. If you wish to overwrite an existing datasheet, chart or report click on its name.
8. Otherwise, **Name** the datasheet, chart or report.
9. Click **Save**.

Organise Saved Views

1. Click on your desired level in the Saved View panel. This may be the master Saved View folder, or an existing sub-folder. The existing group will be highlighted in a box.
2. With the cursor over the highlighted box, right-click and select **New Folder.** A new folder will appear in the tree list.
3. Enter the new folder name.
4. Click out of the box to save.
5. When adding a new folder, if you right-click in any blank space within the Saved View Panel (no folder selected), the new folder will appear under **Saved Views** by default.

Rename a Saved View or Folder

1. Select the item in the Saved View panel by clicking on the item name. The saved view will be highlighted in a box.
2. With the cursor over the highlighted box, right-click and select **Rename**.
3. Enter the new name.
4. Click out of the box to save.

Enable or Disable Access to a Saved View Folder

1. Select the item in the Saved View panel by clicking on the item name. The saved view will be highlighted in a box.
2. With the cursor over the highlighted box, right-click and expand either **User Access** or **User Group Access**.
3. A list of User or Group Accounts are displayed, with accounts already granted access denoted by a tick left of the Account's name.
4. Click on the name of a **User Account** or **Group Account** to add or remove that account's access to the Saved View folder.

Note	If no single User Account has been granted access to the Saved View group, then the group and its contents will be available to all users. Once a single User Account has been granted access, the group will be displayed as disabled in the Saved View panel and its contents will be hidden to all other users unless they are a member of the Admin group.

Refresh Saved Views

- Right-click in the Saved View Panel and select **Refresh**. The Folder Listing will be refreshed.

Delete a Saved View

1. With the appropriate item selected, right-click and select **Delete**.
2. A confirm dialogue will display, and may advise that any task scheduled for that item will also be deleted. Click **Yes** or **No** as required.

Collapse/Expand Search

To collapse or expand the search field, double click on the Search Header.

Use Search

1. Enter the desired Saved View name, or part name, in the **Search** field and click Enter (or Return). The tree list opens to and highlights the first search result.

2. If there is more than one search result, repeatedly press enter to navigate from the current search result to the next result.
3. If there are no Saved Views matching the given criteria, all nodes will be collapsed (to **Saved Views**).
4. If you wish to clear the search, clear the **Search** field and click Enter. This will bring the Saved Views tree to its default state, that is with **Saved Views** expanded to show all Folders and Saved Views, with Folders collapsed.

Note	Searching can be undertaken on partial text and is not case sensitive.

Saved View Properties File

A Saved View Properties file is created with any saved chart, recording the creator and the creation date. If the saved view is subsequently modified, the Saved View Properties will be updated to show the relevant user and date it was last modified. The properties file will also show any tasks that are scheduled to run using that item.

- To view the Saved View Properties, right-click on the name of the saved chart and select **Properties**. Information about associated tasks with the saved view is also available here.

Note	Refer to Reports for further information on accessing and editing your reports from the Saved Views Panel. Certain filter descriptors cannot be clicked upon to change them after they have been saved in a normalised or pivoted datasheet or a chart. This applies to the following Filter Descriptors: • Is greater than. • Is greater than or equal to. • Is less than. • Is less than or equal to. • Is between. • Is not between. To work around this issue either, click on the variable field and choose another variable or add a new condition row. This will re-activate the descriptor so that it can be selected or changed. Or, remove and re-add any Filter Conditions which contain any of the above Filter Descriptors.

See also:

- Saved Views Panel
- Save a Datasheet
- Save a Chart
- DataSight User Interface

Grid Views

Several grid views open within the Main Panel of the user interface.

The views contain various metadata records, related to the the primary data points, and are accessible by clicking on the relevant icon on the DataSight Ribbon.

All metadata records entered into a specific grid view in DataSight are loaded by default when that view is opened. The disconnected SQL query used to return all the data is not customisable, unlike the Filter Panel.

Name	Description

Variables	Definitions of the measured data parameters
Level Properties	Location and descriptive information of a Level 3. Grid views are used for both the Level 3 Comments and Projections.
Construction	To record construction details for a Level 3
Equipment	Equipment involved in data collection
Person	Persons involved in data collection
Standards	Check data entered into the database against certain user-defined guidelines, standards or criteria
Flags	Assign a subjective quality code for quality assurance purposes
Documents	Documents that provide information about the data collected
Gaugings	Level associated listing of gauging records
Conversion Tables	To record numerical relationships between two variables
Tasks	List of automated tasks for importing data, exporting data, charts and reports, performing calculations, and emailing documents and messages

Several other DataSight windows contain data in a grid view. For example Level 3 Collection History, Level Processing History and Security History all display information in a tabular format. As such, data in these grids may be filtered or organised according to grid view functionality.

See also:

- Main Panel
- DataSight User Interface
- DataSight Ribbon
- Grid Filters
- Organise Grid Views
- Export Grid Views

Grid Filters

Grid Filters are excel-like auto filters that can be used when viewing grid views such as that for Variables and other metadata. They are also available during the Import Routine, and in Conversion Tables, Regressions, Gaugings View, Summary Reports and Tasks.

When filtering is applied to a grid view, displayed records are restricted to those that meet the current filter criteria. You can filter data against single or multiple columns and filter criteria are globally updated across all filter types. The choice of filter includes:

- Filter Editor
- Find Panel
- Auto Filters

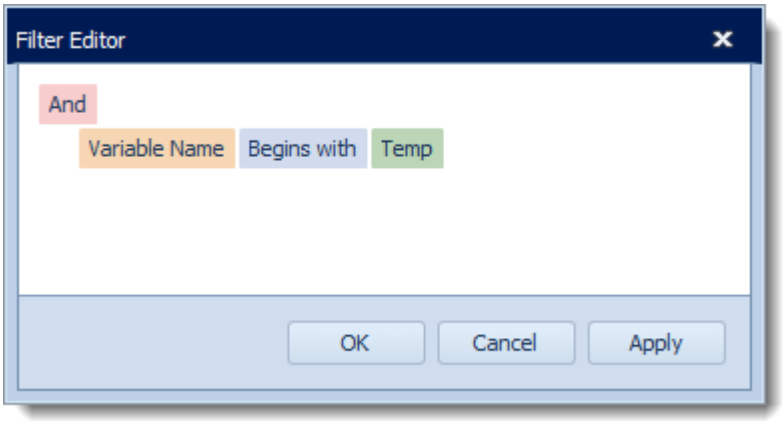
Note	Auto Filters, Auto Filter Row and Filter Editor Window are *not available* for your use with primary data in the main datasheet.

7.6.1.1 Filter Editor

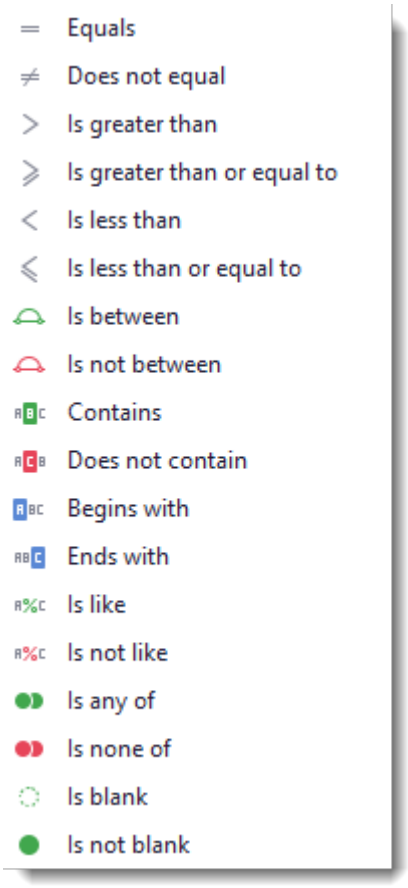
The Filter Editor, of similar usage to the Filter panel, is also available within the **Variables** and other **Metadata** grid views (See Grid Views).

Use the Filter Editor

1. To open the Filter Editor, right-click on a column header and select **Filter Editor**. The Filter Editor Window appears as shown below.



2. Filters consist of a Field, Descriptor and a Value. When the Filter Editor is opened, the Field is set to the column upon which you right-clicked, or the conditions which you imposed. You will need to edit this statement according to your filtering criteria, or delete the criteria using the button to start afresh.
3. Click the button (next to And) in the Filter Editor, to add a new filter condition.
4. Click the 1st part and select a Field from the drop down list of all fields.
5. Click the 2nd part and select a Descriptor. The list of possible descriptors is as follows:



2. Click the 3rd part and select or type a value.
3. You can repeat this process to add more conditions.
4. Click **OK**.
5. The chosen conditions are shown in the **Filter Editor Row** at the base of the Grid. This filter can be toggled on or off, compared with previous filters, or deleted.
6. Click **Edit Filter**, if you wish to modify the filter conditions.
7. Click the close button to clear the filtering.

See also:

- Filter Panel

7.6.1.2 Find Panel

The Find Panel is available:

- Within the **Variables** and other metadata tables to help find and subset data contained therein (See also Grid Views). It is also available during Import.

The Find Panel performs a global search across all columns of data.

By default, the Find Data Panel is hidden from view.

Use the Find Panel

1. Right-click on a column header and select **Show Find Panel**. The Find Panel appears above the column headers and, if present, within the Group By Box.

2. Enter an appropriate value in the find box and click **Find**. Data values that meet this criteria are highlighted yellow in the datasheet.
3. Click for the drop down list of previous searches. Click to remove each search.
4. Click the close button or right-click on a column header and select **Hide Find Panel** when you are finished.

Alternatively, if the Group By Box is present, the Find Panel can be opened by clicking on the **magnifying glass** icon located on the right-hand side of the Group By Box.

7.6.1.3 Auto Filters

Automatic (Auto) Filters are available:

- Within the **Variables** and other **Data Property** grids to help filter the data contained therein (See Grid Views). They are also available during Import.

Use the Auto Filters

1. Hover the mouse over a column header to show the filter icon .
2. Click on it to open a down-down filter menu, organised by tabs.
3. In the **Values** tab, you can either;
   a. Type specific text that you wish to search for, or
   b. Specify cell values from those that are currently displayed by the Grid View. The standard options are **All**, **Blanks** (for Text), or **Empty** (for Numeric and Date). The other options are any of the unique data values within that column.

Use	To return
All	All rows.
Blanks	Only the rows containing blank data values in that column of text-based data. This is not available for **Variable Name** column as this column cannot have blank entries.
Empty	Only the rows containing non-blank data values in that column of date or numeric data.
Unique data value	All the rows containing the specified data value in that column. Display of the data values is dependent upon the type of data.

4. Customised Text Filters, Numeric Filters and Date Filters are also available depending upon the data type.
5. Select the filter conditions. Conditions are applied immediately.
6. Change or **Clear** the filter if required.
7. Click **Close** or click outside the drop-down menu to close the window.
8. The filter icon will be greyed out like so to show that filter conditions have been applied.

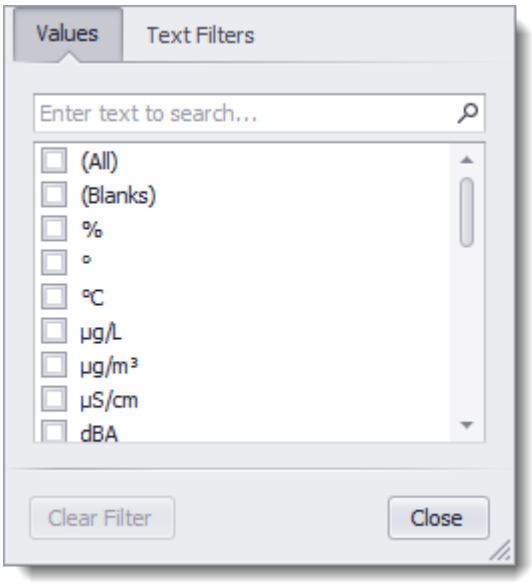
See also:

- Text Filter
- Numeric Filter
- Date Filter
- Custom Filter

- Auto Filter Row

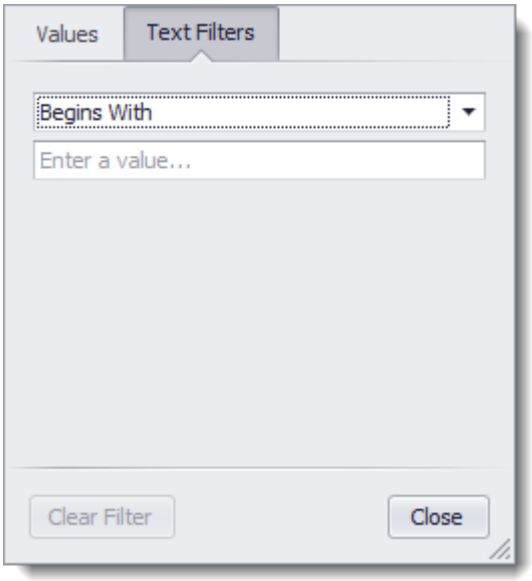
7.6.1.3.1 Text Filter

Filtering for text based values in grids can be undertaken using the **Values** tab or the **Text Filters** tab. Using either tab updates the conditions in the other tab.

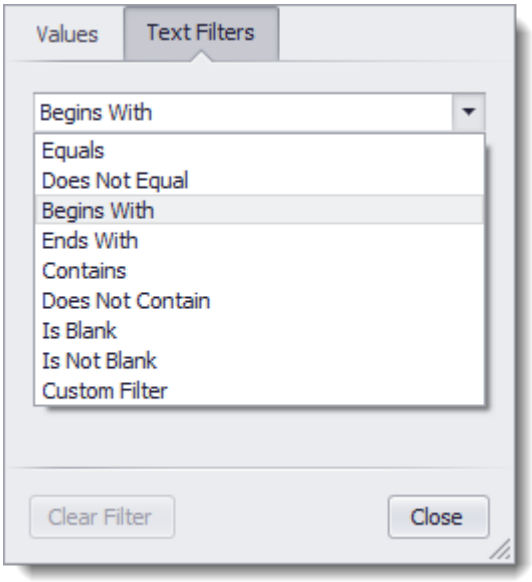


Using Text Filters

1. Select the **Text Filter** tab on the drop-down filter menu on a text specific column header (see also Auto Filters).



2. Click the arrow to display the drop down menu options for filtering the text values.
3. Select a filter descriptor from the drop down list. See also Custom Filter.



4. Enter an appropriate value in the value text box.
5. If you need to find values that share some characters (whether text or numeric) use the like or not like options in conjunction with either " _ " or "%" (with no spaces):

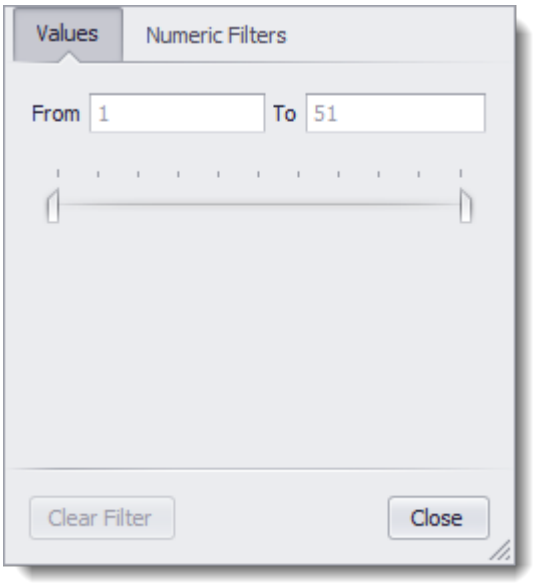
Use	To stand in for
_ (underscore)	any single character • eg, " 8_ " will find "81", "82", "83", "8B" etc • eg, "8__" will find "845", "87A" etc • eg, "T_" will find "TP", "TN", "T3" etc
% (percent)	any number of characters • eg "8%" will find "81", "82456", "8B" etc • eg "fish%" will find "fish", "fished" "fishing", "fishA1" etc

6. The grid view is subsequently populated with the values selected. Click to remove the filter conditions.
7. Change or **Clear** the filter if required.

Note	Blanks are available only if the column you want to filter contains a blank cell.

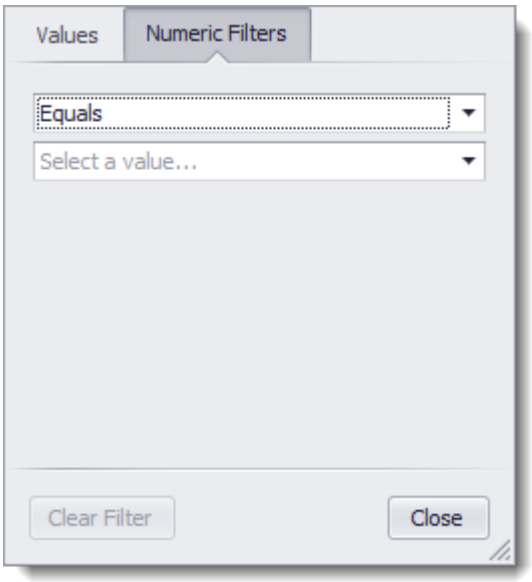
7.6.1.3.2 Numeric Filter

Filtering for numeric values in grids can be undertaken using the **Values** tab or the **Numeric Filters** tab. Using either tab updates the conditions in the other tab.

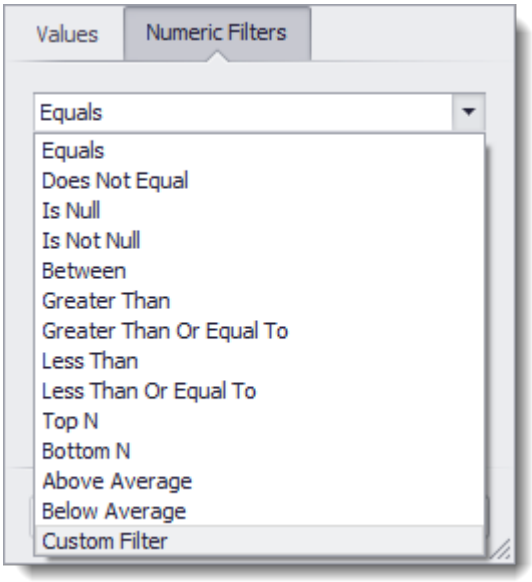


Using Numeric Filters

1. Select the **Numeric Filter** tab on the drop-down filter menu on a text specific column header (see also Auto Filters).



2. Click the arrow to display the drop down menu options for filtering the numeric values.
3. Select a filter descriptor from the drop down list. See also Custom Filter.



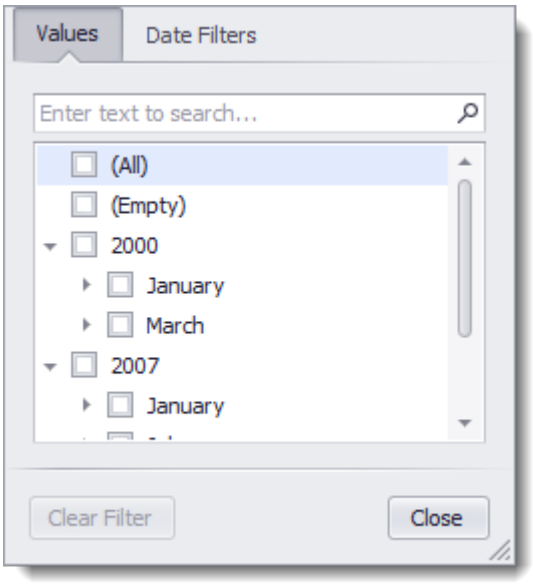
4. Enter an appropriate value in the value text box.
5. If you need to find values that share some characters (whether text or numeric) use the like or not like options in conjunction with either " _ " or "%" (with no spaces):

Use	To stand in for
_ (underscore)	any single character • eg, " 8_ " will find "81", "82", "83", "8B" etc • eg, "8__" will find "845", "87A" etc • eg, "T_" will find "TP", "TN", "T3" etc
% (percent)	any number of characters • eg "8%" will find "81", "82456", "8B" etc • eg "fish%" will find "fish", "fished" "fishing", "fishA1" etc

6. The grid view is subsequently populated with the values selected. Click to remove the filter conditions.
7. Change or **Clear** the filter if required.

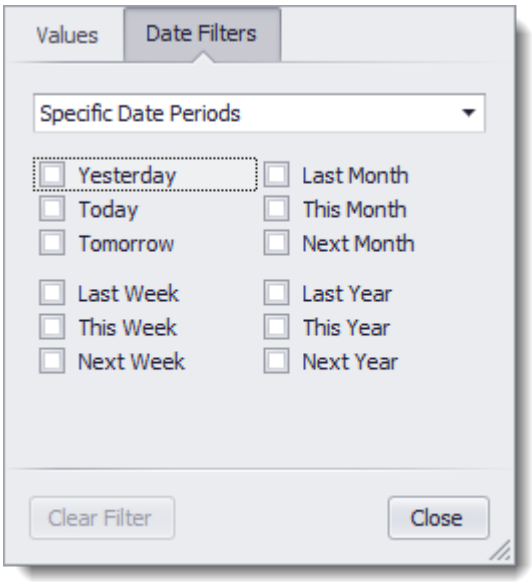
7.6.1.3.3 Date Filter

Filtering for date values in grids can be undertaken using the **Values** tab or the **Date Filters** tab. Using either tab updates the conditions in the other tab.

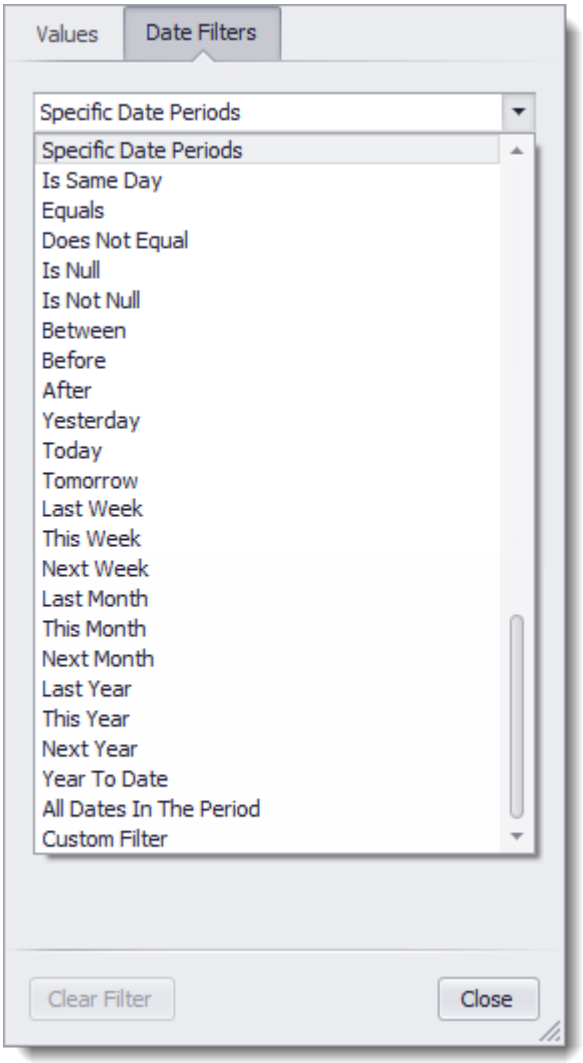


Using Date Filters

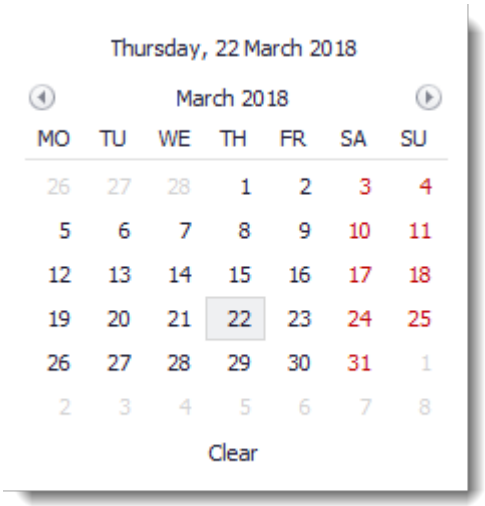
1. Select the **Date Filter** tab on the drop-down filter menu on a text specific column header (see also Auto Filters).



2. The default selection are **Specific Date Period** Filters. Click one or more **Specific Date** checkbox(es).
3. Alternatively, click the arrow to display the drop down menu options for filtering the date values.
4. Select a filter descriptor from the drop down list.



5. If required, you may need to select the date using the Calendar Tool.



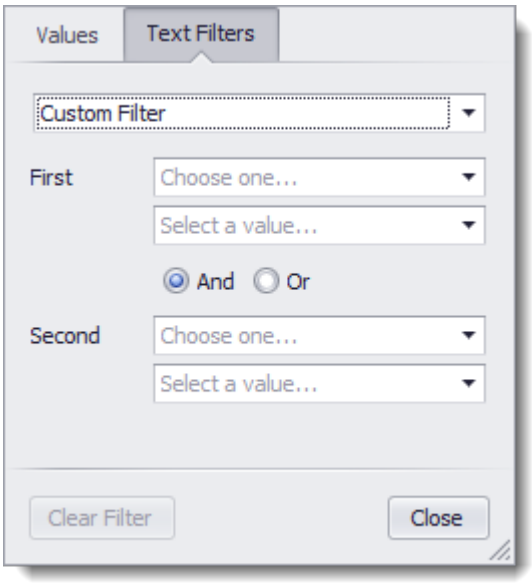
6. The grid view is subsequently populated with the values selected. Click to remove the filter conditions.
7. Change or **Clear** the filter if required.

7.6.1.3.4 Custom Filter

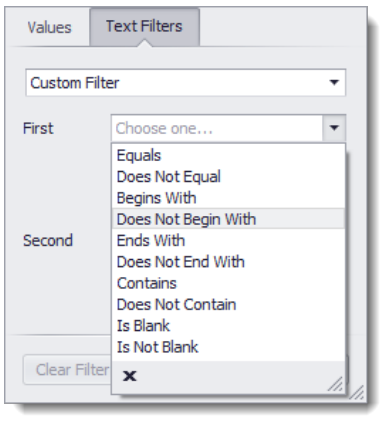
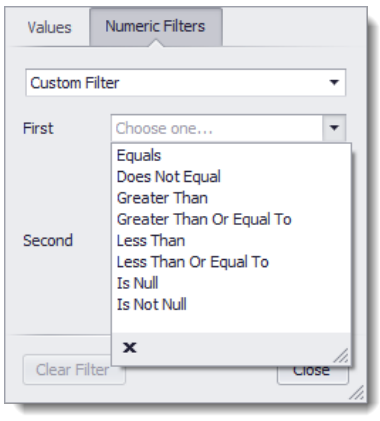
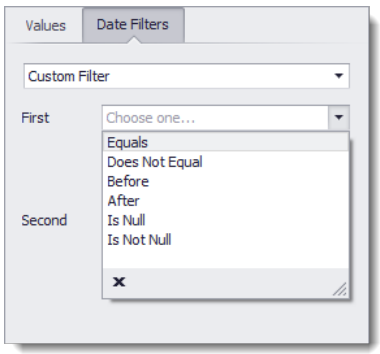
Custom filtering of values in grids can be undertaken on any text, numeric or date based data. Using this filter type updates the conditions in all other parts of the Auto Filter.

Using Custom Filter in Auto Filters (Text, Numeric or Date)

1. Select the **Custom Filter** tab on the drop-down filter menu on a specific column header. An example is shown here for text based custom filtering.



2. Click the arrow to display the drop down menu options for filtering the values.
3. In the **First** custom filter **Choose one** of the filter descriptors from the drop down list The list will vary depending upon the date type.

Text	Numeric	Date
		

4. **Select a value** in the value text box.
5. If you need to find values that share some characters (whether text or numeric) use the like or not like options in conjunction with either " _ " or "%" (with no spaces):

Use	To stand in for
_ (underscore)	any single character

- eg, " 8_ " will find "81", "82", "83", "8B" etc
- eg, "8__" will find "845", "87A" etc
- eg, "T_" will find "TP", "TN", "T3" etc

% (percent) any number of characters

- eg "8%" will find "81", "82456", "8B" etc
- eg "fish%" will find "fish", "fished" "fishing", "fishA1" etc

6. If required, in the **Second** custom filter **Choose one** of the filter descriptors from the drop down list.
7. Also, **Select a value** in the value text box.
8. Specify whether you wish the **First** and **Second** custom filters to be **And** (mutually inclusive) or **Or** (mutually exclusive).
6. The grid view is subsequently populated with the values selected. Click to remove the filter conditions.
7. Change or **Clear** the filter if required.

7.6.1.3.5 Auto Filter Row

An Automatic Filtering Row (Auto Filter Row) is available:

- Within the **Variables** and other **Data Property tables** to help filter the data contained therein (See Grid Views).

Using the Auto Filter Row, you can perform a search within the specified column of data. Specified filter conditions are also populated in the dropdown AutoFilters.

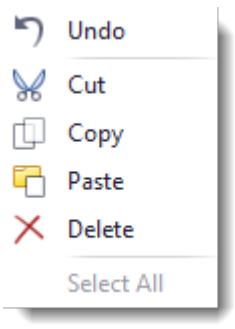
Use the Auto Filter Row

1. Right-click on a column header and select **Show Auto Filter Row**. The Auto Filter Row will appear below the header row in the grid.
2. Type your numeric and text values into your chosen column. As you type, the **Filter Editor Row** appears at the bottom of the grid view showing the filter condition imposed. In the below example, the Variable Name field has been filtered to show only variables that start with "Water".

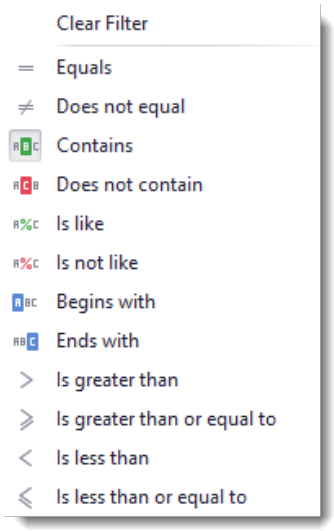
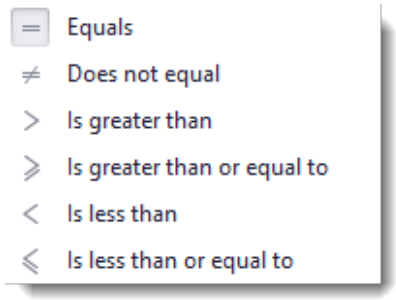
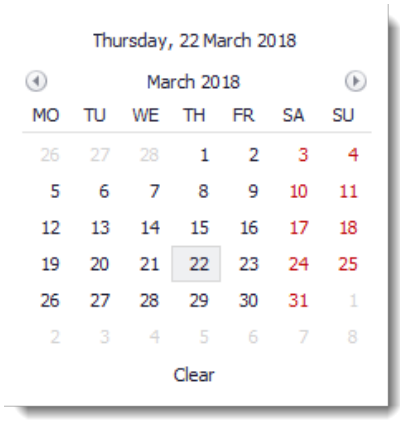
Variable Name	Description	Units	Display Format	Delete
Water				
Temp_Water		°C		
Water Level	Water level at a stream gauging station	m		
Water Temp (Continuous)	Water temperature reading from stream gauging station	°C		
Water Temp (Sample)	Water temperature reading from a water sampling site	°C		

Contains([Variable Name], 'Water') Edit Filter

3. A selection of commands as shown below is available when you right-click on the **Auto Filter Row**. Use these commands to help design your filter(s).



4. Click on the condition selector to choose a specific filter operator for that column. Choices are dependent upon whether the data in the column is text, wholly numeric, or date. Click on in the date column to access the calendar based menu.

Text	Numeric or Date	Date
		

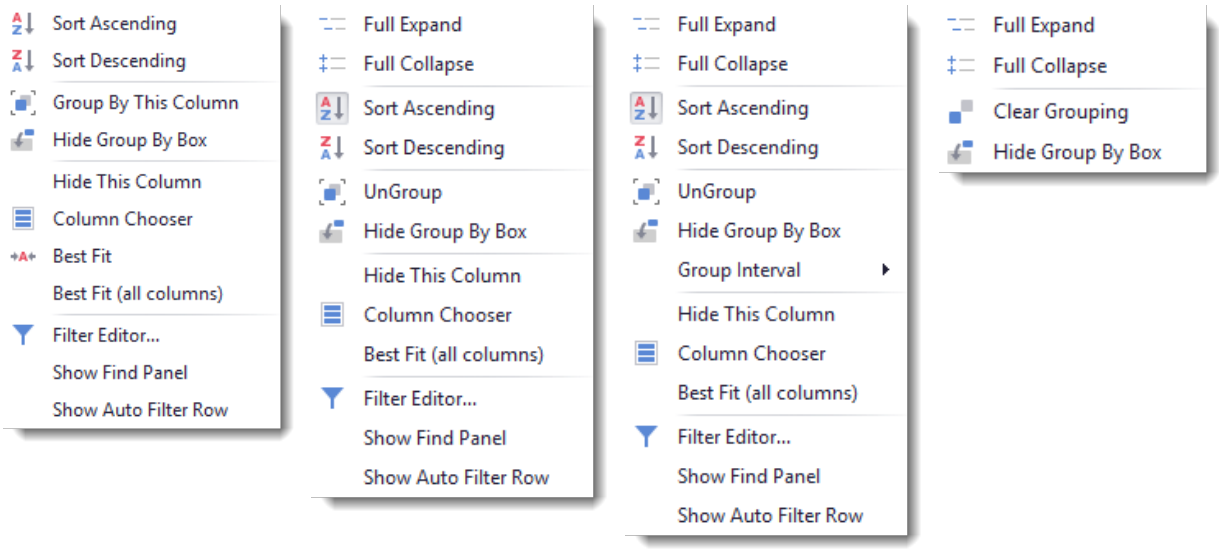
5. In the Filter Editor Row, toggle the filter on and off using the checkbox .
6. Click for the a drop down list of previous filters applied.
7. Hover over a condition and click to remove it from this list.
8. Click **Edit Filter**, if you wish to use the Filter Editor (see Filter Editor).
9. Click the close button to clear the filtering.
10. Right-click on a column header and select **Hide Auto Filter Row** to remove the tool.

Organise Grid Views

When data properties are displayed in grid or tabular format, there are several tools to assist you in organising this data, all of which are accessible via context menus. Different context menus are available depending upon where you click in the grid. For the most part, the functions are applicable only to a specific column of metadata. Many of these functions can also be performed using mouse clicks.

Right-click on the...

Individual Column Header	Column Header dragged to the Group By Box	Date/Time Header dragged to the Group By Box	Group By Box



Organise Your Grid

Maximize view

The DataSight User Interface has been sized to fit within a standard laptop screen. To increase the size of this window:

- Click the **Maximize** button in the top right hand corner of the open datasheet.
- Customise your layout (see Changing the Layout).

Heading order

To change your heading order:

- Click on a column header then drag and drop it sideways to its new position.
- Alternatively select **Column Chooser**, to reorder your column headers. Drag and drop the column headers into the Customise Window, then when ready, drop the columns back onto the datasheet in the desired order.

Column width

The column widths are set to **Best Fit (all columns)** by default. To alter the column widths:

- Hover the cursor over the join between column headers. The cursor will change to a  upon which you can drag the cursor left or right to change the column width.
- Select **Best Fit** to adjust the width of the column to accommodate the maximum width of the field's data.
- Select **Best Fit (all columns)** to adjust the width of all column's to that which best accommodates the data.

Sort data

To sort your data:

- Left-click a column header to sort the data by the ascending order  (first click) and the descending order  (second click). Toggle between the two choices.
- Alternatively select **Sort Ascending** or **Sort Descending** from the right-click menu.
- Select **Clear Sorting** from the right-click menu to restore the column of data to its original order.
- Order by more than one column of data, with the property data sorted in order from first column selected through to the last. This can only be accomplished by selecting the sort order from the right-click menu of each column of data in order of preference.
- Grouped data can also be sorted.

Group data

Data grouping can be used to sort the data into groups with the same value, whether this be a variable value, a date, time or any other column of data. By default, the **Group By Box** appears above the column headers in a new datasheet.

To group your data:

- Right-click on a column header and select **Group By This Column**. The column header will appear in the **Group By Box** above the datasheet and the data will be sorted into groups of the same data value. These groups are shown in bold.
- Once the Group By Box is displayed, your can drag and drop a column header into the box to sort the data into groups.
- Multiple groupings can be made, with data sorted in the order in which you drag or select the column headers. Drag headers about to change the ordering.
- To merge groupings, drag a column header(s) to the group panel and arrange them across a line while pressing the CTRL key. Drag column headers below or above this line to break merged grouping.
- Right-click in either the column header within the Group By Box or the Group By Box itself to remove the column header.

Groupings can be expanded or collapsed to further interrogate the data.

- Within the datasheet, click to expand a group and to collapse a group.
- To fully expand or collapse the data, right-click in the Group By Box and select **Full Expand** or **Full Collapse**.

Remove columns

All columns for a given Level are shown by default. To remove columns:

- Click on the Column header and drag and drop it from the raw data panel.
- Alternatively select **Remove this Column** from the right-click menu.
- If you mistakenly remove a column of data, you will need to close the datasheet and open a new datasheet. The data will be shown again in its original format with the missing column of data, but all layouts will have been lost.

Find data

By default, the Find Data Panel is hidden from view.

- Right-click on a column header and select **Show Find Panel**. The Find Panel appears above the column headers and, if present, within the Group By Box.
- Enter an appropriate value in the find box and click **Find**. Data values that meet this criteria are highlighted yellow in the datasheet.
- Click for the a drop down list of previous searches. Click to remove each search.
- Click the close button or right-click on a column header and select **Hide Find Panel** when you are finished.

Filter data

Refer to Grid Filters

See also:

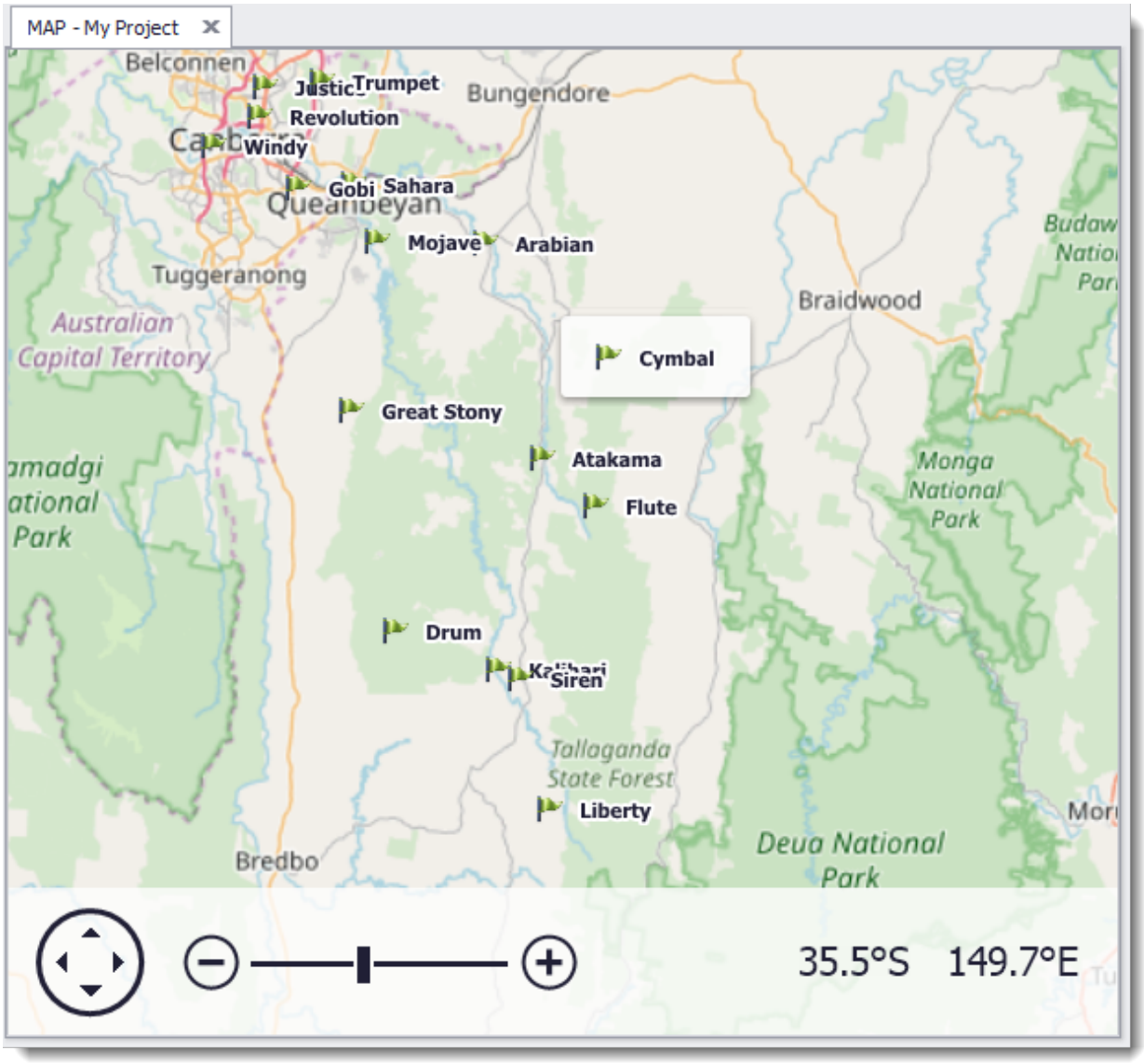
- Context Menus

Maps

Spatial information stored in **Level 3 properties** can be viewed:

1. Right-click on any Level 1, 2 or 3 in the Levels Panel.
2. Select **Map**. You can also click **Map** from the ribbon.

The Map will be displayed in the Main Panel, with site name(s) as white highlighted text. The map is scalable.



Note	DataSight uses **OpenStreetMap** to display the data, so you will require an internet connection. See Also: DataSight Options

Web Browser

The internal **Web Browser** can be used to access pages from the internet. Within the browser, you can also move backward and forward through web pages.

Launch the Web Browser

1. Make sure that your computer is connected to the internet and DataSight is open.
2. Click **Web Browser** in the View group on the DataSight Ribbon.
3. If a default website has been specified, it should now load within the Web Browser tab in the Main panel. Otherwise, the URL bar is empty and the web page is blank.
4. You can choose to either enter a web address in the URL bar, or use the drop down menu to select a pre saved website.
5. Click **Go** to access the website content.

6. Browse through the website and click links to load new content.
7. Click **Back** and **Forward** to move through the content chronology.
8. Close the **Web Browser** tab to quit browsing.

Save Website Links

You can quickly access up to four websites by saving them in DataSight Options. One of these websites is called **Website (Default)**, as it auto-loads the specified website when the Web Browser is launched.

1. Launch DataSight Options.
2. Under General, specify **Website 1**, **Website 2**, **Website 3** and **Website (Default)** as required.
3. Click **Save**.

Note	You will require **Internet Explorer 11** installed on your computer to run the Web Browser. Page loading time through Web Browser is dependent on your internet connection.

Dashboard

DataSight Dashboards allow you to select and display Saved Views in the Main Panel, in a configurable and dock-able Dashboard Panel. Dashboards are useful when you wish to review, at a glance, specific indicators that you are monitoring within your database. Dashboards should be dynamic, and thus used to preferentially display the most recent data in the database.

There are two types of Dashboards provided within DataSight:

- Public Dashboard - Available to all Users within your database. Once designed, the Public Dashboard replaces the Welcome screen when DataSight is first opened.
- User Dashboard - Available only to the specific User logged in to the database and is unique to each User.

Only one Public Dashboard and one User Dashboard can be open in the Main Panel at any time.

By default, Dashboards are disabled for all Users within your DataSight database. Access to the Dashboards is made available by enabling the appropriate (Public Dashboard/ User Dashboard) Security Permissions for the User Account or Group.

Dashboards can be set to automatically refresh the displayed data. You can control the frequency at which this occurs within the DataSight Options menu.

For displaying the most recent data, it is recommended that the Saved Views you wish to use within your Dashboard utilise the additional Date & Time descriptors detailed in Filtering by Date and Time. For example, if you wanted to use a Saved View Chart for data over the last 20 minutes, you would use the **[Minute - Last Minute(s)] Equals 20** additional descriptor in the Filter Panel for that Saved View.

Warning	There may be performance issues when recalling Saved Views with large data sets to your Dashboard. It is not expected that large data sets will be recalled for viewing at any one point in time, as this is likely to exceed the RAM of the computer that is running DataSight. Particularly, running complex reports with multiple variables and levels within a Dashboard may cause issues. If DataSight becomes non-responsive under these circumstances, you may have to manually restart the application.

Open a Dashboard

1. Click **Dashboard** in the View group on the DataSight Ribbon.

2. Select and click either **Public Dashboard** or **User Dashboard** as required from the drop-down menu.
3. The selected Dashboard will be displayed in the Main Panel.

See also:

- Build Your Dashboards
- Change the Layout
- Refresh Dashboards
- DataSight Options
- Permissions
- Saved Views
- Filtering by Date and Time

Build Your Dashboards

Building a Dashboard is simply achieved by dragging and dropping a Saved View to the dashboard panel, and then changing the layout as required.

Add a Saved View to a Dashboard

1. Click-and-drag the **Saved View** from the Saved View Panel to the Dashboard Panel.
2. The Saved View will be automatically docked to the left-hand side of the Dashboard Panel.
3. Click the **Save** button from the Quick Access Toolbar to save changes made to the Dashboard.

Note	You can only add a Saved View to a Dashboard when there is space available to add the view. Change the layout to make space available as required.

Remove a Saved View from a Dashboard

1. Click the **Close** Icon  located at the top-right corner of the Saved View you wish to remove from the Dashboard (OR you can right-click the header of the Saved View and select **Close** from the context menu).
2. DataSight will display a prompt confirming you wish to remove the Saved View from the Dashboard.
3. Click **OK** to remove the Saved View.
4. Click the **Save** button from the Quick Access Toolbar to save changes made to the Dashboard.

Close the Dashboard Panel

1. Click on the **Close** Icon  on the Dashboard tab you wish to close.

Note	Please ensure that you click the Save button from the Quick Access Toolbar prior to closing the Dashboard Panel, otherwise any changes made to the Dashboard will be lost.

Edit a Saved View

Saved views cannot be edited directly within Dashboards. However, you can simply open the Saved View directly from the Dashboard panel.

1. Right-click inside the **Saved View** that you would like to open and select **Open...** (where **...** will be the type of Saved View E.g. Chart/DataSheet etc.).
2. The Saved View will open separately in the Main Panel, ready for editing.
3. After editing and saving, don't forget to refresh your Dashboard.

See also:

- Change the Layout

Change the Layout

You are able to make changes to the layout of your Dashboard as required.

Resize a Saved View

1. Drag the cursor over the Saved View border. The cursor will change to  .
2. Now hold the left mouse button down to drag and drop the border of the Saved View.

Float a Saved View

- Drag the header of the Saved View and drop at a new location where it will float.

Note	Floating Saved Views will sit in front of other panels within DataSight, and their placement is not restricted to the Dashboard Panel the Saved View belongs to. Clicking on a floating Saved View will bring the focus back to that Saved Views Dashboard.

Dock a Saved View

- Drag the header of the Saved View and drop to a selected part of the screen within its Dashboard Panel where it will dock.

Note	As you drag the Saved View, docking hints appear. Use these hints to dock the view to the desired position. Docking hints are semi-transparent square elements that allow you to dock a view to edges, or to an existing container as a tab, or between other docking elements. These hints are displayed separately or grouped in a docking guide. Finally, a docking zone is a semi-transparent preview of exactly where your view will be docked. This zone is displayed when you drag a view into a docking hint, but before you drop it. Saved Views can only be docked within the Dashboard Panel the Saved View belongs to (Public or User), and cannot be docked / moved between Dashboards.

Auto-hide (or Pin) a Saved View

1. Click on the pin in the header of the Saved View. The Saved View will then be pinned to the nearest window frame of the Dashboard Panel.
2. To view the Saved View, drag the mouse over the Saved View label.
3. To dock the Saved View back to its initial position, click on the pin in the Saved View header.

Note	The Auto-hide pin is only available for Saved Views docked to the edges of the Dashboard Panel.

Refresh Dashboards

You can either manually or automatically refresh the displayed data in your Dashboards. The minimum frequency for an automatic refresh is 15 minutes and, once enabled, applies to both Public and User Dashboards.

Manually Refresh your Dashboard

When a dashboard is open, the Dashboard Ribbon Tab can be found next to the Home tab in the DataSight Menu Panel.

A Refresh button is given on the grouped ribbon tab when a Dashboard is focused in the Main Panel.

To immediately refresh your displayed data, click **Refresh**.

Automatically Refresh your Dashboard

1. Click the DataSight **Application Tab**.
2. Then click **Options**.
3. Click the **Enable Auto Refresh** checkbox for Dashboards.
4. Enter the **Minutes to Refresh**, which is the time after which Dashboards will be automatically refreshed. The period starts once a Dashboard is loaded to the main panel.

See also:

- DataSight Options

History

DataSight stores information about how data was obtained prior to import and how data was manipulated after import. Within DataSight, this information is grouped together to form the **Collection History** and **Processing History** respectively.

These histories afford audit trails that can be used to review data for QA/QC purposes.

Note	Datetime stamps captured for Collection and Processing history records are saved in the database's time zone. Histories can be accessed for individual data points on the datasheet or grouped collectively under a Level. When viewing a Level's Collection or Processing History, any Grid View Auto Filter conditions applied will be retained when viewing another Level's Collection or Processing History.

See also:

- Collection History
- Processing History

Collection History

In DataSight, the raw source files and information about how your existing data was **collected**, are stored in DataSight together with the measured data.

The following information can be displayed for any level or data point in the database:

- Person who collected the data
- Equipment used
- Data source files

See also:

- View Level 3 Collection History
- View Data Collection History
- System Defined Collection

7.10.1.1 View Level 3 Collection History

1. With an existing Level 3 selected, right-click and select **History**.
2. Select **Collection** from the History sub-menu.

   The Collection Information window for the selected Level 3 appears.

   Records summarise different Persons and Organisations, Equipment and the source data files stored in Documents that have been recorded against any existing data in this Level 3.
3. Click to view any attached documents. Documents may be the source files used upon import, or they can also be documents loaded to that particular Level 3.
4. Click **Close** to return to the DataSight interface.

See also:

- Set Up Your Database
- Levels

7.10.1.2 View Data Collection History

1. Select the relevant data from the datasheet, right-click and select **History**.
2. Select **Collection** from the History sub-menu.

   The Collection Information window for the selected data appears.

   Records summarise different Persons and Organisations, Equipment and the source data files stored in Documents that have been recorded against any data selected.
3. Click to view any attached documents. Documents may be the source files used upon import, or they can also be documents loaded to that particular Level 3.
4. Click **Close** to return to the DataSight interface.

7.10.1.3 System Defined Collection

When DataSight is used to create or synthesize new data records, such as potentially occurs during a calculation, system generated collection information is recorded against those data points.

From DataSight Version 3.2 onwards, the collection history for calculation is recorded with following information:

Collection Information	System Generated Information
Person Name	User Name
Organization	DataSightV3 Auto Created Person
Equipment Model	DataSight
Equipment Description	DataSightV3 Auto Created Equipment

Serial Number	<Full assembly version> i.e: for 3.2.9.234 it will be 329234

Processing History

Critical records within your database may get modified or deleted from time to time.

With inclusion of a Processing History, DataSight has a solution for **monitoring** and **recording changes to a database**, such as when data has been imported, modified or deleted by a user.

Essentially, the Processing History is a record which tracks and displays:

- who has accessed and edited data,
- from which computer system,
- when the modifications were made, and
- what operations the user has performed at that time.

The Processing History is accessed from right click menus on a datasheet or a level. Details recorded in the processing history include the date and time of the process event, the user who was logged in to DataSight at the time, name of the Computer used, and the type of activity that user completed.

On the Level Processing History window, if you click the **Detail** icon for a logged event, a window detailing the activity including any related variables, calculations etc. is displayed in the "Process Log Details" window. This can be useful when attempting to recover lost, modified or accidentally deleted data, as full details of the data are retained, and these can be copied to the clipboard if required.

Refer to:

- View Level Processing History
- View Data Processing History
- View Security History

To view all the Process Types of DataSight, refer to:

- All Process Types

7.10.2.1 View Level Processing History

When viewing a Level's processing history, the number of records displayed is limited to the most recent 10,000 records. Selecting a Level 0, 1 or 2 to view their processing history will also display the processing history records for all other sub-levels of the selected Level.

To View a Level's Processing History, perform the following steps:

1. Right-click an existing **Level** in the Levels Panel to display the right-click context menu.
2. Expand History and select **Processing** from the sub-menu.

   The Processing Information window for the selected Level appears.

   Records summarise different Process Types and Actions that have been carried out for records in the respective Level.
3. Click to view the Details recorded for that process.
4. Click **Close** to return to the DataSight interface.

Note	Using the Query Builder available in Report Designer, you can query the Process History table to display records older than the most recent 10,000 if required.

7.10.2.2 View Data Processing History

To View a Record's Processing History, perform the following steps:

1. Filter and display the relevant data within a datasheet.
2. Right-click a **record** in the datasheet to display the right-click context menu.
3. Expand History and select **Processing** from the sub-menu.

   The Processing Information window for the selected data appears.

   Records summarise different Process Types and Actions that have been carried out for the selected data.
4. Click to view the Details recorded for that process.
5. Click **Close** to return to the DataSight interface.

7.10.2.3 View Security History

To View Security History records, perform the following steps:

1. With the Security Window open, select **History**.

   The Processing Information window for the all Security Modifications to users, groups and/or their permissions will be shown.

   Records summarise different Process Types and Actions that have been carried out for records in the respective User or Group.
2. Click to view the Details recorded for that process.
3. Click **Close** to return to the Security Window.

Note	The history of updates to the Security records of users, groups and/or permissions is only available in DataSight Version 3.4 and above.

7.10.2.4 All Process Types

Types of Processes currently able to be viewed in DataSight

Process	Action Performed	Access Information Using...
Calculation	Run a calculation on a set of data	Report Designer, Filter Panel, Level Processing History
Calculation Template	Create, modify or delete a Calculation Template	Report Designer
Conversion Tables	Create, modify or delete a Conversion Table	Report Designer
Data	Create, modify or delete data	Report Designer, Level Processing History, Data Processing History
Data Conversion	Create or modify data	Report Designer
Database	Create or update database	Report Designer
Document	Create or delete document	Report Designer
Equipment	Create, modify or delete Equipment	Report Designer, Filter Panel, Level Processing History

Flag	Create, modify or delete Flag	Report Designer
Flag Data	Assign Flag to data	Report Designer, Filter Panel, Level Processing History
Gauging	Create, modify or delete Gauging	Report Designer
Import	Run data import	Report Designer, Filter Panel, Level Processing History
Import Template	Create, modify or delete an Import Template	Report Designer
Level	Create, modify or delete a Level	Report Designer, Filter Panel, Level Processing History
Level 3 Properties	Create, modify or delete Level Properties	Report Designer, Level Processing History
Level Construction	Create, modify or delete Level Constructions details	Report Designer, Level Processing History
Locked Data	Lock data so it is not editable by any user. Only users with the appropriate DataSight permission will be able to unlock this data.	Report Designer, Filter Panel, Level Processing History
Manual Data Editing	Create or edit data using Manual Data Entry	Report Designer
Migrated Data	Create migrated data	Report Designer
Mobile Data Studio	Data insert via Mobile Data Studio	Report Designer
Person	Create, modify or delete a Person	Report Designer, Filter Panel, Level Processing History
Pivoted Variable List	Create, modify or delete Pivoted Variable List	Report Designer, Shelved Version 3.1 onwards
Saved Chart	Create, modify or delete a Chart in Saved Views	Report Designer, Filter Panel, Level Processing History
Saved Datasheet	Create, modify or delete a Datasheet in Saved Views	Report Designer, Filter Panel, Level Processing History
Saved Report	Create, modify or delete a Report in Saved Views	Report Designer, Filter Panel, Level Processing History
Saved View Folder	Create, modify or delete a Saved Views Folder	Report Designer, Filter Panel, Level Processing History
Scheduled Tasks	Create, modify or delete a Task	Report Designer
Security	Create, modify or delete Users and their permissions	Report Designer, Security

Shift Data	Run Shift Analysis on data. In DataSight 3.1 or older, data conversion out of Regressions tool is also assigned a Shift Data process.	Report Designer
Standard	Run, create, modify or delete standard	Report Designer
Unlocked Data	Unlock data so it can be modified. Only users with the appropriate DataSight permission will be able to unlock data.	Report Designer, Filter Panel, Level Processing History
Variable	Create, modify or delete Variable	Report Designer, Filter Panel, Level Processing History
Variable Group	Create, modify or delete Variable Group	Report Designer

8 Analyse Your Data

DataSight allows you to adapt the process of data assessment to your specific needs. Within DataSight there are several methods to interrogate and modify your data sets:

- You can use the filters associated with a Saved Datasheet View or a saved Manual Data Entry template to quickly identify periodically acquired data for routine processing.
- You can edit and **move** your data using Manual Data Entry.
- You can use simple tools within the datasheet or chart to edit or statistically summarise your data.
- Other features such as Flags and Standards can be used for quality assurance and control.
- You can move your Level 3 and all associated data to another Level 2.
- More sophisticated editing of your data sets can be undertaken in the Calculation and Regression Tools.

DataSight's more complex analysis capabilities include:

- The review of data for "gaps" in the data set for given time periods.
- Graphical Flagging.
- Calculation tool functions allowing for data transformation and manipulation into useful values and formats.
- The use of "If" statements to conduct calculations only if conditions are met, including flagging of data.
- The ability to move large data sets from one Level or Variable to another as required.
- Advanced filter options in order to delve deep into datasets.
- Automated processing (see Automate Your Tasks).

See also:

- Flags
- Standards

Datasheet Analysis

Several features within the datasheet can be used to assist with your data analysis.

These include:

- Editing your data point by point
- Using a Standard to identify outliers
- Applying your user defined Flags
- Locking and unlocking the data for archival purposes
- Deleting as required
- Grouping your data and applying Statistics to the group
- Auditing the data's history

Edit Data using MDE

Data values can be simply modified point by point directly from the datasheet using Manual Data Entry (MDE).

Edit data using Manual Data Entry

1. Highlight the selected data point on the datasheet.
2. Right-click on the datasheet and select **Edit Record with MDE**. The Manual Data Entry Form is opened and is populated with the variables for that datum and site.
3. In the Main Fields Section, you can edit any or all of the **Level 3**, **Datetime**, **Person**, **Equipment**, **Flag** and **Variables** fields. Select your preference using the associated combo boxes.
4. When you edit the Level 3 or Datetime, data is moved to the new Level 3 or date and time, and the original collection and processing history is dropped from it.
5. You can then also edit the individual Variable **Values** or their individually associated **Flags**.
6. Click **Save** to update the data.
7. **Close** the Manual Data Entry form.

Note	DataSight maps data to only one Person or piece of Equipment during import. It is advisable to only import blocks of data that have the same collection information. If this collection information changes within a data file, you may need to undertake separate imports for subsets of the data to vary the collection information assigned to each record. Alternatively and depending upon the number of records affected, you may wish to simply use Manual Data Entry to modify the Person and Equipment for the required records after import.

See also:

- Quick Access Toolbar
- Manual Data Entry
- Manual Data Entry Templates

Apply Standards

Using Standards, the datasheet allows you to visually identify data that falls outside of predefined values. Once you have set up your Standards, you can apply these standards to data in your datasheet. Maximum, minimum and goal standard values are highlighted using coloured fonts, which are selected in Options.

Apply a Standard to a set of data

1. Right-click on the datasheet and navigate through the menu to **Apply Standard**.
2. Select a Standard from the sub-menu Standards listing. The selected Standard name will be ticked. The value text of all applicable variables in the datasheet is coloured according to your colour section. Colours identify whether the value is below the minimum standard value, within the expected range (goal), or above the maximum standard value. By default, values that meet the goal are coloured **Green**, values that are above maximum are coloured **Red** and values that are below minimum are coloured **Blue**.
3. (Optional) To change the colours for minimum, maximum and goal ranges, see DataSight Options.

Alternatively,

1. Click on the **Datasheet** tab on the DataSight Ribbon.
2. Use the **Apply Standard** drop down list to apply the appropriate standard.

Clear a Standard

1. Right-click on the datasheet and navigate through the menu to **Apply Standard**.

2. Deselect the ticked Standard from the sub-menu Standards listing. The Standard name will be unticked. The value text will return to the default black colour.

Note	Only those standards that have been made available on the datasheet will be shown from the right-click menu. Any changes to the visibility of standards will only be apparent on newly displayed datasheets in the Main Panel. Standards are not saved with the data or datasheet. Apply a Standard to a set of data to view the target values.

See also:

- Set Standards

Apply Variable Alias

Using Reference Groups, you can display an alternate Variable name (Variable Alias) in your datasheet. Reference Groups are applied on demand and are not saved with the data or datasheet.

Apply a Variable Alias

1. Click the **Apply Variable Alias by Reference** button from the Datasheet Ribbon, and click to select a Reference Group from the drop down list.
2. The selected Reference Group name will be ticked, and the alternate Variable name(s) will be displayed.
3. By default, the **Show Aliased Variables** option is enabled. A Filter Condition is added to the Filter Panel which shows only the Variables in the Reference Group.
4. You can select the **Show All Variables** button from the Datasheet Ribbon to remove the Filter Condition and show all Variables within the dataset. Only those variables with an alias, as defined in the Reference Group, will alter in name.

Clear a Variable Alias

1. Click the Apply Variable Alias by Reference button from the Datasheet Ribbon, and click the applied Reference group from the drop down list to clear the selection.
2. The Reference Group name will be unticked and the original Variable Names will be displayed. If Show Aliased Variables was enabled, the corresponding Filter Condition will be removed.

Note	Any changes to Reference Groups will only be apparent on newly displayed datasheets in the Main Panel. Open datasheets must be refreshed.

See also:

- Reference Groups
- References
- Set References
- Datasheet Ribbon Tab
- Export from a Datasheet

Flag Data

In a normalised datasheet, each datum can be flagged. By default, the Flag descriptors are always shown in the column after the Variable value in the normalised datasheet.

Prior to flagging your data, you need to have Set Flags.

Apply Flags in a Datasheet

1. Highlight the data row(s) that you wish to apply a Flag to, or right-click on the datasheet and choose to **Select All**.
2. Right-click on the datasheet and navigate through the menu to **Apply Flag** and select a Flag from the sub-menu Flags listing. Flagged cells will now display the selected Flag and show the selected Flag colour.

Alternatively,

1. Select a data set in your datasheet and click on the **Datasheet** tab on the DataSight Ribbon.
2. Use the **Apply Flag** drop down list to apply the required Flag.

Clear Flags

- With the row(s) of data highlighted, right click on the datasheet and choose **Clear Flag**. Previously flagged cells will now be cleared.

Alternatively,

1. Click the **Datasheet** tab on the DataSight Ribbon.
2. Use the **Apply Flag** drop down list to deselect the flag by choosing the blank white-space.

You can also flag numerical data from **Graphical Flagging** (See Graphical Flagging for more details).

See also:

- Set Flags
- Graphical Flagging

Lock Data

Lock data in the datasheet

1. Highlight the data record(s) that you wish to lock, or right-click on the datasheet and choose **Select All**.
2. Then right-click on the datasheet and select **Lock Record**. The text in the locked row(s) of data will be greyed out.

Unlock data in the datasheet

1. Apply a filter to help identify what data has been locked.
2. Highlight the data records that you wish to unlock, or right-click on the datasheet and choose **Select All**.
3. Then right-click on the datasheet and select **Unlock Record**. The text in the unlocked row(s) of data will return to the default black coloured text.

You can also Lock or Unlock numerical data from **Graphical Flagging** (See Graphical Flagging for more details).

Note	To lock and unlock data, you will need to have the Lock/Unlock data permission.

See also:

- Permissions
- Set Permissions

Delete Data

1. Highlight the data record(s) that you wish to delete.
2. To delete multiple records at once:

   Use CTRL in conjunction with clicking to select non-consecutive data records.

   To select a range of data records, use SHIFT in conjunction with clicking.

   Use **Select All** to select all records returned by the filter in the datasheet.
3. Right-click on the datasheet and select **Delete**.
4. The text in the highlighted rows will be displayed with a strike-through.
5. You will be asked to confirm the deletion. Click **Save**.

See also:

- Permissions
- Set Permissions

Summary Statistics

Within a datasheet, you can easily calculate and display summary statistics for your data values using grouping. Data grouping sorts data into groups with the same value, whether this be a variable value, a date, time or any other column of data.

By default, the **Group By Box** appears above the column headers in a new datasheet.

Group data

1. Right-click on a column header and select **Group By This Column**. The column header will appear in the **Group By Box** above the datasheet and the data will be sorted into groups of the same data value. These groups are shown in bold.
2. Once the Group By Box is displayed, you can drag and drop a column header into the box to sort the data into groups.
3. Multiple groupings can be made, with data sorted in the order in which you drag or select the column headers. Drag headers about to change the ordering.
4. Right-click in either the column header within the **Group By Box** or the **Group By Box** itself and select **UnGroup** to remove the column header.
5. Groupings can be expanded or collapsed to further interrogate the data. Within the datasheet, click ▸ to expand a group and ▾ to collapse a group.
6. To fully expand or collapse the data, right-click in the Group By Box and select **Full Expand** or **Full Collapse**.

Sort data by groups

As a default, the count for each group is automatically displayed next to the group name header. This default setting in DataSight allows groups to be quickly sorted according to these values in ascending or descending order.

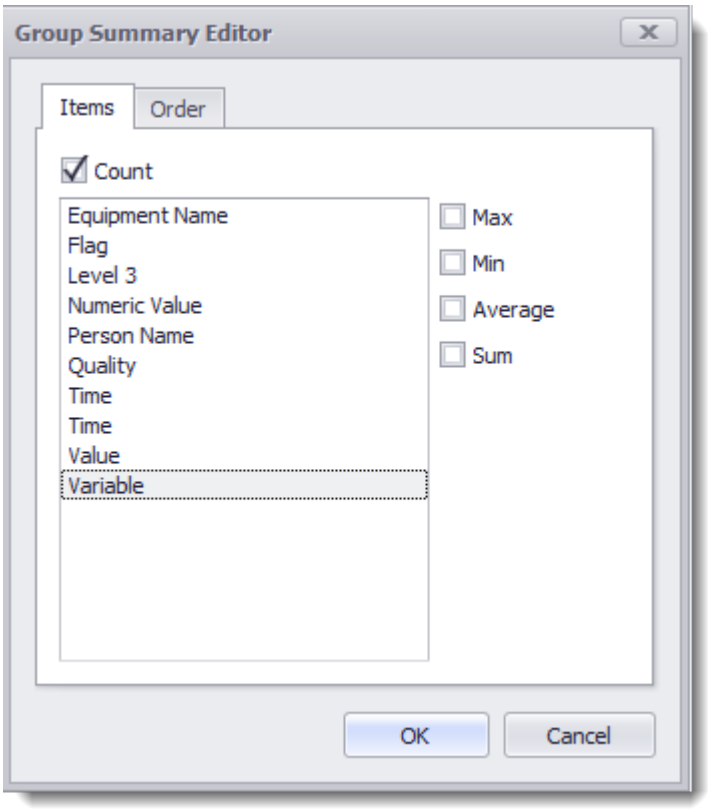
- Right-click in the column header within the **Group By Box** and select **Sort by Summary**.

  Select Count by Value (ascending or descending) . This organises the groupings from groups with the least rows of data to groups with the greatest number of rows of data, in either ascending or descending order.

Note	Any additional summary statistics added to the grouping will be available within the Sort by Summary listing.

Use the Group Summary Editor

1. Right-click in the column header within the **Group By Box** and select **Group Summary Editor**.
2. The Group Summary Editor Window opens showing items from the datasheet available for selection. By default the Count for values in the group is selected.



3. Click on the name of an appropriate Item you wish to summarise and select from Max, Min, Average or Sum as applicable.

Note	Although the options remain available to compute Max, Min, Average or Sum values for non-numeric fields such as Equipment Name, Flag and Person Name, doing so will not return meaningful results. It is recommended that these functions are only used with the Numeric Value field.

4. Click on the **Order** tab to order the summaries within the group header.
5. Click **OK**. The group name header will now display the selected summaries for each group.

Date and Time Group Interval

A Group Interval feature is available for any date or time column header in a datasheet dragged to the Group By box. This setting allows data to be grouped by **Day**, **Month**, **Year** or **Smart**. See Date and Time Group Interval for more details.

See also:

- Filter Panel
- Organise Data

8.1.7.1 Date and Time Group Interval

A Group Interval can edit the period of data grouping in a datasheet when a date or time column header is dragged to the Group By box. To edit the date or time group interval of your data:

1. Drag **Date** or **Time** column header to the **Group By Box**.
2. Right-click in the column header within the **Group By Box**.
3. Select **Group Interval** in the context menu.
4. Select one of the following intervals:
   - **Day** - Group data for each day together.
   - **Month** - Group data for each month together.
   - **Year** - Group data for each year together.
   - **Smart** - Group data together by matching date portions such as today, yesterday, last week, etc. In this interval, the time portion is ignored; data with matching date intervals but different times will be combined into a single group.
5. Groupings can be expanded or collapsed to further interrogate the data. Within the datasheet, click ▸ to expand a group and ▾ to collapse a group.
6. (Optional) You can then use **Group Summary Editor** to compute Summary Statistics for the data.
7. Right-click in either the column header within the **Group By Box** or the **Group By Box** itself and select **UnGroup** to remove the column header.

Graphical Analysis

Several graphical tools in DataSight assist with your data analysis:

- You can statistically analyse data within a chart using the Chart Series options. For more information refer to Chart Series Functions.
- You can **flag** your data in a chart in the Graphical Flagging Tool. Graphical Flagging is used to visually review and flag data point-by-point, checking one or more variables, and to quickly identify erroneous values in order to make a correction.
- Additional chart views are featured in Calculations, Conversion Tables and Regressions.

See also:

- Chart Editor
- Set Flags

Graphical Flagging

Graphical Flagging allows you to assign your user-defined flags to data points using a graphical interface. You can use the tool to quickly identify and visually flag a continuous series of data. In much the same way as Standards, the Graphical Flagging tool assumes you are dividing your data values into three subsections. However, unlike Standards where the maximum and minimum values are set, in Graphical Flagging the *bounding values can vary* .

You can also graphically compare the selected Variable against a **Reference Variable** from within the same filtered data set.

You can also lock and unlock data using this graphical interface.

Prior to flagging your data, you need to have Set Flags.

Open the Graphical Flagging Tool

1. Right-click in the datasheet or chart and select **Graphical Flagging** from the menu.
2. You can also click **Graphical Flagging** from the Analyse group on the DataSight Ribbon, with the datasheet or chart focused.
3. A Graphical Flagging tab will open in the Main Panel.

See also:

- Set Flags
- Flag Data
- Data Subset

8.2.1.1 Flag Data

1. With a datasheet or chart open, filter the data you wish to review and flag.
2. Open the Graphical Flagging Tool.
3. Click on the **Flagging** grouped tab on the DataSight Ribbon. Note the groups **Main**, **Reference**, **Settings**, **Lock/Unlock** and **View** from left to right on the Flagging Ribbon which identify the natural progression through Graphical Flagging.
4. Build a **Main** variable series whose data points you will be flagging using the graphical interface.
   i. Select the **Level** for your Main variable.
   ii. Select the **Variable** values that you wish to flag.
   iii. Select an **Axis** to display the Main series values on.
   iv. Wait for the progress count on the Status Bar to run until "Data is loaded".
5. (Optional) To compare your data before flagging, you may build a **Reference** variable series whose data points are displayed on the chart for viewing only.
   i. Select the **Level** for your Reference variable.
   ii. Select the **Variable** values that you wish to display in the chart.
   iii. Select an **Axis** to display the reference series values on.
   iv. Wait for the progress count on the Status Bar to run until "Data is loaded".
1. Identify the bounding values in the **Settings** group.
   i. Select the Flag for Above and click **Start Edit** or press **CTRL+A**.
   ii. Click in the chart to create the freehand line above which any data points will be labelled with the Flag for Above. The line is shown in Red.
   iii. Click **Stop Edit**, or press **CTRL+A**, to temporarily suspend or finish the drawing.
   iv. Click **Clear**, or press **CTRL+SHIFT+A**, if you wish to start the line anew.
   v. Select the Flag for **Below** from the drop down list, and click **Start Edit** or press **CTRL+B**.

vi. Click in the chart to create the freehand line **Below** which any data points will be labelled with the Flag for Below. The line is shown in Blue.

vii. Click **Stop Edit**, or press **CTRL+B**, to temporarily suspend or finish the drawing. Click **Clear**, or **CTRL+SHIFT+B**, if you wish to start the line anew.

viii. Select the Flag for Between from the drop down combo box. The points between Above and Below will be labelled with the Flag for Between.

ix. You can remove a Flag selection from your Above, Between or Below bounds by clicking the **Remove** (**X**) button located to the right of the corresponding Flag drop down list.

2. (Optional) Check **Lock All Data** if you wish to **Lock** the data set shown in the Graphical Flagging window. This will prevent any changes being made to this dataset once you save.
3. (Optional) Check **Lock Data Between Bounds** to **Lock** only the data that is within your Above and Below bounds. This option can be selected and applied without requiring a Flag to be selected for the Above, Between and Below bounds.
4. (Optional) Check **Unlock All Data** if you wish to **Unlock** the data set shown in the Graphical Flagging window. This will allow any changes to be made to this set of data once you save.
5. (Optional) You can also zoom in and out of the chart as needed, or right-click on the chart and hold to move the entire plot around to assist you in placing the tag lines.
6. Click **Data** in the **View** group to review your modified flags.
7. Click **Save** on the Quick Access Toolbar to save your flagging and, if selected, lock the data.
   a. An error message will be displayed if any part of the Above line intersects with the Below line. This is because a data record may only have one Flag assigned.
   b. A marker will be shown on the intersect points of the Above and Below lines to help you identify and correct these.
   c. A dialogue box will be displayed to confirm any locking or unlocking of data.

Note	A straight line interpolation is undertaken between the first two points in the freehand line back to the left-hand y axis and the last two points in the freehand line forward to the right-hand y axis to allow for flagging of data over the entire datetime period shown. Care is needed when there is a marked difference in value between these consecutive points in the freehand line. A steep interpolation gradient may cause the bounding freehand line to cut through some of your data points, and incorrectly assign flags. As a data point can only be assigned one Flag, the Above line cannot intersect with the Below line. Modifying or adding a new point inflexions on Above or Below lines may only be performed when the corresponding **Start Edit** button is active.

Computations

For larger datasets, it may be necessary to use some of DataSight's more complex analysis tools.

The Calculation and Regression tools can be used to analyse and transform large data sets. These tools are particularly useful for sizeable *continuous time series* data sets.

Calculation Tool

The Calculation tool provides numerous analytical and logical operators, plus pre-set functions, to build a review computation for a data set. Data can be filtered for the period that requires editing, and then you can apply shifts to the data, or even review data against other monitoring sites (Levels) using many different calculations. Equidistant data and non-equidistant data can be analysed together. The Calculation tool also provides the facility to convert event-based observations to equidistant data.

See Calculations.

Regression Tool

The Regression tool can be used to analyse the relationship between different Variables and to fit statistical functions to a set of data in order to understand the relationship between these Variables.

See Regressions.

Conversion Tables

Conversion Tables can be used for interpolation within the Calculation tool and for regression analysis within the Regression tool. Variable relationships, determined by other software, can be stored in Conversion Tables.

See Conversion Tables.

Calculations

Calculations is a DataSight tool that allows you to calculate and create new data using your data set and also to adjust and modify data in your data set. You can use conversion tables or free hand formulae or a combination of each to perform calculations on large data sets.

Calculations can be used to:

- Undertake calculations using free hand formulas.
- Convert data using conversion tables.
- Adjust data using Variable offset with either absolute, percentage or multiplier values.
- Use the data from multiple Levels or multiple Variables to undertake calculations.
- Generate new data and place in a Variable.
- Copy data (numeric only) to an appropriate Variable.
- Undertake Scientific unit conversion.
- Undertake data analysis for alarm notification.

Usage of the Calculation Tool

- The Calculations Tool does not undertake any review of the accuracy or validity of the data being adjusted, generated or calculated. Please note that no warranty is given as to the accuracy of your calculations, and it is **your responsibility to check your work**. By using Calculations the user warranties Seveno against any claims to that extent.
- We recommend that you create two or three variables that are used for reviewing calculated data. Typically three Variables can be added to your database, nominally Calc 1, Calc 2, Calc 3, for all data modified or generated. This allows you to review any modifications to the data before archiving.
- The Calculations Tool **cannot** be used to modify timestamps. The only way to modify timestamps within DataSight is to use the Manual Data Entry tool to edit individual records. Alternatively, you could export the data, correct the timestamps and then re-import the corrected data. You would then need to remove (delete) or Flag the original data.
- While the Calculation Tool can be used to copy data from one Variable to another, or from one Level to another, the input data remains unchanged excepting when the same Level and Variable are being overwritten. If you wish to **move** data to different Levels and Variables, to avoid creating duplicate data, you must ensure when the copy is complete, that you delete the original input records.

See also:

- Calculations Layout
- Perform a Calculation

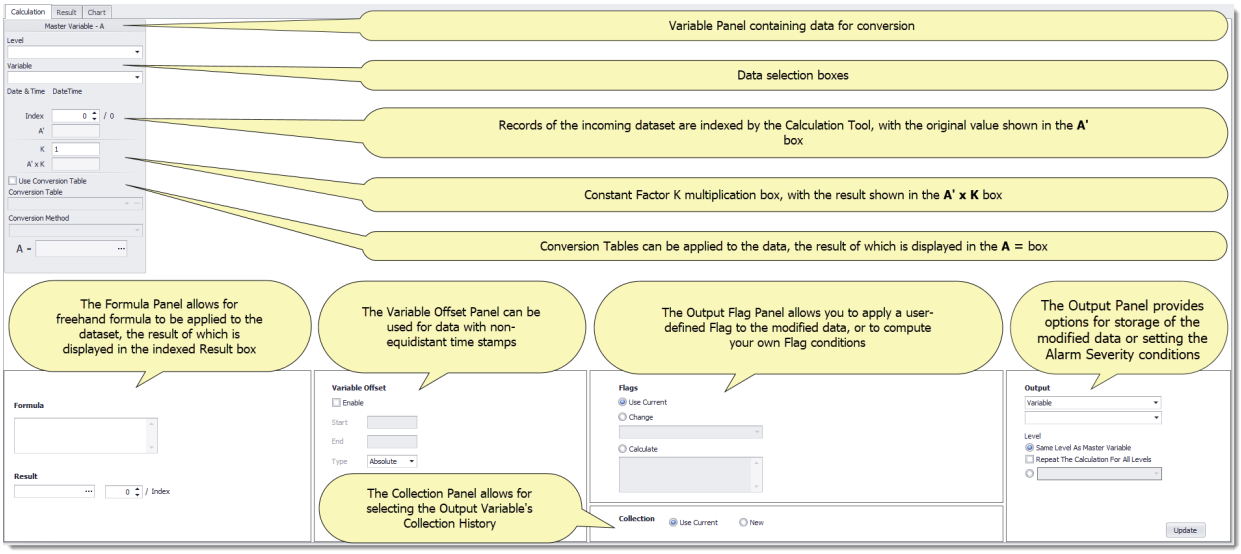
8.3.1.1 Calculations Layout

DataSight Calculations is designed to enable you to manipulate your data. The calculations are linked directly to the datasheet, so only data that can be seen within the Datasheet is available for manipulation. Calculations can be across multiple Levels and multiple Variables, the performance of the tool being dependent on your computer's performance.

The Calculation tool is accessed either from within the Datasheet panel or from the Menu ribbon of DataSight. You should ensure the Variables you wish to use in the calculation or conversion (including the Calc variables; see Note in Calculations) appear in your Datasheet.

Open the Calculation Tool

1. Right-click on the Datasheet and select **Calculations**. You can also click **Calculation** in the Analyse group on the DataSight Ribbon, with your Datasheet open in the Main Panel.
2. The Calculation window will open within the Main Panel. The following image identifies the main components of this window.



See also:

- Perform a Calculation
- Conversion Tables

8.3.1.2 Perform a Calculation

The Calculation Tool is extremely versatile and can be used to accomplish all manner of numerical data transformations and validations.

Note	While performing a calculation, DataSight operates only on the numeric value, extracted from the value string. For example, <0.1 is treated as 0.1 for the purposes of calculation. Only records that are able to generate a numeric value are included in the record count. Records whose data values are non-numeric will be ignored.

Performing a Calculation in DataSight requires the configuration of several inputs, outputs and settings. When using Calculations, you will undertake combinations of the following steps.

- Load a Data Set.
- Set the Input Level and Variable for Master Variable A.
- Add additional Variables and/or References.
- Multiply a Variable value by a constant factor K.
- Use a Conversion Table to convert variable values.
- Create a Formula for your calculation.
- Preview data in the Results and Chart Tabs.
- Apply a periodic Variable Offset to your data values between the start and end timestamps of your data set.
- Specify the Flag that will be applied to your Output data records.
- Specify the Collection History that will be applied to your Output data records.
- Specify either the Output Level and Variable that data will be written to, or the output Alarm Severity and expression.
- Update the database.

Notes	The Calculation process tag will be automatically assigned to your data when you perform a calculation. Data that has been processed using Calculations can be identified by filtering by the Calculation process type in the main filter panel. If you you do not wish for the History (Collection and Processing) to be captured while using Calculations, then output your data to Variables belonging to a Variable Group with setting **Excluded from Calculation Audit**.

The first step in performing a Calculation is to load a data set from a data sheet or chart.

8.3.1.2.1 Load Data Set

Calculations can be performed upon data loaded from a data sheet or chart. The Calculation tool uses the filters selected in the filter panel and only loads and display data that applies to the filter.

You should filter your data before calculation to better define the calculation data set.

It is possible to have several Levels (sites) and Variables displayed so they are all available for the calculation.

Load Calculation Data Set

- Right-click on a datasheet containing your data, and select **Calculation**.
- Right-click on a chart containing your data, and select **Calculation**.
- With a datasheet or chart focussed, click **Calculation** in the Analyse group on the DataSight Ribbon; or select **Calculation** from the drop down list.
- To activate **Calculation with Subset**, see Data Subset.

The Calculation tool window opens in the Main Panel, with a blank Master Variable A template showing.

Note	To perform a new calculation on the same datasheet, first update the values by refreshing the datasheet (see Datasheet Ribbon Tab), and then open a new calculation.

8.3.1.2.2 Master Variable

Because you are working with time series data, when you undertake any transformation of numeric data using DataSight, we need to establish the output timestamps for the resultant data set. By default, all output timestamps are set to the first Variable loaded to the calculation. This is known as the Master Variable (Position A).

Note	Users must understand that the Master Variable datetime stamps will determine the datetime stamps of the Output data records, and so must choose their Master Variable A accordingly. The Master A Variable series is chronologically sorted by datetime stamp from oldest to newest.

Set the Input Level and Variable for the Master Variable

1. Either open a saved calculation template to use (See Calculation Templates), or select the specific **Level** and **Variable** to use in the calculation.
2. Select the Level from the drop-down list of **Levels**.
3. If you already know the name of the DataSight Level, simply type in the name in the drop-down list to limit the choices and speed up the mapping.
4. Select the Variable from the drop-down list of **Variables**.
5. If you already know the name of the DataSight Variable, simply type in the name in the drop-down list to limit the choices and speed up the mapping.
6. Alternatively, you may continue to use the pre-filled Level and Variable if a saved Calculation Template is opened.
7. The Datetime of the oldest record in the data set is displayed, and the record value is displayed at Index 1. Variable values are always sorted chronologically in Calculations. The number of records for that Variable is indexed. Check the Variable value is correctly displayed as expected.
8. Scroll through the indexed records using ▲▼ and note the Variable value changes accordingly in the preview field.
9. Set other Options, such as the Constant Factor K, or Conversion Table, in the Variable Panel, as required.

Constant Factor K

You can enter a multiplication factor "K" to use together with the Variable value. This is sometimes useful when changing units on an individual variable.

Check the value is correct in the preview field.

The default value of K is always set to 1.

Conversion Table

Check **Use Conversion Table** to select a conversion for variable (See Conversion Tables for more details).

The default setting for Conversion Table is not checked.

8.3.1.2.3 Add Variables

When required it is possible to add additional Variables to your Calculation. All additional Variables must be available in the datasheet or chart for selection.

1. Click the Calculation tab on the Menu Panel.
2. Then click **Add Variable**. A new Variable panel is added, labelled with the next letter in the alphabet. The letter is shorthand for use when referring to the Variable in the Formula bar.

3. Select the Level from the drop-down list of **Levels**.
4. If you already know the name of the DataSight Level, simply type in the name in the drop-down list to limit the choices and speed up the mapping.
5. Use the drop list of **Variables** to identify the Variable of the data you wish to use.
6. If you already know the name of the DataSight Variable, simply type in the name in the drop-down list to limit the choices and speed up the mapping.
7. Check the Variable value is correctly displayed as expected.
8. Scroll through the indexed records using  and note the Variable value changes accordingly in the preview field.
9. Set other Options, such as the Constant Factor K, or Conversion Table, Fixed, in the Variable Panel, as required.

Note	For Calculations being run across multiple levels using the **Repose The Calculation For All Levels** option, you can enable the "Fixed" option on added variables (excluding the Master Variable). This ensures that the selected Level for that variable will not change when the calculation is performed.

Interpolation of data

Interpolation is automatically performed between data points of Added Variables. This is required because the timestamps of the Master Variable and the timestamps of any other Variables added to the Calculation may not match exactly.

An added Variable value is therefore interpolated at the date-time stamps of Master Variable A.

The interpolation method used to interpolate the added Variable data values is that of *Linear Spline* . A linear spline simply involves forming consecutive data through straight lines, using existing (known) data points. It is a piecewise linear function, has a low precision, but does not provide first derivative continuity.

There are some known constraints that DataSight applies when conducting this interpolation. These relate to the chronologically oldest and youngest records of the added Variable time series, and may skew end member results.

These are:

- If the first Master Variable A date-time stamp is chronologically older than the first date-time stamp of an added Variable, then the first point within the added Variable series, at the Master Variable A date-time stamp, is assigned a default value of zero (0).
- If the last Master Variable A date-time stamp is chronologically younger than the first date-time stamp of an added Variable, then the last point within the added Variable series, at the Master Variable A date-time stamp, is assigned a default value of zero (0).
- Values of the added Variable beyond the indices of Master Variable A are ignored.

8.3.1.2.4 Add References

It is possible to apply References, as numerical constants, to your Calculation.

References are not interpolated and values are applied against every record in the Master Variable A time series as specified in the Formula.

References must be individually defined for each and every calculation you perform manually. Reference Level assignments and Equipment assignments help to filter the References pertinent to the data set when constructing a Calculation, and when manually undertaking a Calculation using a Calculation template.

When performing a manual calculation using a Reference, no validation steps are performed and the selected Reference is used regardless of any Level, Variable, Equipment assignments defined within the selected Reference.

Add a Reference

1. Click the **Calculation** tab on the Menu Panel.
2. Then click **Add Reference**. A new panel is added, labelled with the next letter in the alphabet. The letter is shorthand for use when referring to the Reference in the Formula bar.
3. Select the Reference from the drop list of **References**.
4. To appear in the list, References must be either:
   a. Global References
   b. Level-Specific Reference with Level assignments matching a data point in the calculation data set
   c. Equipment-Specific References with Equipment assignments matching a data point in the calculation data set
5. If you already know the name of the Reference, simply type in the name in the drop-down list to limit the choices and speed up the mapping.
6. Check the correct Reference value is shown in the preview field.

Note	The Add Reference button remains disabled until the Master Variable Level and Variable have been selected. If you wish to automate Reference assignment in a Calculation Task, then you must ensure that References used in the Calculation Template have both the Level and Equipment assigned.

See also:

- Automate Calculations with References

8.3.1.2.5 Formulae and Results

Formulae are at the heart of the DataSight Calculation tool. Each Variable or Reference added into a Calculation is represented with a corresponding letter in the formula. The first Variable is a Master Variable, named A, and then additional Variables and/or References are named B, C, etc.

Variable or Reference	Formula Representation
Master Variable A	A or a
Variable / Reference B	B or b
Variable / Reference C	C or c
…	

DataSight supports all common mathematical and logical operators, and in addition provides numerous statistical and time dependent transformation options. These operators can be used, for example, to determine minimum, maximum and mean values for different time periods from a record and to determine peaks (instantaneous values) or totals (accumulated values) over a threshold. Please refer specifically to the following topics for more detail:

- Operators
- Mathematical Functions
- Statistical Functions
- Calculating Differences
- Alarm Severity

Construct a Formula, Check and Format the Result

1. Click within the **Formula** text box in the Result panel to enter a calculation (or use the pre-filled formula if a saved Calculation Template is open).
2. Any formula entered in the Formula box is checked for potential errors.
   a. Click in the **Result** preview field, and if the formula is correct, a tick will appear next to the Formula text box and the formula will be coloured green.
   b. Click in the **Result** preview field, and if the formula is in correct, a cross will appear next to the Formula text box and the formula will be coloured red.
3. Check the resultant value in the Result preview field is displayed as expected. See also Result and Chart Tabs.
4. Scroll through the indexed records using and note the resultant value changes accordingly in the preview field.
5. In the **Check the Result** you can format your data prior to updating the data in the database. To do this:
   i. Click **...** to edit formatting. A Display Format - Output box will open.
      - Select the **Number of Decimal Places** radio button to edit the decimal places. Click the up and down arrows to change the decimal places. By default, this is set to show 3 decimal places (see also DataSight Options to set the default).
      - Select the **Scientific** radio button to view your results in a scientific format. Click the up and down arrows to change the decimal places in your scientific data. By default, this is set to show 3 decimal places.
      - Select **No Formatting** to view the actual values that will be saved back to the database, without formatting.
   ii. Then click **OK**. Your output will be formatted as required.

8.3.1.2.5.1 Result and Chart Tabs

When you click in the **Results** preview text box in Calculations, the **Results** and **Chart** Tabs are updated with your newly calculated data. Previewing your data in the Results Tab or Chart Tab is useful prior to the output of data to the database.

The **Result** tab displays the tabular result of the **Calculation**.

Here you can see three columns:

- Date and time stamp.
- Values of all Variables open on the datasheet.
- Resulting values post-calculation.

By default, data in the Result tab is sorted by the date and time stamp.

You can choose to export your Calculations result data to a file.

The **Chart** tab displays the graphical result of the **Calculation**.

Here you can see two series: **Original Variable series**, and **Result series**.

The series are plotted between Datetime and Variable values.

You can choose to export your Calculations chart to a file.

See also:

- Export Calculations

8.3.1.2.5.2 Operators

Type	Operators	Descriptor	Notes
Arithmetic	+	Add	
Arithmetic	-	Subtract	
Arithmetic	*	Multiply	
Arithmetic	/	Divide	
Assignment	=	Equal To	
Comparison	<	Less Than	
Comparison	>	Greater Than	
Comparison	<>	Not Equal To	Sometimes also used as Angle Brackets.
Comparison	<=	Less Than or Equal To	
Comparison	>=	Greater Than or Equal To	
Bitwise	&	And	
Bitwise	|	Or	
Bitwise	!	Not	
Bitwise	^	Exclusive Or	
Precedence	(,)	Parentheses	Round Brackets. Identifies the evaluation order of expressions. Expressions enclosed in parentheses have the highest evaluation precedence. Nested expressions enclosed in parentheses are evaluated in inner-to-outer order.
Precedence	{, }	Braces	Curly Brackets define a Set.
Precedence	[,]	Brackets	Square Brackets may also identify the order of expressions. Square brackets are also often used in place of a second set of parentheses when they are nested, to provide a visual distinction.

- Scientific notation is supported.

- Functions, Variables, References and constant values can be nested. Using parentheses, even when they are not required, can improve the readability of an equation and reduce the chance of making a subtle mistake because of operator precedence.
- Arithmetic, and bitwise, operators are handled before logical operators.
- When more than one logical operator is used in a statement, NOT is evaluated first, then AND, and finally OR.

Examples of use...

Formula	Returns
A	The value of Master Variable A
A+B	The sum of Master Variable A and Variable/Reference B
A*2.3+B	The value of Master Variable A multiplied by 2.3, added to the value of Variable/Reference B
A+COSH(3E-2)	The value of Master Variable A added to the Cosine of the value of (3 multiplied by10 raised to the power of -2) (see Mathematical Functions)
2*[LN(1+X) / LOG(1-X)]	The result of taking the Natural Log of the Sum of 1 and Variable/Reference X divided by the Log of the Sum of 1 minus Variable/Reference X and multiplying this by 2 (See also Mathematical Functions)

8.3.1.2.5.3 Mathematical Functions

Functions with single parameters, where A is the Master Variable

Function	Description	Formula	Purpose	Example
SQR	Square	SQR(A)	Returns the value of A multiplied by itself	
SIN	Sine	SIN(A)	Returns the sine of the angle A in radians	
COS	Cosine	COS(A)	Returns the cosine of the angle A in radians	
TAN	Tangent	TAN(A)	Returns the tangent of the angle A in radians	
SINH	Hyperbolic Sine	SINH(A)	Returns the hyperbolic sine of the angle A in radians	
COSH	Hyperbolic Cosine	COSH(A)	Returns the hyperbolic cosine of the angle A in radians	
COTAN	Cotangent	COTAN(A)	Returns the cotangent of the angle A in radians	

ATAN	ArcTangent	ATAN(A)	Returns the arctangent of the angle A in radians	
EXP	Exponential	EXP(A)	Returns the value of Euler's number raised to the power of A	
LN	Natural log	LN(A)	Returns the power to which Euler's number would have to be raised to equal A	
LOG	Common Log	LOG(A)	Returns the exponent by which the common logarithm (base 10) has to be raised to yield A	
SQRT	Square Root	SQRT(A)	Returns the value which when multiplied by itself yields A	
ABS	Absolute Value	ABS(A)	Returns the distance of A from zero, a positive number	
SIGN	Signum	SIGN(A)	Returns -1 if A<0, 0 if A=0, 1 if A>0	
TRUNC	Truncation	TRUNC(A)	Discards the fractional part of number A	TRUNC(-3.2) = -3, TRUNC(3.2) = 3
CEIL	CEIL Function	CEIL(A)	Maps a real number to the smallest following integer. CEILA = the smallest integer not less than A	CEIL(-3.2) = -3, CEIL(3.2) = 4
FLOOR	FLOOR Function	FLOOR(A)	Maps a real number to the largest previous integer. FLOORA = the largest integer not greater than A	FLOOR(-3.2) = -4, FLOOR(3.2) = 3

Functions that accept two parameters, where A is the Master Variable, B is another Variable or Reference

Function	Description	Formula	Purpose	Example
INTPOW	Integral Power	INTPOW(A, x)	Raises the Base A to an integral power x.	Where A = 2, INTPOW(A, 3) = 8. Note that result of INTPOW(2, 3.4) = 8 as well

POW	Power Function	POW(A, x)	Raises the base A to any power x including decimals. For fractional exponents or exponents greater than MaxInt, x must be greater than 0.	
LOGN	Log Base Function	LOGN(A,B)	Returns the exponent by which the logarithm to the base of A yields B.	LOGN(10, 100) = 2
MIN	Minimum of two values	MIN(A,B)	Returns the minimum value when comparing two values.	Where Variable A = 2 and Variable/Reference B = 5, MIN(A, B) = 2
MAX	Maximum of two values	MAX(A,B)	Returns the maximum value when comparing two values.	Where Variable A = 2 and Variable/Reference B = 5, MAX(A, B) = 5

Functions that accept more than 2 parameters, where A is the Master Variable, B or X are other Variables or References

Boolean operators are supported. Any non-zero value is TRUE, 0 is FALSE.

Function	Description	Examples
IF		IF(BOOL, A, B) returns A if BOOL is <> 0, returns B if BOOL = 0. Values of A and B are calculated regardless of BOOL (Full Boolean Evaluation).
IF(a,b,c)	If a is true, then perform b, otherwise perform function c.	IF(X>0, 3/X, X)
		IF(A>=B,A,B/2)
		A-IF(A<>0,3*A,3)
		IF(A>=B,A,B/2)
		A-IF(A<>0,3*A,3)
		A+B+IF(A,A,B)

8.3.1.2.5.4 Statistical Functions

Function	Description	Formula	Purpose
MIN	Minimum	MINA, MINB, etc.	Returns the lowest value of Variable A.
MAX	Maximum	MAXA	Returns the highest value of Variable A.

AVG	Average	AVGA	The sum of all the Variable A values, divided by the number of values. Also commonly referred to as the Mean.
SUM	Summation	SUMA	The addition or summation of all the Variable A values.
CUMULATIVE	Cumulative	CUMULATIVEA	The cumulative sum affords a partial sum for any given Variable timestamp of a given sequence. Summation is sequential through the time series in chronological order from oldest to the newest timestamp.
HOURLYMIN	Hourly Minimum	HOURLYMINA	Returns the lowest value of Variable A in an hour period.
HOURLYMAX	Hourly Maximum	HOURLYMAXA	Returns the highest value of Variable A in an hour period.
HOURLYSUM	Hourly Summation	HOURLYSUM	The addition or summation of all the Variable A values in an hour period.
HOURLYAVG	Hourly Average	HOULRYAVG	The sum of all the Variable A values, divided by the number of values in an hour period.
DAILYMIN	Daily Minimum	DAILYMINA	Returns the lowest value of Variable A in a 24 hour period.
DAILYMAX	Daily Maximum	DAILYMAXA	Returns the highest value of Variable A in a 24 hour period.
DAILYSUM	Daily Sum (Total)	DAILYSUMA	The sum of all the Variable A values in a 24 hour period.
DAILYAVG	Daily Average	DAILYAVGA	The average of all the Variable A values in a 24 hour period.
WEEKLYMIN	Weekly Minimum	WEEKLYMINA	Returns the lowest value of Variable A in a calendar week period between Monday and Sunday.
WEEKLYMAX	Weekly Maximum	WEEKLYMAXA	Returns the highest value of Variable A in a calendar week period between Monday and Sunday.

WEEKLYSUM	Weekly Sum (Total)	WEEKLYSUMA	The sum of all the Variable A values over a calendar week between Monday and Sunday.
WEEKLYAVG	Weekly Average	WEEKLYAVGA	The average of all the Variable A values over a calendar week between Monday and Sunday.
MONTHLYMIN	Monthly Minimum	MONTHLYMINA	Returns the lowest value of Variable A over a month.
MONTHLYMAX	Monthly Maximum	MONTHLYMAXA	Returns the highest value of Variable A over a month.
MONTHLYSUM	Monthly Sum (Total)	MONTHLYSUMA	The sum of all the Variable A values over a month.
MONTHLYAVG	Monthly Average	MONTHLYAVGA	The average of all the Variable A values over a month.
YEARLYMIN	Yearly minimum	YEARLYMINA	Returns the lowest value of Variable A over a year.
YEARLYMAX	Yearly maximum	YEARLYMAXA	Returns the highest value of Variable A over a year.
YEARLYSUM	Yearly Sum (Total)	YEARLYSUMA	The sum of all the Variable A values over a year.
YEARLYAVG	Yearly Average	YEARLYAVGA	The average of all the Variable A values over a year.
MEDIAN	Median	MEDIANA	"Middle value" of a Variable A. The smallest number such that at least half the Variable A values are no greater than it. If Variable A has an odd number of entries, the median is the middle entry after sorting the values into increasing order. If Variable A has an even number of entries, the median is the smaller of the two middle numbers after sorting.
STDEV	Standard Deviation	STDEVA	The standard deviation of Variable A is the root-mean-square (RMS) of the set of deviations between each data point in the series and the mean. The RMS is a measure of the average "size" of the data

			in Variable A. To compute the RMS of Variable A, you square all the entries, average the numbers you get, and take the square-root of that average.
VARIANCE	Variance	VARIANCEA	The square of the standard deviation of Variable A, or in other words, the average of the squares of the deviations of the numbers in Variable A from their mean. It reflects the dispersion of the empirical values around its mean.
CofV	Coefficient of Variance	CofVA	The standard deviation of a Variable A divided by the mean.
PERCENTILE	Percentile (included) value	PERCENTILE(A,p)	The value at which the given percentage (p) of values in the range of values is at or below this value. It is calculated using an interpolated, inclusive method as follows: 1. Arrange n number of data points in ascending order: x1, x2, x3, ... xn 2. Calculate the rank (r) for the percentile p: r = (p/100) * (n - 1) + 1 3. If r is an integer then the data value at location r, xr, is the percentile p: p = xr 4. If r is not an integer, p is interpolated using ri, the integer part of r, and rf, the fractional part of r: p = xri + rf * (xri+1 - xri)

8.3.1.2.5.5 Calculating Differences

Calculations can be used to determine previous, next and time differences within records in the database.

Function	Description	Formula	Purpose	Example
Combine Formulae		A-MINA	Calculates the difference between each value and the lowest value in a series	

PVAL	Previous Value	PVALA can be used to determine the previous reading / value (of Variable A) Previous reading / value (of Variable B)	When PVAL is used for the first value within the dataset it will return that first value.	By using the Previous Value and Next Value in a formula you can calculate differences between values.
NVAL	Next Value	NVALA can be used to determine the next reading / value (of Variable A)	Similarly, when NVAL is used for the final value in a set it will return that final value.	The NVAL formula could be used to ensure correct functioning of an instrument, such as looking at future (next or NVAL) values to see if a water meter is increasing in value as a flow increases.
DIFF	Calculates the sum of the differences between the current value and the previous value, with the option to ignore records with a value of zero which could result in a negative difference for that row.	DIFF(A,x)	Used to calculate the sum of the differences between the current value and previous value. Setting the functions x value to 1 will not calculate a difference if the current value is zero (0). Setting the functions x value to 0 will calculate the difference regardless of the current value. This has been designed for cumulative value resets, to prevent false alarms on value resets.	DIFF(A,1) to sum the differences between the current value and the previous value for each record of Variable A, ignoring records with a current value of zero. DIFF(A,0) to sum all the differences between the current value and the previous value for each record of Variable A, regardless of the current value.
TIMEDIFF	Time Difference between two values	TIMEDIFFA	Returns the time difference between records (in seconds).	
VALUEBYINDEX	Display variable values starting from specified index	VALUEBYINDEXA(n), where n is an integer that specifies position of the variable value on the datasheet. Integers may be positive (moving forwards through a data set) or negative (moving backwards through a data set).	Used to display the value of the nominated variable, giving the first data entry in the series a value located by the index number, and the next value of the consecutive indices.	VALUEBYINDEXA(2) will display values of variable A starting from its value at 2nd position, then 3rd, then 4th and so on until the end of the variable dataset. Values of A at 0th and 1st positions will be omitted.

VALUEBYTIME	Display values of variables located by increments specified as time in seconds	VALUEBYTIMEA(n) where n is a value of time in seconds that specifies increment of the variable time value on the datasheet. Integers may be positive (moving forwards through a data set) or negative (moving backwards through a data set).	Used to display values of variables at n-th seconds from the start of the monitoring. If a value for the variable does not exist at that time, then the Calculation tool will compute an approximate value.	VALUEBYTIMEA(900) will display values of variable A at every 900th second from the start of the monitoring date and time.
RECORDNUMBER	Index a range of Values for a Variable series	RECORDNUMBER	Used to display the index of the master variable A, giving the first data entry in the series a value of 0, the next a value of 1, then 2 and so on	RECORDNUMBER will number your master variable starting from 0.
RANKASC	Rank a range of Values for a Variable Series	RANKASCA	RANKASC - values sorted in ascending order from smallest to largest	
RANKDSC	Rank a range of Values for a Variable Series	RANKDSCA	RANKDSC - values sorted in descending order from largest to smallest	
ROFC	Rate of Change	ROFCA(x)	Calculates the per second Rate of Change from one data point to the next where x = the number of points.	The formula ROFCA(3) will calculate the per second rate of change for variable A over the previous three points.
				The formula ROFCA(3) *3600 calculates the hourly rate of change for variable A of the previous three (3) points.
			IF function used in combination with **Rate of Change** function to **Flag** data	IF(ROFCA(3) *3600>0.1,IF((ROFCA(3)*3600>2*ROFCA(6) *3600,20,15),20)
COUNT	Calculate the number of rows	COUNTA	Calculates the number of rows of nominated	

		variable in the datasheet.
HOURLYCOUNT	Calculate the number of HOURLYCOUNTA rows per hour	Calculates the number of rows of nominated variable per hour in the datasheet.
DAILYCOUNT	Calculate the number of DAILYCOUNTA rows per day	Calculates the number of rows of nominated variable per day in the datasheet.
WEEKLYCOUNT	Calculate the number of WEEKLYCOUNTA rows per week	Calculates the number of rows of nominated variable per calendar week in the datasheet.
MONTHLYCOUNT	Calculate the number of MONTHLYCOUNTA rows per month	Calculates the number of rows of nominated variable per month in the datasheet.
YEARLYCOUNT	Calculate the number of YEARLYCOUNTA rows per year	Calculates the number of rows of nominated variable per year in the datasheet.

8.3.1.2.6 Variable Offset

Using calculations, you can offset the resultant value when an error is found in the data. Master Variable A timestamps remain the same (x axis) and it is the vertical axis (y axis) that is proportionally offset.

For example:

On installation a sensor may have no error. However, after 6 months deployment the sensor may have drifted by 10%.

By using **Variable Offset**, selecting the Start and End Offset amount/percentage, you can adjust the data proportionally over time to compensate for this drift.

The middle data is adjusted *proportionally* to meet the start and end offset expectations.

The shift is calculated per second and applied accordingly. This means that Variable Offset can be used for both equidistant data and non-equidistant data.

It is important to note that the Variable Offset assumes that the error is linear and undertakes the calculations using this assumption.

You can select the following offset types:

- Absolute: Adjusts your data by the raw offset value.
- Percentage: Adjusts your data by the offset value in percentage.
- Multiplier: Multiplies your data by the offset value.

Apply a Variable Offset

Check **Enable Variable Offset** to apply a start or end offset to your data.

Using Start Offset

When you enter a **Start Offset**, DataSight adjusts the starting value of the first data point in a time series by the offset amount.

Using End Offset

When you enter an **End Offset**, DataSight adjusts the final value of the last data point in a time series by the offset amount.

8.3.1.2.7 Flag During a Calculation

During a calculation, you may wish to flag your output data set. The Flags section allows you to:

- Use the current Flag to your calculated data as set for the input variable if writing to a new variable record, or if overwriting data, then use the output variable flag.
- Change to a new flag from the available Flags
- Calculate or compute the conditions for using Flag(s)

Use Current Flag

To continue flagging your output data with the same flag as set for the input variable, you can select to Use Current Flag. If overwriting data, then selecting this option means that the output flag is that which already exists on the output data.

Note	If you choose to use a conversion table during your calculation, then you may not Use Current Flag with your data.

Change Flag

To choose an alternative flag for your output data, you apply a Flag from the drop down menu in the Output Flag panel.

Calculate Flag

Using the Flag Index number, the Flags can be defined according to logic given in the flag formula box.

For example you can use an IF statement:

- Enter IF(a>#,x,y) into the Output Flag Formula box where 'a' is the variable, # is a real value, and x and y are the Flag Index Numbers.
    - Where the value for variable 'a' is greater than #, the output result will be flagged x.
    - Otherwise the output result will be flagged y.

You can use any valid logic in combination with Operators to customise your Output Flag conditions.

Note	The Calculation process tag will be automatically assigned to your data when you perform a calculation. Data that has been processed using the calculation tool can be identified by filtering by the Calculation process type in the main filter panel.

See also:

- Set Flags
- Formulae
- Conversion Tables

8.3.1.2.8 Collection History

When performing a Calculation the current Collection History of the Master Variable will be used for your output data records; allowing you to keep the Person, Equipment and Data Source Files of the Master Variable.

Alternatively you can create a New Collection History for your output data records, which will assign:

- The currently logged in user as the Person
- The current DataSight client version as the Equipment; and
- An empty Data Source File as the data is generated by the Calculation Tool

If either the Person or Equipment being assigned above does not exist, then the Calculation Tool will create them. The Equipment Name will be 'DataSight'; and its Serial Number will be the DataSight Client version number, e.g. version 3.8.9.290 will be recorded as '389290'.

Collection

1. Select either the **Use Current** or **New** option in the Collection section of the Calculation Tool.

8.3.1.2.9 Output Data

When you output data from Calculations, you need to set the Output Variable and Output Level prior to the database update.

Set Output Variable

1. A variable must always be selected before the database itself can be updated.
2. Verify the type of **Output** from the drop-down list. Variable is shown by default, but select **Variable** if not.
3. Select the Variable from the drop-down list of variables underneath.
4. If you already know the name of the DataSight Variable, simply type in the name in the drop-down list to limit the choices and speed up the mapping.
5. Alternatively,you may continue to use the pre-filled variable if a saved Calculation Template is open.

Set Output Level(s)

1. Select the Output **Level** for your resultant data, or you may continue to use the pre-filled Level 3 if a saved Calculation Template is open. **One** of the two radio buttons must be selected.
2. The default selection for every calculation is the first **Same Level as Master Variable** radio button, which writes the resultant values to the same Level 3 as that of your Master A Variable.
3. You can optionally tick the checkbox for **Repeat The Calculation For All Levels** in the data set.

   This option is particularly useful for automated calculations, and should be set when running the calculation as a task across multiple Levels.

   This option cannot be selected when a single Level is specified using the second radio button (see following).
6. Alternatively you can select a different Level 3 to that of Master Variable A, by selecting the second radio button.
7. Click in the drop-down Level list, and select the Output **Level**.
8. If you already know the name of the DataSight Level, simply type in the name in the drop-down list to limit the choices and speed up the mapping.

Update Database

1. Click **Update** to commit the data to the database.
2. A Comment form appears. You may enter details about your calculation that are stored in the Process log.
3. Then click **OK**.
4. If the combination of the output Variable, output Level, and Master Variable A date-time stamp does not have a current value (records not do exist), the records will be newly created.
5. If a value of the output Variable on the output Level, for the given Master Variable date-time stamp can be found (records already exist), the data will be overwritten, **unless** the record is locked.
6. At this stage, wait for the update to finish. You will be notified by a confirmation message.
7. Click **OK**.

Cancel Update

1. To stop the database update, click **Cancel** once the Comment form appears.
2. You will be asked if you wish to Cancel the Update.
3. Click **Yes** to confirm.
4. Click **No** to continue to update the database.

8.3.1.2.10 Alarm Severity

In DataSight, an Alarm Output calculation is designed purely to be used with an automated Alarm Task. Alarm Tasks notify recipients, by email, the current Alarm Severity (or otherwise).

Alarming in DataSight has been designed to make full use of the Calculations tool. Within Calculations, you can use boolean operators in the formulae, particularly IF THEN (see Mathematical Functions), to calculate when a condition has been met. Consequently, satisfying conditions for alarming in DataSight can be as complex as required, using multiple variables and/or references.

Formulae are always devised to return the met conditions as index numbers. A DataSight Alarm requires the result of the formula to be an integer value equal to or greater than zero, where zero means the alarm is not active. Upon selecting Output in Calculations, these indices then translate to an Alarm Severity expression.

Alarm Severity expression(s) are accessed from the Output panel, displayed in a grid view as a set of indexed values that cross reference the index values used in a Calculation formula. Each Alarm Severity expression is assigned a positive integer value starting at 1 and incrementing by 1 for each additional expression. Expressions are assigned a text message and colour, which help communicate the status of the alarm when notified by email.

Alarm Severity expressions can be completely customised, and can be used to escalate and de-escalate alarm notifications as required.

Adding, deleting and modifying expressions in the Alarm Severity window is performed using the navigation buttons located at the bottom of the Alarm Severity grid view.

The buttons available on the navigation bar consist of:

- First Record.
- Previous Page.
- Previous Record.
- Next Record.
- Next Page.

- Last Record.
- Append.
- Delete.
- Edit.
- End Edit.
- Cancel Edit.

Note	Your Calculation Template must be saved prior to entering any Alarm Severity expressions. Alarm Severity expressions must be assigned a unique integer value starting with 1, with the largest integer value being equal to the number of expressions being entered. As an Alarm calculation does not update or alter data within your database, the Variable Offset, Flags and Collection History panels are disabled.

Set Alarm Severity Expressions

1. Save your Calculation template.
2. Click on the type of **Output** from the drop-down list. Select **Alarm**.
3. (Optional) Enter an Expression Name (short) to describe the formula being used. This message will be displayed on the notification email. For example, a formula for summing the last 12 hours worth of rainfall could be expressed as 'Rainfall (mm) over 12 hours'.
4. Click the **three ellipses** button located next to the Output drop-down to display the Alarm Severity window.
5. Click in the **Severity** field for the first row and **describe** the first Alarm Severity expression. You will notice that the Index field will be automatically populated with the next available Alarm Severity index value, starting at 1.
6. (Optional) Click the **Highlight** field to display the colour picker and select a **colour** for the condition.
7. (Optional) Click within the **Index** field to select it, then click the **increment** or **decrement** buttons to change the index value.
8. Click either the **Append** or **End Edit** button on the navigation bar to confirm your changes and display the next condition row for editing.
9. (Optional) Repeat steps 3 to 5 above to add more Alarm Severity expressions as needed.
10. Once you have finished entering your conditions, click **OK** to save your changes and close the Alarm Severity window, or click **Cancel**.

Change the Alarm Severity Expressions

1. Open the Calculation Tool and load the saved alarm **Calculation Template** needing to be updated.
2. Click the **three ellipses** button located next to the Output drop-down to display the Alarm Severity window.
3. Click in the **Severity** or **Highlight** fields needing to be altered and update entries as required.
4. Click **OK** to save your changes and close the Alarm Severity window, or click **Cancel**.

Delete the Alarm Severity Expressions

1. Open the Calculation Tool and load the saved alarm **Calculation Template** needing to be updated.

2. Click the **three ellipses** button located next to the Output drop-down to display the Alarm Severity window.
3. Click to select the Alarm Severity **expression** for deletion and then click the **Delete** button from the navigation bar.
4. (Optional) Repeat the above step to delete more conditions if required.
5. Click **OK** to save your changes and close the Alarm Severity window, or click **Cancel**.

See also:

- Alarm Calculation
- Automatically Email Alarm Notifications

8.3.1.2.11 Calculation Templates

DataSight allows you to save your Calculation as a template that can be accessed later to:

- Pre-fill Level, Variable, Reference, Formula, Variable offsets, Flags and Output fields in Calculation as defined in the saved template.
- Be used as reference by any other user.

The Calculation Template window consists of the following items:

- Name - the name of the saved calculation template.
- Formula - the formula used in the calculation template.
- When Saving, Delete - a check-box allowing you to select and delete a calculation template.

Open a Calculation Template

1. On a Calculation, click **Open** from the Quick Access Toolbar or press ALT+O. The Calculation Templates Window opens.
2. Select a suitable template from the list and click **Open**. The calculation is pre-filled with preferences as defined in your selected template. You may also edit these preferences further if necessary.

Save a Calculation Template

1. With your Calculation preferences set, click **Save** on the Quick Access Toolbar or press CTRL+S. The Calculation Templates Window opens.
2. Enter a name for your template.
3. Click **Save**. Your Calculation Template is now saved.

Modify a Calculation Template

1. Open a Calculation Template.
2. Edit preferences on Calculation as required.
3. Click **Save**. Your Calculation Template has now been modified.

Delete a saved Calculation Template

1. When in a Calculation, click **Save** on the Quick Access Toolbar or press CTRL+S. The Calculation Templates Window opens.

2. Click on a template to delete it.
3. Check the **Delete** box.
4. Click **Save**.
5. A dialogue box confirms your action. Click **OK**.

Conversion Tables

Conversion Tables are used to record relationships between two variables. Conversion Tables in DataSight are a type of look up or interpolation table.

They can be used to hold data for:

- Stream/River stage discharge curves
- Water quality data. For example, plotting turbidity against discharge
- Stream rating tables
- Pump rating tables

Data can be entered manually point by point or by using simple cut/copy/paste functions from other electronic data sets. Once a Conversion Table has been created, it can be assigned to a specific Level 3 so that it can be compared with other data, or used in analysis.

Open Conversion Tables List

- Click **Conversion Tables** in the Analyse group on the DataSight Ribbon. The Conversion Tables list appears in the Main Panel, together with a Conversion Table grouped tab on the ribbon.

Note	Conversion Tables that appear with yellow highlighted fields are Shift tables (See Shift Analysis). When using a Conversion Table in a Calculation, any values which fall outside of the Conversion Table will be extrapolated using linear extrapolation based on the last two X/Y values of the Conversion Table.

See also:

- Create a Conversion Table
- Use a Conversion Table
- Manage Conversion Tables

8.3.2.1 Create a Conversion Table

1. Select the Conversion Tables tab in the Main Panel.
2. Click **New** on the Quick Access Toolbar. A new Conversion Table form appears in the Main Panel. This form consists of a Table panel, a Values panel and a Conversion Table chart. Associated functionality can be found on the Conversion Table grouped tab on the ribbon.
3. Click on the Table **Name** text box and enter the table name.
4. Click in the **X** and **Y** Coordinate Label text boxes and type in the names of your two variables.
5. Enter dates for the **Period of Applicability** for the Conversion Table.
6. **Assign** the Conversion Table to a specific Level.
7. Click **Comments** to open the Comments window. Enter comments as required and click **OK**.
8. Select the Values Panel. Data can be entered either:

- Individually using the navigation buttons at the bottom of the data area  where you select + to add a line and enter data, and - to remove a line of data.

Or,

- Directly from a spreadsheet in Excel or similar program. Highlight and copy your data in Excel. Return to the Conversion Table and in the Values panel right-click and select **Paste**.

As data is entered it is graphed in the Conversion Table chart.

9. Click **Transpose** on the Conversion Table grouped tab to swap the position of the x and y axes.
10. Click **Logarithmic** on the Conversion Table grouped tab to change the chart scale to Logarithmic, which can be helpful when the data entered covers a large range of values.
11. Click **Save** in the Quick Access Toolbar. The Conversion Table is now saved and will appear in the Conversion Tables list.

Note	Period of Applicability is indicative only and is not used elsewhere in DataSight.

8.3.2.2 Use a Conversion Table

Conversion tables can also be used to convert data from one form to another. There is no limit to the number of points that can be converted. By default, Calculations uses a linear interpolation to calculate data between points. If data is above or below the values specified in the table the slope of the line is continued and the data calculated.

Convert data using a conversion table in Calculations

1. Ensure the data for conversion is displayed in your datasheet.
2. Right-click in the datasheet area and select **Calculation**.
3. In the Calculation window select the appropriate **Level** for Master Variable A.
4. Select a **Variable** as the Master Variable A.
5. Check **Use Conversion Table**.
6. Select the saved conversion table from the drop-down list or select **Use Active table**.
7. (Optional) To view the Conversion Table, click **...** next to the drop-down arrow.
8. Select the type of Spline Interpolation between the selected variable and the conversion table from the **Conversion Method** drop down combo box.
   - Linear - assumes a straight-line relationship and draws a straight line between the points in the table. Linear is the default setting in the Calculations Tool.
   - Cubic - forms a piecewise continuous curve, passing through each of the known values with a separate cubic polynomial for each interval.
   - Catmull-Ron - a specific cubic spline interpolation, requiring at least two points either side of the differential point.
   - Akima - a special spline which is more stable to outliers than cubic splines.
9. When completing conversions using a Conversion Table, the Formula entered can simply be A (or lower case, a).
10. (Optional) If you want to view the conversion result, click on the **Calculation Result** tab.
11. Select the **Output Variable** that the result will be written to.
12. Select the **Output Level**. Mostly, this will be the same Level as the originating data, however you may wish to transfer large volumes of data from one Level to another.
13. (Optional) Set Flags, if required.
14. (Optional) Set Collection, if required.

15. Click **Update** to finish. Your converted data will be updated.

Notes	When you choose "Use latest table", Calculations will apply the most recently saved Conversion Table assigned to that Level. Thus, when you combine this setting with **Repeat The Calculation For All Levels**, the most recently saved Conversion Table for that Level is applied across all Levels founds within the input data set. In mathematics, a spline is a sufficiently smooth polynomial function that is piecewise-defined, and possesses a high degree of smoothness at the places where the polynomial pieces connect (which are known as knots). Interpolation is to determine a value of y corresponding to some value of x for a set of bivariate data (x, y), at which there is no measurement of y. Spline interpolation if favoured over polynomial interpolation because when the number of data points involved becomes large, in many cases, you can get oscillatory behaviour in the resulting polynomial.

Open Regressions tool from the Conversion Table

You can load the current conversion table into the Regressions tool directly from the Conversion Table grouped tab.

1. Click **Conversion Tables** from the DataSight Ribbon.
2. Double-click on the Conversion Table row that you would like to load. A new tab with the Conversion Table opens.
3. Click **Conversion Table** grouped tab on the ribbon.
4. Click **Regressions** to load your table in the Regressions tool (See Regressions to find out more about this tool).

Create Expanded Conversion Table Report from the Conversion Table

You can create an Expanded Conversion Table report of the current conversion table directly from the Conversion Table grouped tab.

1. Click **Conversion Tables** from the DataSight Ribbon.
5. Double-click on the Conversion Table row that you would like to load. A new tab with the Conversion Table opens.
6. Click **Conversion Table** grouped tab on the ribbon.
2. Click **Expanded Rating Conversion Table** to create the report (See Expanded Conversion Table to find out more about this report).

See also:

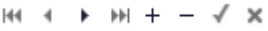
- Calculations
- Perform a Calculation
- Example Computation: Converting Depth to Discharge

8.3.2.3 Manage Conversion Tables

The Conversion Tables panel lists the names of all saved Conversion Tables, their assigned Level 3 (if applicable) and their period of applicability.

Modify and/or Copy a Conversion Table

1. Click **Conversion Tables** tab in the Main Panel.
2. Double click on the chosen conversion table row. The Conversion Table will open in a new threaded form in the Main Panel.

3. Modify the Conversion Table record as required. Use the Editing Navigation Bar  at the bottom of the panel to do this.
   - Select + to add a line and enter data.
   - Click in a record to focus the cell and edit the line of data.
   - Click ✓ to end the edit.
   - Click × to cancel the edit if you make a mistake.
   - Focus on a record, click outside the row then select - to remove a line of data.
4. You can also right click on the Conversion Table Values Panel and either **Copy**, **Cut** or **Paste** values into the table. **Select All** to highlight all the values, and then **Copy** to copy the entire table to clipboard.
5. Click **Save** in the Quick Access Toolbar. The Save As window appears.
6. Enter a new name for your modified table or click **OK** to overwrite the existing table.
7. The Conversion Table is now saved and will appear in the Conversion Table list.

Delete a Conversion Table

1. Click **Conversion Tables** tab in the Main Panel.
2. Click to check the **Delete** check box(es) against any Conversion Table that you wish to delete.
3. Click **Save** in the Quick Access Toolbar at any point to save changes and continue, otherwise when you **Close** the Conversion Tables panel you will be prompted to save your changes.

Regressions

In DataSight, Regressions can be used to model the relationship between **different** variables.

Using the Regression tool you can fit statistical functions to your data sets in order to analyse and model the relationship between *dependent* and *independent* variable.

An independent variable is the variable that is supposed to explain the other; the term is a synonym for "explanatory variable." Usually, one regresses the "dependent variable" on the "independent variable", however there is not always a clear choice of the independent variable. The independent variable is generally plotted on the horizontal axis.

It is possible to test new data against an established correlation for several time series data sets in the following manner:

- The new data points are visualised in a chart where data points that break the historically established correlation are easily identified.
- As regression models are solved, they are sorted *automatically* according to the **goodness of fit** criteria specified (Residual Sum of Squares, Correlation Coefficient, DOF Adjusted Correlation Coefficient or Standard Error). The automatic sorting helps you choose the most appropriate model.
- Using Regressions, you can develop and save a Conversion Table from a modelled relationship.
- There is currently the choice of **298** two-dimensional non-linear regression models within the tool.

The Regression tool uses the least squares method for linear models and the Levenberg-Marquardt method with double precision for non-linear regression models. The pre-defined non-linear regression models are those most commonly used in scientific, statistical and engineering applications. DataSight reports the coefficient of multiple determination (R2) about each solved regression model.

Note	With the inclusion of Gauging data in your DataSight database, you are able to use Regressions to adjust Stream Rating Tables based on actual physical measurements (refer to Test and Modify Rating Tables).

See also:

- Regressions Layout
- Regression Analysis

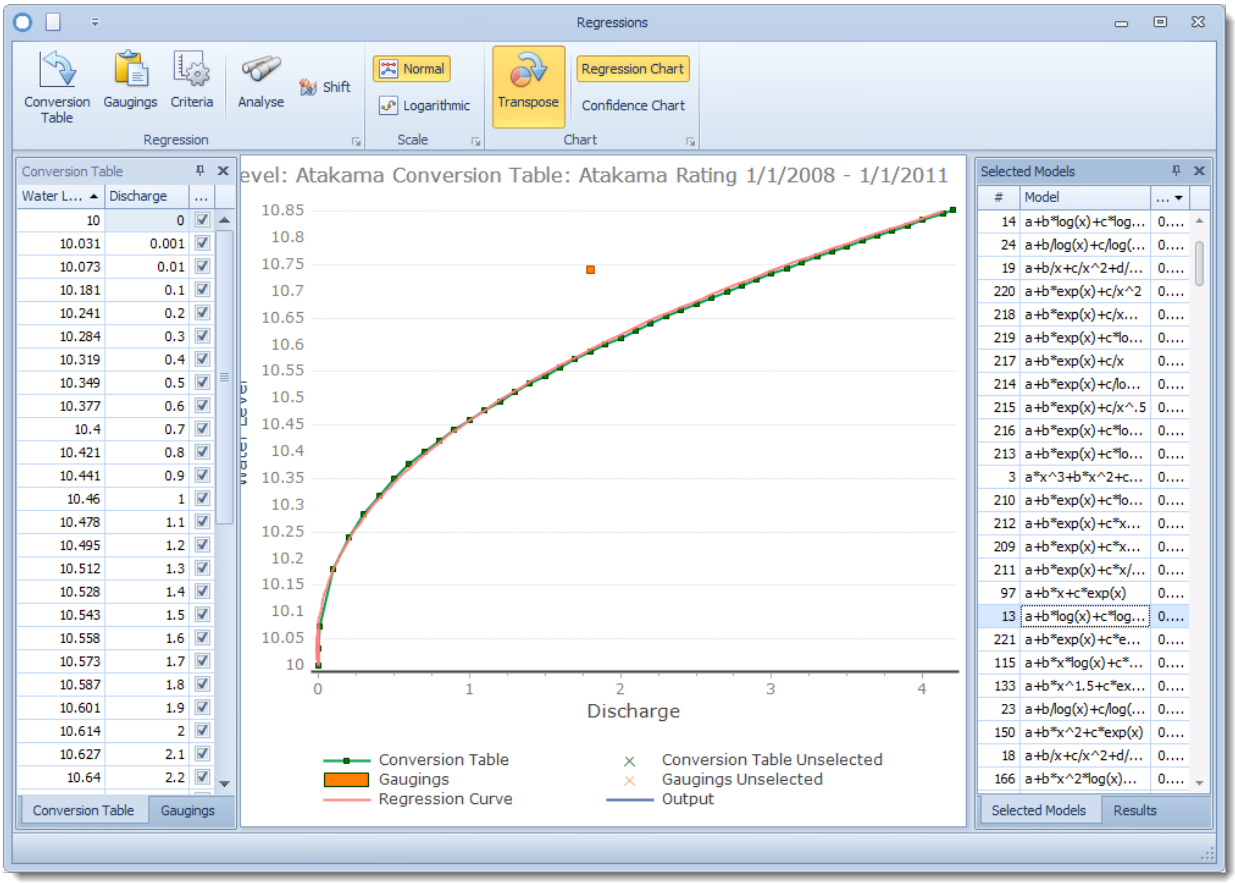
8.3.3.1 Regressions Layout

Regressions can be used for any bivariate data modelling. It requires you to format a table of x and y data values, saved in DataSight as a Conversion Table.

Note	With the inclusion of Gauging data, you are able to use Regressions to adjust Stream Rating Tables based on actual physical measurements (refer to Test and Modify Rating Tables). You do not need to enter any Gaugings to undertake modelling for other bivariate data sets however.

Open Regressions

1. Click **Regressions** in the Analyse group on the DataSight Ribbon. The Regressions window appears.
2. Regression Analysis can be performed according to your preferences.



See also:

- Regression Analysis
- Shift Analysis
- Regression Settings
- Regression Models

8.3.3.1.1 Regression Settings

Navigate through the Regressions user interface to interrogate and customise your regression settings:

- **Scroll through the Models**

  On the right, click on **Selected Models** to view a list of the models used to regress data. They are sorted according to the best fit for your data values. To display a model on the chart, click on it from this list.

- **Add/remove conversion table or gauging points**

  On the left, select the **Conversion Table** or the **Gaugings** tab to switch between them.

  Check or Uncheck the boxes in the conversion table and gauging list to remove these from the regression analysis.

- **Alter the Criteria**

  Click **Criteria** on the ribbon to alter the start and end values of the X axis.

  You can also alter increments and number of decimal places for display.

- **Shift Analysis**

  Shift in the Regression group is designed to meet the United States Geological Survey (USGS) Standard for the Analysis and Processing of Surface-Water Data and Information (See Shift Analysis for more details).

- **Scale**

  Click **Logarithmic** to view your graph in a log scale.

  Click **Normal** to return to the linear scale.

- **Transpose**

  Switch your axes using **Transpose** in the Chart group.

- **Zoom**

  Click anywhere in the chart and drag up/left *zoom-in* .

  Click anywhere in the chart and drag down/right *zoom-out* .

- **Pan**

  Right-click anywhere in the chart and drag.

- **Context menu (copy, turn series on or off, transpose)**

  Right-clicking the mouse button also displays a menu allowing you to copy the chart, transpose the axes and turn the various series in the chart on or off.

- **Save Conversion Tables**

  Use the Quick Access Toolbar to save your conversion tables (See Save a Conversion Table for more details).

Note	If you are using **Shift**, the variable where a **Criteria** condition is applied changes. In this case, please enter your start and end values for the corresponding X-axis variable.

See also:

- Regression Models
- Regressions Layout
- Conversion Tables

8.3.3.2 Regression Models

The following is a list of the in-built models that are available within the DataSight Regression Tool.

Model Number	Formula	Model Name	Group Name
1	a*x+b	First Order Polynomial	Polynomial
2	a*x^2+b*x+c	Second Order Polynomial	Polynomial
3	a*x^3+b*x^2+c*x+d	Third Order Polynomial	Polynomial
4	a*x^4+b*x^3+c*x^2+d*x+e	Fourth Order Polynomial	Polynomial
5	a*x^5+b*x^4+c*x^3+d*x^2+e*x+f	Fifth Order Polynomial	Polynomial
6	a*x^6+b*x^5+c*x^4+d*x^3+e*x^2+f*x+g	Sixth Order Polynomial	Polynomial
7	a*x^7+b*x^6+c*x^5+d*x^4+e*x^3+f*x^2+g*x+h	Seventh Order Polynomial	Polynomial
8	a*x^8+b*x^7+c*x^6+d*x^5+e*x^4+f*x^3+g*x^2+h*x+i	Eighth Order Polynomial	Polynomial
9	a*x^9+b*x^8+c*x^7+d*x^6+e*x^5+f*x^4+g*x^3+h*x^2+i*x+j	Ninth Order Polynomial	Polynomial
10	a*x^10+b*x^9+c*x^8+d*x^7+e*x^6+f*x^5+g*x^4+h*x^3+i*x^2+j*x+k	Tenth Order Polynomial	Polynomial
45	a+b*log(x)	First Order Logarithm	Logarithm Polynomial
45	a+b*log(x)	Logarithm Model	Logarithm Polynomial
12	a+b*log(x)+c*log(x)^2	Second Order Logarithm	Logarithm Polynomial
13	a+b*log(x)+c*log(x)^2+d*log(x)^3	Third Order Logarithm	Logarithm Polynomial
14	a+b*log(x)+c*log(x)^2+d*log(x)^3+e*log(x)^4	Fourth Order Logarithm	Logarithm Polynomial
15	a+b*log(x)+c*log(x)^2+d*log(x)^3+e*log(x)^4+f*log(x)^5	Fifth Order Logarithm	Logarithm Polynomial
50	a+b/x	First Order Inverse	Inverse Polynomial
50	a+b/x	Hyperbolic Model	Inverse Polynomial
17	a+b/x+c/x^2	Second Order Inverse	Inverse Polynomial
18	a+b/x+c/x^2+d/x^3	Third Order Inverse	Inverse Polynomial
19	a+b/x+c/x^2+d/x^3+e/x^4	Fourth Order Inverse	Inverse Polynomial
20	a+b/x+c/x^2+d/x^3+e/x^4+f/x^5	Fifth Order Inverse	Inverse Polynomial
21	a+b/log(x)	First Order Inverse Logarithm	Inverse Logarithm

22	a+b/log(x)+c/log(x)^2	Second Order Inverse Logarithm	Inverse Logarithm
23	a+b/log(x)+c/log(x)^2+d/log(x)^3	Third Order Inverse Logarithm	Inverse Logarithm
24	a+b/log(x)+c/log(x)^2+d/log(x)^3+e/log(x)^4	Fourth Order Inverse Logarithm	Inverse Logarithm
25	a+b/log(x)+c/log(x)^2+d/log(x)^3+e/log(x)^4+f/log(x)^5	Fifth Order Inverse Logarithm	Inverse Logarithm
26	log(x-a)		Single Parameter Convex/Concave
27	1/(1+a*x)		Single Parameter Convex/Concave
28	exp(x-a)		Single Parameter Convex/Concave
29	x^a		Single Parameter Convex/Concave
30	a^(1/x)	Root Model	Single Parameter Convex/Concave
31	1/(x+a)		Single Parameter Convex/Concave
32	1-1/(x^a)		Single Parameter Convex/Concave
33	log(a+b*x)		Two Parameter Convex/Concave
34	a*x^b	Power (Freundlich)	Two Parameter Convex/Concave
35	a*b^x	Modified Power	Two Parameter Convex/Concave
36	a*exp(b*x)	Exponential	Two Parameter Convex/Concave
37	a*exp(b/x)	Modified Exponential	Two Parameter Convex/Concave
38	exp(a+b*x)		Two Parameter Convex/Concave
39	a*b*x/(1+b*x)	Rectangular Hyperbola	Two Parameter Convex/Concave
40	x/(a*x+b)		Two Parameter Convex/Concave
41	1/(a+b*x)	Reciprocal Model	Two Parameter Convex/Concave
42	a/(1+b*x)		Two Parameter Convex/Concave
43	a*(x-b)		Two Parameter Convex/Concave
44	a*(1+x)^b		Two Parameter Convex/Concave
45	a+b*log(x)	First Order Logarithm	Two Parameter Convex/Concave
45	a+b*log(x)	Logarithm Model	Two Parameter Convex/Concave
46	1/(a+b*log(x))	Reciprocal Logarithm Model	Two Parameter Convex/Concave
47	a*x^(b*x)	Geometric Model	Two Parameter Convex/Concave
48	a*x^(b/x)	Modified Geometric Model	Two Parameter Convex/Concave
49	a*x/(b+x)	Saturation Growth Model	Two Parameter Convex/Concave
50	a+b/x	First Order Inverse	Two Parameter Convex/Concave
50	a+b/x	Hyperbolic Model	Two Parameter Convex/Concave

51	a*b^x*x^c	Hoerl Model	Three Parameter Convex/Concave
52	a*b^(1/x)*x^c	Modified Hoerl Model	Three Parameter Convex/Concave
53	1/(a+b*x+c*x^2)	Reciprocal Quadratic (Holliday)	Three Parameter Convex/Concave
54	exp(a+b/x+c*log(x))	Vapour Pressure Model	Three Parameter Convex/Concave
55	a+b*x+c/x^2	Heat Capacity Model	Three Parameter Convex/Concave
56	a/(1+b*x+c*x^2)		Three Parameter Convex/Concave
57	cos(x+a)	Trigonometric	Single Parameter with Max/Min
58	sin(x+a)	Trigonometric II	Single Parameter with Max/Min
59	1-exp(-a*x^2)		Single Parameter with Max/Min
60	exp(-a*x^2)		Single Parameter with Max/Min
61	a*cos(x)+b*sin(x)		Two Parameter with Max/Min
62	x/(a+b*x+c*x^2)		Three Parameter with Max/Min
63	a+b*cos(x)+c*sin(x)		Three Parameter with Max/Min
64	exp(a+b*x+c*x^2)		Three Parameter with Max/Min
65	x/(a+b*x+c*sqr(x))	Gunary Model	Three Parameter with Max/Min
66	a*x^b*exp(-c*x)		Three Parameter with Max/Min
67	x^a*exp(b-c*x)		Three Parameter with Max/Min
68	a*x^b*(1-x)^c	Beta Distribution Model	Three Parameter with Max/Min
69	a*exp((-(x-b)^2)/(2*c^2))	Gaussian Distribution Model	Three Parameter with Max/Min
70	1-exp(-x^a)		Single Parameter Sigmoid-ally Shaped
71	exp(-x^a)		Single Parameter Sigmoid-ally Shaped
72	1-exp(-a*x^b)		Two Parameter Sigmoid-ally Shaped
73	1-exp(-a*b^x)		Two Parameter Sigmoid-ally Shaped
74	exp(-exp(a-b*x))		Two Parameter Sigmoid-ally Shaped
75	a+b*x*log(x)		Single Term Intercept
76	a+b*x^1.5		Single Term Intercept
77	a+b*x^2		Single Term Intercept
78	a+b*x^2*log(x)		Single Term Intercept
79	a+b*x^2.5		Single Term Intercept
80	a+b*x^3		Single Term Intercept
81	a+b*exp(x)		Single Term Intercept
82	a+b*x^.5*log(x)		Single Term Intercept

83	a+b*log(x)^2	Single Term Intercept
84	a+b*x/log(x)	Single Term Intercept
85	a+b*x^.5	Single Term Intercept
86	a+b/x^.5	Single Term Intercept
87	a+b*log(x)/x	Single Term Intercept
88	a+b/x^1.5	Single Term Intercept
89	a+b*log(x)/x^2	Single Term Intercept
90	a+b/x^2	Single Term Intercept
91	a+b*exp(-x)	Single Term Intercept
92	a+b*x+c*x*log(x)	Two Term Intercept
93	a+b*x+c*x^1.5	Two Term Intercept
94	a+b*x+c*x^2*log(x)	Two Term Intercept
95	a+b*x+c*x^2.5	Two Term Intercept
96	a+b*x+c*x^3	Two Term Intercept
97	a+b*x+c*exp(x)	Two Term Intercept
98	a+b*x+c*x^.5*log(x)	Two Term Intercept
99	a+b*x+c*log(x)^2	Two Term Intercept
100	a+b*x+c*x/log(x)	Two Term Intercept
101	a+b*x+c*x^.5	Two Term Intercept
102	a+b*x+c*log(x)	Two Term Intercept
103	a+b*x+c/log(x)	Two Term Intercept
104	a+b*x+c/x^.5	Two Term Intercept
105	a+b*x+c*log(x)/x	Two Term Intercept
106	a+b*x+c/x	Two Term Intercept
107	a+b*x+c/x^1.5	Two Term Intercept
108	a+b*x+c*log(x)/x^2	Two Term Intercept
109	a+b*x+c*exp(-x)	Two Term Intercept
110	a+b*x*log(x)+c*x^1.5	Two Term Intercept
111	a+b*x*log(x)+c*x^2	Two Term Intercept
112	a+b*x*log(x)+c*x^2*log(x)	Two Term Intercept
113	a+b*x*log(x)+c*x^2.5	Two Term Intercept
114	a+b*x*log(x)+c*x^3	Two Term Intercept

115	a+b*x*log(x)+c*exp(x)	Two Term Intercept
116	a+b*x*log(x)+c*x^.5*log(x)	Two Term Intercept
117	a+b*x*log(x)+c*log(x)^2	Two Term Intercept
118	a+b*x*log(x)+c*x/log(x)	Two Term Intercept
119	a+b*x*log(x)+c*x^.5	Two Term Intercept
120	a+b*x*log(x)+c*log(x)	Two Term Intercept
121	a+b*x*log(x)+c/log(x)	Two Term Intercept
122	a+b*x*log(x)+c/x^.5	Two Term Intercept
123	a+b*x*log(x)+c*log(x)/x	Two Term Intercept
124	a+b*x*log(x)+c/x	Two Term Intercept
125	a+b*x*log(x)+c/x^1.5	Two Term Intercept
126	a+b*x*log(x)+c*log(x)/x^2	Two Term Intercept
127	a+b*x*log(x)+c/x^2	Two Term Intercept
128	a+b*x*log(x)+c*exp(-x)	Two Term Intercept
129	a+b*x^1.5+c*x^2	Two Term Intercept
130	a+b*x^1.5+c*x^2*log(x)	Two Term Intercept
131	a+b*x^1.5+c*x^2.5	Two Term Intercept
132	a+b*x^1.5+c*x^3	Two Term Intercept
133	a+b*x^1.5+c*exp(x)	Two Term Intercept
134	a+b*x^1.5+c*x^.5*log(x)	Two Term Intercept
135	a+b*x^1.5+c*log(x)^2	Two Term Intercept
136	a+b*x^1.5+c*x/log(x)	Two Term Intercept
137	a+b*x^1.5+c*x^.5	Two Term Intercept
138	a+b*x^1.5+c*log(x)	Two Term Intercept
139	a+b*x^1.5+c/log(x)	Two Term Intercept
140	a+b*x^1.5+c/x^.5	Two Term Intercept
141	a+b*x^1.5+c*log(x)/x	Two Term Intercept
142	a+b*x^1.5+c/x	Two Term Intercept
143	a+b*x^1.5+c/x^1.5	Two Term Intercept
144	a+b*x^1.5+c*log(x)/x^2	Two Term Intercept
145	a+b*x^1.5+c/x^2	Two Term Intercept
146	a+b*x^1.5+c*exp(-x)	Two Term Intercept

147	a+b*x^2+c*x^2*log(x)	Two Term Intercept
148	a+b*x^2+c*x^2.5	Two Term Intercept
149	a+b*x^2+c*x^3	Two Term Intercept
150	a+b*x^2+c*exp(x)	Two Term Intercept
151	a+b*x^2+c*x^.5*log(x)	Two Term Intercept
152	a+b*x^2+c*log(x)^2	Two Term Intercept
153	a+b*x^2+c*x/log(x)	Two Term Intercept
154	a+b*x^2+c*x^.5	Two Term Intercept
155	a+b*x^2+c*log(x)	Two Term Intercept
156	a+b*x^2+c/log(x)	Two Term Intercept
157	a+b*x^2+c/x^.5	Two Term Intercept
158	a+b*x^2+c*log(x)/x	Two Term Intercept
159	a+b*x^2+c/x	Two Term Intercept
160	a+b*x^2+c/x^1.5	Two Term Intercept
161	a+b*x^2+c*log(x)/x^2	Two Term Intercept
162	a+b*x^2+c/x^2	Two Term Intercept
163	a+b*x^2+c*exp(-x)	Two Term Intercept
164	a+b*x^2*log(x)+c*x^2.5	Two Term Intercept
165	a+b*x^2*log(x)+c*x^3	Two Term Intercept
166	a+b*x^2*log(x)+c*exp(x)	Two Term Intercept
167	a+b*x^2*log(x)+c*x^.5*log(x)	Two Term Intercept
168	a+b*x^2*log(x)+c*log(x)^2	Two Term Intercept
169	a+b*x^2*log(x)+c*x/log(x)	Two Term Intercept
170	a+b*x^2*log(x)+c*x^.5	Two Term Intercept
171	a+b*x^2*log(x)+c*log(x)	Two Term Intercept
172	a+b*x^2*log(x)+c/log(x)	Two Term Intercept
173	a+b*x^2*log(x)+c/x^.5	Two Term Intercept
174	a+b*x^2*log(x)+c*log(x)/x	Two Term Intercept
175	a+b*x^2*log(x)+c/x	Two Term Intercept
176	a+b*x^2*log(x)+c/x^1.5	Two Term Intercept
177	a+b*x^2*log(x)+c*log(x)/x^2	Two Term Intercept
178	a+b*x^2*log(x)+c/x^2	Two Term Intercept

179	a+b*x^2*log(x)+c*exp(-x)	Two Term Intercept
180	a+b*x^2.5+c*x^3	Two Term Intercept
181	a+b*x^2.5+c*exp(x)	Two Term Intercept
182	a+b*x^2.5+c*x^.5*log(x)	Two Term Intercept
183	a+b*x^2.5+c*log(x)^2	Two Term Intercept
184	a+b*x^2.5+c*x/log(x)	Two Term Intercept
185	a+b*x^2.5+c*x^.5	Two Term Intercept
186	a+b*x^2.5+c*log(x)	Two Term Intercept
187	a+b*x^2.5+c/log(x)	Two Term Intercept
188	a+b*x^2.5+c/x^.5	Two Term Intercept
189	a+b*x^2.5+c*log(x)/x	Two Term Intercept
190	a+b*x^2.5+c/x	Two Term Intercept
191	a+b*x^2.5+c/x^1.5	Two Term Intercept
192	a+b*x^2.5+c*log(x)/x^2	Two Term Intercept
193	a+b*x^2.5+c/x^2	Two Term Intercept
194	a+b*x^2.5+c*exp(-x)	Two Term Intercept
195	a+b*x^3+c*exp(x)	Two Term Intercept
196	a+b*x^3+c*x^.5*log(x)	Two Term Intercept
197	a+b*x^3+c*log(x)^2	Two Term Intercept
198	a+b*x^3+c*x/log(x)	Two Term Intercept
199	a+b*x^3+c*x^.5	Two Term Intercept
200	a+b*x^3+c*log(x)	Two Term Intercept
201	a+b*x^3+c/log(x)	Two Term Intercept
202	a+b*x^3+c/x^.5	Two Term Intercept
203	a+b*x^3+c*log(x)/x	Two Term Intercept
204	a+b*x^3+c/x	Two Term Intercept
205	a+b*x^3+c/x^1.5	Two Term Intercept
206	a+b*x^3+c*log(x)/x^2	Two Term Intercept
207	a+b*x^3+c/x^2	Two Term Intercept
208	a+b*x^3+c*exp(-x)	Two Term Intercept
209	a+b*exp(x)+c*x^.5*log(x)	Two Term Intercept
210	a+b*exp(x)+c*log(x)^2	Two Term Intercept

211	a+b*exp(x)+c*x/log(x)	Two Term Intercept
212	a+b*exp(x)+c*x^.5	Two Term Intercept
213	a+b*exp(x)+c*log(x)	Two Term Intercept
214	a+b*exp(x)+c/log(x)	Two Term Intercept
215	a+b*exp(x)+c/x^.5	Two Term Intercept
216	a+b*exp(x)+c*log(x)/x	Two Term Intercept
217	a+b*exp(x)+c/x	Two Term Intercept
218	a+b*exp(x)+c/x^1.5	Two Term Intercept
219	a+b*exp(x)+c*log(x)/x^2	Two Term Intercept
220	a+b*exp(x)+c/x^2	Two Term Intercept
221	a+b*exp(x)+c*exp(-x)	Two Term Intercept
222	a+b*x^.5*log(x)+c*log(x)^2	Two Term Intercept
223	a+b*x^.5*log(x)+c*x/log(x)	Two Term Intercept
224	a+b*x^.5*log(x)+c*x^.5	Two Term Intercept
225	a+b*x^.5*log(x)+c*log(x)	Two Term Intercept
226	a+b*x^.5*log(x)+c/log(x)	Two Term Intercept
227	a+b*x^.5*log(x)+c/x^.5	Two Term Intercept
228	a+b*x^.5*log(x)+c*log(x)/x	Two Term Intercept
229	a+b*x^.5*log(x)+c/x	Two Term Intercept
230	a+b*x^.5*log(x)+c/x^1.5	Two Term Intercept
231	a+b*x^.5*log(x)+c*log(x)/x^2	Two Term Intercept
232	a+b*x^.5*log(x)+c/x^2	Two Term Intercept
233	a+b*x^.5*log(x)+c*exp(-x)	Two Term Intercept
234	a+b*log(x)^2+c*x/log(x)	Two Term Intercept
235	a+b*log(x)^2+c*x^.5	Two Term Intercept
236	a+b*log(x)^2+c*log(x)	Two Term Intercept
237	a+b*log(x)^2+c/log(x)	Two Term Intercept
238	a+b*log(x)^2+c/x^.5	Two Term Intercept
239	a+b*log(x)^2+c*log(x)/x	Two Term Intercept
240	a+b*log(x)^2+c/x	Two Term Intercept
241	a+b*log(x)^2+c/x^1.5	Two Term Intercept
242	a+b*log(x)^2+c*log(x)/x^2	Two Term Intercept

243	a+b*log(x)^2+c/x^2	Two Term Intercept
244	a+b*log(x)^2+c*exp(-x)	Two Term Intercept
245	a+b*x/log(x)+c*x^.5	Two Term Intercept
246	a+b*x/log(x)+c*log(x)	Two Term Intercept
247	a+b*x/log(x)+c/log(x)	Two Term Intercept
248	a+b*x/log(x)+c/x^.5	Two Term Intercept
249	a+b*x/log(x)+c*log(x)/x	Two Term Intercept
250	a+b*x/log(x)+c/x	Two Term Intercept
251	a+b*x/log(x)+c/x^1.5	Two Term Intercept
252	a+b*x/log(x)+c*log(x)/x^2	Two Term Intercept
253	a+b*x/log(x)+c/x^2	Two Term Intercept
254	a+b*x/log(x)+c*exp(-x)	Two Term Intercept
255	a+b*x^.5+c*log(x)	Two Term Intercept
256	a+b*x^.5+c/log(x)	Two Term Intercept
257	a+b*x^.5+c/x^.5	Two Term Intercept
258	a+b*x^.5+c*log(x)/x	Two Term Intercept
259	a+b*x^.5+c/x	Two Term Intercept
260	a+b*x^.5+c/x^1.5	Two Term Intercept
261	a+b*x^.5+c*log(x)/x^2	Two Term Intercept
262	a+b*x^.5+c/x^2	Two Term Intercept
263	a+b*x^.5+c*exp(-x)	Two Term Intercept
264	a+b*log(x)+c/log(x)	Two Term Intercept
265	a+b*log(x)+c/x^.5	Two Term Intercept
266	a+b*log(x)+c*log(x)/x	Two Term Intercept
267	a+b*log(x)+c/x	Two Term Intercept
268	a+b*log(x)+c/x^1.5	Two Term Intercept
269	a+b*log(x)+c*log(x)/x^2	Two Term Intercept
270	a+b*log(x)+c/x^2	Two Term Intercept
271	a+b*log(x)+c*exp(-x)	Two Term Intercept
272	a+b/log(x)+c/x^.5	Two Term Intercept
273	a+b/log(x)+c*log(x)/x	Two Term Intercept
274	a+b/log(x)+c/x	Two Term Intercept

275	a+b/log(x)+c/x^1.5	Two Term Intercept
276	a+b/log(x)+c*log(x)/x^2	Two Term Intercept
277	a+b/log(x)+c/x^2	Two Term Intercept
278	a+b/log(x)+c*exp(-x)	Two Term Intercept
279	a+b/x^.5+c*log(x)/x	Two Term Intercept
280	a+b/x^.5+c/x	Two Term Intercept
281	a+b/x^.5+c/x^1.5	Two Term Intercept
282	a+b/x^.5+c*log(x)/x^2	Two Term Intercept
283	a+b/x^.5+c/x^2	Two Term Intercept
284	a+b/x^.5+c*exp(-x)	Two Term Intercept
285	a+b*log(x)/x+c/x	Two Term Intercept
286	a+b*log(x)/x+c/x^1.5	Two Term Intercept
287	a+b*log(x)/x+c*log(x)/x^2	Two Term Intercept
288	a+b*log(x)/x+c/x^2	Two Term Intercept
289	a+b*log(x)/x+c*exp(-x)	Two Term Intercept
290	a+b/x+c/x^1.5	Two Term Intercept
291	a+b/x+c*log(x)/x^2	Two Term Intercept
292	a+b/x+c*exp(-x)	Two Term Intercept
293	a+b/x^1.5+c*log(x)/x^2	Two Term Intercept
294	a+b/x^1.5+c/x^2	Two Term Intercept
295	a+b/x^1.5+c*exp(-x)	Two Term Intercept
296	a+b*log(x)/x^2+c/x^2	Two Term Intercept
297	a+b*log(x)/x^2+c*exp(-x)	Two Term Intercept
298	a+b/x^2+c*exp(-x)	Two Term Intercept

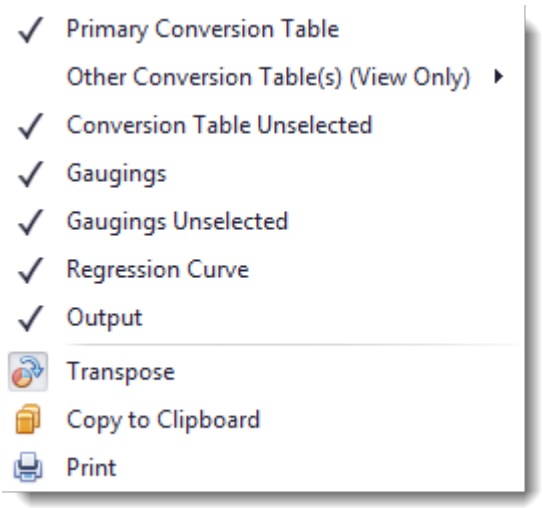
8.3.3.3 Regression Analysis

Regression analysis on data in a Conversion Table

To perform regression analysis on two variables a conversion table must exist (see Create a Conversion Table).

1. Click **Regressions** on the DataSight Ribbon. The Regressions Window opens.
2. On the Regressions window, view the list of conversion tables by clicking **Conversion Table** on the Menu Panel. The Conversion Table window opens.
3. To load a conversion table, click on its row and then click **OK**. The table will be displayed in the Conversion Table panel as well as graphically in the Regression Chart.

4. Click **Gaugings** in the Regression Group. Click **OK** to load all the Gaugings or select the desired Gaugings by checking the box(es) against each row, then click **OK**. To view the coordinates of a gauging point on the chart, hover your mouse over it and hold to display its label.
5. To develop a best "fit" Conversion Table, follow the iterative process below:
   i. Click **Gaugings** in the Regression group.
   ii. Load all the Gaugings or select the desired Gaugings by checking the box(es) against each row.
   iii. Then click **OK**.
   iv. To view the coordinates of a gauging point on the chart, hover your mouse over it and hold to display its label.
   v. Right click within the Chart to show the Regressions Chart context menu:



   All series are shown on the chart by default. Click on each series individually to toggle their display setting on or off. You can also **Transpose** the axes, **Copy** the chart to clipboard, or **Print** the chart directly.

   vi. (Optional) Click on the **Confidence Chart** tab. This shows the conversion table as the zero point and the Gaugings as a percentage off the curve.
   - The quality of the Gaugings is also represented by scaled error bars - the larger the error bars, the lower the quality of the gauging measurement.
   - Original Gaugings are represented by a Red scaled error bar, and Output Gaugings are represented by a Blue scaled error bar.
   - The Confidence chart is interactive. When you hover the mouse over a gauging, details regarding the gauging are listed.
   - You may also add confidence values from other Conversion Tables by clicking on Conversion Table to load them and electing to switch to Confidence Chart. Duplicated values are ignored in the output.

   vii. (Optional) To exit the Confidence Chart, click **Regression Chart**.
   viii. (Optional) Click **Shift** to perform a shift analysis (See Shift Analysis).
   ix. (Optional) Click **Transpose** to switch the axes of your curve. You can also right-click on the chart and select **Transpose**.
   x. (Optional) You can choose to copy values from the original table in the left panel into your output. This is helpful when only a subset of the Conversion Table rows needs to be manipulated. To do this, right-click on a row you wish to copy to the output and select **Copy Values to Output**. To select multiple rows or a range of rows, hold down CTRL or SHIFT respectively when clicking on the rows. Then copy values with the right-click menu.

- It is possible to ignore the copied rows from affecting your curve (as they are already added to the output), by right-clicking on the row(s) and electing to **Unselect**. To include an unselected row back into your curve, right-click on the row and click **Select**.

xi. (Optional) Click **Criteria** to apply start and end values on your Conversion Table x-axis and output increments for the regression analysis. You can elect to:

- **Automatically set start and end values**: the regression tool will use the lowest and highest values in the data as the start and end values. For a transposed curve, the start and end values apply to the original x-axis, not the x-axis post-transpose.
- Check **Use these values** and enter values manually.
- Enter a number of **Increments at each step** of the regression or enter a total **Number of increments** for the regression analysis.

Click **OK** to load your preferences.

xii. Click **Analyse** on the Regressions Ribbon Menu to model your curve against the Regression Models in DataSight. A list of Regression Models will open in a new window. Click **Analyse** to confirm you wish to carry out the analysis, otherwise click **Cancel**.

xiii. Select models on the right by clicking on them to find the best fit for your curve. The regression analysis will be completed using all the regression models according to a goodness of fit and the results are displayed to the right of the Regressions window. Selecting a model from the list will display the model graphically and present the R2 value.

- If you would like to view further statistical information for the selected regression model, double-click on a regression model from the list of Selected Models, which will display the selected Regression Model Details window.
- Full details for the selected regression model in the Regression Model Details window are only available for models that can be solved for the selected table.

xiv. Review the results, then select or unselect points on the original table and/or gaugings to achieve a better "fit".

See also:

- Save a Conversion Table
- Regression Settings
- Regression Models
- Regressions Layout
- Conversion Tables
- Shift Analysis

8.3.3.3.1 Save a Conversion Table

You can model your data using Regression Analysis and then save the results as a Conversion Table.

Save a Conversion Table

1. Perform a Regression Analysis.
2. Select the **Results** tab to display the finalised results of the selected model.
3. Highlight the value(s) from the Results that you wish to move across to the Output Table, right-click and select **Copy Values to Output**. Data in the **Output** tab is displayed in the Chart area in blue.

   To select multiple values, hold down CTRL or SHIFT and click on the rows.

4. The Output table will be displayed in the charting area and can be saved (as a DataSight Conversion Table) by clicking **Save** on the Quick Access Toolbar and entering the Conversion Table Name, the X and Y axis Labels, and the Period of Applicability (this is simply a set of reference dates for the user). To prevent overwriting of an existing table, the system date is automatically appended to the Conversion Table name upon saving. You may edit this as you wish. You can also assign the conversion table to a Site (Level 3).
5. When the relationship between your variables changes, you can elect to use differing regression models to build consecutive parts of the Conversion Table. Simply copy the selected rows of data from the Analyse Results Tab into the Output Table before saving.
6. You can add **Comments** about the new Conversion Table as required.
7. Click **Save** to save the Conversion Table. The Conversion Table will then be available for interpolation and use with other datasets.
8. You can construct the one conversion table from consecutive data ranges that vary in their modelled relationships. In this instance, you need to reiterate the process of including/excluding data points from the analysis and once each section is modelled, copying that regression data to the Output table as explained in step 2.

Note	If you wish to update any applicable data using the new conversion table (rating table) right away, then check the **Apply to existing data** box prior to saving the Conversion Table (See Data Conversion for more details).

8.3.3.3.2 Data Conversion

Applicable data can be converted immediately after saving the Conversion Table.

1. When you Save a Conversion Table, check the **Apply to existing data** box prior to saving the Conversion Table.
2. The Data Conversion window opens. Select an **Input Variable**. The values for this variable are converted according to the saved Conversion Table.
3. (Optional) Set an input **Flag**.
4. Click **Load Data** to view conversion results on a chart on the right.
5. Select an **Output Variable** from the drop down list to save converted results to. If the variable does not already exist on the level, it will be created there by appending to the database.
6. (Optional) Set an output **Flag.** The default setting will **Keep flag as it is** from the input variable.
7. Select the number of **Decimal Points** that you wish to use to format your Output Variable values. The default setting is 1 decimal place.
8. Click **Save** to apply conversion to the data. The progress bar runs until the process has completed.

Data can also be converted during Calculations using saved Conversion Tables (See Use a Conversion Table for more details).

8.3.3.4 Shift Analysis

Regressions model the relationship between two variables as defined by a Conversion Table. In this relationship, one of the variables is independent (x) and the other is dependent (y).

Regressions can be used in hydrographic analysis to review a conversion table against manual gaugings in order to refine the stage (water level) to discharge relationship or rating (see Test and Modify Rating Tables). In this case the stage or depth of water is the primary "independent" data shown on the x axis and discharge, "dependent" upon the stage measurement, is shown on the y axis.

Using DataSight's Regressions **Shift**, you reverse this process and use the discharge as the primary "independent" data set and shift the "dependent" measured stage data, to take into account site specific conditions such as ice or sedimentation. This allows you to "shift" stage data as required by the United States Geological Survey (USGS) Standard for the Analysis and Processing of

Surface-Water Data and Information. DataSight draws the shifted conversion table with a new reference where the curve axes are also transposed.

Apply Shift Analysis

1. In the Regressions window, load a **Conversion Table**.
2. Click **Shift** in the Regression group. A successful shift is indicated by yellow highlighted fields in your conversion table in the left panel.
3. Click **OK** to load your Gaugings with your shifted conversion table, or select gaugings of your choice by checking the selection box(es) against the Gauging(s) on the right.To view the coordinates of a gauging point on the chart, hover your mouse over it until its label is displayed. The gauging may be a single point measurement, and applicable over a certain period of time (see also Gage Height and Discharge).
4. Model your shifted conversion table using the following iterative process (See also Regression Analysis):
   i. Select the range of the curve that you wish to analyse using **Criteria**. To achieve the best results, the conversion table should be analysed in sections where there is no major break or inflection in the table.
   ii. Customise the chart using Regressions as you see fit for your curve.
   iii. (Optional) You can choose to copy values from the original table in the left panel into your output. This is helpful when only a subset of the Conversion Table rows needs to be manipulated.

      To do this, right-click on a row you wish to copy to the output and select **Copy Values to Output**. To select multiple rows or a range of rows, hold down CTRL or SHIFT respectively when clicking on the rows. Then copy the values with the right-click menu.

      It is possible to ignore the copied rows from affecting your curve (as they are already added to the output), by right-clicking on the row(s) and clicking **Unselect**. To include an unselected row into your curve, right-click on the row and click **Select**.

   iv. **Analyse** your table/rating with Regression Models.
   v. Review the results then select or deselect points on the original table and/or gaugings to achieve a better "fit".
   vi. When you are happy with the "fit", highlight a value you wish to move across to the Output Table, right-click and select **Copy Values to Output**. To copy all the values, press CTRL + A, and then copy values to output with the right-click menu.
5. Once the new shifted conversion table is finalised, click **Save** to save the values in a Conversion Table.
6. **Name** the new shifted conversion table.
7. Set the **Period of Applicability** if required.
8. **Apply to existing data** to apply conversion to data set immediately (See Data Conversion for more details), or alternatively use the saved conversion table at a later date in a Calculation (See Use a Conversion Table for more details).

See also:

- Conversion Tables
- Calculations

Example Computations

The suite of analysis tools in DataSight can be used to complete a range of meteorological and hydro-metric data computations. Simple scientific equations can be entered into the Calculation Tool formulae area, and data transformed accordingly. The combination of the Calculation and Regression tools can be used to overcome more complex problems such as corrections for sensor drift and backwater effects, and to create rating tables and transform water level to discharge data. Rainfall and stream

analysis curves, including flow duration and frequency curves, stage-discharge curves and intensity-frequency-duration curves are readily produced using these tools.

Several examples of these computations and processes are given hereafter.

- Air Density
- Dew Point Temperature
- Calculating Evapotranspiration
- Converting Depth to Discharge
- Test and Modify Rating Tables
- Ratings Adjustment
- Flow Duration Curves
- Calculate the Rate of Change
- Subtracting Catchment Flows

8.3.4.1 Air Density

The calculation of the Density of Air is an example of a simple mathematical computation that can be undertaken with the Calculation Tool.

Air Density can be calculated using the equation **ρdry air = P / R x T**

where:

ρdry air = Density of dry air (kg/m3)

P = air pressure (Pa)

R = Specific gas constant for dry air, 287.05 J/(kg. K)

T = Temperature (°K)

Calculate Air Density

1. Ensure the Variables Air Density, Air Pressure and Temperature are displayed in your datasheet.
2. Right-click on the datasheet and select **Calculation**.
3. For **Master Variable A**, select the **Level** in which your data resides and the **Variable** Air Pressure.
4. Click **Add Variable** on the DataSight Ribbon and select the same **Level** and Temperature for **Variable B**.
5. Enter the formula used to calculate air density in the **Formula Box** in the Output Panel: Density = (A*100) / (287.05 * (B + 273.15)).

Note	This formula assumes that the units of Air Pressure are in mbar or h Pa, and the units of Temperature are stored as °C, so you need to multiply the A by 100 to convert to Pa, and Temperature °C is converted to °K by adding 273.15 to B.

6. Select the **Output Variable**, Air Density at the desired level.
7. Select the Calculation **Chart** tab, where you can review the calculation input variables and the result of the proposed calculation.
8. Similarly, select the Calculation **Result** tab to review the data in grid view, before completing the calculation.

9. Select the **Database** check box and click **Update**.
10. Enter comments about your processing, if any. Then click **OK**.

Note	This option saves the Calculation Tool window variable/s and formula to a template. You do not need to save to complete the calculation.

8.3.4.2 Dew Point Temperature

The calculation of Dew Point Temperature is another example of a computation that can be undertaken in the Calculation Tool. The dew point is the temperature below which the water vapour in a volume of humid air at a constant barometric pressure will condense into liquid water. Condensed water is called dew when it forms on a solid surface.

Dew Point Temperature is calculated using the variables Temperature and Relative Humidity. The calculation is based on the Magnus-Tetens formula, over the range:

0° C < **T** < 60 °C

0.01 < **RH** < 1.00

0° C < $\mathbf{T_d}$ < 50° C

where:

T is the measured temperature [°C]

RH is the measured relative humidity

and $\mathbf{T_d}$ is the calculated dew point temperature [°C]

The dew point temperature is derived using:

$$T_d = \frac{b\left(\mathrm{Ln}(RH) + \frac{aT}{b+T}\right)}{a - \mathrm{Ln}(RH) - \frac{aT}{b+T}}$$

with a = 17.27

and b=237.7 [°C]

Calculate Dew Point Temperature

1. Ensure the Variables Temperature, Relative Humidity and Dew Point Temperature are displayed in your datasheet.
2. Right-click in the datasheet area and select **Calculation**.
3. Select Temperature as **Master Variable A** by selecting the Level and Variable from the populated drop-down lists.
4. Add a second Variable by clicking **Add Variable**.
5. Select Relative Humidity as **Variable B**.
6. In the Output Panel of the Calculation window enter the **Formula** required to complete the calculation.

(237.7* (((17.27*A) / (237.7+A)) + ln(B/100))) / (17.27 -(((17.27*A) / (237.7+A)) +ln(B/100)))

Where A=Temperature and B=Relative Humidity.

7. Select the **Output Variable** Dew Point Temperature at desired level.
6. Select the Calculation **Chart** tab, where you can review the calculation input variables and the result of the proposed calculation.
7. Similarly, select the Calculation **Result** tab to review the data in grid view, before completing the calculation.
8. Select the **Database** box and click **Update**.
9. **Close** the calculation tool. The Dew Point (°C) variable has been populated within the specified datasheet.

8.3.4.3 Calculating Evapotranspiration

The calculation of evapotranspiration (ET_o) in DataSight can be undertaken by following the equation based on the Hargreaves Model. Whilst simplistic when compared to the more complex Penman-Monteith equation, correlation results with R^2 >0.9 have been achieved (Wu, I. P., 1997, A Simple Evapotranspiration Model for Hawaii: The Hargreaves Model. *Engineer's Notebook no. 106.*).

The Hargreaves Model

$$ET_o = 0.0135(T_m + 17.78)R_S\left(\frac{238.8}{595.5 - (0.55 * T_m)}\right)$$

Where:

ET_o = Evapotranspiration in mmd^{-1}

T_m = Mean daily temperature in °C

R_S = Solar radiation in $MJ/m^2/day$

This model can only be applied to a complete previous 24 hour dataset.

To use this model, the following variables are required:

- T_m as mean daily temperature in °C;
- R_S as daily solar radiation in $MJ/m^2/day$; and
- ET_o as evapotranspiration in mmd^{-1}

DataSight can readily accommodate other evapotranspiration models.

Calculate Evapotranspiration

1. Ensure that data containing T_m and R_S values are visible in your datasheet.
2. Right-click in the datasheet and select **Calculation**.
3. In the Calculation window, select the appropriate **Level** for Master Variable A.
4. Select Mean daily temperature as **Master Variable A**.
5. Add a second Variable by clicking **Add Variable**.
6. Select Solar radiation as **Variable B**.
7. Enter the **Formula** required to complete the calculation.

```
0.0135*(A+17.78)*B*(238.8/(595.5-(0.55* A)))
```

where A = Mean daily temperature and B = Daily Solar radiation

8. Select the **Output Variable** Evapotranspiration at desired level.
6. Select the Calculation **Chart** tab, where you can review the calculation input variables and the result of the proposed calculation.
7. Similarly, select the Calculation **Result** tab to review the data in grid view, before completing the calculation.
9. Select the **Database** box and click **Update**.
10. **Close** the calculation tool. The Evapotranspiration (mmd^{-1}) variable has been populated within the specified datasheet.

8.3.4.4 Converting Depth to Discharge

Hydrologists routinely use measurements of Depth and Discharge to produce what is known as a Rating Table or Curve. The Rating Table is a mathematically modelled relationship between the water surface elevation and the quantity of water moving through that location. These rating tables are typically derived from both hydraulic theory and actual field measurements of discharge taken at various water elevations, and they can be applied to the time series of water level record to determine a time series of discharge.

Before undertake this conversion, you need to have an applicable rating table, i.e. a DataSight Conversion Table, in the DataSight Conversion Table module.

Create a theoretical Rating Table in DataSight

(See also Create a Conversion Table for more details).

1. Open **Conversion Tables**.
2. Enter Depth and Discharge as the **X** and **Y** labels, respectively. This can be undertaken manually or by pasting directly from an electronic file to populate the conversion table.
3. Enter dates for the **Period of Applicability**.
4. **Save** the conversion table.

Use a Rating Table to Convert Depth to Discharge

1. Ensure the Variables Depth and Discharge are displayed in your datasheet.
2. Right-click on the datasheet and select **Calculation**.
3. In the Calculation window select the appropriate **Level** for Master Variable A.
4. Select Depth as **Master Variable A**.
5. Check **Use Conversion Table**.
6. Select the **Saved Conversion Table** from the drop-down list.
7. Select the **Conversion Method.**
8. When completing conversions using a Conversion Table, the **Formula** entered can simply be A (or lower case, a).
9. Select the **Output Variable** Discharge at desired level.
6. Select the Calculation **Chart** tab, where you can review the calculation input variables and the result of the proposed calculation.
7. Similarly, select the Calculation **Result** tab to review the data in grid view, before completing the calculation.
10. Check the **Database** button and click **Update**.

11. **Close** the Calculation Tool and open/refresh your datasheet. The Discharge variable has been populated within the datasheet.

8.3.4.5 Test and Modify Rating Tables

Rating Tables are mathematically modelled relationships between depth and discharge for a water body. Using DataSight's analysis tools, you can easily test the applicability of a pre-existing rating table to measured Gauging data. DataSight's Regression module can be used to generate a Confidence chart for the analysis and validation of rating equations. The regression analysis can be performed on the Gauging data, the Conversion Table data or both, and you can then adjust the modelled relationship and save it. An additional review of a ratings table can be undertaken in the Calculations Tool, by executing two data conversions and calculating the difference between the two tables.

Use the Regression tool

You require:

- A pre-existing rating table, known as a Conversion Table within DataSight. Refer to Create a Conversion Table.
- The Conversion Table must also be assigned to a specific site.
- Gauging Data for that site. Refer to Add Gauging Data.

1. Open **Regressions**.
2. Click **Conversion Table** to select the Conversion Table for analysis. You will be presented with a list of available Conversion Tables in the database.
3. Select the Conversion Table you wish to use for analysis and click **OK**. Within the Regression Tool, the Conversion Table area will be populated with data from the selected Conversion Table and the Regression Chart area will display the Conversion Table graphically.
4. Click **Gaugings** to select the Gaugings for analysis.
5. Select individual Gaugings by checking the boxes against their rows. This will populate the Gauging Panel of the Regressions Window, allowing regressions to be carried out on those selected, and plot the Gaugings graphically in the Regression Chart.
6. Select **Criteria** to define the upper and lower boundaries of the result set produced during analysis, along with the required number of increments required for the result set.
7. Once you have selected the Conversion Table and Gaugings you wish to use, click **Analyse** to begin regression analysis. A list of the available Regression Models will be displayed.
8. Select the applicable **Model**, or select **All Models**, or create your own Model using the in-built regression models.
9. Click **OK**. DataSight will complete the regression analysis and display the results of each model graphically. In the right panel, details of the Regression Models will be displayed. A graphical representation of the model will be displayed in the Regression Chart window in the middle of the Regression Tool. The chart legend is standard, displaying the six different series viewable in the Regression Models panel. Model details are displayed at the bottom of the Models window (at the right). This includes the R2 value, p-Value, Standard Error and Sum of Squares information. Further details can be found by clicking the Details button.
10. Click on the **Confidence Chart** tab. This shows the rating table as the zero point and the Gaugings as a percentage off the curve. The quality of the Gaugings is also represented by scaled error bars - the larger the error bars, the lower the quality of the gauging measurement. Original gaugings are represented by Red scaled error bars and Output gaugings are represented by Blue scaled error bars. The Confidence chart is interactive. When you hover the mouse over a gauging, details regarding the gauging are listed.

11. Return to the **Regression Chart** tab. Once you have analysed the relationship between the rating table and your measured Gauging Data, you may wish to create a new Rating Table.
12. Scroll through the regression models from the Models tab on the right to identify the curve that lines up suitably with the existing data points.
13. Select the **Analyse Results** panel to display the results of the selected model.
14. Highlight the values you wish to move across to the Output Table, right-click and select Copy Selected Into Output. Data in the Output Table is displayed in the Chart area in blue.
15. The Output Table will be displayed in the charting area and can be saved (as a DataSight Conversion Table) by clicking the Save button on the toolbar and entering the Conversion Table Name, the X and Y axis Labels, and the Period of Applicability. You can also assign the conversion table to a Site (Level 3).
16. Click **OK** to save the Conversion Table. The Conversion Table will then be available for interpolation and use with other datasets.
17. You can construct the one conversion table from consecutive data ranges that vary in their modelled relationships. In this instance, you need to reiterate the process of including/excluding data points from the analysis and once each section is modelled, copying that regression data to the Output table.

Use the Calculation tool

Additional review of the ratings is available via the Calculation Tool. By executing two data conversions, you are able to calculate the difference between the two tables.

8.3.4.6 Ratings Adjustment

For a given stream gauging site, rating tables can be developed that define the relationship between water depth and the stream discharge or flow. The correct application of these rating tables is dependent upon the stream dimensions remaining constant. In reality, river and stream cross sections can change as a result of scouring of the channel bottom, deposition of sediment, growth of vegetation and so forth. To accommodate these changes hydrographers can perform what is termed a Ratings adjustment - a modification of the ratings table that has a period of applicability, and then apply that modified rating table to the water depth to give a more applicable discharge values.

Identify and flag data

1. Select the Level and the period of hydrographic data you wish to review and flag using the **Filter Panel** or otherwise. Copy your filter conditions for the datasheet.
2. Click **Chart** in the View group of the Menu ribbon.
3. Drag datetime on to the x axis and your depth variable on to the y axis (See Charts for more details).
4. Paste your filter conditions from the datasheet in the filter panel under the chart.
5. Set **Flags** which will identify the data that requires a rating shift and which can remain unaltered e.g. Flag = Ratings shift and Flag = Verified data (See Flags for more details).
6. Carry out a Graphical Flagging of the data in your datasheet as desired.
7. Click **Save** on the Quick Access Toolbar to save your data. Then **Close** the graphical flagging tool.
8. In the **Datasheet** tab in the Menu Panel, click **Refresh Datasheet**. Then in the reloaded datasheet, check that the data flags are showing correctly (cell colours).
9. Go back to your **Chart** and drag another depth variable onto the y axis.
10. In the Filter Panel for this new depth series, add filter condition **Flag Equals Ratings Shift**.

11. Right-click on the Chart and select **Chart Editor**.
12. Go to **Series** page. Select your depth variable from the drop down list and adjust the properties as required.
13. When you return to the chart, you should be able to see all the data points to which the ratings shift will be applied.

Develop and apply the modified ratings table

1. Open the **Regression** Tool.
2. Click **Conversion Table** in the Menu Panel and select the appropriate conversion table (old rating table) to use from that site.
3. Click **Gaugings** in the Menu Panel. Load all the gaugings or select a gauging by checking the box against its row.
4. Once both the conversion table and gaugings table are selected, the regression chart is drawn and the confidence chart is populated.
5. Identify the outliers in the data set, by hovering the mouse over the plotted confidence point and reading off the gauging information. Use zoom as required.
6. Unselect the box in the gauging list against the gauging identified as an outlier. As a general rule, remove all gaugings that sit outside of the 10% confidence limit.
7. (Optional) You may also exclude data from the original conversion table, depending upon how closely the gaugings follow the original. Unselect the boxes in the conversion table list against the records identified as outliers.
8. (Optional) You can also unselect or select a portion of the Conversion Table. Left click and highlight the rows you wish to remove, then right-click and choose **Unselect**.
9. Select the **Criteria** for the modelled regression. You may wish to target only the area of the original conversion table (old rating table) where you have removed points.
10. Select the two depths between which you wish to model and choose the depth increment for the modelled data, for example 0.1m.
11. View the tabulated results in the Analyse Results panel on the right.
12. Right-click on the table to save these results to the Output Table panel.
13. Click **Save** to save the new rating table with a new name, appropriate x (depth) and y (discharge) labels and a period of applicability which corresponds with the time period of the data that requires the time shift.
14. Choose to assign the new ratings table to the site that the data originated from and then also choose to **Apply to Existing Data**. In doing so, you bring up another Window called the Data Conversion Window.
15. In the Data Conversion Window, you select the depth variable, the tag you want to use which would be Ratings shift, an output variable which will be Discharge, and select another tag for the discharge data which might be something like Requires final review.
16. Click the **Save** button and then you are prompted to update the database. Click **Yes**.
17. Close the Data Conversion Window, and close the Regression Tool.

You can now view the modified discharge data in the datasheet, highlighted as *Requires final review* .

8.3.4.7 Flow Duration Curves

To establish representative low flows and floods (high flows) for a river course a hydrologist will analyse the frequency of daily flows in the form of a flow duration curve. A flow duration curve is a plot of discharge versus the amount of time that a certain discharge was exceeded. For most studies the data needed for this analysis is the daily average flow (the average discharge or flow for each day), calculated using instantaneous discharge data as shown in this example.

Calculate Daily Average Flow

1. Ensure the Variables required for the calculation **Discharge** can be viewed in your datasheet and two variables to output to, **Daily Average Flow** and **Percent of time exceeded** exist in your list of Variables.
2. Right-click on the datasheet and select **Calculation**.
3. Select **Master Variable A** as Discharge.
4. Enter the **formula**: DAILYAVGA
5. Select the **Output variable** Daily Average Flow at the desired level.
6. Select the Conversion **Chart** tab, where you can review the calculation input variables and the result of the proposed calculation.
7. Similarly, select the Conversion **Result** tab to review the data in grid view, before completing the calculation.
6. Check the **Database** box in the Update section.
7. Then click **Update**. Once the calculation has run you will have calculated the Daily Average Flow using the instantaneous discharge data.
8. (Optional) To continue to calculate Percent of time exceeded as directed below, please keep the Calculation window open.

Calculate Percent of Time Exceeded

To calculate the percent of time exceeded requires the use of the **RANK** function. RANKDSC is used to sort (rank) the data series from the *largest value to the smallest value* .

The formula (RANKDSCA/(n + 1))*100 will rank the average daily discharge for the period of record from the largest value to the smallest value, involving a total of n values, where n equals the number of points or events for the period of flow records being analysed. Using this formula, you are also ranking the point as a percentage.

In the Calculation window:

1. Change **Master Variable A** to Daily Average Discharge.
2. Enter the following formula (RANKDSCA/(n + 1))*100 where n is the total number of indexed records.
3. Select the **Output Variable** Percent of time exceeded.
4. Select the Calculation **Chart** tab, where you can review the calculation input variables and the result of the proposed calculation.
5. Similarly, select the Calculation **Result** tab to review the data in grid view, before completing the calculation.
6. Check the **Database** box in the Update section.
7. Then click **Update**. Once the calculation has run you will have calculated the Percent of time exceeded.
8. **Close** the Calculation window.

Create a Flow Duration Curve

1. Click **Chart** in the View group of the Menu ribbon.
2. Drag the **Percent of Time Exceeded** variable on to the x-axis.
3. Drag the **Daily Average Flow** variable on the y-axis. Your data should be ready on the chart momentarily.

8.3.4.8 Calculate the Rate of Change

The formula ROFC(x) allows you to calculate the per second Rate of Change from one data point to the next, where x = the number of points. For example, the formula ROFCA(3) will calculate the per second rate of change for variable A --over the previous-- back three (3) points. Multiplying the output by number of seconds allows you to calculate the rate of change over longer time intervals. For example, the formula ROFCA(3)*3600 calculates the hourly rate of change for variable A over the previous three (3) points. This calculation is extremely useful for calculating the rate of change in river height as it occurs.

Create a Rate of Change Calculation

1. Ensure the variables **Depth** and **Rate of Change** are visible in the datasheet.
2. Right-click in the datasheet area and select **Calculation**.
3. Select Depth as **Master Variable A**.
4. Enter the formula: IF(ROFCA(3)*3600>0.1,IF(ROFCA(3)*3600>2*ROFCA(6)*3600,20,15),20)
5. Select the output variable **Rate of Change**.
6. Select the Calculation **Chart** tab, where you can review the calculation input variables and the result of the proposed calculation.
7. Similarly, select the Calculation **Result** tab to review the data in grid view, before completing the calculation.
6. Check the **Database** box in the output section.
7. Click **Update**. Enter comments about your processing, if any. Then click **OK**.
8. Once you have completed the calculation you can **Save** the Calculation Template (from the Quick Access Toolbar) if you wish to use this specific calculation again. The Calculation can be named.

The Calculation can be scheduled to run on a routine basis using Tasks.

See also:

- Automate Your Tasks
- Calculation Templates

8.3.4.9 Subtracting Catchment Flows

At times you may wish to determine the difference in flow or discharge between an upstream and a downstream point in a river catchment. This requires the subtraction of the upstream flow from the flow at a downstream point in the river.

Determine the time of travel between sites

1. Identify the monitoring sites that you wish to review by selecting the **Level** under which the sites can be found. This selection will become the All-series filter. You may wish to select a time period also to remove as many irrelevant sites as possible.
2. Drag the datetime variable to the bottom x-axis of your chart.
3. Drag and drop the flow or discharge variable onto your chart.
4. In the Filter Panel click on the Discharge Variable Tab.
5. Add filter conditions specific to your first site (e.g. Level2/Level 3 selections).
6. Drag and drop another flow or discharge variable onto your chart.
7. Right-click on the Chart and select **Chart Editor**.
8. Click on the series and rename the as the site name for convenience.

9. Select the next series tab, and change its filter conditions to specify the next site.
10. You would expect that the Upstream site will have a Lower flow, with an earlier peak in hydro graph and the downstream site will have a greater flow, later peak in hydrograph.
11. Determine the time difference in the hydrograph peaks in seconds by zooming into your chart. This number, in seconds, will be entered into a conversion formula, and is represented here as N.

Determine the difference in water volume between the two sites

1. Open **Calculations** from the Chart.
2. In **Master Variable A** select the downstream site, then pick up depth, and select the rating (conversion) table you want to use for that site.
3. Add a new **Variable B**, select the upstream site, then pick up depth, select the rating (conversion) table for that site.
4. Click in the formula bar and type **TIMEDIFFA**. This determines the time increment between consecutive points in the depth variable A at the downstream site. Click on the index button in the output area to see the result for each step. When using event based logging where data is not equidistant, the time diff function will pick up the difference in time between each record.
5. Continue to write the formula. Multiply timediffA by variable A; TIMEDIFFA * A This part of the formula converts the flow into a volume of water rather than flow rate. For any indexed point, the formula gives the volume of water that has passed that individual point. You should note that the depth variable A has been converted to flow using the ratings table.
6. Subtract the upstream site. Continue to type into formula bar "minus TIMEDIFFB*(VALUEBYTIMEB(N)). This part of the formula gives the time difference between consecutive points for variable B (from the upstream site) multiplied by the flow for each of those records.
7. Check that the formula is correct. It should read **TIMEDIFFA*A-TIMEDIFFB*(VALUEBYTIMEB(N))**
8. The formula in total gives you the difference in volume between the upstream site and the downstream site - the additional volume of water on the downstream site.
9. Select an output variable e.g. **Discharge (Difference)**.
10. Check the **Database** box in the output section.
11. Click **Update**. Enter comments about your processing, if any. Then click **OK**.
12. Once you have completed the calculation you can **Save** the Calculation Template (from the Quick Access Toolbar) if you wish to use this specific calculation again. The Calculation can be named.

Display the difference in discharge

13. Within the Chart, you can right-click onto properties and overlay the two flow measurements from the upstream and downstream sites (move series A to right hand axis, move series B to right hand axis leaving the newly calculated value of volume difference plotted on the left hand axis.
14. As get close to an event if the time of travel between the peaks is out, which can happen between high flow and low flow, you will get a drop in volume before the event starts and vice versa after an event sometimes you can see the flow has dropped off more quickly.
15. You would expect to get a large positive flow downstream compared to the upstream site.

8.3.4.10 Alarm Calculation

The example Alarm Calculation provided is that of a gauging station used to monitor water levels for flooding, and where an organisation needs to be notified periodically about changes in the water level.

The primary configuration steps, completed in the following order, are:

1. Identify the Alarm conditions.
2. Define Alarm calculation dataset.
3. Define Alarm calculation formula.
4. Enter the Alarm Severity expressions and confirm their index values.
5. Test the Alarm calculation.
6. Configure the Alarm Task.

Identify the Alarm Conditions

Our organisation has categorised the way they wish to be notified about changes in water level at their gauging station as follows:

1. **Flood Watch** for water levels > 1m but < 2m.
2. **Flood Warning** for water levels >= 2m but < 3m.
3. **Minor Flood Level** for water levels >= 3m but < 4m.
4. **Moderate Flood Level** for water levels >= 4m but < 5m.
5. **Major Flood Level** for water levels >= 5m.

A DataSight Alarm requires the result of the formula to be an integer value equal to or greater than zero, where zero means the alarm is not activated.

The number for each item above will be used as its Alarm Severity index value, with the Alarm Severity condition name shown in bold text.

Define Alarm Calculation Dataset

With the above five conditions defined, we then define what data (Variables) we need to bring into the Alarm calculation. We need to consider the scheduled timing of each automated step relative to each other.

This example organisation is importing water level data files every fifteen minutes, so we would set our datasheet to display the last twenty minutes of data. We will be running the Alarm Task five minutes after the data has been imported to ensure we have left enough time for the import task to run and the data to be available.

Our filter on the datasheet, which we will save as the 'Flood Monitoring Alarm' Saved View, will be:

[Level 1] Equals My Project

[Level 2] Equals Stream Monitoring

[Level 3] Equals Monitoring Site

[Minute - Last Minute(s)] Equals 20

[Variable] Equals Water Level

Define Alarm Calculation Formula

The next step is to define the formula to be used for the calculation in order to generate integer values. This is achieved by using nested IF statements.

With the datasheet filter defined and the datasheet saved, open the Calculation Tool and perform the following steps:

1. Select the **Monitoring Site** Level from the drop-down list of **Levels**.
2. Select **Water Level** for the Master Variable A from the drop-down list of **Variables**.
3. Click within the **Formula** text box in the Result panel and enter **IF(A<1,0,IF(A<2,1,IF(A<3,2,IF(A<4,3,IF(A<5,4,5)))))**.
    a. This formula will result in an integer value (from 0 to 5 inclusive), corresponding to an Alarm Severity index value, being generated by the calculation.
    b. Although we haven't defined a result of zero for our Alarm Severity, zero is used by the calculation alarm to show that the alarm is not active.
4. Click **Save** on the Quick Access Toolbar or press CTRL+S. The Calculation Templates Window opens.
5. Enter a name for your template; we will save this one as 'Flood Monitoring Alarm'.
6. Click **Save**. Your Calculation Template is now saved.

Enter Alarm Severity Expressions

Once the Calculation Template has been saved, we can now enter the Alarm Severity information and confirm the index values. To do so, perform the following steps:

1. Click on the type of **Output** from the drop-down list. Select **Alarm**.
2. Enter the Expression Name 'Water Level', which will be displayed on the notification emails providing a description of the formula being used.
3. Click the **three ellipses** button located next to the Output drop-down to display the Alarm Severity window.
4. Click in the **Severity** field for the first row and **enter the description "Flood Watch"** for the first Alarm Severity. You will notice that the Index field is automatically populated with the next available Alarm Severity index value, starting at 1.
5. (Optional) Click the **Highlight** field to display the colour picker and select a **colour** for the Alarm Severity.
6. Click either the **Append** or **End Edit** button on the navigation bar to confirm your changes and display the next Alarm Severity row for editing.
7. Repeat steps 3 to 5 above to add the other four Alarm Severity expressions: **Flood Warning**, **Minor Flood Level**, **Moderate Flood Level** & **Major Flood Level**.
8. Once you have finished entering your Alarm Severity expressions, click **OK** to save your changes and close the Alarm Severity window.
9. Click **Save** on the Quick Access Toolbar or press CTRL +S to save your Calculation Template.
10. Clicking the **Update** button will execute the Alarm Calculation on the current dataset, displaying the current Alarm Severity expression. Try loading different datasets and comparing the expected Alarm Severity with that displayed to ensure that your combination of formula and Alarm Severity expression are producing the desired results.

Test Alarm Calculation

Now that we have the Alarm Calculation Template saved, we should test that it will work as expected. This is best achieved by having either an existing historic dataset which would have resulted in notifications being sent, or creating a dummy dataset which should result in notifications being sent for each Alarm Severity level for both escalation and de-escalation of your alarm. For this example we will assume there is existing data which can be used. To test your alarm calculation, perform the following steps:

1. Load a datasheet with the data set to be used for testing.

2. Open the Calculation Tool and load your saved Alarm Calculation Template.
3. Review the Level and Variable selections for your Master Variable A, and update if required.
4. Check the resultant Alarm Index value in the Result preview field is displayed as expected for the data record.
5. Further, review the Results Tab to display the Alarm Index for each record in the data set.
6. Click Update and check that the displayed Alarm Severity Expression matches your expected results for the dataset loaded.

Configure Alarm Task

We are now ready to create the Alarm Task which will generate and send the email notifications.

We need to define:

- how often the Task is executed.
- how often to re-send the email notifications.
- the reset period is for clearing the alarm after it is no longer active before a new alarm is generated.

Our example organisation would like to be notified when the alarm becomes active, but then only receive notifications once an hour after the initial notification. They would also like the alarm to be reset/cleared for half an hour before the alarm is activated again.

To configure this example Alarm Task, perform the following steps:

1. Click Tasks in the Automate Group on the DataSight Ribbon. The Tasks grid view will appear in the Main Panel.
2. Click **New** on the DataSight Quick Access Toolbar. The task selection window will appear.
3. Click the Active **check-box** to enable the Task.
4. Type in 'Flood Monitoring Alarm' as the **Description** for the task.
5. Select the **Alarm** task type.
6. Select **ALARM based on Calculation Result** for the Alarm Activate Condition.
7. Select the **'Flood Monitoring Alarm'** Saved View datasheet from the **Filter From** drop down list.
8. Select the **'Flood Monitoring Alarm'** saved calculation template from the **Calculation** drop down list. A calculation template will only be displayed in the drop down list if Alarm has been selected as the calculation template's output type.
9. Enter 3 for the **Resend email every # iterations** value. The time shown in brackets is the Task's recurrence period multiplied by the number of iterations. As we have yet to set the recurrence period, this value is currently incorrect.
10. Enter 30 for the **reset period**, which is how many minutes must elapse while the Alarm is not active before a new Alarm will be generated.
11. Enter the desired email address in the **Recipient(s)** field. To enter more than one email address, separate each address with a comma.
12. Set the **Recurrence** interval to 20 minutes. You will notice that the resend time shown in brackets from step 9 above is now showing the correct value of 60 minutes (20 minutes * 3 iterations).
13. Click **OK**.
14. Click **Save** in the Quick Access Toolbar to save the Alarm Task.

Note	Your Alarm formula can include any number of Variables and References as needed, and you can use any combination of the Calculation Tools mathematical and statistical functions in your Alarm formula, as long as the result generated is an integer value of zero or greater.

There is no need to define the email Subject or Body as these are automatically set by the Alarm Task.

See also:

- Alarm Severity
- Automatically Email Alarm Notifications

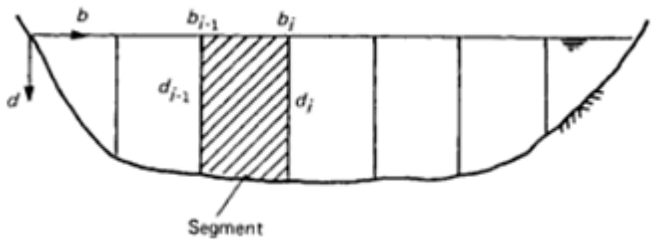
Gauging Calculations

Specific to hydrographic data, DataSight provides a Gauging management area for the storage and calculation of stream gauging measurements.

This module comes complete with a set of predetermined calculations to obtain the Mean Staff Gauge Height, Total Discharge, Total Area and Mean Velocity from gauging data. A cross section diagram displaying the depth profile, observation points, velocity profile, and distribution of discharge per panel is produced for each set of calculations. Each of the velocity observation points can be clicked to reveal more detail about the velocity measurements in the panel.

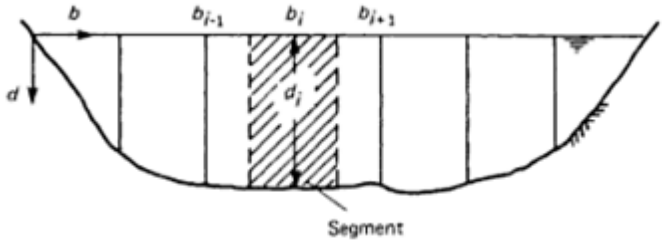
The calculation of the discharge from velocity and depth measurements is undertaken using one of two methods. The Mean section method uses the mean velocities and depths at the subdivision point, while the Mid section method uses averages of the mean velocities in the verticals and the width of the sub divisions as shown below.

Mean Section Method: Averages of the mean velocities in the verticals and of the depths at the boundaries of a section sub-division are taken and multiplied by the width of the sub-division or segment. b_i is the distance of the measuring point (i) from a bank datum and there are n-sub-areas.



$$Q = \Sigma q_i = \Sigma\, \bar{v}.a = \sum_{i=1}^{n} \frac{(\bar{v}_{i-1} + \bar{v}_i)}{2} \quad \frac{(d_{i-1} + d_i)}{2} \quad (b_i - b_{i-1})$$

Mid Section Method: The mean depth and velocity measured at a subdivision point are multiplied by the segment width measured between the mid-points of the neighbouring segments, with n being the number of measured verticals and sub-areas. In the mid-section calculation, some flow is omitted at the edges of the cross-section, and therefore the first and last verticals should be sited as near to the banks as possible.



$$Q = \Sigma q_i = \Sigma \bar{v}.a = \sum_{i=1}^{n} \bar{v}_i.d_i \ \frac{(b_{i+1} - b_{i-1})}{2}$$

In DataSight, the calculated results are continuously refreshed after adding or editing Chainage measurements and are displayed in the same measurement units as the data being entered. There is also an option to enter these values manually by clicking the Manual Override check box.

9 Output Your Data

DataSight has several features that allow you to easily communicate your data.

Print or export your current data selection

This data can be on the Main Panel, whether it is in a datasheet, grid view or a chart.

- Print your data to retain as hard copy.
- Export your data to retain as electronic copy.
- Exported data can be opened in other software programs.
- You can edit the data external to DataSight.
- You can easily email the exported file to a colleague or client.

Copy files from the database

- You can save a copy of any file, for example, a raw data file, or a construction image, that has been saved to your database.

Create a standard electronic or hardcopy report

- You can elect to use some of DataSight's inbuilt Summary Reports.

Create customised report templates

- Using the Report Wizard or the Report Designer you can create your own report templates and use them in DataSight.
- You can combine a number of DataSight charts, tables and text – extracted from the database - to produce a multi-page document.
- You can output this document to printer, screen or file.
- Reports can be run and saved in *printer-friendly* formats such as PDF formatted for European (DIN) or North American (Letter/Legal) size paper.
- Reports can also be saved in text, CSV, Microsoft Excel formats that provide easy dissemination.
- You can output to file in both text and spreadsheet compatible format.

Print Your Data

DataSight offers standard print methods to print the on-screen datasheet or chart 'as is' to the Printer.

You can modify various print parameters to alter the document depending upon the Printer selected from the drop down Printer combobox.

See also:

- Print Your Data
- Print Your Chart

Datasheet

1. Ensure that the datasheet view that you wish to print is selected in the Main Panel.
2. Show the data you wish to print by using the Filter panel. All data within the datasheet will be printed to the Print dialogue by default.
3. Right-click on the datasheet and select **Print**. The Print dialogue will be invoked.
4. Select your **Printer** from the dropdown combobox. Change its **Preferences** if required.
5. Specify the **Number of copies** and whether you wish to **Collate** copies.
6. Specify the **Page range** for printing.
7. Specify the **Paper source** which is automatically selected by default.
8. To also save a printed copy of your data to file, click the **Print to File** check box.
9. Enter your File name in the **File path** text box.
10. If you wish to specify your folder location click **...** at the end of the text box.
11. On the invoked Save As dialogue, locate a folder where you want to store your file, enter the document's name and click **Save**.

    Your document will be saved with the .prn file extension. Note that this extension will be added to the file name even if you enter another one.
12. Click **Print**.

Note	If you try to print a document whose margins are outside of the printable area, you will see a warning message. If you are sure that your printer supports the specified page margins, click Yes to print the document anyway. **Print to File** If you have modified a document and may need to print more than once, you can also save the document to a file on disk. You can then simply load your file and print it out, without having to apply the same changes again.

Chart

1. Ensure that the chart that you wish to print is selected in the Main Panel.
2. Right-click on the chart and select **Print**. The Chart Print Preview will open.
3. Select your **Printer** from the dropdown combobox. Change its **Setup** as required.
4. Specify the **Page Orientation** and the **Margins**.
5. Specify the **Format** for printing. Change the Print Background, Quality, Proportional and Grayscale formats. You can also specify the Resolution.
6. Click **Print**.

Note	When printing to Grayscale printers, you should take care that the colours of the Chart are easily distinguishable when translated to shades of grey. To help, you could add Brush styles to the Chart Series to more easily distinguish Series when printed. You can also print Grayscale Charts to colour printers using the Grayscale property. Depending on the Printer Driver selected, the graph may be printed as a picture to File (e.g. pdf drivers).

Export Your Data

In most cases, exporting to an electronic file in DataSight only needs selection of the file type and a destination filename.

See also:

- Export a datasheet
- Export a chart
- Export a grid view
- Export Calculation results or chart

Datasheet

Export data in a datasheet

1. Ensure that the datasheet you wish to export is open in the Main Panel.
2. Select **Export** on the DataSight Ribbon. You can also right-click on the datasheet and select **Export**.
3. From the export list, select your format (csv, rtf, pdf, txt, xls, xlsx, html). Then the Save as dialogue box appears.
4. Navigate to a chosen folder, name your file and click **Save**.

Note	Refer also to Exporting for Specific Export Format Options. All viewable data with the grid itself is exported. Data in columns placed in the Group Header or Column Chooser is not exported.

Chart

There are several methods by which you can choose to export a chart. You can copy a chart and paste it as a Windows MetaFile to another application. You can also save your chart to file as an image.

Copy chart to clipboard

1. With your cursor anywhere on the chart, right-click and select **Copy to Clipboard**.
2. Navigate to your open application right-click and **Paste**.

Export chart to a file

1. With your cursor anywhere on the chart, right-click and select **Export**.
2. The Export Chart window opens.
3. Select your **Format** from the drop down list.
4. Select the **Colours** you want to export your chart in - GrayScale or Default (default selects export in full colour).
5. In the **Size** tab you can also change the size settings.
6. To download your chart, click **Save**.
7. The Save As dialogue window opens. In the Save In drop-down menu, select the folder that you wish to save to. Type in a File name and click **Save**.

Image formats include but are not limited to:

Format Class	Description

BMP: Bitmap	BMP file export has additional parameters for colours and size.
JPEG	JPEG file export has parameters for speed and quality for both SaveToFile and SaveToStream.
WMF & EMF: Metafile	Enhanced Metafiles
PNG	PNG improves on GIF in its ability to progressively display an image; that is, to display better and better approximations of the chart if it arrives over a network connection. Only .png format supports transparent background, which can be set within General Settings of the Chart Editor.
TIFF	TIFF is a flexible and extendible format that is supported by a wide variety of platforms and image-processing applications.

Grid View

Export data in a grid view

1. Ensure that the grid view you wish to export is open in the Main Panel.
2. Select **Export** on the DataSight Ribbon.
3. From the export list, select your format (csv, rtf, pdf, txt, xls, xlsx, html). Then the Save as dialogue box appears.
4. Navigate to a chosen folder, name your file and click **Save**.

Grid views that can be exported include:

- Variables
- Level Properties including Comments or Projections
- Construction
- Equipment
- Person
- Standards
- Flags
- Documents
- Gaugings
- Conversion Tables
- Tasks

Note	If the grid view is able to be exported, the Export button on the DataSight Ribbon will be enabled (not greyed out). Refer also to Exporting for Specific Export Format Options.

Calculations

Export your calculation results

1. Ensure that the calculation you wish to export the results from is open in the Main Panel.
2. Select the **Result** tab.
3. Select **Export** on the DataSight Ribbon.
4. From the export list, select your format (csv, rtf, pdf, txt, xls, xlsx, html). Then the Save as dialogue box appears.
5. Navigate to a chosen folder, name your file and click **Save**.

Export your calculation chart

1. Ensure that the calculation you wish to export the chart from is open in the Main Panel.
2. Select the **Chart** tab.
3. Select **Export** on the DataSight Ribbon.
4. From the export list, select your format (pdf, jpeg, html, bmp, png). Then the Save as dialogue box appears.
5. Navigate to a chosen folder, name your file and click **Save**.

Note	Refer also to Exporting for Specific Export Format Options.

Export Your Files

Export Documents

1. Open an appropriate document list.
2. Right-click on a row to save its document.
3. Select **Save File As** from the drop down list.
4. Save the file with the same name or enter a new name.

Export Construction Images

1. With an existing Level 3 selected, click **Construction** in the Configure group on the ribbon. You can also right-click and select **Construction** on an existing Level 3.

   The Construction Details table for the selected Level 3 appears in the Main Panel.
2. Right-click on any row of the construction data record.
3. Select **Open Image** to view a construction image.
4. Right-click and select **Save Image As** to save the construction image.

   The Save As dialogue window will open.
5. Select a destination folder to save your image.
6. Select the file format you wish to save the image as. Available file formats include .jpg, .bmp, .gif and .png.
7. Click **Save**.

Reports

DataSight can create any combination of reports with both tabular and graphical data to suit your data reporting requirements.

There are three types of reports that can be generated using DataSight:

- DataSight comes with several standardised **Summary Reports**. Data can be aggregated and disaggregated using time steps. For instance, there are reports configured as daily, weekly, monthly, seasonally, annually, a custom time interval (e.g. 10 days), or a custom number of sequential data points.
- You can access the **Report Wizard** to quickly build a report template based upon a data set within a datasheet.
- You can also access the **Report Designer** to build and customise your report templates built by running a Query.

The following chapters detail in increasing complexity how to report on your DataSight data.

See also:

- Summary Reports
- Report Wizard
- Report Designer

Summary Reports

Several annual, monthly, daily and special summary reports come standard with DataSight and are a fixed type reporting solution. You can simply select the date ranges, levels, time zone offset and variables from your database and the type of summary (total, average etc) that you wish to view in a report. You cannot change the report layouts but you can determine the output file type and save them to Saved Views.

For the most part, the reports are tabular summary statistic reports (such as average, maxima, minima and totals) for a designated time period as indicated in the table below and are therefore sometimes referred to as **Tabular Reports**. More specialised report templates have been built for Meteorological and Hydrological Data, such as Rainfall Intensity, Wind Roses, IDF Curves and Pentads.

Display the Summary Reports List

1. Click **Summary Reports** in the Output Group of the DataSight Ribbon. The Summary Reports List will appear.
2. Select the Summary Report you wish to run.

9.4.1.1 Types of Summary Reports

Summary Reports are available for the following purposes and reporting periods. Please also note the period definitions.

Report Type	Purpose	Reporting Period
Basic Statistics	Average, standard deviation, maximum, minimum and median data over a given time period	Enter a Date Range or a Period
Annual	Average or cumulative reports over 12 months	Enter Year and Start Month
Monthly - Daily Basis	Daily averages or totals for multiple variables	Enter Year and Month
Monthly - Hourly Basis	Monthly tabular report for individual variables in hours	Enter Year and Month
Daily	Average and total figures hourly over the day	Enter the Date
Standards - Exceeding Data	Identifies all occurrences of exceeding data for selected variable(s) against a chosen Standard	Enter a Date Range or a Period
Data Recovery	Identifies the operational days for selected variables within the specified date range, and calculates the percentage data recovery	Enter a Date Range or a Period
Operational Days	Identifies the number of operational days for selected variables only between the first and last days identified as operational	Enter a Date Range or a Period
Wind Direction	Displays a wind rose showing the frequency of winds blowing from particular directions	Enter a Date Range or a Period
Wind Rose	Displays a wind rose showing the percentage of counts of a Dependant Variable by Wind Direction.	Enter a Data Range or a Period.

Rainfall Intensity	Displays the amount of rainfall received per intervals of time	Enter a Date Range
IDF Rainfall	Displays an Intensity-Duration-Frequency curve (IDF Curve) for using instantaneous rainfall data.	Enter a Date Range
IDF Discharge	Displays an Intensity-Duration-Frequency curve (IDF Curve) for discharge data.	Enter a Date Range
Pentad Wet	Provides total precipitation estimates over 5-day pentads to define the start of the wet season	Enter a Date Range of at least four months and no greater than one year
Pentad Dry	Provides total precipitation estimates over 5-day pentads to define the start of the dry season	Enter a Date Range of at least four months and no greater than one year
Gage Height and Discharge	Provides tabular representation of the water level values adjusted according to discharge after carrying out a Shift Analysis.	Enter a Date Range
Expanded Conversion Table	Displays an expanded table of Conversions for interpolated variable values	Enter a Variable range and difference between rows
Moving Average	Displays the moving average over a specified number of points	Enter a Date Range
Reference Group	Displays data showing the Variable names specified in the selected Reference Group	Enter a Date Range or a Period.
WQX Set of Reports	Displays data and generates export files for import in to	Enter a Date Range or a Period.

Note	In preparing a Summary Report, DataSight operates only on numeric values, extracted from the value string. For example, <0.1 is treated as 0.1 for the purposes of generating the report. Only records that are able to generate a numeric value are included in the record count. Records whose data values are non-numeric will be ignored.

Period Definitions

Period	Definition
Is Last Hour	Last 60 Minutes, filtered immediately from the current date and time on your local PC.
Is Last Day	Last 24 Hours, filtered immediately from the current date and time on your local PC.
Is Last Week	Last 7 Days, filtered immediately from the current date and time on your local PC.
Is Last Month	Last Calender Month, filtered immediately from the current date and time on your local PC.
Is Last 3 Months	Last 3 Calender Months, filtered immediately from the current date and time on your local PC.
Is Last 6 Months	Last 6 Calender Months, filtered immediately from the current date and time on your local PC.

Is Last Year Last Calendar Year, filtered immediately from the current date and time on your local PC.

9.4.1.1.1 Basic Statistics

The Basic Statistics Summary Report provides the average, standard deviation, maximum, minimum and median data over a selected time period. When the Variable Display Format is set in the Variables grid view, this format is preferentially used in the Basic Statistics Summary Report. In the absence of a designated variable format, the resultant values are shown to 2.d.p.

Create a Basic Statistics Report

1. Select the **Basic Statistics** report from the Summary Reports drop down list. The Summary Reports window will open.
2. Specify the **Date Range**.
3. Select the **Levels** required.
4. Select the **Variable(s)** you wish to check. Use the Grid Filters to help make your selection.
5. Select the **Flag(s)**, **Quality(s)** and **Process Type(s)** from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
6. Collate the report by **Level** or **Variable** or no collation (no selection).
7. Click **OK** to run the report. The Preview window appears with the output from your selections.
8. Save, print or export your report as required (refer to Print Preview Reports).
9. **Close** the Preview window.
10. **Close** the Summary Report window.

See Also:

- Summary Reports

9.4.1.1.2 Time Period Summaries

Time Period Summaries are useful to analyse data over periods of time such as:

- Annual.
- Monthly - Daily basis.
- Monthly - hourly basis.
- Daily.

See Summary Reports for the period of data contained in each time period.

When the Variable Display Format is set in the Variables grid view, this format is preferentially used in the Time Period Summary Reports. In the absence of a designated variable format, the resultant values are shown to 2 decimal places.

Create a Time Period Report

1. Select the time period summary report from the Summary Reports drop down list based on your preference: **Annual**, **Monthly - Daily Basis**, **Monthly - Hourly Basis** or **Daily** reports. The Summary Reports window will open.
2. Specify the **Date Range**.

   In an Annual report, the Year and Month specify the beginning of the one year period.

   For example, Annual report generated for Year - 2015 and Month - July, will take into account all relevant data for a 12 month period starting from July 2015.

3. Select the **Levels** required.
4. Select the **Variable(s)** you wish to check. Use the Grid Filters to help make your selection.
5. Select the Summary Method from the options of:
   - **Mean (AVG)**.
   - **Total (SUM)**.
   - **Min (MIN)**.
   - **Max (MAX)**.
6. Select the **Flag(s)**, **Quality(s)** and **Process Type(s)** from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
7. Click **OK** to run the report. The Preview window appears with the output from your selections.
8. Save, print or export your report as required (refer to Print Preview Reports).
9. **Close** the Preview window.
10. **Close** the Summary Report window.

9.4.1.1.3 Standards - Exceeding Data

Standards - Exceeding Data Summary Report identifies all occurrences of exceeding data for selected variable(s) against a chosen Standard. When the Variable Display Format is set in the Variables grid view, this format is preferentially used in the Standards - Exceeding Data Summary Reports. In the absence of a designated variable format, the resultant values are shown to 2.d.p.

Create a Standards - Exceeding Data Report

1. Select the Standards - Exceeding Data report from the Summary Reports drop down list. The Summary Reports window will open.
2. Specify a Date Range with begin and end dates. Or you can simply choose a datetime period such as **Is Last Hour**, **Is Last Day**, **Is Last Week**, **Is Last Month**, **Is Last 3 Months**, **Is Last 6 Months** or **Is Last Year**.
3. Select the Levels required.
4. Select the Variable(s) you wish to check. Use the Grid Filters to help make your selection.
5. Select the Flag(s), Quality(s) and Process Type(s) from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
6. Collate the report by **Level** or no collation (no selection).
7. Click **OK** to run the report. The Preview window appears with the output from your selections.
8. Save, print or export your report as required (refer to Print Preview Reports).
9. **Close** the Preview window.
10. **Close** the Summary Report window.

See Also:

- Summary Reports

9.4.1.1.4 Data Recovery

Data Recovery Summary Report generates the number of operational days for the variable over the specified date range, showing both the number of operational days within this specified report period, the actual numbers of days specified in the report period, and then the percentage data recovery.

A day is defined as operational when at least one data point exists in the period 12:00:00am to 11:59:59pm. A single data point has been selected due to DataSight 's capability to manage discrete data as well as time series.

Create Data Recovery Report

1. Select the Data Recovery report from the Summary Reports drop down list. The Summary Reports window will open.
2. Specify the Date Range.
3. Select the Levels required.
4. Select the Variable(s) you wish to check. Use the Grid Filters to help make your selection.
5. Select the Flag(s), Quality(s) and Process Type(s) from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
6. Collate the report by **Level** or **Variable** or no collation (no selection).
7. Click **OK** to run the report. The Preview window appears with the output from your selections.
8. Save, print or export your report as required (refer to Print Preview Reports).
9. **Close** the Preview window.
10. **Close** the Summary Report window.

See Also:

- Summary Reports

9.4.1.1.5 Operational Days

Operational Days Summary Report identifies the number of operational days for the variable within a selected period. The first day and last day of data are firstly identified within the selected date range. The number of operational days versus the number of actual days between the first and last day are then provided.

A day is defined as operational when at least one data point exists in the period 12:00:00am to 11:59:59pm. A single data point has been selected due to DataSight 's capability to manage discrete data as well as time series.

Create Operational Days Report

1. Select the Operational Days report from the Summary Reports drop down list. The Summary Reports window will open.
2. Specify the Date Range.
3. Select the Levels required.
4. Select the Variable(s) you wish to check. Use the Grid Filters to help make your selection.
5. Select the Flag(s), Quality(s) and Process Type(s) from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
6. Collate the report by **Level** or **Variable** or no collation (no selection).
7. Click **OK** to run the report. The Preview window appears with the output from your selections.

8. Save, print or export your report as required (refer to Print Preview Reports).
9. **Close** the Preview window.
10. **Close** the Summary Report window.

See Also:

- Summary Reports

9.4.1.1.6 Wind Direction

The Wind Direction summary report displays a wind rose showing the frequency of winds blowing from particular directions. The length of each "spoke" around the circle is related to the frequency of time that the wind blows from a particular direction.

Create a Wind Direction Report

1. Select the Wind Direction Report from the Summary Reports drop down list. The Summary Reports window will open.
2. Specify the Date Range.
3. Select the Levels required.
4. Select the Wind Direction Variable (Units in Degrees). Use the Grid Filters to help make your selection.
5. Select the Flag(s), Quality(s) and Process Type(s) from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
6. Click **OK** to run the report. The Preview window appears with the output from your selections.
7. Save, print or export your report as required (refer to Print Preview Reports).
8. **Close** the Preview window. **Close** the Summary Report Wind Direction report window.

See Also:

- Summary Reports

9.4.1.1.7 Wind Rose

The Wind Rose summary report displays a wind rose showing the frequency of winds blowing from particular directions, as well as colour coded bands showing the frequency the value of the Dependant Variable was recorded in that direction.

Wind Direction is divided into Segment Angles of either 5, 10, 15 or 30 degrees. The frequency the value that the Dependant Variable occurs is divided into colour banded Segment Boundaries, with the number of Segment Boundaries and their Bounding Values defined by the user.

Create a Wind Rose Report

1. Select the **Wind Rose Report** from the Summary Reports drop down list. The Summary Reports window will open.
2. Specify the **Date Range**.
3. Select the **Levels** required.
4. Select the **Wind Direction Variable** (Units in Degrees).
5. Select the **Dependant Variable**. This should be set to a Variable corresponding to the selected Wind Direction Variable.
6. Enter the **Chart Size (in %)**. This field allows you to define the number of Wind Rose charts per page:
   a. 100% for one Wind Rose chart per page.

b. 50% for four Wind Rose charts per page.

7. Enter the **Segment Angle**. Value must be 5, 10, 15 or 30.
   a. This field defines the size of each radial segment of the Wind Rose in degrees.
8. Enter the **Segment Boundaries**. Value must be greater than zero.
   a. This field defines how many Segment Boundaries will be displayed for the percentage of counts by value of the Dependant Variable, represented by coloured bands.
   b. The number of coloured bands displayed will be the number of Segment Boundaries entered, plus one.
9. Enter the **Bounding Value for segment #** for each Segment Boundary.
   a. These fields define the boundaries for the values of the Dependant Variable.
10. The **Reset Segments** button resets the Chart Size, Segment Angle and Segment Boundaries fields to their default values.
11. Click **OK** to run the report. The Preview window appears with the output from your selections.
12. Save, print or export your report as required (refer to Print Preview Reports).
13. **Close** the Preview window. **Close** the Summary Report Wind Rose report window.

See Also:

- Summary Reports

9.4.1.1.8 Rainfall Intensity

The Rainfall Intensity summary report generates the greatest amount of rainfall measured in mm recorded over the following intervals of time between two dates.

- 5 minutes (Standard US time interval)
- 6 minutes (Standard Australian time interval)
- 10 minutes
- 20 minutes
- 30 minutes
- 1 hour
- 2 hours
- 4 hours
- 6 hours
- 12 hours
- 24 hours
- 48 hours
- 72 hours

The report is best used with instantaneous rainfall data. The time increment of the input variable will determine the minimum duration shown on the report.

When the Variable Display Format is set in the Variables grid view, this format is preferentially used in the Rainfall Intensity Summary Report. In the absence of a designated variable format, the resultant values are shown to 2.d.p.

Create a Rainfall Intensity Report

1. Select the Rainfall Intensity Report from the **Summary Reports** drop down list. The Rainfall Intensity report window will open.
2. Specify the Date Range.
3. Select the Levels required.
4. Select the Rainfall Variable. Use the Grid Filters to help make your selection.
5. Select the Flag(s), Quality(s) and Process Type(s) from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
6. Click **OK** to run the report. The Preview window appears with the output from your selections.
7. Save, print or export your report as required (refer to Print Preview Reports).
8. **Close** the Preview window.
9. **Close** the Rainfall Intensity Summary Report window.

9.4.1.1.9 IDF Rainfall

An Intensity-Duration-Frequency curve (IDF Curve) is a graphical representation of the probability that a given event will occur. It lets you know how common or rare a given rainfall intensity is.

For storm intensity, Rainfall intensity (RF in mm/hr) and Rainfall Duration (how many hours it rained at that intensity) are the axes that make up a IDF chart. The Rainfall Frequency or Annual Exceedance Probability (AEP), that is the probability of a given rainfall intensity being equalled or exceeded in any one year, is given for the specified curve on the chart.

An IDF curve is created with long term records collected at a monitoring station and is based on the statistical analysis of these historical records. The more data you have, the more accurate your curves will be.

The IDF Rainfall report uses instantaneous rainfall data (IDF - Rainfall).

Log-Pearson III Distribution Method for producing IDF Curves

The typical estimation procedure for IDF curves consists of several steps. Steps followed here are outlined in Kuczera G and Frank S, Australian Rainfall and Runoff, Book IV and also the Oregon State University Tutorial for Flood Frequency Analysis

http://streamflow.engr.oregonstate.edu/analysis/floodfreq/index.htm#log

The steps involved for rainfall are as follows.

1. Identification and grouping of the events within a nominated historical data set (years defined by the user) that occur for periods of 1, 2, 5, 10, 20, 30 minutes increasing to 1, 2, 4, 6, 12 hours followed by 1, 2, 3, 4, 6, 8 days duration.
2. Ranking of the data from a specific duration from the highest to lowest volume of instantaneous rainfall.
3. Calculation of the logarithmic values of the records for that duration.
4. Following the log Pearson III Distribution the Mean (M), Standard deviation (S) and coefficient of skewness (g) for these logarithmic values are determined, where

$$S = \left[\frac{\sum(LogV - M)^2}{N-1}\right]^{0.5}$$

$$g = \frac{N\sum(LogV - M)^3}{(N-1)(N-2)S^3}$$

5. Frequency Factors (K) are then determined. The value of K is obtained from tables in many hydrology references. By knowing the skewness coefficient and the annual exceedance probability (AEP), the frequency factor, K for the log-

Pearson III Distribution is extracted. Annual Exceedance Probabilities are defined as the reciprocal of the Return Period (Tr), where

Return Period = (No of values in the dataset + 1) /Rank

6. The predicted rainfall for the given AEP, for that specific duration is defined by the following relationship.

$$Log\ R = M + KS$$

The antilog of the solution will provide the estimated rainfall (R) for the given annual exceedance probability.

The steps involved for discharge are similar as follows.

1. Identification of the maximum flow rate for a given year within a nominated historical data set (years defined by the user).
2. Ranking of the data for the given year from the highest to lowest rate of stream discharge.
3. Calculation of the logarithmic values.
4. Calculation of the Log Pearson III, and Log Normal discharge for a given recurrence interval using the same formula specified for rainfall.

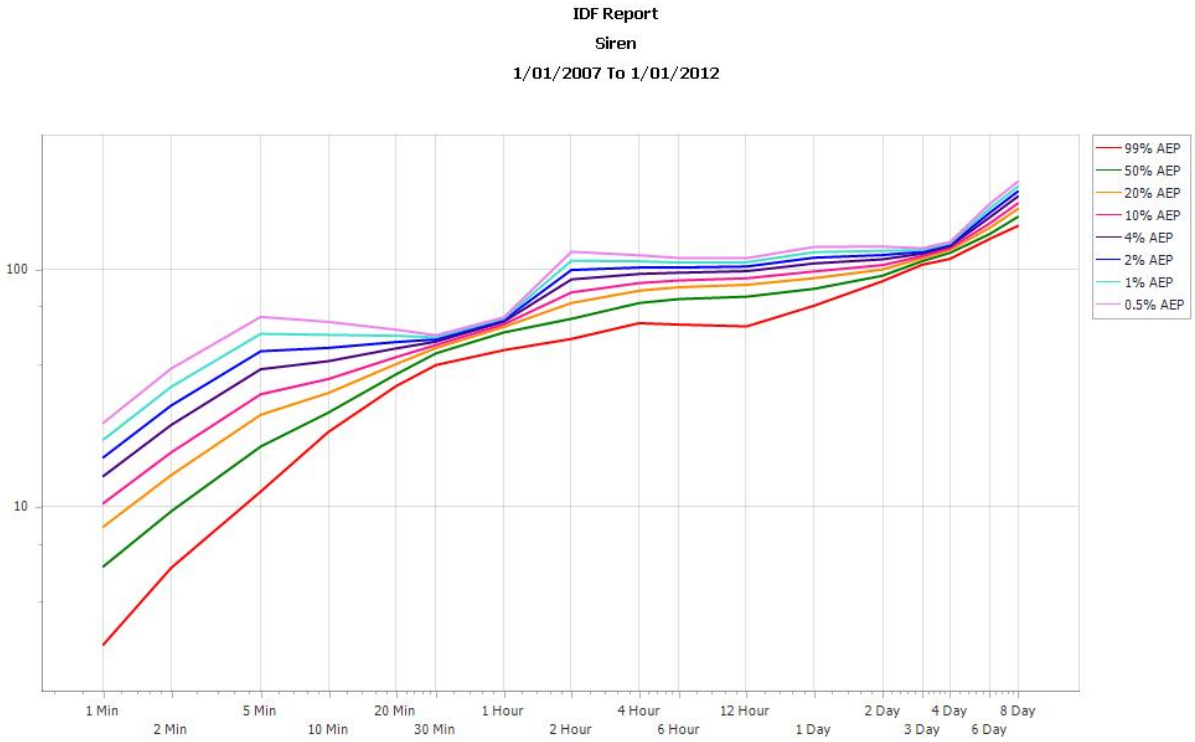
Generate the IDF Curve reports in DataSight

1. Click **Summary Reports** on DataSight Ribbon. This opens the drop down list of available reports.
2. Select your Report Type of IDF - Rainfall.
3. Specify the Date Range. The report is best run with several years of data.
4. Specify the Levels required.
5. Select the IDF - Rainfall variable. Use the Grid Filters to help make your selection.
6. Select the Flag(s), Quality(s) and Process Type(s) from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
7. Click **OK** to run the report. The Preview window appears with the output from your selections.
8. Save, print or export your report as required (refer to Print Preview Reports).
9. **Close** the Preview window.
10. **Close** the Summary Report report window.

Note	IDF Curves must be produced with more than one year of data. This might be one year and one day, however several years will provide a more meaningful result.

Example IDF-RF report

The report below shows the computed frequency precipitation (rainfall volume in mm) on a logarithmic scale for the specified durations of 1 minute duration through to 8 days, for varying Annual Exceedance Probabilities.



9.4.1.1.10 Pentads

Pentadal rainfall data that provide total precipitation estimates over the 5-day pentad period can be used to define the start and stop of the wet season in equatorial regions. Precipitation estimates are used to identify the period of onset of rains (or start-of-season) often for the purpose of identifying the agricultural growing season. Cumulative rainfall accounting criteria are applied to the rainfall estimates. Beginning several periods in advance of the usual onset of rains, each pentad is tested to identify the first 20-day period in which at least 50 mm of rain has fallen. Onset of rains is then identified by one of several criteria as follows.

Terms of the Rainy or Wet Season in DataSight

These criteria have been specified by the Meteorological Service for Panama.

Criteria of the WET Pentad Report where is the precipitation in pentad numbe, with criteria applied looking forwards from the selected Pentad:

Criteria		**Accumulated Precipitation in the Pentad**					
	Pentad No.		!	?	3	4	5
a)		≥ 25 mm	≥ 25 mm	> 0.5 mm			
b)		≥ 25 mm	≥ 25 mm		> 0.5 mm		
c)		≥ 25 mm		≥ 25 mm	> 0.5 mm		
d)		≥ 25 mm		≥ 25 mm		> 0.5 mm	
e)		≥ 25 mm	> 0.5 mm	> 0.5 mm	≥ 25 mm	> 0.5 mm	
f)		≥ 25 mm	> 0.5 mm	> 0.5 mm	≥ 25 mm		> 0.5 mm

As an example, if we start at the first pentad in the calendar year where =1, the criteria can also be written as:

a) ≥ 25 mm ≥ 25 mm > 0.5 mm,
b) ≥ 25 mm ≥ 25 mm > 0.5 mm,
c) ≥ 25 mm ≥ 25 mm > 0.5 mm,
d) ≥ 25 mm ≥ 25 mm > 0.5 mm,
e) ≥ 25 mm ≥ 25 mm > 0.5 mm > 0.5 mm,
f) ≥ 25 mm ≥ 25 mm > 0.5 mm > 0.5 mm > 0.5 mm.

Criteria a) is met if the 1st 10-day period of the calendar year in which at least 25 mm of rain falls in both periods is followed by at least 0.5 mm of rain in the next pentadal update. If rainfall for the latter update totals at least 0.5 mm of rain, the 1st 10-day period of 25 mm rainfall is identified as meeting the criteria. If the latter pentad period does not total at least 0.5 mm of rain, then the testing proceeds to the next criteria and so on. If any of the above criteria are fulfilled, then the Pentad is coloured red in the DataSight Pentad-WET report to indicate this.

The same set of criteria can be applied looking backwards through the dataset, which are the terms of the DRY Pentad Report.

Criteria of the DRY Pentad Report where is the precipitation in pentad number with criteria applied looking backwards from the selected Pentad:

Criteria		**Accumulated Precipitation in the Pentad**					
	Pentad No.						
a)		≥ 25 mm	≥ 25 mm	> 0.5 mm			
b)		≥ 25 mm	≥ 25 mm		> 0.5 mm		
c)		≥ 25 mm		≥ 25 mm	> 0.5 mm		
d)		≥ 25 mm		≥ 25 mm		> 0.5 mm	
e)		≥ 25 mm	> 0.5 mm	> 0.5 mm	≥ 25 mm	> 0.5 mm	
f)		≥ 25 mm	> 0.5 mm	> 0.5 mm	≥ 25 mm		> 0.5 mm

If any of the above criteria are fulfilled, then the Pentad is coloured red in the DataSight Pentad-DRY report to indicate this.

Generate the Pentad reports in DataSight

1. Click **Summary Reports** on DataSight Ribbon. This opens the drop down list of available reports.
2. Select your Report Type of Pentad Wet or Pentad Dry.
3. Specify the Date Range. The report can be run with a minimum of four months but no longer than a year's worth of data.
4. Specify the Levels required.
5. Select the Pentad variable. Use the Grid Filters to help make your selection.
6. Select the Flag(s), Quality(s) and Process Type(s) from the drop down list for each individual Variable, as required. Alternatively, make a selection for one Variable row and click **Apply All** to globally set the criteria against multiple selected variables. Individual criteria may still be applied.
7. Click **OK** to run the report. The Preview window appears with the output from your selections.
8. Save, print or export your report as required (refer to Print Preview Reports).
9. **Close** the Preview window.

10. **Close** the Summary Report report window.

Below are example reports output in PDF format.

- For the start of the rainy season **(Pentad Report WET)**, the red signifies that the criteria have been met. It should be noted that report is scanning forwards in time from each pentad to determine if the criteria are met. Consequently the last two pentads of the Wet Report cannot be tested. Our interpretation of the report shown is that the start of the Wet Season has not been captured within the report, and would require the report to be run over earlier months.

Pentad Report (Wet)
Rainfall Hr Tot
1/01/2006 - 1/05/2006

	Pentads																								
Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Camp AWS	26.5	11.0	28.5	31.5	68.5	19.5	12.5	38.5	28.0	39.5	10.0	12.0	95.5	63.5	49.0	6.5	18.5	31.5	20.5	46.5	9.5	0.0	0.0	0.0	0.0

* Three consecutive pentads are required to meet the criteria to identify a wet or dry Pentads. The first two for the Dry Pentad Report and the last two pentads for the Wet Pentad Report cannot meet the Pentad Criteria.
* The Pentad Reports are designed to work within a single calendar year.
* Red indicates the pentads meet the wet/dry criteria (please refer to DataSight User Manual).

- For the end of the rainy season **(Pentad Report DRY)**, the red also signifies that the criteria have been met, as shown below for the same dataset. This report is determining the criteria looking at preceding pentads. Consequently the first two pentads included in the Dry report cannot be tested. It might be possible to interpret from this report that we have captured the end of the wet season and start of the dry in Pentad 20.

Pentad Report (Dry)
Rainfall Hr Tot
1/01/2006 - 1/05/2006

	Pentads																								
Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Camp AWS	26.5	11.0	28.5	31.5	68.5	19.5	12.5	38.5	28.0	39.5	10.0	12.0	95.5	63.5	49.0	6.5	18.5	31.5	20.5	46.5	9.5	0.0	0.0	0.0	0.0

* Three consecutive pentads are required to meet the criteria to identify a wet or dry Pentads. The first two for the Dry Pentad Report and the last two pentads for the Wet Pentad Report cannot meet the Pentad Criteria.
* The Pentad Reports are designed to work within a single calendar year.
* Red indicates the pentads meet the wet/dry criteria (please refer to DataSight User Manual).

9.4.1.1.11 Gage Height and Discharge

Discharge values are generally not measured directly, but rather computed from other measured values such as gage height or stage. Using DataSight's Regressions **Shift**, you reverse this process and use the discharge as the primary "independent" data set and shift the "dependent" measured gage height data, to take into account site specific conditions such as ice or sedimentation. This allows you to "shift" gage height data as required by the United States Geological Survey (USGS) Standard for the Analysis and Processing of Surface-Water Data and Information.

The **Gage Height and Discharge Report** is a tabular representation of the gage height values adjusted according to a measured discharge after carrying out a Shift Analysis and a Data Conversion. The maximum, minimum and mean values of corrections (e.g. variable offset) of the shifted gage heights, as well as the maximum, minimum and mean daily discharges for the site(s) are also computed and presented in this report.

Preparing data for Gage Height and Discharge Report

During Shift Analysis, DataSight adjusts the gage height corresponding to the discharge. To do this and save your stage values, follow the steps directed below:

1. Once you have a measured discharge, carry out a Shift Analysis of your applicable rating curve(s) in the Regression tool.
2. Undertake a Data Conversion using the Shifted rating table, whereby your raw gage height values are shifted to account for the manual discharge measurement. You need to save these shifted gage height values to a pre-existing variable.

This will be your **shift variable** in the report.

3. Filter a data sheet to show both your shifted gage height data together with the original gage height values.
4. Right-click on the datasheet and select **Calculation**.
5. Select the original and shifted gage hieght variables as **Master Variable A** and **Variable B**.
6. Depending on how data has been adjusted, based on the rating table, enter the **Formula**: a-b or b-a.
7. Save the resulting values as a separate output variable in to the same level as your water level variables. This will be your **shift difference variable**.
8. Check the **Database** box in the update section.
9. Click **Update**.

The variables are now ready to be selected towards generating a Gage Height and Discharge Report.

Note	If you need to undertake a manual correction of the shifted stage values, then you can do so using following Perform a Calculation. Please ensure, for the purposes of this summary report, that you always OVERWRITE the existing Shift Variable values to allow the report to track changes in the Corrected Stage column.

Create Gage Height and Discharge Report

1. Select Gage Height and Discharge Report from the **Summary Reports** drop-down list in the Menu ribbon.
2. Select the begin and end dates of the water year you would like to prepare the report for.
3. Select the **Level(s)** where your data is located.
4. Select your **Shift Variable** as saved in the database from the list.
5. Select the **Calculated Shift Difference** variable from the list.
6. Select your **Discharge** variable from the list.
7. Select the relevant **Conversion Table(s)**.
8. Click **OK** to generate your report.

Features of the Report

- The name of the selected Rating Table (Conversion Table) is shown at the beginning of the report.
- The first column of the report table lists dates of the water year where there is data returned for the selected shift variable (shifted stage or gage height).
- The second and third columns list those dates that have shifted variable data that has been corrected. The extent of the correction is listed as a daily minimum, maximum, and means computed using the difference between the existing shift variable values versus any archived values as tracked by DataSight. This makes use of the DataSight data tracking capabilities (the mean does not have a time stamp as it is a computed value).
- The discharge columns list the daily maximum, minimum and mean values of the discharge variables and the time stamps at which they occurred (the mean does not have a time stamp as it is a computed value).
- The shift column lists the daily maximum and minimum values of the difference between the original stage data and shifted stages as calculated and displayed in the shift difference variable.
- The remaining columns list the maximum values of the shift variable during the indicated hours.

9.4.1.1.12 Expanded Conversion Table

The Expanded Conversion Table Report expands a Conversion Table by:

- Spacing x values down rows.
- Spacing x values by smaller increments, across the table according to your increment selection.
- Generating y values for all the x increments you specify.
- Interpolating values of x and y wherever they are not set in the Conversion Table.

Usually, the x-axis holds the independent variable. In an Expanded Conversion Table Report, you can specify the start and end values for x, difference between rows, and the number of decimal places.

Create Expanded Conversion Table Report

1. Select the Expanded Conversion Table summary report from the Summary Reports drop down list.
2. Specify **Start Value** and **End Value** (to generate x values).
3. Specify **Row Increment** (any reasonable non-negative value). This is the value by which x is incremented to calculate corresponding y values for each row.

   For example,

   x is incremented by 0, 0.3, 0.6 and so on if the specified difference between rows is 3 so that, y is calculated for x, x+0.3, x+0.6 etc.

   x is incremented by 0, 0.4, 0.8 and so on if the specified difference between rows is 4 so that y is calculated for x, x+0.4, x+0.8 etc.
4. Specify the **Number of Decimal Places** to display for your values.
5. In the Conversion Tables Section, select a desired conversion table. Use the Grid Filters to help make your selection.
6. Click **OK** to run the report. The Preview window appears with the output from your selections.
7. Save, print or export your report as required (refer to Print Preview Reports).
8. **Close** the Preview window.
9. **Close** the Summary Report window.

Features of the report

- The first row of the report table displays values by which x is incremented to calculate corresponding y values for each row.
- The first column in the report table displays the x values between the start and end values spaced by specified difference between rows. This column will determine the value of x and its increments for a row against which corresponding y's are calculated.
- The second column and beyond display values of y as obtained as is or calculated according to the Conversion Table for various x.

9.4.1.1.13 Moving Average

The Moving Average Report provides the average value of a variable in steps moving through a specified date range. The steps are specified by the number of records to be included in each calculation of the average, and the maximum number of records that can be included in any one report is 5000. For instance, if you have 15 minute data, and wish to average your data every 4 records (e.g. hourly), then you can only run the report over a maximum of 52 (or so) days.

Create a Moving Average Report

1. Select the Moving Average report from the Summary Reports drop down list. The Summary Reports Standard window will open.
2. Specify the Date Range.
3. Specify the Number of Records to be included in the Moving Average.
4. Select the Level you wish to use.
5. Select the Variable you wish to use. Use the Grid Filters to help make your selection.
6. Click **OK** to run the report. The Preview window appears with the output from your selections.
7. Save, print or export your report as required (refer to Print Preview Reports).
8. **Close** the Preview window.
9. **Close** the Summary Report window.

See Also:

- Summary Reports

9.4.1.1.14 Reference Group

While you can export data from a data sheet with a Variable Alias, the Reference Group selection cannot be saved with a data sheet Saved View. As such, automated exports of data with the alternate Variable names are not possible using a data sheet Saved View. As a result the Reference Group summary report has been provided for this purpose. It is also an alternative method by which you can export your data.

The report is hard coded to show the Level 3, Date, Time, Variable, Value, Flag, Quality, Person and Equipment fields. Obviously, the Variable Name is changed to that specified in the Reference setting.

Note	Only Variables which have a Variable Alias assigned in the selected Reference Group will be populated in the report.

Create a Reference Group Report

1. Select the Reference Group report from the Summary Reports drop down list. The Summary Reports Standard window will open.
2. Specify the Date Range.
3. Select the Level(s) required.
4. Select the Reference Group you will use to rename the Variables.
5. Select the Variable(s) within the Reference Group that you wish to check. Use the Grid Filters to help make your selection.

   Alternatively, you may click **Fill Reference Variables** to automatically select the Variables which are assigned to the selected Reference Group.
6. Click **OK** to run the report. The Preview window appears with the output from your selections.
7. Save, print or export your report as required (refer to Print Preview Reports).
8. **Close** the Preview window.
9. **Close** the Summary Report window.

See Also:

- Summary Reports

9.4.1.1.15 WQX Set of Reports

The WQX Set of Reports Summary Report allows you to define and export a set of reports and export files which can be used for upload to the USA Environmental Protection Agency for Water Quality Data Upload with WQX using a Standard Upload. Water Quality Data Upload with WQX | US EPA

THe WQX exported Excel files will consist of a single file each for Projects, Monitoring Locations & Results as per the data requirements of the WQX Web guides.

- 'Projects' file containing at least one project which describes the purpose of the monitoring.
- 'Monitoring Locations' file containing descriptions of the geographic location of the site where the monitoring took place.
- 'Results' file containing the water quality sampling and field observations that took place during a visit to a monitoring location, including descriptions of what was sampled or observed, analytical methods, sample collection procedures and measurements of what was monitored.

Create a WQX Set of Reports

1. Select the **WQX Set of Reports** report from the Summary Reports drop down list. The Summary Reports window will open.
2. Specify the **Date Range**.
3. **Expand** the **WQX Projects** section and:
   a. Enter a **Project Identifier**.
   b. Enter a **Project Name**.
   c. Select the **Levels** for the report from the Monitoring Locations section.
   d. Enter a **Project Description**.
   e. Click **Add** to add the entered Project Identifier, Project Name, selected Levels and Project Description to the Projects list displayed below.
   f. Repeat steps a. to e. above to record additional projects information.
4. To edit your project information:
   a. Click the **Edit** button for the project information you would like to edit. The entered Project Identifier, Project Name, selected Levels and Project Description will be loaded back in to their respective fields above.
   b. Edit as required, clicking **Add** to finalise and save your changes.
5. **Expand** the **WQX Location Columns** section and:
   a. Select a **Column Type** from the corresponding drop-down list.
   b. Select a **Field Name** from the corresponding drop-down list.
   c. Enter a **Caption** for the selected Column Type and Field Name.
   d. Click **Add** to add the selected Column Type, Field Name and entered Caption to the Location Columns list displayed below.
   e. To make changes to your selections, simply **click** within the relevant fields in the Location Columns list and update as required.
   f. Repeat steps a. to e. above to add additional location column records.
6. **Expand** the **WQX Results Columns** section and:

a. Select a **Column Type** from the corresponding drop-down list.

b. Select a **Field Name** from the corresponding drop-down list.

c. Enter a **Caption** for the selected Column Type and Field Name.

d. Click **Add** to add the selected Column Type, Field Name and entered Caption to the Results Columns list displayed below.

e. To make changes to your selections, simply **click** within the relevant fields in the Results Columns list and update as required.

f. Repeat steps a. to e. above to add additional results column records.

7. Click **OK** on the Summary Reports window to display the WQX Report Preview and Export to CSV Files section.

a. To generate a preview of a report, click the **Preview Report** button corresponding with the report you would like to preview.

b. To export a CSV file for a report, click the Export to CSV button corresponding with the report you would like to export.

Save a WQX Set of Reports

1. **Follow** the steps above under Create a WQX Set of Reports up to and including step 7.
2. Click the **Preview Report** button for the report you would like to save, the Preview window will be displayed along with a preview of the selected report.
3. Click **Save** from the **Document** group on the Preview window's Main Ribbon to save the report as a Saved View.
4. Once a WQX Set of Reports has been saved (either of Project Details, Location Details or Results Detail), you can **right-click** the report in the Saved View panel, expand **Preview** and select **With A New Filter** to display the Summary Report window for WQX Set of Reports which will load all previously entered Projects, Location Columns and Results Columns information.

See Also:

- Summary Reports

9.4.1.2 Save a Summary Report

1. Click **Save** in the Print Preview Ribbon and the Save As dialogue window appears.
2. Click on your desired folder in the **Saved Views** folders list. This may be the master Saved Views folder, or an existing folder. The selection will be highlighted.
3. Alternatively add a new folder. Highlight the folder under which the new folder will be created, and select **New Folder**.
4. **Name** the new folder.
5. If you wish to overwrite an existing report click on the report name. Otherwise, **Name** the report.
6. Click **Save**.

Report Wizard

The Report Wizard is a tool that allows you to easily create reports using data from the currently selected filter in a datasheet, focussed in the Main Panel. These reports are sometimes referred to as **Datasheet Reports**. Report Wizard is also invoked when you design a report using the Report Designer

Create a new report using the Report Wizard

1. With a desired datasheet for the report open, click **Report Wizard** from the Output group on the DataSight Ribbon.
2. The Report Wizard dialogue window opens. Step through the Wizard as required:
   - Choose Columns
   - Add Grouping Levels
   - Summary Options
   - Choose Report Layout
   - Choose Report Style
   - Enter a Report Title and Save

9.4.2.1 Choose Columns

This step allows you to choose fields (attributes) whose data will be displayed in your report. The selected fields and corresponding captions will be automatically added to your report, arranged one under another.

Choose your Columns of Data

1. Double-click items in the left-hand side list to move them to the right. These items will be displayed in your report. You can also use the arrow buttons shown in the Wizard box to move items or drag them with your mouse to the list box on the right.

   Select at least one field to continue.
2. If you want to customise your report further, click **Next** to proceed to the next wizard page: Add Grouping Levels. Click **Finish** to complete the wizard at any stage.

9.4.2.2 Add Grouping Levels

This step allows you to group data in your report. Nested grouping and grouping against multiple fields are fully supported.

Note	Click **Next** on this page to skip grouping.

Group your Data

1. The list on the left-hand side displays data fields that can be used to group data. To apply grouping, do one of the following.
   - Select columns and click the right arrow (>) button.
   - Double-click columns.
2. Note that grouping fields on the right-hand side can be selected by clicking them. This is useful if you need to remove them or change their order. To accomplish the latter, use the up arrow (∧) and down arrow (∨) buttons.
3. You can complete the wizard at this step by clicking **Finish**. If you want to customise your report further, click **Next**. If data grouping has been applied on this page, you will proceed to the Summary Options page. If you have not grouped your data, you may skip the Summaries step and go to the Choose Report Layout page.

9.4.2.3 Summary Options

The Summary Options step is only available if you have applied data grouping in the previous step (Add Grouping Levels). If your data is not grouped, this step is skipped.

Specify Functions to calculate and display

Specify totals to be displayed for each data group and grand totals for the entire report. For instance, you may need to display the sum of values in a particular field, the average value, etc. Specified totals will be displayed after corresponding groups, and in the report footer.

This page displays all available numerical and date-time fields that are not used to group data. Using the check box table, you can specify which functions should be calculated for these fields.

Ignore Empty Values

If your data contains empty values (this is different from, say, zero in a numeric field) you can choose to not take these into account when calculating totals by checking **Ignore NULL values**.

By default, empty values are treated as zeros for numeric fields and the earliest system date for date-time fields.

Finish Wizard or Continue customisation

You can complete the wizard at this step by clicking **Finish**.

If you want to customise your report further, click **Next** to proceed to the next wizard page: Choose Report Layout.

9.4.2.4 Choose Report Layout

Set the layout of elements in your report. Additionally, this page allows you to specify the page orientation for your report.

If report data is **grouped**, you can choose one of the available indentation styles for nested elements. The following options are available if data grouping has been applied.

- Stepped
- Outline 1
- Outline 2
- Align Left 1
- Align Left 2

If **data grouping is not applied**, you can specify how data field values are arranged - into a table, one under another, etc. If data has not been grouped, you will see the following report layout options.

- Columnar
- Tabular
- Justified

If you want to customise your report further, click **Next** to proceed to the next page: Choose Report Style. Otherwise, click **Finish** to complete report wizard.

9.4.2.5 Choose Report Style

Apply a predefined style sheet to your report

1. Select one of the predefined styles from the list box.
    - Bold
    - Casual
    - Corporate

- Compact
- Formal

2. If you want to customise your report further, click **Next** to proceed to the next page: Enter a Report Title.
3. Otherwise, click **Finish** to complete report wizard.

9.4.2.6 Enter a Report Title and Save

Specify the report title and finish report customisation

- Enter a title string into the editor and click **Finish** to complete report wizard. The report will open in the Report Designer.

Save the Report to Saved Views

1. Click **Save** in the Report Designer ribbon and the Save As dialogue window appears.
2. Click on your desired folder in the **Saved Views** folders list. This may be the master Saved Views folder, or an existing folder. The selection will be highlighted.
3. Alternatively add a new folder. Highlight the folder under which the new folder will be created, and select **New Folder**.
4. **Name** the new folder.
5. If you wish to overwrite an existing report click on the report name. Otherwise, **Name** the report.
6. Click **Save**.

Print the Report

1. Click on the **Print Preview** Tab in the Report Designer.
2. Click **Print** on the ribbon. You can also press CTRL+P. The Print dialogue will be invoked.
3. Specify the necessary settings and click **Print**.

Notes	To make changes to your Report Design refer to Report Designer. For further information on the Print Preview tab refer to Print Preview Report.

Report Designer

Using Report Designer you can create your own report templates and use them in DataSight.

Within Report Designer you define the data to use for a report using a Query Builder, add data regions to the report design surface, link the data and data regions, apply formatting, create or modify parameters to provide user interactivity, preview the result, and publish the report. These are sometimes referred to as **Query Reports**.

To make effective choices about report design, you can explore the following report features:

- A basic report has a header, a body, and a footer.
- A report also has a default page size with page headers and page footers.
- You can place report items such as images, text boxes, and lines in headers and footers.
- The body of the report contains the report data.
- You can combine a number of charts, tables and text – extracted from the database - to produce a multi-page document and output this document to printer, screen or file.
- You link report data to report items on the design surface.
- When the report is processed, the report data and layout items are combined.

- When you view the report, the combined data and layout elements are sent to a report renderer. The renderer dynamically determines how much data fits on each page.
- Report parameters are used to specify the data to use in a report, connect related reports together, and vary report presentation.
- In a report, you can place report items anywhere on the design surface; you are not limited to "bands" of data.
- You can place data regions with different sets of data side-by-side.
- Certain report items can also contain other report items.

To use DataSight Report Designer to design reports requires a reasonable proficiency in computing. Report Designer is complex, containing a wealth of features to help you create and edit customised reports.

Reports are created and saved using either the Report Wizard or the Report Designer, but both are editable in the Report Design Panel.

Create a report using Report Designer

1. Click **Report Designer** from the Output group on the DataSight Ribbon.
2. Create a query with **Run a Query Builder** or select a **Stored Procedure** (See Query Builder for details).
3. Click **Finish**. DataSight will take you to Report Wizard.
4. Step through the Report Wizard as required (See Report Wizard for more details).
5. Click **Finish** to complete the Report Wizard. DataSight will now take you to the Report Designer.

9.4.3.1 Report Designer User Interface

The documents in this section are dedicated to the elements of the Report Designer User Interface.

Section	Element	Description
Main Surface	Design Panel	A surface where a report layout is displayed and edited.
Functionality	Context Menu	Right click context menus are offered.
	Smart Tag	Smart Tags provide easy access to the most frequently used settings.
	Ribbon	The Ribbon contains buttons that collate the functionality offered in Report Designer
	Standard Controls	Lists all available report controls. You can drag a control from the toolbox and drop it onto a report's surface.
Windows	Group and Sort Panel	Allows you to quickly perform grouping and sorting operations throughout a report, and visually represents the report's grouping structure.
	Scripts Errors	When errors are found in a report's scripts (after clicking Validate in the Scripts Tab), it lists these errors. Clicking an error opens the corresponding script section in the Scripts tab.
	Report Explorer	Displays a tree-like hierarchy of report elements and allows you to manage a report's collection of formatting rules and visual styles.

	Field List	Displays the structure of a report's data source and allows you to maintain a report's collection of calculated fields and parameters.
	Property Grid	Used to access and modify properties of a report and all its elements (bands and controls).
	Report Gallery	Stores common report controls, styles, data sources and full report layouts, and re-use them in different reports.
Tabs	Designer	Switch between the Designer, Preview and Scripts Tabs
	Preview	
	Scripts	
Status Bar		Provides tips and specific information about the Designer element being hovered by a cursor or an action being currently performed. It also allows you to change a report's zoom factor.

9.4.3.1.1 Design Panel

The Design Panel is the Report Designer's main area, where a report is being constructed and previewed.

9.4.3.1.2 Context Menu

The Context Menu can be invoked by the **right-clicking** a report or its elements (bands and controls).

This menu provides quick access to frequently used commands (e.g. zooming, clipboard operations, inserting bands, etc.) The available action set varies, depending on the element where you invoked the Context Menu.

9.4.3.1.3 Smart Tag

Most report elements have Smart Tags that provide easy access to the **most frequently used** settings. Clicking an element's Smart Tag invokes an actions list with action links and editors, allowing you to customise this element.

Smart Tag	Access location
Report	Top left corner of the Design Panel
Band	Band strip right next to its caption
Control	Top right corner of the control

9.4.3.1.4 Ribbon

The Ribbon contains buttons that collate the functionality offered in Report Designer. The Ribbon is divided into several tabs and groups as follows:

Home Tab

- The **Report** Group allows you to save the report and its template or open a saved template.
- The **Data** Group allows you to Add a Data Source, Calculated Field or Parameter.
- The **Edit**, **Font**, **Alignment**, **Borders** and **Styles** Groups allow you to easily customise an element's font, colour, alignment, border and overall style settings.

Layout Tab

- The **Snapping**, **Alignment**, **Layout** and **Arrange** Groups allow you to easily align report elements to one another, change their size to match one another and customise spacing and z-order.

Page Tab

- The **Page Setup** Group allows you to change the page size, orientation and margins.
- The **Appearance** Group allows you to change your page colours or watermarks.

View Tab

- The **Show** Group allows you to display a watermark or grid lines.
- The **Zoom** Group allows you to zoom a report in and out, providing easier control over report's layout.
- The **View** Group allows you to show/hide the various elements on display in the Report Designer.

9.4.3.1.5 Standard Controls

The Standard Controls Panel lists all available controls and allows you to add them to your report.

See Report Designer Controls for more detailed information.

9.4.3.1.6 Group and Sort Panel

The Group and Sort Panel allows you to quickly apply grouping and sorting to your report data. It is located at the bottom of the Designer Tab in the Design Panel.

Create a new grouping or sorting criterion

- Click **Add a Group** or **Add a Sort**.

Manage Group Header or Footer band

- Use the **Show Header** and **Show Footer** check boxes. An ascending or descending grouping (sorting) mode is specified via the Sort Order drop-down list.

  You can change the order in which multiple grouping and sorting criteria are to be performed, via the **Move Up** and **Move Down** buttons.

Remove a grouping or sorting criterion

1. Select a sorting criterion.
2. Click **Delete**.

Show a hidden Group and Sort Panel

- Select **Group** and **Sort** in the View Group of the ribbon.

9.4.3.1.7 Scripts Errors

The Scripts Errors Panel displays the result of scripts validation after it is forced in the Scripts tab on the ribbon. For more information, refer to Handle Events via Scripts.

Scripts Errors Panel is located at the bottom of the Design Panel next to the Group and Sort Panel.

a*Errors in the scripts* : If errors are located, they are listed in Scripts Errors panel. To get to the corresponding line of code, click an item in the panel's list.

b*Valid scripts* : If all scripts are valid, then the panel reports that the scripts are valid.

Show a hidden Scripts Errors Panel

- Click **Scripts Errors** in the View Group of the ribbon.

9.4.3.1.8 Report Explorer

The Report Explorer:

- Shows a report's structure in tree form, providing easy access to report elements.
- Displays non-visual report components (e.g., report data sources) inside its Components node.

Once an element has been selected in the Report Explorer, its settings can be changed using the Property Grid.

The Report Explorer tab is co-located by default with the **Field List** tab in the Designer tab of the Design Panel.

Show a hidden Report Explorer

- Click **Report Explorer** in the View Group of the ribbon.

9.4.3.1.9 Field List

The Field List window serves the following purposes:

- Displays the list of all available data fields (attributes you can show in your report) and allows you to create report elements that will show information from these fields.
- Allows you to create calculated fields by building expressions based on the values of data fields, report parameter values, etc.
- Shows existing report parameters, and allows you to add parameters to your report.

Click on **Field List** tab next to Report Explorer on the Report Designer tab of the Design Panel.

Show a hidden Field List

- Click **Field List** in the View Group of the ribbon.

9.4.3.1.10 Property Grid

The Property Grid allows you to change the settings of the currently selected report element.

To select an element and show its properties within the Property Grid, do **one** of the following.

- Click the required element on the Report Designer surface.
- Select an element using the Report Explorer window.
- Select an element from the Property Grid's combo box.

The **Property Grid** is co-located by default with the Report Gallery below Report Explorer/Field List panels.

Reset a property value

1. Right-click the property.
2. Click **Reset**.

Show a hidden Property Grid List

- Click **Property Grid** in the View Group of the ribbon.

9.4.3.1.11 Report Gallery

The Report Gallery allows you to:

- Store common report controls, styles, data sources and full report layouts, and re-use them in different reports.
- Create frequently used templates and apply them afterward to other reports.

The Report Gallery tab is located on the right next to the **Property Grid** tab in the Report Designer tab of the Design Panel.

Notes	Do not confuse the Report Gallery with the Report Explorer, which has a similar user interface, but provides a different functionality. The Report Explorer reflects the current report structure and displays components and styles available in the report.

Show a hidden Report Gallery

- Click **Report Gallery** in the View Group of the ribbon.

See also:

- Designing with Report Gallery

9.4.3.1.12 Designer Tab

The Report Designer Tab allows you to customise a report, manage its bands and controls and define their properties.

9.4.3.1.13 Preview Tab

The Preview Tab is intended to check the print output of a report and customise its additional options. You can also export your report directly from here.

9.4.3.1.14 Scripts Tab

The Scripts Tab on the Report ribbon allows you to manage your report's scripts. It provides centralised access to all the scripts being written for a report or any of its elements (bands and controls).

The built-in scripts validation capability is provided in this tab. After clicking Validate, the result is displayed in the Scripts Errors Panel.

For more information, refer to Handle Events via Scripts.

9.4.3.1.15 Report Settings

This document details settings that affect the entire report. A Report is the main object in the Report Designer, as it's the document being edited.

While the main report's properties can be accessed via the report's Smart Tag, the complete settings list is available in the Property Grid, where all the report's properties are divided into the following groups.

Property	Function
Appearance	
Background colour	Specifies the background colour of report elements.
Borders, Border colour and Border Width	Specify border settings for report elements.
Font	Specifies the font settings for report elements.
Foreground colour	Specifies the text colour for report elements.

Formatting Rule Sheet	Invokes the Formatting Rule Sheet Editor, allowing you to manage and customise formatting rules, which can then be defined for a report's bands and controls. To learn more on this, refer to Conditionally Change a Control's Appearance.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the report during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Padding	Specifies indent values used to render the contents of a report's controls.
Page colour	Specifies the fill colour for report pages. This colour may be changed later in a report's Print Preview.
Style Sheet	Allows you to invoke the Styles Editor, which is intended to manage and customise a report's style sheets. To learn more on this, refer to Store and Restore Style Sheets.
Style Sheet's Path	Allows you to define a path to the style sheet contained in a report style sheet file (.REPSS). To learn more on this, refer to Store and Restore Style Sheets.
Text Alignment	Allows you to change the alignment of a report controls' text.
Watermark	Allows you to customise a report's watermark options. For more information about this, refer to Create or Modify Watermarks of a Report.

Behaviour

Display Name	Specifies the name of the report, which is displayed in its Design Panel tab.
Export Options	Allows you to set the export options for each file type (PDF, XLS, TXT, etc.). These options vary with the file type.
Measure Units	Allows you to choose units of measurement for a report (one hundredth of an inch or a tenth of a Millimeter).
Print when Data Source is Empty	Ability to print when there is no data.
Script Language	Allows you to choose the programming language to be used in scripting (C#, Visual Basic or J#).
Script References	Allows you to manage the collection of strings that represent the paths to the assemblies used by the scripts in a report.
Scripts	This property contains events which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Show Margin Lines in Preview	The page margin lines are dotted lines shown on the currently selected page in the report's preview. Use this property to change the visibility of these lines.
Vertical Content Splitting	Allows you to choose whether report controls outside the right page margin should be split across pages, or moved in their entirety to the next page. This option is useful for the cross-tab reports creation.
Visible	Specifies whether a report should be created in print preview.

Data

Calculated Fields	Allows you to access a report's calculated fields collection.
Data Adapter	Determines a report's data adapter used to populate the report's data source. It is created automatically when the Data Member property is defined. To learn more about this, refer to Bind a Report to Data.
Data Member	Determines a specific list in a report's Data Source, for which the Report Designer objects display data. To learn more about this, refer to Bind a Report to Data. Note: Usually, it is not necessary to specify the Data Member property when binding a report to data. This property should only be set directly if the dataset contains more than one table.
Data Source	Determines a report's data source. To learn more about this, refer to Bind a Report to Data.
Filter String	Allows you to invoke the Filter String Editor, which is intended to easily define a filtering condition for a report's data. For more information about this, refer to Change or Apply Data Filtering to a Report.
Tag	This property allows you to add some additional information to a report; for example its id, by which it can then be accessible via scripts.
XML Data Path	Allows you to define a path to data contained in an external XML file. The data contained in the file will then be used as a report's data source.

Design

Name	Determines a report's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Data Source's Schema	Allows you to load an XML/XSD file, containing the schema of a report's data source.
Designer Options	Contains the following options. • Show Designer's Hints: The designer hints are intended to provide tooltips, both describing the purpose of certain report elements for inexperienced users, and describing the reasons and solutions for possible export or printing warnings. By using this property, these hints can be turned on or off. • Show Export Warnings: The export warnings appear when report controls are overlapped, indicating that a report layout may be incorrect when exporting to certain table-based formats (such as XLS, HTML or RTF). • Show Printing Warnings: The printing warnings are intended to notify you that some of a report's controls are placed outside the right page margin, so that the report contains unnecessary pages.
Detail Print Count	Specifies how many times the Detail band should be printed when a data source is defined for the report, and it is not empty.

Detail Print Count when Data Source is Empty	Specifies how many times the Detail band should be printed when no data source is defined for the report.
Draw the Grid	Determines whether to draw the Snap Grid when a report is being designed.
Snap Grid Size	Determines the size of the Snap Grid's cells.
Snap to Grid	Specifies whether to snap controls to the Snap Grid when they are located or resized.
Snapping Mode	Specifies the snapping mode for report elements when they are being aligned using the Snap Grid.

Navigation

Bookmark	Allows you to define how a report is named in the document map when the report bookmarks are implemented. By default, it is synchronised with the report's Name property.

Page Settings

Landscape	Determines whether the page orientation is Landscape (when set to Yes) or Portrait (when set to No).
Margins	Determines the width of a report's margins (measured in report units). Note that the report's Margins.Top and Margins.Bottom properties are tied to the Height property of the Page Margin Bands. So, changing these properties' values will cause changing the appropriate bands' Height value as well, and vice versa.
Page Height	Specifies page height, in report units. This property can only be set if the Paper Kind property is set to Custom.
Page Width	Specifies page width, in report units. This property can only be set if the Paper Kind property is set to Custom.
Paper Kind	Determines the type of paper for a report. Setting this property to any value different from Custom will prevent the Page Height, Page Width and Paper Name properties from being customised. Note: If the Paper Kind property is set to Custom, then the printer paper will be selected according to the Paper Name property's value. In this case, it's also necessary to set the Page Width and Page Height properties to the corresponding values of the paper selected.
Paper Name	Determines the name of the custom paper used in the printer that will print the document. The Paper Name property's value is in effect only when the Paper Kind property is set to Custom. If the printer on which a document is printed does not support the paper type specified by the Paper Name property's value, then it will default to the Letter paper size. In this case, it's also necessary to set the Page Width and Page Height properties to the corresponding values of the selected paper.

Printer Name	Determines the name of the printer to use when printing a report. Note that the specified printer should be installed on the machine.
Using Settings of the Default Printer	Specifies which of the default printer's settings should be used when printing a report.

Parameters

Parameters	Allows you to access a report's parameters collection.
Request Parameters	Allows you to define whether it's required to request the values of a report's parameters when generating the report.

Printing

Report Print Options	Specifies options that define how a report is printed in various circumstances. • BlankDetailCount: Specifies how many times the empty Detail band is repeated before printing the regular data. • Detail Count: Specifies how many times the Detail band should be printed when a datasource is defined for the report, and it is not empty. • Detail Count at Design Time: Specifies how many times the Detail band is printed when a report is being previewed at design time. • Detail Count when Data Source is Empty: Specifies how many times the Detail band should be printed when no datasource is defined for the report. • Print when Data Source is Empty: Specifies whether or not a report should be printed if its datasource is empty.
Show Print Margin Warnings	Specifies whether an error message is shown when the page margins are set outside the printable area.
Show Print Status dialogue	Specifies whether a print status dialogue is shown when a document is being printed.

Structure

Bands	Allows you to invoke the Report Editor, intended to manage and customise a report's bands.

9.4.3.2 Report Designer Bands

Reports built using DataSight 's Report Designer follow a conventional banded report design advocated by Microsoft® and adopted by many other report engines. As opposed to "What you see is what you get" WYSIWYG reports in which a designed report is no different from how it would look on paper, banded reports provide a generalised notion of a report layout that is different from how a published document looks in Print Preview.

In the Report Designer, the report bands are sections of varied type and purpose, where report controls are contained. Bands are featured in the Designer Tab, solely to represent different sections of a report document (such as detail, report or page header, or footer). They allow you to select exactly where a control should be printed, and how many times.

This section describes the available report bands, explains their use, and illustrates how to add new bands to a report. Please refer to the following:

- Understanding Report Bands
- Detail Band
- Detail Report Band for Master-Detail Reports
- Grouping Bands
- Report Header and Footer
- Page Header and Footer
- Page Margin Bands
- Managing Report Bands

See also:

- Report Designer User Interface
- Design Panel

9.4.3.2.1 Understanding Report Bands

Main Report Bands

Basically, a report layout consists of various bands that contain report controls and define their location on document pages. When you start with creating a blank report, it contains only the essential bands by default (the detail band for displaying recurring contents that comes from a report's data source, along with the areas reserved for the top and bottom page margins).

The simplest examples of bands are page margins (repeated once on every document page) along with various headers and footers (repeated once for each page, group or an entire document).

The detail band differs both in its purpose (displaying recurring contents that comes from a report's data source) and behaviour (it is printed as many times, as there are records available in a data source unless you have filtered the incoming data). Every report must have a detail band and you cannot delete it.

Note	Only the detail and group bands are used for displaying dynamic data source contents. Other headers and footers are commonly used to display various titles, summaries and customary information.

Creating Sub-Reports

The Detail report band enables you to create hierarchical master-detail reports that provide detail information about each record displayed in the master report's detail band. You can create such reports when master-detail relationships are defined between data source tables:

In essence, a detail report band is a separate report (subreport) with its own data source, detail and other bands. A report can have any number of detail reports that can also be nested one into another.

Note	You can display hierarchical information in a report in two different ways: • by creating groups • by using subreports See Providing Data to Reports to learn how to choose the approach that best suits your data hierarchy.

Creating Band Copies

You can create functional copies of any band by adding sub-bands to it. This may be useful, for example, when you need a band to display different contents based on a specific condition.

See also Laying out Dynamic Report Contents to learn how you can control the location of bands' content on document pages.

9.4.3.2.2 Detail Band

The Detail band is the central part of a report.

Unlike other bands, it **cannot be deleted** - the present report structure includes the Detail band in its core.

In a data-bound report, the contents of the Detail band are repeated for every data entry (e.g. if you are building a report that lists, say, products, it will be rendered for each product in the database). And, if static data is also present in the Detail band, in the resulting report, it is repeated with each new entry.

In the Property Grid, the Detail Band's properties are divided into the following groups.

Property	Function
Appearance	
Background colour	Specifies the background colour for the controls contained within the band.
Borders, Border colour and Border Width	Specify border settings for the controls contained within the band.
Font	Specifies the font settings for the controls contained within the band.
Foreground colour	Specifies the text colour for the controls contained within the band.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the band during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Padding	Specifies indent values which are used to render the contents of the controls contained within the band.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the controls contained within the band, as well as to assign an existing style to them (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the text alignment of the controls contained within the band.
Behaviour	
Keep Together	As stated above, the detail band is printed repeatedly for every data entry. When the Keep Together option is on, the report engine tries to keep sequential detail band entries together. This option makes sense only when data is grouped or you are working with a master-detail report. In this case, the report engine tries to keep group contents on one page. If a group does not fit and it starts somewhere in the middle of a page, the report

	moves this group to a new page, thus trying to reduce the number of page breaks in continuous data.
Multi-Column Options	This property allows you to arrange the printout of the band's content in several columns. For more information, refer to Multi-Column Report.
Page Break	Use this property if the current report design requires that the detail section should be separated from previous sections or follow-ups. Specify the Before the Band or After the Band values to insert a page break before or after the current band. In many cases, this property may be used instead of the Page Break control.
Scripts	This property contains events, which you can handle by the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the band should be visible in print preview.

Data

Sort Fields	Invokes the Group Field Collection Editor, which enables you to specify the fields for sorting the records within the band, the sorting order (Ascending/Descending) for each field and the order sequence. For more information, refer to Change or Apply Data Sorting to a Report.
Tag	This property allows you to add some additional information to the band; for example its id, by which it can then be accessible via scripts.

Design

Name	Determines a band's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.

Layout

Height	Specifies the band's height, in report measurement units.
Snap Line Padding	Specifies the padding (in report measurement units), which is to be preserved within the band when controls it contains are aligned using Snap Lines.

Misc

Keep Together with Detail Reports	When this option is on, the Detail Band will be always printed on the same page together with its child Detail Report Band, or multiple bands.

See also:

- Property Grid

- Report Designer Bands

9.4.3.2.3 Detail Report Band for Master-Detail Reports

The Detail Report Band for Master-Detail Reports is a type of band used to incorporate one report into another. It is quite different from the Detail band, since it holds the whole detail report in a master-detail report layout, and therefore can contain other types of bands within it. There can be an unlimited number of Detail Report bands nested inside one another. To add a Detail Report band, use the Context Menu. If the bound data source contains a data relationship, the submenu will contain an item with its name. Otherwise, add an unbound detail report and specify its data binding options later.

In the Property Grid, the properties of this band are divided into the following groups.

Property	Function
Appearance	
Background colour	Specifies the background colour for the controls contained within the band.
Borders, Border colour and Border Width	Specify border settings for the controls contained within the band.
Font	Specifies the font settings for the controls contained within the band.
Foreground colour	Specifies the text colour for the controls contained within the band.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the band during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Padding	Specifies indent values which are used to render the contents of the controls contained within the band.
Text Alignment	Allows you to change the text alignment of the controls contained within the band.
Behavior	
Level	Specifies the order of several Detail Report Band objects in a report. It allows the reordering of different Detail Report Bands at the same level of master-detail relationships. The lower the level number, the closer the band is to the Detail band.
Page Break	Use this property if the current report design requires that the band's section should be separated from previous sections or follow-ups. Specify the Before the Band or After the Band values to insert a page break before or after the current band. In many cases, this property may be used instead of the Page Break control.
Print when Data Source is Empty	Specifies whether the band should be printed if its data source is empty.
Scripts	This property contains events which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the band should be visible in print preview.
Data	

Data Adapter	Determines a Detail Report Band's data adapter that provides the detail data for the report. To learn more, refer to Master Detail Report.
Data Member	Determines a name of the data relationship established within the bound data source. To learn more, refer to Master Detail Report.
Data Source	Determines the data source that provides the detail data for the report. If this property isn't defined, the detail report gets data from the master report's data source. To learn more, refer to Master Detail Report.
Filter String	Allows you to invoke the Filter String Editor, which is intended to easily define a filtering condition for a detail report's data. For more information, refer to Change or Apply Data Filtering to a Report.
Tag	This property allows you to add some additional information to the band; for example its id, by which it can then be accessible via scripts.
XML Data Path	Allows you to define a path to the data contained in an XML file. The data contained in the file will then be used as the Detail Report Band's data source. In this case, the Data Member property will specify the bound list in the XML data source. Note that a detail report uses the XML Data Path property value only when the Data Source property is set to None. The XML Data Path property has a lower priority than the Data Source property.

Design

Name	Determines a band's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Detail Print Count	Specifies how many times the Detail band should be printed when a data source is defined for the sub-report, and it is not empty.
Detail Print Count when Data Source is Empty	Specifies how many times the Detail band should be printed when no data source is defined for the sub-report.

Structure

Bands	Allows you to invoke the Report Editor intended to manage and customise the report's bands.

See also:

- Property Grid
- Report Designer Bands

9.4.3.2.4 Grouping Bands

The Group Header and Group Footer bands are shown above and below each group. Usually, you do not need to manually manage these bands, as they are auto-created via the Group and Sort Panel. For more information, refer to Change or Apply Data Grouping to a Report and Change or Apply Data Sorting to a Report.

You may use the Group Header bands for grouping by multiple data fields in one of the following ways.

- Add several Group Header bands. Specify one group field for each of these bands. This results in nested grouping of the report's data.
- Specify several group fields for the Group Fields property of the Group Header band. The data will be grouped by certain combinations of field values.

The Group Footer band is unnecessary without the corresponding Group Header band, to which its properties are similar. The Group Footer can be used to display group totals, or group page numbers.

In the Property Grid, the properties of both these bands are divided into the following groups.

Property	Function
Appearance	
Background colour	Specifies the background colour for the controls contained within the band.
Borders, Border colour and Border Width	Specify border settings for the controls contained within the band.
Font	Specifies the font settings for the controls contained within the band.
Foreground colour	Specifies the text colour for the controls contained within the band.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the band during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Padding	Specifies indent values which are used to render the contents of the controls contained within the bands.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the controls contained within the bands, as well as to assign an existing style to them (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the text alignment of the controls contained within the bands.
Behaviour	
Group Fields	This property is available for the Group Header band only. It invokes the Group Field Collection Editor, allowing you to add and remove grouping fields, define data fields to be used as grouping criteria and the grouping order (ascending or descending). In most scenarios, it's quick and practical to use the Group and Sort Panel, rather than manually adjust the band's group fields collection. However, this is the only way to assign multiple group fields to a single Group Header.
Group Union	Determines whether group rows can be printed on different pages (in this case both Group Union and Group Footer Band.Group Union are set to None), or the entire group will be printed on a single page (if the Group Union is set to Whole Page).

	Also, if a group can be split across pages, but you do not want a Group Header to be printed on a page if there is no data row below it (in case a group starts at the bottom of the page and there is enough room for only a Group Header), you may set the Group Union to With First Detail. In this case, if a Group Header is alone on a page, it will be moved to the beginning of the next page. It is the same for the Group Footer. If you do not want it to be printed alone on a page, you may set its Group Union to With Last Detail, and the last group row from the previous page will be moved to the next page to be printed together with a Group Footer. This property is quickly accessible via the band's Smart Tag.
Keep Together	When this option is on, the report tries to fit the band contents entirely on one page, not allowing it to split across several pages. In general, if the contents are too large to fit on a single page, then the band is started on a new page, and continues on the following page.
Level	Specifies the nesting level of a group band. The lower the level number, the closer the group band is to the Detail band. The numeration starts at zero. It is the parameter that identifies the Group Header / Group Footer band pairs. This option is auto-defined when using the Group and Sort Panel.
Page Break	Use this property if the current report design requires that the band's section should be separated from previous sections or follow-ups. Specify the Before the Band or After the Band values to insert a page break before or after the current band. In many cases, this property may be used instead of the Page Break control.
Print at Bottom	This property is available for the Group Footer band only. It determines whether the band should be printed at the bottom of a page, or immediately after the last group's details. If a report contains several Group Footers with their Print at Bottom properties set to different values, then the outer Group Footer has the highest priority. This feature is helpful when the Page Break property of the Group Header band is set to After the Band. In this instance each group starts a new page, and the Group Footer has two distinct places to reside - after the last row, or at the bottom of the page.
Repeat Every Page	This property improves the readability of reports with group contents that are several pages long. Without a repeated group header at the top of the page, the report may be difficult to read. This property is also accessible via the band's Smart Tag.
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Sorting Summary	This property is available for the Group Header band only. It allows you to sort groups by a summary function result.
Visible	Specifies whether the bands should be visible in print preview.

Data

Tag	This property allows you to add some additional information to the band; for example its id, by which it can then be accessible via scripts.

Design

Name	Determines a band's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.

Layout

Height	Specifies the band's height, in report units.
Snap Line Padding	Specifies the padding (in report measurement units), which is to be preserved within the band when controls it contains are aligned using Snap Lines.

See also:

- Property Grid
- Report Designer Bands

9.4.3.2.5 Report Header and Footer

The Report Header and Report Footer are the only types of report bands rendered once per report. The Report Header is the first band of a report on the first page (not counting margins as they are "out-of-page" zones). The Report Header also precedes the Page Header, making it the best place to display the report's name, company logo, date of creation and user name, etc. And, if you plan to add a Chart that visualises the report's data, place this control onto this band. The Report Footer finalises the informative part of the report. It is placed before the Page Footer and Bottom Margin on the report's last page. Use the Report Footer for report grand totals or conclusions.

In the Property Grid, the properties of these bands are divided into the following groups.

Property	Function
Appearance	
Background colour	Specifies the background colour for the controls contained within the band.
Borders, Border colour and Border Width	Specify border settings for the controls contained within the band.
Font	Specifies the font settings for the controls contained within the band.
Foreground colour	Specifies the text colour for the controls contained within the band.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the band during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Padding	Specifies indent values which are used to render the contents of the controls contained within the bands.

Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the controls contained within the bands, as well as to assign an existing style to them (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the text alignment of the controls contained within the bands.

Behaviour

Keep Together	When this option is on, the report tries to fit the band contents entirely on one page, not allowing it to split across several pages. In general, if the contents are too large to fit on a single page, then the band is started on a new page, and continues on the following page.
Page Break	Use this property if the current report design requires that the band's section should be separated from previous sections or follow-ups. Specify the Before the Band or After the Band values to insert a page break before or after the current band. In many cases, this property may be used instead of the Page Break control.
Print at Bottom	This property is available for the Report Footer band only, and determines whether this band should be printed at the bottom of the last page, or immediately after the last report's details. The Report Footer has priority over the Group Footer's Print at Bottom property, so the Group Footer can never be placed after the Report Footer.
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the band should be visible in print preview.

Data

Tag	This property allows you to add some additional information to the band; for example its id, by which it can then be accessible via scripts. .

Design

Name	Determines a band's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts

Layout

Height	Specifies the band's height, in report units.

Snap Line Padding	Specifies the padding (in report measurement units), which is to be preserved within the band when controls it contains are aligned using Snap Lines.

See also:

- Property Grid
- Report Designer Bands

9.4.3.2.6 Page Header and Footer

The Page Header and Page Footer bands are located at the top and bottom of every page in a report. The Page Header/Footer bands are the best place for information that should be printed on every page. For example, use them to display the header of a table which is continued from the previous page (an example can be found at Table Report). If you insert page break right after the Report Header (by setting its Page Break to After the Band), the Page Footer and Page Header bands will not be printed on the first page.

In the Property Grid, the properties of these bands are divided into the following groups.

Property	Function
Appearance	
Background colour	Specifies the background colour for the controls contained within the band.
Borders, Border colour and Border Width	Specify border settings for the controls contained within the band.
Font	Specifies the font settings for the controls contained within the band.
Foreground colour	Specifies the text colour for the controls contained within the band.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the band during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Padding	Specifies indent values which are used to render the contents of the controls contained within the bands.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the controls contained within the bands, as well as to assign an existing style to them (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the text alignment of the controls contained within the bands.
Behavior	
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the band should be visible in print preview.

Data

Tag	This property allows you to add some additional information to the band; for example its id, by which it can then be accessible via scripts.

Design

Name	Determines a band's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.

Layout

Height	Specifies the band's height, in report units.
Snap Line Padding	Specifies the padding (in report measurement units), which is to be preserved within the band when controls it contains are aligned using Snap Lines.

Misc

Print On	This property specifies whether the band should be printed on the same page with Report Header and Report Footer bands.

See also:

- Property Grid
- Report Designer Bands

9.4.3.2.7 Page Margin Bands

The Top Margin and Bottom Margin bands represent the top and bottom page margins. Unlike other bands, they are not accompanied by strips displaying their titles in the Design Panel. They are intended for displaying page numbers, or some sort of supplementary information (e.g. current system time or the user name).

In the Property Grid, the properties of these bands are divided into the following groups.

Property	Function
Appearance	
Background colour	Specifies the background colour for the controls contained within the band.
Borders, Border colour and Border Width	Specify border settings for the controls contained within the band.
Font	Specifies the font settings for the controls contained within the band.

Foreground colour	Specifies the text colour for the controls contained within the band.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the band during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Padding	Specifies indent values which are used to render the contents of the controls contained within the bands.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the controls contained within the bands, as well as to assign an existing style to them (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the text alignment of the controls contained within the bands.

Behaviour

Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the band should be visible in print preview.

Data

Tag	This property allows you to add some additional information to the band; for example its id, by which it can then be accessible via scripts.

Design

Name	Determines a band's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.

Layout

Height	Specifies the band's height, in report units. Note that this property is tied to the report's Margins.Top (or Margins.Bottom) property, so that changing this property's value will cause the appropriate Margin value to be changed, and vice versa.
Snap Line Padding	Specifies the padding (in report measurement units), which is to be preserved within the band when controls it contains are aligned using Snap Lines.

See also:

- Property Grid
- Report Designer Bands

9.4.3.2.8 Managing Report Bands

Manage Bands in a Report

1. To manage bands in a report, click on any band's Smart Tag or right-click on the report.
2. In the Context Menu, click **Edit and Reorder Bands...**.
3. In the invoked Report Editor, you may add, remove and reorder any band, and adjust their individual Property Grid settings on the right.

Band Tasks

You can perform various Band tasks such as set formatting and print rules, page break settings, sorting etc.

1. To perform tasks on a band, click its Smart Tag.
2. Make your changes in the Band Tasks menu.

Insert a Band

Right-clicking a report's design surface invokes a context menu containing various commands. The most commonly used commands enable you to add new bands to a report and clone existing bands by creating sub-bands.

You can insert a detail report if a report's data source has any master-detail relations assigned to its tables.

1. Right-click on the Report where you would like to insert a band.
2. In the Context Menu, click **Insert Band**.
3. Then click on the desired Band from the sub-menu.

Hide a Band

You can collapse or expand a band in the Report Designer by clicking the arrow button located on the band's title.

You can avoid printing a band's content in a document by setting its Height to a zero value or its Visible property to false.

Remove a Band

1. Right-click on the Band you wish to remove.
2. Click **Delete** to remove the band.

Note	Detail Band cannot be deleted.

9.4.3.3 Providing Data

Report Designer allows you to use data from any data table in DataSight to supply your customised reports with data. The Query Builder is used to construct SQL queries to access tables and views in DataSight.

Externally sourced data from other SQL databases, Entity Framework data sources, custom objects or Excel files are also possible. This requires the use of the DataSource Wizard.

You can also create calculated fields and report parameters that allow you to apply complex expressions to data fields obtained from the DataSight data. See also Shaping Report Data for more details.

9.4.3.3.1 Query Builder

This topic describes how to use the Query Builder to select DataSight data for your report. The Query Builder is launched from either the:

- **Report Designer** on the DataSight Ribbon, or by
- Clicking on a saved report's Smart Tag.

Note	Once the Report Designer is opened, the Query Editor window may disappear from view when the user clicks outside of DataSight. The Query Editor window will not be visible on the DataSight taskbar. In this case, hold down the ALT and Tab keys, to reveal all open windows and reselect the Query Editor.

Bind Data to a new Report

1. In the invoked Query Builder window, select an item from the list of available tables on the left and drop it onto the list of data tables to be used. It is only possible to add one table at a time using the Query Builder. When creating a Master Detail Report, add the master table first.
2. Enable the check box near the added table to include all of its fields in the data view.
3. To assign a custom name to a data field, specify its **Alias** in the field list displayed in the bottom panel.
4. Click **OK** to exit the Query Builder.
5. Click **Finish** to exit and open the Report Wizard dialogue window. Step through the Wizard as required. The newly created DataSight data source will be displayed in the **Components** node of the Report Explorer. By default, the created report contains three bands - Page Header and Footer, and the Detail band.

Add a New DataSource to an existing Report

1. Click on the Smart Tag and in the invoked actions list, expand the **Data Source** drop-down list and click **Add New DataSource**.
2. The first wizard page of the invoked Data Source Wizard allows you to specify what type of a data source you want to use. Select **Database** and click **Next** to proceed.
3. On the next page, specify the database to be used. If it is absent in the drop-down selector containing existing connections, select **No, create a new connection** and click **Next**.
4. Define a custom connection string, or select from the supported data source types. Depending on the data provider selected, it may be necessary to specify additional connection options (such as authentication type and database name) on this page.
5. If server authentication is required for the selected database type, the next page will prompt you to specify whether or not you want to save the user credentials along with the connection string. Select the required option and click **Next**.
6. On the next page, you can construct an SQL query to obtain data from the database. To construct an SQL query, click **Run Query Builder...**
7. In the invoked Query Builder window, select an item from the list of available tables on the left and drop it onto the list of data tables to be used. It is only possible to select a single table using the Query Builder. When creating a Master Detail Report, add the master table first.
8. Enable the check box near the added table to include all of its fields in the data view.
9. To assign a custom name to a data field, specify its **Alias** in the field list displayed below.
10. Click **OK** to exit the Query Builder.
11. Click **Finish** to exit and open the Report Wizard dialogue window. Step through the Wizard as required.

12. The newly created SQL data source will be displayed in the **Components** node of the Report Explorer.

Note	When using the Report Designer to generate a Report, DataSight will crash (as your computer runs out of memory) if an excessively large number of data rows have been requested within the Query Builder. You may be unable to retrieve all the data records from certain tables, depending upon the number of records stored in them and how large they have become. Particular tables that might be affected are: data, process, collection, data tracking, scheduler log. To resolve this issue, correctly utilise Filters within the Query Builder to limit the amount of data being retrieved within the Report Designer. Apply an appropriate filter in the query (e.g. where condition on the date_created) to limit the number of rows returning from the database.

9.4.3.3.2 DataSource Wizard

The DataSource Wizard enables you to configure a data source external to DataSight and retrieve the required data. It supports the following data source types:

- **Database**: Obtains data from all major data providers (Microsoft SQL Server, XML data, Microsoft Access, Oracle, etc.)
- **Entity Framework**: Supports binding to a Microsoft ADO.NET Entity Framework data source.
- **Object Binding**: Connects to any data object implementing the IList, IList<T> and IEnumerable<T> interfaces.
- **Excel File**: Obtains data from Microsoft Excel workbooks (XLS, XLSX or XLSM files) or CSV files.

Note	Please note that no warranty is given as to the accuracy of your reports designed using data from other data sources, and it is your responsibility to check your work. By using Report Designer for this purpose the user warranties Seveno against any claims to that extent.

9.4.3.4 Report Controls

The documents in this section describe options for each report control available in the Report Designer.

In general, report controls allow you to do the following:

- Represent information of different kinds (e.g. simple or formatted text, pictures, tables, etc.) in both static and dynamic reports.
- Adjust report layout (by organising controls within panels, and inserting page breaks at the required positions).

You also can extend the standard functionality of each control by writing scripts for its available events. Controls can be accessed from the Standard Controls Panel.

Available Controls

The following table lists the available controls (in the same order as in the Control Toolbox). For each control's options description, refer to the corresponding document.

Controls	Description
Pointer	The Pointer control is intended to return to the select mouse cursor from any control. Select the Pointer item when you need to perform selection, re-positioning or resizing operations. It is automatically selected after you drop a control onto a report.
Label	The Label control is intended to display text in your report. It can represent static or dynamic text, or both. In addition, it can be used to calculate standard summary functions across a data

	field. The Label's text can only be formatted as a whole. So, if it is required to differently format parts of text, use the Rich Text control.
Check Box	The Check Box control is intended to display True/False or Checked/un-checked/Indeterminate states in a report, by displaying (or not) a check mark, which can be accompanied by a text description.
Rich Text	The Rich Text control allows you to display formatted text in your report. It can represent static or dynamic text, or both. You can load content to the Rich Text from an external TXT or RTF file (which can also contain images) and then format any part of it. The formatting options include font face, styles and sizes, and colour.
Picture Box	The Picture Box control is intended to display images of numerous formats in a report. An image can be loaded from an external file, from the DataSight database, or from a web location using the specified URL.
Panel	The Panel control is a container that frames separate report controls to allow them to be easily moved, copied and pasted, and visually unite them in the report's preview (with borders or a uniform colour background).
Table	The Table control is designed to arrange information in a tabular layout. It may contain any number of Rows comprised of individual Cells. Both Rows and Cells can be selected and customised individually. In most aspects, a Cell is similar to a Label, but can also contain other controls (e.g. Picture Box or Rich Text).
Character Comb	The Character Comb control displays text so that each character is printed in an individual cell.
Line	The Line control draws a line of a specified direction, style, width and colour. It can be used for both decoration and visual separation of a report's sections. The Line cannot cross bands, as opposed to the Cross-band Line control.
Shape	The Shape control allows you to embed simple graphic objects into your report. You can choose one of multiple predefined shapes (e.g. rectangles, ellipses, arrows, polygons, crosses and brackets of various kinds).
Bar Code	The Bar Code control transforms its content into a bar code of the specified type. Multiple standard bar code symbologies are supported.
Chart	The Chart is a sophisticated control used to embed graphs into your report. It graphically represents a series of points using numerous 2D or 3D chart types. A Chart can be populated with points both manually (by specifying arguments and values for each point) and dynamically (by connecting it to the report's data source, or binding it to a separate one).
Gauge	The Gauge control provides you with the capability to embed graphical gauges into your report.
Sparkline	The Sparkline control displays a compact chart that is commonly used to reflect the flow of data for every row in a report.
Pivot Grid	The Pivot Grid control represents dynamic data (obtained from DataSight) in a cross-tabulated form to create cross-tab reports, similar to Pivot Tables in Microsoft Excel®. Column headers display unique values from one data field, and row headers - from another field. Each cell displays a summary for the corresponding row and column values. By specifying different data fields, you can see different totals. This allows you to get a compact layout for a complex data analysis.
Sub-Report	The Sub-Report control allows you to include other reports in your current report.

Table of Contents	The Table of Contents control generates a table of contents based on bookmarks specified for report elements.
Page Info	The Page Info control is intended to add page numbers and system information (the current date and time or the current user name) into your report. As with many other controls, you can format this control's content.
Page Break	The Page Break control's sole purpose is to insert a page delimiter at any point within a report.
Cross-band Line	The Cross-band Line control allows you to draw a line through several bands. This can be useful if it is required to visually emphasise a section consisting of multiple band areas. In other aspects, it is similar to a regular Line.
Cross-band Box	The Cross-band Box control allows you to draw a rectangle through several bands. This can be useful if it is required to visually encompass a section consisting of multiple band areas.

See also:

- Field List

9.4.3.4.1 Pointer

The Pointer control is intended to return to the select mouse cursor from any other control. Select the Pointer item when you need to perform selection, re-positioning or resizing operations. It is automatically selected after you drop a control onto a report.

The Property Grid is not active for a Pointer control.

9.4.3.4.2 Label

The most basic Label control is intended to display text in your report. It can represent static or dynamic text, or both. In addition, it can be used to calculate standard summary functions across a data field. The Label's text can only be formatted as a whole. So, if it's required to differently format parts of text, use the Rich Text control.

After a Label is added to a report, you can customise its text, appearance and other properties, which can be accessed in the Property Grid. The most important properties are also available via a control's Smart Tag, which makes it easy to perform common operations. And, the Formatting Toolbar allows you to easily adjust a Label's text formatting.

In the Property Grid, the Label control properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Font	Specifies the font settings for the control.
Foreground Colour	Gets or sets the control's foreground colour.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the floating-point representation of the coordinates of the control's upper-left corner.

Padding	Specifies indent values which are used to render the contents of a Label (measured in report units).
Size	Specifies the control's size, in report measurement units.
Style Priority	Specifies the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	Specifies odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Specifies the alignment of the control's text.
Text Trimming	Specifies the string trimming mode of the control's text.

Behaviour

Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of a Label, so that after page rendering it stays attached to the top control, bottom control, or both. The property setting is useful for data-bound Labels located between upper and lower controls, which are allowed to resize depending on their contents. Note that if the Anchor Vertically property is set to Bottom or Both, the Can Grow and Can Shrink property (see below) values are ignored, and do not participate in calculating a final height value of this control.
Angle	Specifies the rotation angle of the text. The measurement unit is a degree, and the orientation is counter-clockwise. Since standard HTML does not support text orientation, this parameter is ignored when a report is displayed within a web page.
Auto Width	Specifies whether or not a Label's width should be automatically determined based on its text.
Can Grow	When this property is set to Yes, a Label's height can be automatically increased, if required, to display the text. If there are other controls below the current Label, they will be pushed down to prevent them from overlapping. Note that if a control overlaps the growing Label by even one pixel, it will not be pushed down by the growing Label.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Can Shrink	When this property is set to Yes, and the text does not completely fill a Label, then the Label's height will be decreased to the height of its text. If there are other controls below the current Label, they will be moved up to fill the gap. Note that if a control overlaps the shrinking Label by even one pixel, it will not be pushed up by the shrinking Label.
Edit Options	Provides access to options that define whether and how a control's content can be edited in Print Preview. The Editor Name Image and Signature can be specified. The Edit

	options can be given a Unique Identifier.
Interactive Sorting	Enables sorting a report in Print Preview by clicking the XRLabel. You can specify the band for sorting and the collection of data field used to sort the data in the report's data source (Group Field Collection Editor; see also Sorting a Report in Print Preview).
Keep Together	Specifies whether the contents of a Label can be horizontally split across pages. In other words, if a Label occupies more space than remains on the page, this property specifies whether this Label should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Label's content does not fit on the current page. If it does not fit on the next page either, then the Label will be split, irrespective of this property's value.
Multiline	When this property is set to Yes, a Label processes newline characters found in the text to start a new line. For example, when editing a Label's text, you can insert a new line by pressing ENTER, and in this case, the Multiline property will be automatically set to Yes.
Process Duplicates Mode	Determines the control's behaviour when its data source contains consecutive repeating records. They can be processed as is (when the property is set to Leave), suppressed except for the first entry (Suppress) and suppressed with the blank space printed instead of the repeated records (Suppress and Shrink).
Process Duplicates Target	When the Value and Tag settings are selected, the control processes duplicate values by merging the identical content into a single line of text.
Process Null Values	Determines whether to process Null (blank) values if they appear in the control's data source. They can be processed as is (when the property is set to Leave), suppressed (Suppress) and suppressed with the blank space printed instead of the blank records (Suppress and Shrink).
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Text Fit Mode - Visible	Specifies whether the control should be visible in print preview.
Text Fit Mode - Word Wrap	When this property is set to Yes, text entered into the multiline Label is wrapped to the next line if it does not fit the line or comes across a newline character. If the this property is set to No, text entered into the multiline Label will be displayed on the same line until a newline character is entered.

Data

Data Bindings	This property allows you to bind some of the control's properties (see Miscellaneous: Bookmark, Navigation URL, Tag and Text) to a data field obtained from the report's data source, and to apply a format string to it.
Null Value Text	Specifies the text shown by the control when the value of its bound data field is null.
Summary	Allows you to perform calculations (summary, max, min, average, etc.) over a data field. For more information on calculating summaries, refer to Add Summaries to a Report. Note: Summation is possible for a single data column only. To perform calculations with several data fields, use calculated fields.

Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.
Text	Allows you to define a line of static text to be displayed. To type several lines of text, click the control's Smart Tag, and in the invoked actions list, click Edit Text, or use the Lines property. Note that when a Label is selected in the designer, you may simply start typing the text, and it will be automatically entered into the in-place editor.
Text Format String	Specifies the output format for the label's bound value (provided by the applied expression, data binding or summary). Click **...** to show the Format String Editor.
Xlsx Format String	Specifies the native XLSX format string for the control's content, which is to be preserved when the report is being exported to XLSX. This format string is independent from the general value formatting.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).

Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Auto Width, Can Grow, Can Shrink, Multiline, Summary, Text, Text Format String, Word Wrap

9.4.3.4.3 Check Box

The Check Box control is intended to display True/False or Checked/un-checked/Indeterminate states in a report, by displaying (or not) a check mark, which can be accompanied by a text description.

In the Property Grid, the Check Box's control properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width & Borders	Specify border settings for the control.
Font	Specifies the font settings for the control.
Foreground colour	Specifies the text colour for the control.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Glyph Alignment	Specifies the glyph alignment as near, centre or far.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of a Check Box
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the alignment of the control's text.
Text Trimming	Specifies the string trimming mode of the control's text.

Behaviour

Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both. The property setting is useful for data-bound Check Boxes located between upper and lower controls, which are allowed to resize depending on their contents.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Edit Options	Provides access to options that define whether and how a control's content can be edited in Print Preview. The Editor Name Image and Signature can be specified. The Edit options can be given a Unique Identifier.
Keep Together	Specifies whether the contents of a Check Box can be horizontally split across pages. In other words, if a Check Box occupies more space than remains on the page, this property specifies whether this Check Box should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Check Box's content does not fit on the current page. If it does not fit on the next page either, then the Check Box will be split despite this property's value.
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in print preview.
Word Wrap	When this property is set to Yes, text entered into a Check Box is wrapped to the next line if it does not fit the line.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark, Check State, Navigation URL, Tag and Text) to a data field obtained from the report's data source, and to apply a format string to it. For more information on this, refer to Displaying DataSight.
Check State	This property allows you to quickly specify the Checked/un-checked/Indeterminate state of a Check Box (the Indeterminate state is displayed as a grayed out checked box.) Note that if you only want to use Checked and un-checked states, you may use the Checked property, instead.
Checked	This property allows you to define whether a Check Box is checked or not.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.

Text	Allows you to define a line of static text to be displayed. Note that when a Check Box is selected in the designer, you may simply start typing the text, and it will be automatically entered into the in-place editor.
Text Format String	Specifies the output format for the control's bound value (provided by the applied expression, data binding or summary). Click **...** to show the Format String Editor.
Xlsx Format String	Specifies the native XLSX format string for the control's content, which is to be preserved when the report is being exported to XLSX. This format string is independent from the general value formatting.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Check State, Text, Word Wrap

9.4.3.4.4 Rich Text

The Rich Text control allows you to display formatted text in your report. It can represent static or dynamic text, or both. You can load content to the Rich Text from an external TXT or RTF file (which can also contain images) and then format any part of it. The formatting options include font face, styles and sizes, and colour. A content from an external TXT or RTF file can be loaded to this control via its Smart Tag.

In the Property Grid, the Rich Text control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Font	Specifies the font settings for the control.
Foreground Colour	Specifies the text colour for the control.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of the control.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both. The property setting is useful for data-bound controls located between upper and lower controls, which are allowed to resize depending on their contents.

	Note that if the Anchor Vertically property is set to Bottom or Both, the Can Grow and Can Shrink properties (see below) values are ignored, and do not participate in calculating a final height value of this control.
Can Grow	When this property is set to Yes, the control's height can be automatically increased, if required, to display the text. If there are other controls below the current control, they will be pushed down to prevent them from overlapping. Note that if a control overlaps the growing Rich Text by even one pixel, it will not be pushed down by the growing Rich Text.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Can Shrink	When this property is set to Yes, and the text does not completely fill a Rich Text, then the control's height will be decreased to the height of its text. If there are other controls below the current one, they will be moved up to fill the gap. Note that if a control overlaps the shrinking Rich Text by even one pixel, it will not be pushed up by the shrinking Rich Text.
Keep Together	Specifies whether the contents of the control can be horizontally split across pages. In other words, if the control occupies more space than remains on the page, this property specifies whether this control should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when the control's content does not fit on the current page. If it does not fit on the next page either, then the control will be split despite this property's value.
Process Duplicates Mode	Determines the control's behaviour when its data source contains consecutive repeating records. They can be processed as is (when the property is set to Leave), suppressed except for the first entry (Suppress) and suppressed with the blank space printed instead of the repeated records (Suppress and Shrink).
Process Duplicates Target	When the Value and Tag settings are selected, the control processes duplicate values by merging the identical content into a single line of text.
Process Null Values	Determines whether to process Null (blank) values if they appear in the control's data source. They can be processed as is (when the property is set to Leave), suppressed (Suppress) and suppressed with the blank space printed instead of the blank records (Suppress and Shrink).
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in print preview.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark, Html, Navigation URL, Rtf and Tag) to a data field obtained from the report's data source, and to apply a format string to it.
Null Value Text	Specifies the text shown by the Rich Text when the value of its bound data field is null.

Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Tag.Binding drop-down selector, select the required data field.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Can Grow, Can Shrink

9.4.3.4.5 Picture Box

The Picture Box control is intended to display images of numerous formats in a report. An image can be loaded from an external file, from the DataSight database, or from a web location using the specified URL. The following image formats are supported: BMP, DIB, RLE, JPG, JPEG, JPE, JFIF, GIF, EMF, WMF, TIF, TIFF, PNG and ICO. To quickly load an image from an external file, use the control's Smart Tag. To bind the control to a data field containing images, right-click the corresponding Field List item, and then drag and drop it onto a report. This will invoke the Context Menu, where you can choose the Picture Box, and it will be automatically created and bound to the selected data field.

In the Property Grid, the Picture Box control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of the control.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both. The property setting is useful for data-bound controls located between upper and lower controls, which are allowed to resize depending on their contents.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Edit Options	Provides access to options that define whether and how a control's content can be edited in Print Preview. The Editor Name Image and Signature can be specified. The Edit options can be given a Unique Identifier.
Image Alignment	Specifies the alignment of a displayed image in relation to the XRPictureBox control's boundaries.
Keep Together	Specifies whether the contents of a Label can be horizontally split across pages. In other words, if a Label occupies more space than remains on the page, this property specifies whether this Label should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Label's

content does not fit on the current page. If it does not fit on the next page either, then the Label will be split, irrespective of this property's value.

Process Duplicates Mode — Determines the control's behaviour when its data source contains consecutive repeating records. They can be processed as is (when the property is set to Leave), suppressed except for the first entry (Suppress) and suppressed with the blank space printed instead of the repeated records (Suppress and Shrink).

Process Duplicates Target — When the Value and Tag settings are selected, the control processes duplicate values by merging the identical content into a single line of text.

Process Null Values — Determines the control's behaviour when its data source contains a null value. They can be processed as is (when the property is set to Leave), suppressed except for the first entry (Suppress) and suppressed with the blank space printed instead of the repeated records (Suppress and Shrink).

Scripts — This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.

Sizing — Defines the sizing mode of a contained image. To quickly adjust the image size and position within the control, click its Smart Tag, and choose Sizing.

The image sizing settings are briefly described as follows

Mode	Description
Normal	The image is placed in the upper-left corner of the control. The image is clipped if it is larger than the Picture Box which contains it.
Stretch Image	The image within the control is stretched or shrunk to fit the size of a Picture Box.
Auto-Size	The Picture Box size is adjusted to that of the image it contains.
Center Image	The image is displayed in the centrer of the control. If the image is larger than the Picture Box, the outer edges are clipped.
Zoom Image	The image is sized proportionally (without clipping) for best fit into the control.
Squeeze	If the dimensions of a Picture Box exceed that of the image it contains, the image is centred and shown full-size. Otherwise, the image is resized to fit into the Picture Box's dimensions.
Tile	The original image is replicated within the Picture Box starting from the upper-left corner. The replicated image is clipped if it does not fit in the Picture Box which contains it.

Visible — Specifies whether the control should be visible in print preview.

Data

Data Bindings — This property allows you to bind some of the control's properties (Bookmark, Image, Image URL, Navigation URL and Tag) to a data field obtained from the report's data

	source, and to apply a format string to it.
Image Source	Specifies an image to display in the Picture Box control. When you click the ellipsis button, you will see the Open File dialogue that enables you to specify the file to load. Then, this image is embedded into a report and saved within this report, so it is always available. Note that this increases the size of a saved report definition. If you want to save only the image path, and not the image itself, use the Image URL property instead.
Image URL	Specifies the URL of the image to display in the Picture Box control. It supports both absolute and relative paths. A relative path may be related to the Web site or to the current Web page. In the second case, the path to the image must start with the "~" symbol. Setting a relative path makes it easier to move the entire application to another directory on the server without having to update the code.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.

Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Image Alignment, Image Source, Image URL, Sizing

9.4.3.4.6 Panel

The Panel control is a container that frames separate report controls to allow them to be easily moved, copied and pasted, and visually unite them in the report's preview (with borders or a uniform colour background). Currently, there are several limitations on Panel usage. One of them is that Panel cannot shrink, and therefore cannot suppress the white space that appears when the controls inside are shrunk or collapsed. Also, the Panel cannot cross bands, as Cross-band Line and Cross-band Box can do.

In the Property Grid, the Panel control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of controls contained in a Panel.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both.

	Note that if the Anchor Vertically property is set to Bottom or Both, the Can Grow property (see below) values are ignored, and do not participate in calculating a final height value of this control.
Can Grow	When this property is set to Yes, the control's height can be automatically increased, if required, to display the text. If there are other controls below the current control, they will be pushed down to prevent them from overlapping. Note that if a control overlaps the growing Panel by even one pixel, it will not be pushed down by the growing Panel.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Can Shrink	When this property is set to Yes, and the text does not completely fill a Label, then the Label's height will be decreased to the height of its text. If there are other controls below the current Label, they will be moved up to fill the gap. Note that if a control overlaps the shrinking Label by even one pixel, it will not be pushed up by the shrinking Label.
Keep Together	Specifies whether the contents of the control can be horizontally split across pages. In other words, if the control occupies more space than remains on the page, this property specifies whether this control should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when the control's content does not fit on the current page. If it does not fit on the next page either, then the control will be split despite this property's value.
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in print preview.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark, Navigation URL and Tag) to a data field obtained from the DataSight database, and to apply a format string to it.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks.

	The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.
Snap Line Padding	Specifies the padding (in report measurement units), which is to be preserved within the control when controls it contains are aligned using Snap Lines.

Favourites

Default List	Can Grow, Can Shrink

9.4.3.4.7 Table

The Table control is designed to arrange information in a tabular layout. It may contain any number of Rows comprised of individual Cells. Both Rows and Cells can be selected and customised individually. In most aspects, a Cell is similar to a Label, but can also contain other controls (e.g. Picture Box or Rich Text). When a Table is dropped onto a band from the Toolbox, it has one row and three columns. If you click and drag over several bands, the resulting table will be split by the bands into several tables. This creates a table header and the detail table with one mouse move. When you drag and drop an entire data table from the Field List, a Table with cells bound to the corresponding data fields is created automatically. A table's elements are managed by using its Context Menu. The whole Table, or its individual Row or Cell can be selected either in the Report Designer, the Report Explorer or the drop-down selector of the Property Grid.

In the Property Grid, the Table control's properties are divided into the following groups:

Property	Function

Appearance

Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Font	Specifies the font settings for the control.
Foreground Colour	Specifies the text colour for the control.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of a Table's cells.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the alignment of a Table's text.

Behaviour

Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of a Table, so that after page rendering it stays attached to the top control, bottom control, or both.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Keep Together	Specifies whether the contents of a Table can be horizontally split across pages. In other words, if a Table occupies more space than remains on the page, this property specifies whether the Table should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Table's content does not fit on the current page. If it does not fit on the next page either, then the Table will be split despite this property's value.
Process Hidden Cell Mode	Specifies how to distribute a space remaining after hiding table cells among the table's visible cells.
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.

Visible	Specifies whether the control should be visible in print preview.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark and Tag) to a data field obtained from the DataSight database, and apply a format string to it.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Favourite properties are not specified for this report control.

9.4.3.4.7.1 Table Row

The Table Row Control represents a single row within a Table. This control is useful for changing the layout of the entire row. Although in this document, a Row is described as a separate control, in fact most of its properties are actually applied to the Cells contained within the selected row.

In the Property Grid, the Table Row control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.

Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Font	Specifies the font settings for the control.
Foreground Colour	Specifies the text colour for the control.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Height	Specifies the Row's height, in report measurement units.
Padding	Specifies indent values which are used to render the contents of a Row.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the alignment of the control's text.

Behaviour

Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Keep Together	Specifies whether the contents of a Row can be horizontally split across pages. In other words, if a Row occupies more space than remains on the page, this property specifies whether this Row should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Row's content does not fit on the current page. If it does not fit on the next page either, then the Row will be split despite this property's value.
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in print preview.

Data

Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.

Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Favourite properties are not specified for this report control.

9.4.3.4.7.2 Table Cell

The Table Cell control represents an individual cell within a Table. In general, the Table Cell control's properties are similar to the properties of the Label control.

In the Property Grid, the Table Cell control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Font	Specifies the font settings for the control.
Foreground Colour	Specifies the text colour for the control.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Padding	Specifies indent values which are used to render the contents of a Label.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the alignment of the control's text.
Text Trimming	Specifies the string trimming mode of the control's text.
Width	Specifies the Cell's width, in report measurement units.
Behaviour	
Angle	Specifies the rotation angle of a Cell's text. The measurement unit is a degree, and the orientation is counter-clockwise. Since standard HTML does not support text orientation, this parameter is ignored when a report is displayed within a web page.

Can Grow	When this property is set to Yes, a Cell's height can be automatically increased, if required, to display the text. If there are other controls below the current Cell, they will be pushed down to prevent them from overlapping. Note that if a control overlaps the growing Cell by even one pixel, it will not be pushed down by the growing Cell.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Can Shrink	When this property is set to Yes, and the text does not completely fill a Cell, then the Cell's height will be decreased to the height of its text. If there are other controls below the current Cell, they will be moved up to fill the gap. Note that if a control overlaps the shrinking Cell by even one pixel, it will not be pushed up by the shrinking Cell.
Edit Options	Provides access to options that define whether and how a control's content can be edited in Print Preview. The Editor Name Image and Signature can be specified. The Edit options can be given a Unique Identifier.
Interactive Sorting	Enables sorting a report in Print Preview by clicking the control. You can specify the band for sorting and the collection of data field used to sort the data in the report's data source (Group Field Collection Editor; see also Sorting a Report in Print Preview).
Keep Together	Specifies whether the contents of a Cell can be horizontally split across pages. In other words, if a Cell occupies more space than remains on the page, this property specifies whether this Cell should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Cell's content does not fit on the current page. If it does not fit on the next page either, then the Cell will be split despite this property's value.
Multiline	When this property is set to Yes, a Cell processes newline characters found in the text to start a new line. For example, when editing a Cell's text, you can insert a new line by pressing ENTER, and in this case the Multiline property will be automatically set to Yes.
Process Duplicates Mode	Determines the control's behaviour when its data source contains consecutive repeating records. They can be processed as is (when the property is set to Leave), suppressed except for the first entry (Suppress) and suppressed with the blank space printed instead of the repeated records (Suppress and Shrink).
Process Duplicates Target	When the Value and Tag settings are selected, the control processes duplicate values by merging the identical content into a single line of text.
Process Null Values	Determines whether to process Null (blank) values if they appear in the control's data source. They can be processed as is (when the property is set to Leave), suppressed (Suppress) and suppressed with the blank space printed instead of the blank records (Suppress and Shrink).
Row Span	pecifies the number of rows in the table control that the cell spans
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Text Fit Mode	Specifies whether and how a control's text size can be changed to fit the control's boundaries. This property is not available if the Can Grow, Can Shrink and Auto Width options are enabled.

Visible	Specifies whether the control should be visible in print preview.
Word Wrap	When this property is set to Yes, text entered into the multiline Cell is wrapped to the next line if it does not fit the line or comes across a newline character. If the this property is set to No, text entered into the multiline Cell will be displayed on the same line until a newline character is entered.

Data

Data Bindings	This property allows you to bind some of a Cell's properties (Bookmark, Navigation URL, Tag and Text) to a data field obtained from the DataSight database, and to apply a format string to it. For more information on this, refer to Displaying DataSight Values.
Null Value Text	Specifies the text shown by the Label when the value of its bound data field is null.
Summary	Allows you to perform calculations (summary, max, min, average, etc.) over a data field. For more information on calculating summaries, refer to Add Totals to a Report. Note: Summation is possible for a single data column only. To perform calculations with several data fields, use calculated fields.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.
Text	Allows you to define a line of static text to be displayed. When a Cell is selected in the designer, you may simply start typing the text, and it will be automatically entered into the in-place editor. To type several lines of text, use the Lines property. The Text property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Text.Binding drop-down selector, select the required data field. For more information on this, refer to Displaying DataSight Values.
Text Format String	Specifies the output format for the control's bound value (provided by the applied expression, data binding or summary). Click **...** to show the Format String Editor.
Xlsx Format String	Specifies the native XLSX format string for the control's content, which is to be preserved when the report is being exported to XLSX. This format string is independent from the general value formatting.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.

Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.
Favourites	
Default List	Can Grow, Can Shrink, Multiline, Summary, Word Wrap

9.4.3.4.8 Character Comb

The Character Comb control displays text so that each character is printed in an individual cell. When exporting this control to third-party formats, consider the following:

- When a report is exported to an XLS or XLSX file, the cells of the Character Comb correspond to the cells of a resulting Excel sheet.
- When a report is exported to a CSV (or TXT) file, the content of individual cells is separated (or spaced) by a specified Separator character.

In the Property Grid, the Character Comb options are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.

Border Colour, Border Dash Style, Border Width and Borders	Specify border settings applied to the control's cells. When the cell spacing is set to zero, the borders of adjacent cells are merged (i.e., the actual border width is not doubled). When the control's content is to be printed on multiple pages, a page break occurring at a horizontal border of a cell will move the entire row above this border to the next page and split its upper border in two parts (one half stays on the previous page, and the other half moves to the next). However, this is not the case if the vertical cell spacing is not zero, in which case the same border width is maintained on both pages.
Cell Height	Specifies the height of the cells in the Character Comb (measured in report units). This is not available when Cell Size Mode is set to Auto.
Cell Horizontal Spacing	Specify the horizontal spacing between adjacent cells (measured in report units). These values do not depend on the specified border width of a control. The area between cells is not affected by the Background Colour property of a control. When applying a style to a Character Comb, the style's Padding property is ignored.
Cell Size Mode	Specifies whether or not the cell size should depend on the current font size of a control. The following cell size modes are supported. • **Auto Size**: The cell size depends on the current font size of a control (the Cell Height and Cell Width properties are ignored). With this setting, the actual cell size does not depend on the specified border width of a control. • **Auto Height**: Only the cell height depends on the current font size of a control (the Cell Height property is ignored), and the Cell Width value is specified manually. With this setting, the actual cell height does not depend on the specified border width of a control, while the effective cell width is the difference between the specified Cell Width and Border Width values. • **Auto Width**: Only the cell width depends on the current font size of a control (the Cell Width property is ignored), and the Cell Height value is specified manually. With this setting, the actual cell width does not depend on the specified border width of a control, while the effective cell height is the difference between the specified Cell Height and Border Width values. • **Custom**: The cell size is determined by the Cell Height and Cell Width property values and does not depend on the assigned font size. With this setting, the actual cell size is less than the specified Cell Height and Cell Width by the Border Width value.
Cell Vertical Spacing	Specify the vertical spacing between adjacent cells (measured in report units). These values do not depend on the specified border width of a control. The area between cells is not affected by the Background Colour property of a control. When applying a style to a Character Comb, the style's Padding property is ignored.
Cell Width	Specifies the width of the cells in the Character Comb (measured in report units). This is not available when Cell Size Mode is set to Auto.
Font	Specifies the font settings for the control.
Foreground Colour	Specifies the text colour for the control.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.

Location	Specifies the control's location, in report measurement units.
Size	Specifies the control's size, in report measurement units.
Style Priority	Specifies the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	Specifies odd and even styles for the control and enables you to assign an existing style to the control (or a newly created one). To learn more, see Understanding Style Concepts.
Text Alignment	Specifies the alignment of the control's text.

Behaviour

Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of a control, so that after page rendering it stays attached to the top control, bottom control, or both. The property setting is useful for data-bound controls located between upper and lower controls, which are allowed to resize depending on their contents. Note that if the Anchor Vertically property is set to Bottom or Both, the Can Grow and Can Shrink property (see below) values are ignored, and don't participate in calculating a final height value of this control.
Auto Width	Specifies whether or not a control's width should be automatically determined based on its text.
Can Grow	When this property is set to Yes, a Character Comb's height can be automatically increased, if required, to display the text. If there are other controls below the current control, they will be pushed down to prevent them from overlapping. Note that if a control overlaps the growing Character Comb by even one pixel, it will not be pushed down by the growing control.
Can Publish	Specifies whether or not a control is displayed in a printed or exported document.
Can Shrink	When this property is set to Yes, and the text does not completely fill a control's dimensions, the control's height will be decreased to the height of its text. If there are other controls below the current control, they will be moved up to fill the gap. Note that if a control overlaps the shrinking Character Comb by even one pixel, it will not be pushed up by the shrinking control.
Edit Options	Provides access to options that define whether and how a control's content can be edited in Print Preview. The Editor Name Image and Signature can be specified. The Edit options can be given a Unique Identifier.
Interactive Sorting	Enables sorting a report in Print Preview by clicking the XRLabel. You can specify the band for sorting and the collection of data field used to sort the data in the report's data

	source (Group Field Collection Editor; see also Sorting a Report in Print Preview).
Keep Together	Specifies whether the contents of a Character Comb can be horizontally split across pages. In other words, if a Character Comb occupies more space than remains on the page, this property specifies whether this Character Comb should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Character Comb's content does not fit on the current page. If it does not fit on the next page either, then the Character Comb will be split, irrespective of this property's value.
Multiline	When this property is set to Yes, a Character Comb processes newline characters found in the text to start a new line. For example, when editing a Character Comb's text, you can insert a new line by pressing ENTER, and in this case, the Multiline property will be automatically set to Yes.
Process Duplicates Mode	Determines the control's behavior when its data source contains consecutive repeating records. They can be processed as is (when the property is set to Leave), suppressed except for the first entry (Suppress) and suppressed with the blank space printed instead of the repeated records (Suppress and Shrink). When the MergeByValue and MergeByTag settings are selected, the control processes duplicate values by merging the identical content into a single line of text.
Process Duplicates Target	Specifies whether to process duplicate values of the control's Text or Tag property.
Process Null Values	Determines whether to process Null (blank) values if they appear in the control's data source. They can be processed as is (when the property is set to Leave), suppressed (Suppress) and suppressed with the blank space printed instead of the blank records (Suppress and Shrink).
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in print preview.
Word Wrap	When this property is set to Yes, text entered into the multiline Character Comb is wrapped to the next line if it doesn't fit the line or comes across a newline character. If the this property is set to No, text entered into the multiline Character Comb will be displayed on the same line until a newline character is entered.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark, Navigation URL, Tag and Text) to a data field obtained from the DataSight database, and to apply a format string to it. For more information on this, refer to Displaying DataSight Values.
Null Value Text	Specifies the text displayed by a control when the value of its bound data field is null.
Summary	Allows you to perform calculations (summary, max, min, average, etc.) over a data field. For more information on calculating summaries, refer to Add Summaries to a Report.

	Note that Summarization is possible for a single data column only. To perform calculations with several data fields, use calculated fields.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.
Text	Allows you to define a line of static text to be displayed. To type several lines of text, click the control's Smart Tag, and in the invoked actions list, click Edit Text, or use the Lines property. Note that when a Character Comb is selected in the designer, you may simply start typing the text, and it will be automatically entered into the in-place editor.
Text Formatting String	Specifies the output format for the control's bound value (provided by the applied expression, data binding or summary). Click **...** to show the Format String Editor.
Xlsx Format String	Specifies the native XLSX format string for the control's content, which is to be preserved when the report is being exported to XLSX. This format string is independent from the general value formatting.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to

	Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.
Favourites	
Default List	Auto Width, Can Grow, Can Shrink, Multiline, Summary, Text, Text Format String, Word Wrap

9.4.3.4.9 Line

The Line control draws a line of a specified direction, style, width and colour. It can be used for both decoration and visual separation of a report's sections. The Line cannot cross bands, as opposed to the Cross-band Line control.

In the Property Grid, the Line control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Foreground Colour	Specifies the Line's colour.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Line Direction	The line can be drawn vertically, horizontally and from one corner of the rectangle, representing the Line control, to another, across the rectangle. That is, Vertical, Horizontal, Slant and Back Slant types.
Line Style	You can select the solid (by default), dashed, dotted or mixed style for the line.
Line Width	Specifies the Line's width, in report measurement units.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of the control.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.

Behaviour

Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Keep Together	Specifies whether the contents of the control can be horizontally split across pages. In other words, if the control occupies more space than remains on the page, this property specifies whether this control should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when the control's content does not fit on the current page. If it does not fit on the next page either, then the control will be split despite this property's value.
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in print preview.

Data

Data Bindings	If the current report is bound to data, this property allows you to bind the control's Tag property.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Line Direction, Line Style, Line Width

9.4.3.4.10 Shape

The Shape control allows you to embed simple graphic objects into your report. You can choose one of multiple predefined shapes (e.g. rectangles, ellipses, arrows, polygons, crosses and brackets of various kinds).

In the Property Grid, the Shape control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Fill Colour	Specifies the colour to fill the contour of a Shape, if applicable. It is transparent by default.
Foreground Colour	Determines the colour of a Shape's contour.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Line Style	You can select the solid (by default), dashed, dotted or mixed style for the line.
Line Width	Here you can set the width of a line used to draw the Shape, expressed in the measure units defined by the report's Measure Units property. To learn more about this, refer to Change Measurement Units of a Report.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of the control.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both.
Angle	The value in degrees specifies the rotation angle of a Shape. It indicates counterclockwise rotation.

You can hold CTRL while pressing the left mouse button to rotate a Shape within the control's borders.

Can Publish

Specifies whether or not a report control is displayed in a printed or exported document.

Scripts

This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.

Shape

Determines which of the various built-in shapes to use within the control.

A certain shape has its own unique set of properties. The following list is intended to give a brief overview of these special properties specific to a certain shape.

Property	Description	Supported by Shapes
Fillet	This property specifies how much a Shape's corners are rounded. It enables display of rounded boxes and triangles.	Arrows, Polygons, Stars and Cross
Number of Sides	This property allows you to set the number of sides.	Polygons
Count of Star Points	This property allows you to set the number of star points.	Stars
Concavity	Defines the level of inward-curve for the lines connecting the vertices of a Star. It may be an integer in the range of 0 - 100.	Stars
Tip's Length	This property specifies the length of the Bracket's ends.	Bracket and Brace
Tail's Length	This property specifies the tail length of a Brace.	Brace
Arrow Height	Gets or sets the height of an arrow (in percent.	Arrow
Arrow Width	Gets or sets the width of an arrow in percent.	Arrow
Horizontal Line Width	Gets of sets the horizontal line width of a cross (in percents)	Cross
Vertical Line Width	Gets of sets the vertical line width of a cross (in percents)	Cross

Stretch

If the Shape is rotated to some degree (that is, its Angle property is not zero), you may turn on the Stretch property. The Shape image will be stretched to cover maximum space within the control's borders.

Visible

Specifies a value indicating whether the current control should be printed (when set to Yes) or hidden (No) on report generation.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark, Navigation URL and Tag) to a data field obtained from the DataSight database, and to apply a format string to it.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Angle, Fill Colour, Line Width, Shape, Stretch

9.4.3.4.11 Bar Code

The Bar Code control transforms its content into a bar code of the specified type. Multiple standard bar code symbologies are supported.

Note: The barcode quality can degrade when the report is exported to formats other than PDF. To ensure reliable barcode recognition, print the report directly from an application using the native printing methods. The Module and Auto-Module properties of a control should be used with care.

In the Property Grid, the Bar Code control's properties are shown divided into the following groups:

Property	Function
Appearance	
Alignment	Determines the alignment of the barcode image within the control. To define the text alignment, use the Text Alignment property.
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Font	Specifies the font settings for the control.
Foreground Colour	Specifies the text and image colour for the bar code.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of a Bar Code.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the alignment of the control's text. To define the alignment of the barcode image, use the Alignment property.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that, after page rendering, it stays attached to the top control, bottom control, or both.

Auto-Module	When this property is set to Yes, the barcode image is stretched to fit the entire control's width. When this option is turned off, this behaviour is determined by the Module property.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Keep Together	Specifies whether the contents of the control can be horizontally split across pages. In other words, if the control occupies more space than remains on the page, this property specifies whether this Bar Code should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Bar Code's content does not fit on the current page. If it does not fit on the next page either, then the Bar Code will be split, despite this property's value.
Module	Specifies the width of the narrowest bar or space in the barcode, in report measurement units. You may set this property to Yes for automatic adjustment of its value, when the control is resized. Note that if the Module value is too low, the barcode output may become unreadable by a barcode scanner. When the Auto-Module property is set to No, there could be a situation when the barcode image generated with the current setting of Module property is larger than the control itself. In this case, the control displays a warning, as illustrated below. So, increase the dimensions of the control, to avoid this.
Orientation	The barcode image within the control can be rotated. If you need this feature, use the Orientation property to specify one of four possible orientations (Normal, Upside Down, Rotate to the Left and Rotate to the Right) for an image within the control.
Process Duplicates Mode	Determines the control's behaviour when its data source contains consecutive repeating records. They can be processed as is (when the property is set to Leave), suppressed except for the first entry (Suppress) and suppressed with the blank space printed instead of the repeated records (Suppress and Shrink).
Process Duplicates Target	When the Value and Tag settings are selected, the control processes duplicate values by merging the identical content into a single line of text.
Process Null Values	Determines whether to process Null (blank) values if they appear in the control's data source. They can be processed as is (when the property is set to Leave), suppressed (Suppress) and suppressed with the blank space printed instead of the blank records (Suppress and Shrink).
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Show Text	Determines whether to display the numerical value, or only the barcode within the control.
Symbology	The Symbology defines the mapping between barcode text and an image. The symbologies supported by the Bar Code control are listed in the following table:

Symbology	Description
Codabar	The Codabar is an old format that uses discrete, self-checking symbology, capable of encoding 16 different characters, plus an

	additional 4 start/stop characters. You should also specify the Start and Stop Symbols and Wide Narrow Ratio properties.
Code11	Code 11, also known as USD-8, was developed as a high-density numerical-only symbology. The symbology is discrete, and is able to encode the numbers 0 through to 9, the dash symbol (-), and start/stop characters.
Code128	Code 128 has been widely implemented. It is a high-density symbology which permits encoding messages of arbitrary lengths of any character of the ASCII character set. The symbology includes a checksum digit for verification. You should also specify the Character Set. The recommended setting is Auto Charset.
Code39	Code 39 is also known as "3 of 9 Code" and "USD-3". It can encode uppercase letters (A through Z), digits (0 through 9) and several special characters like the $ sign. The Calculate a Checksum and Wide Narrow Ratio (which should be in a range of 2.2 -3) properties can also be specified.
Code39Extended	This is an extension of Code 39, also known as "Full ASCII Code 39". It is capable of encoding all 128 ASCII characters. The Calculate a Checksum and Wide Narrow Ratio (which should be in a range of 2.2 -3) properties can be specified.
Code93	Code 93 was designed to supplement and improve Code 39. It is an alphanumeric, variable length symbology, providing higher reliability and density than Code 39. The Calculate a Checksum property can be specified.
Code93Extended	It enables encoding of all 128 ASCII characters using Code 93's "Full ASCII Mode". This is accomplished by using the ($), (/), (%), and (+) symbols as "shift" characters. The Calculate a Checksum property can be specified.
CodeMSI	MSI symbology, also known as Modified Plessey, is a low-density, numerical only symbology. To specify the checksum, use the MSI Checksum property. It can be set to None, Modulo 10 and Double Modulo 10.
DataMatrix	Data Matrix ECC200 code is a two-dimensional matrix barcode consisting of black and while "cells" arranged in a square or a rectangular pattern. The encoded information can be text or raw data.
DataMatrix GS1	GS1 DataMatrix uses a special start combination to differentiate the GS1 DataMatrix symbol from the other Data Matrix ECC 200 symbols. The Bar Code control now supports this symbology.
EAN128	UCC/EAN-128 symbology has the newer name GS1-128. It is based on the Code128 standard, additionally specifying the Application Identifiers for data sections within the code. It includes best before

dates, batch numbers, quantities, weights and other attributes. The Character Set property can be specified (Auto Charset is the recommended value). The FNC1 Functional Character property defines a symbol that is not included in a bar code when met in text, but used to generate the application identifiers. The Human-Readable Text property, when set to Yes, inserts parentheses into the text below the bar code for better readability.

EAN13 The EAN-13 barcode contains 13 digits, no letters or other characters. The first two or three digits represent the country. The leading zero actually signifies the USA, and UPC-A coding. The last digit is the checksum digit. The control calculates it automatically and it should not be present in the control's text string. So, make sure that the text for this symbology contains no more than 12 digits. If fewer digits are supplied, the string is padded with zeroes on the left.

EAN8 EAN-8 is a shortened version of the EAN-13 code. It includes a 2 or 3 digit country code, 4 of 5 data digits (depending on the length of the country code), and a checksum digit. The control calculates the checksum digit automatically and it should not be present in the control's text string. So, make sure that the text for this symbology contains no more than 7 digits. If fewer digits are supplied, the string is padded with zeroes on the left.

GS1 Data Bar This bar code is based on a family of symbols often used in the GS1 DataBar Coupon (coupon codes commonly used in retail). These bar codes can encode up to 14 digits, which makes them suitable for GTIN 8, 12, 13 and 14. GS1 DataBar Expanded and GS1 DataBar Expanded Stacked can encode up to 74 numeric or 41 alphanumeric characters, and provide the capability to utilise all GS1 Application Identifiers (e.g., expiration date, batch and serial number). These bar codes are often used in manufacturer coupons.

Industrial2of5 The Industrial (or non-interleaved) 2 of 5 code is a numerical, low-density symbology, based on two-out-of-five code. The Calculate a Checksum and Wide Narrow Ratio (which should be greater than or equal to 2.5) properties can be specified.

Intelligent Mail The Intelligent Mail (IM) code is a 65-bar code for use on mail in the United States. The Intelligent Mail barcode is a height-modulated barcode that encodes up to 31 decimal digits of mail-piece data into 65 vertical bars.

Intelligent Mail Package The Intelligent Mail Package Barcode (IMPB) was developed for the use on mail in the United States. Bar codes of this symbology are used only for packages as opposed to Intelligent Mail bar codes, which are used for postcards, letters, and flats.

This bar code is capable of encoding package tracking information required for more efficient sorting and delivering of packages with the capability of piece-level tracking.

Interleaved2of5	The Interleaved 2 of 5 code is a higher-density numerical symbology, based on two-out-of-five code. The Calculate a Checksum and Wide Narrow Ratio (which should be greater than or equal to 2.5) properties can be specified.
ITF-14	This bar code, also known as "UPC Shipping Container Symbol", is used to mark packaging materials that contain products labeled with a UPC or EAN product identification number. This bar code provides a GS1 implementation of an Interleaved 2-of-5 symbology for encoding a Global Trade Item Number (an identifier for trade items developed by GS1). This bar code always uses a total of 14 digits.
Matrix2of5	A variant of non-interleaved 2 of 5 code. It is a numerical only symbology. The Calculate a Checksum and Wide Narrow Ratio (which should be greater than or equal to 2.5) properties can be specified.
PDF417	This Portable Data File symbology is used in a variety of applications, and can also be used to generate postage accepted by the United States Postal Service. It consists of a variable number of rows, each of which is like a small linear bar code. Among other options, the Error Correction Level specifies the amount of redundancy, to protect a barcode's legibility.
PostNet	This symbology is used by the United States Postal Service to assist in directing mail. The code usually contains the zip-code and delivery point number. Unlike most other barcodes, PostNet actually encodes data in the height of the bars.
QR Code	QR (Quick Response) Code is a popular two-dimensional matrix barcode that consists of black modules arranged in a square pattern on a white background.
UPCA	The UPC-A barcode contains 12 digits, no letters or other characters. The first digit is the prefix signifying the product type. The last digit is the "check digit". The check digit is calculated using the first eleven figures when the barcode is constructed. So, for a correct UPC-A, make sure that the text contains no more than 11 digits. If there are fewer than 11, the string is padded with zeroes on the left.
UPCE0	This symbology is a variation of UPC-A which allows for a more compact barcode by eliminating "extra" zeros. The first digit is always zero; the last digit is a checksum digit of the original UPC-A code. Not every UPC-A code can be transformed into UPC-E0. E.g., the control's text string "4210000526" is displayed by UPC-E0 symbology as "04252614" and represents the "042100005264" UPC-A code (check digit included).
UPCE1	This symbology is a variation of UPC-A, which allows for a more compact barcode by eliminating "extra" zeros. The first digit is always 1, and the last digit is a checksum digit of the original UPC-A code. Not every UPC-A code can be transformed into UPC-E1. E.g., the control's text string "4210000526" is displayed by UPC-E1 symbology as

	"14252611" and represents the "142100005261" UPC-A code (check digit included).
UPCSupplement al2	This is a supplemental two-digit barcode. Make sure that the control's text string contains two digits.
UPCSupplement al5	This is a supplemental five-digit barcode, usually used to indicate the suggested retail price of a book. Make sure that the control's text string contains five digits.
Visible	Specifies whether the control should be visible in print preview.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark, Navigation URL, Tag and Text) to a data field obtained from the DataSight database, and to apply a format string to it.
Binary Data	Get or sets the byte array to be coded into a bar code.
Tag	This property allows you to add additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Tag.Binding drop-down selector, select the required data field.
Text	Allows you to define a string to be encoded as a barcode. You can define whether to display this value within the control using the Show Text property. Note that when the control is selected in the designer, you may simply start typing the text, and it will be automatically entered into the in-place editor. If the content does not conform to the rules of a certain symbology (determined by the Symbology property), the control may display a warning, as in the picture below, or automatically correct the input string by padding it with zeroes or only allowing an acceptable number of characters to be displayed. The Text property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Text.Binding drop-down selector, select the required data field. For more information on this, refer to Displaying DataSight Values.
Text Format String	Specifies the output format for the control's bound value (provided by the applied expression, data binding or summary). Click **...** to show the Format String Editor.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.

Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Auto-Module, Module, Orientation, Show Text, Symbology, Text, Text Format String

9.4.3.4.12 Chart

The Chart is a sophisticated control used to embed graphs into your report. It graphically represents a series of points using numerous 2D or 3D chart types. A Chart can be populated with points both manually (by specifying arguments and values for each point) and dynamically (by connecting it to the DataSight database).

There are many available Chart types you can choose from. To name a few, these are Bar, Point, Line, Pie and Doughnut, Area, Radar and Polar, Range Bar, Gantt, Candle Stick and Stock charts.

A Chart control contains multiple elements (diagram, series, series points, axes, legend, titles, labels, strips, constant lines, etc.). When any of these elements is selected, the Property Grid shows only the properties which correspond to the selected item.

The Chart control is data-aware in a different manner than the other report controls. Consider three common report scenarios:

1. Static data for a Chart's series is provided manually. It can be done using the Series Collection Editor invoked by the Chart's Series property. It allows you to manually define values and arguments for each series point.
2. Chart's series are created automatically, getting their data from the DataSight database and dependent on the rules defined by the Series Template property. This approach is described in Chart with Dynamic Series.
3. Each series is created and customised manually and has a separate Data Source. This approach is described in Chart with Static Series.

You can customise a created chart using both the Property Grid and the Chart Designer. To invoke the Chart Designer, click a Chart's Smart Tag, and in the invoked actions list, click the **Run Designer...** link.

The Chart Designer will guide you through the whole process of customising the Chart, from defining its view type to providing its data and customising its appearance.

In the Property Grid, the Chart control's properties are divided into the following groups:

Property	Function
Appearance	
Annotation Repository	Provides centralised access to all annotations that are present in the Chart.
Annotations	Provides access to the annotations collection of the Chart.
Appearance Name	Allows you to choose one of the available appearances, to be used to draw the Chart's elements (Diagram, Axes, Legend, etc.).
Automatic Layout	Specifies whether or not the Chart's layout is automatically adjusted when its data source is a Pivot Grid.
Background Colour	Specifies the background colour for the control.
Background Image	Allows you to load a background image to a Chart (or define its URL), and also define whether it should be stretched to fit the entire Chart's area, or not.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Diagram	Allows you to customise a Chart's diagram elements: main and secondary axes and panes. By default, a Chart is displayed in the Default Pane, but if necessary, you can display each Chart's series in a separate pane. To do this, click the Pane's ellipsis button, to invoke the Pane Collection Editor, allowing you to manage and customise panes. Then, select the required series within the Chart and set its View.Pane property to the required pane. Note that the diagram is null until no visible series exists in the Chart's collection. So, to access the diagram's options, you should create a series first.
Fill Style	Determines the fill style of a Chart's background (Empty, Solid, Gradient or Hatch) and define other fill options if required.
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Image Type	Determines whether a Chart should be internally rendered as a metafile in a report (in this case the quality of the rendered image is always good, but in particular cases some details of the control may be lost), or as a bitmap (in this case the quality of the rendered image is sometimes poor, but it allows a control to be drawn more precisely).
Indicators Palette Name	Specifies the palette that is used to paint all indicators that exist in a Chart.
Legend	Allows you to customise a Chart's legend, by defining such properties as text alignment and antialiasing, font style, background colour or image, border options, markers' size and visibility, shadow options, etc.

Legends	Returns a collection of additional legends. Edit using the Legend Collection Editor.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies the internal space between the Chart's content (the diagram and legend) and its edge, in pixels.
Palette Name	Allows you to choose one from the built-in palettes to be used to draw a Chart's series.
Palette's Base Colour Number	Allows you to define an integer index determining the base colour for the palette defined by the Chart's Palette Name property.
Series	Invokes the Series Collection Editor, which allows you to manage and customise a Chart's series. Note that series which are bound to data at the level of a chart control (in particular, using the Data Source, Series Data Member and both the Argument Data Member and Value Data Members properties) are created dynamically, based upon the data obtained from the specified data source, and they are not presented within the Series collection. To perform a centralised customisation of such series, use the settings which are available via the Series Template property.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Titles	Invokes the Chart Title Collection Editor, which allows you to manage and customise a Chart's titles.

Behaviour

Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Empty Chart Text	Specifies the text to be shown in the Chart, when it has no data to display.
Scripts	This property contains events, which you can handle by the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Small Chart Text	Specifies the text to be shown in the Chart, when it's too small to fit the diagram.
Visible	Specifies whether a Chart should be visible in print preview.

Data

Data Bindings	If the current report is bound to data, this property allows you to bind some of a Chart's properties (Bookmark, Navigation URL and Tag) to a data field obtained from the report's data source, and to apply a format string to it. For more information on this, refer to Displaying Values from DataSight.
Data Adapter	Determines a data adapter that will populate a Chart's data source which is assigned via the Data Source property. It is automatically set to the appropriate value, when the Data Member property is defined. To learn more on this, refer to Chart with Static Series.
Data Member	Determines the data source member which supplies data to a Chart. To learn more on this, refer to Chart with Static Series. Usually, it is not necessary to specify the Data Member property when binding a Chart to data. This property should only be set directly if the dataset contains more than one table.
Data Source	Determines a Chart's data source. To learn more on this, refer to Chart with Static Series.
Pivot Grid Data Source Options	Determines a Chart's data source. To learn more on this, refer to Chart with Static Series.
Series Data Member	Determines the name of the data field whose values are used to automatically generate and populate a Chart's series. To learn more on this, refer to Chart with Dynamic Series. When Chart binding is used to automatically generate series within a chart control based upon the data obtained from the associated data source (defined by the Data Source property), a rule needs to be defined that helps the Chart recognise the data records whose values are used to construct individual series objects. To do this, the Series Data Member property, which specifies the data field whose values are taken into account when series objects are automatically created and populated, can be used. Each automatically generated series gets its name from the data field specified by the Series Data Member property. For example, this name is used to identify a series within the chart control's legend. The names of all automatically generated series can be supplemented with the same prefix and postfix defined by the settings which are available via the Series Name Template property. The template settings for the dynamically created series are defined by the specific properties which are available via the SeriesTemplate property of a Chart. In particular, the Argument Data Member and Value Data Members properties specify the data fields from which the arguments and data values of the series data points are obtained. Note that if the Series Data Member property is not set for a Chart, the Chart control can't automatically generate series even if the Argument Data Member and Value Data Members properties are defined.
Series Name Template	Determines the settings used to name data bound series defining the prefix and postfix texts for the names of series which are dynamically created as a result of binding a Chart to data (using the Data Source, Series Data Member, Argument Data Member and Value Data Members properties). The series names, to which these prefixes and postfixes are added, are taken by each series from the data field defined by the Series Data Member property. To learn more on this, refer to Chart with Dynamic Series.

	Note that the settings available via the Series Name Template property are not applied to the data bound series which are contained within the Series collection of a Chart.
Series Sorting	Allows you to define the sort mode of a Chart's series (None by default, Descending or Ascending).
Series Template	Allows you to customise a template for series which are created dynamically as a result of binding a Chart to data (via the Data Source and Series Data Member properties). The settings which are available via the Series Template property are common to all such data bound series. These settings allow you to provide centralised customisation of all dynamically created data bound series. To learn more on using this property, refer to Chart with Dynamic Series. Note that the settings which are customised via the Series Template property do not apply to the series contained within the Series collection of a Chart.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.

Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Data Member, Data Source

9.4.3.4.13 Gauge

The Gauge control provides you with the capability to embed graphical gauges into your report.

In the Property Grid, the Gauge control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Formatting Rules	Invokes the **Formatting Rules Editor**, which allows you to choose which rules should be applied to a control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Image Type	Specifies how the Gauge is rendered.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies the indent values that are used to render the contents of a Label.
Size	Specifies the control's size, in report measurement units.
Style Priority	Specifies the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	Assigns an existing (or newly created) style to the control, and also specifies odd and even styles. For more information on style inheritance, refer to Understanding Style Concepts.
View Style	Specifies the style of the displayed gauge.
View Theme	Specifies the colour theme of the displayed gauge.
View Type	Specifies the type of the displayed gauge. The following view types are supported: Circular and Linear.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report

	control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchor style of the control, so that after a page is rendered it stays attached to the top control, bottom control, or both.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Scripts	This property contains events that you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether or not the control should be visible in a print preview.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark, Navigation URL, Tag and Text) to a data field obtained from the report's data source, and to apply a format string to it. For more information on this, refer to Displaying Values from DataSight.
Actual Value	Specifies the value displayed by a gauge.
Maximum	Specifies the gauge's maximum value.
Minimum	Specifies the gauge's minimum value.
Tag	This property allows you to add some additional information to the control; for example, its id, by which it is then accessible via scripts.
Target Value	Specifies the position of the target value marker.
Tickmark Count	Specifies the number of tick marks displayed on a gauge scale

Miscellaneous

Name	Determines the control's name by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks.

	The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Actual Value, Maximum, Minimum, Target Value, View Style, View Theme, View Type

9.4.3.4.14 Sparkline

The Sparkline control displays a compact chart that is commonly used to reflect the flow of data for every row in a report.

In the Property Grid, the Sparkline control's properties are divided into the following groups:

Property	Function
Appearance	
Background colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width, and Borders	Specify border settings for the control.
Formatting Rules	Invokes the Formatting Rules Editor, which allows you to choose which rules should be applied to a control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Image Type	Specifies how the Sparkline contents are rendered.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values that are used to render the contents of a Label.
Size	Specifies the control's size, in report measurement units.
Style Priority	Specifies the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	Assigns an existing (or newly created) style to the control, and also specifies odd and even styles. For more information on style inheritance, refer to Understanding Style Concepts.
View	Specifies the type of a chart displayed by a Sparkline control. The available Sparkline view types are Line, Area, Bar, and Win-loss.

Behaviour

Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchor style of the control, so that after a page is rendered it stays attached to the top control, bottom control, or both.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Scripts	This property contains events that you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in a print preview.

Data

Data Bindings	This property allows you to bind some of the control's properties (Bookmark, Navigation URL, Tag and Text) to a data field obtained from the report's data source, and to apply a format string to it. For more information on this, refer to Displaying Values from DataSight.
Data Adapter	Determines the data adapter that will populate the Sparkline's data source, which is assigned via the Data Source property. It is automatically set to the appropriate value when the Data Member property is defined.
Data Member	Determines the data source member that supplies data to a Sparkline. Usually, it is not necessary to specify the Data Member property when binding a Sparkline to data. This property should only be set directly if the dataset contains more than one table.
Data Source	Determines a Sparkline's data source.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Tag.Binding drop-down selector, select the required data field.
Value Member	Specifies the data member field that provides point values for a Sparkline.
Value Range	Provides access to the range of values displayed by a Sparkline. Values set determine whether or not range limits should be calculated automatically.

Miscellaneous

Name	Determines the control's name by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Data Member, Data Source, Value Member, View

9.4.3.4.15 Pivot Grid

The Pivot Grid control represents dynamic data (obtained from an underlying data source) in a cross-tabulated form to create cross-tab reports, similar to Pivot Tables in Microsoft Excel®. Column headers display unique values from one data field, and row headers - from another field. Each cell displays a summary for the corresponding row and column values. By specifying different data fields, you can see different totals. This allows you to get a compact layout for a complex data analysis. The Pivot Grid has a designer which allows you to easily adjust its layout. It can be invoked using the control's Smart Tag.

In the Property Grid, the Pivot Grid control's properties are divided into the following groups:

Property	Function
Appearance	
Appearance	Allows you to define the appearance properties (such as Background colour, Foreground colour, Font, etc.) for the Pivot Grid's elements (Cell, Field Value, Filter Separator, Header Group Line, etc.).
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules.

	To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Size	Specifies the control's size, in report measurement units.
Styles	Allows you to invoke the Styles Editor, which is intended to manage and customise the control's styles, which then can be assigned to the Pivot Grid's elements.

Behaviour

Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the Pivot Grid, so that after page rendering it stays attached to the top control, bottom control, or both.
Keep Together	Specifies whether the contents of the control can be horizontally split across pages. In other words, if the control occupies more space than remains on the page, this property specifies whether this Pivot Grid should be split between the current page and the next, or whether it will be printed entirely on the next page. This property is in effect only when a Pivot Grid's content does not fit on the current page. If it does not fit on the next page either, then the Pivot Grid will be split despite this property's value.
Scripts	This property contains events, which you can handle by the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in print preview.

Data

Data Adapter	Determines a data adapter that will populate a Pivot Grid's data source which is assigned via the Data Source property. It is automatically set to the appropriate value, when the Data Member property is defined. To learn more on this, refer to Cross-Tab Report.
Data Member	Determines the data source member which supplies data to a Pivot Grid. To learn more on this, refer to Cross-Tab Report. Usually, it is not necessary to specify the Data Member property when binding a Pivot Grid to data. This property should only be set directly if the dataset contains more than one table.
Data Source	Determines a Pivot Grid's data source. To learn more on this, refer to Cross-Tab Report.
Fields	Invokes the Pivot Grid Field Collection Editor, allowing you to manage and fully customise a Pivot Grid's fields.
OLAP Connection String	Specifies a connection string to a cube in an Microsoft Analysis Services database. A connection string can be built via the Connection String Editor. To invoke it, click the ellipsis button for the OLAP Connection String property.

	To represent information from the bound cube, create specific Pivot Grid fields, and bind them to the required fields in the data source. If the OLAP Connection String property is set to a valid string, the value of the Data Source property is cleared. Setting the Data Source property to a valid object clears the OLAP Connection String property.
OLAP Data Provider	Specifies an OLAP data provider.
Prefilter	When this property is expanded in the Property Grid, you can set its Enabled property to Yes, and use the Criteria property to invoke the Pivot Grid Prefilter dialogue. This dialogue allows you to build complex filter criteria with an unlimited number of filter conditions, combined by logical operators. It provides a set of logical operators that significantly simplify the process of creating filters for text, numeric and date-time fields. Note The Prefilter is not supported in OLAP mode.
Tag	Tag is Bindable. It gets or sets the object that contains data about this control.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Data Field Options	Allows you to customise the options which control the presentation of the data fields.
Data Options	Allows you to define whether a Pivot Grid's fields must be case sensitive or not.
Options Chart Data Source	Provides access to the options controlling the display of the Pivot Grid's data in a Chart.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Print Options	Allows you to customise the print options of a Pivot Grid.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.
View Options	Allows you to customise the Pivot Grid's display options.

Favourites

Default List	Data Member, Data Source, OLAP Connection String

9.4.3.4.16 Sub-Report

The Sub-Report control allows you to include other reports in your current report. This allows you to solve the following tasks:

- Reuse reports. This can be of help if there is a particular report structure (template) that has to be included in all reports, and the report must have consistent appearance and functionality. A good example is a report header that always contains the same information.
- Create side-by-side reports. By placing two Sub-Reports side-by-side, you can create effective comparisons of data coming from two different reports.
- Create Master Detail Reports. You can double click a Sub-Report, to open the report to which it is linked in a new Design Panel.

In the Property Grid, the Sub-Report control's properties are divided into the following groups:

Property	Function
Appearance	
Formatting Rules	Invokes the Formatting Rules Editor allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Size	Specifies the control's size, in report measurement units. The Sub-Report isn't limited by the visible size of the control. The size of its actual content is taken into account when rendering the sub-report on the page. Note that depending on its contents, its width is unlimited and its height is increased.
Behaviour	
Can Shrink	Determines whether a Subreport's height should be decreased if its contents do not completely fill the control. Use this property to specify whether the height of the Sub-Report control should be taken into account when generating a report. This may be required, because usually the mutual location of report controls is considered when generating a report document. But, as the Sub-Report control actually represents a report itself, the height of a Sub-Report normally should not be taken into account in the generated report document. Also, note that there is no Can Grow option for the Sub-Report control, as it always increases its height depending on its contents.
Scripts	This property contains events, which you can handle by the required scripts. For more information on scripting, refer to Handle Events via Scripts.

Visible	Specifies a value indicating whether the current control should be printed (when set to Yes) or hidden (No) on report generation.

Data

Parameter Bindings	Provides access to the collection of subreport parameter bindings, which allow you to bind a subreport's parameter value to a master report's data field.
Report Source	Determines a report to be included as a Sub-Report. If report classes of the application that invoked the Report Designer are compiled into one assembly, then they are available as items in this combo box.
Report Source Url	Defines an URL of a report definition file (*.REPX), to be used as a report source.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Can Shrink, Report Source, Report Source URL

9.4.3.4.17 Table of Contents

The Table of Contents control generates a table of contents based on bookmarks specified for report elements. When a Table of Contents control is dropped onto a report's body from the Toolbox, it is placed on the Report Header band of the report. If there is no Report Header in the report, it is created automatically. A table of contents is generated based on the hierarchy of report bookmarks. To learn how to provide a report with bookmarks, refer to Add Bookmarks.

In the Property Grid, the Table of Contents control's properties are divided into the following groups:

Property	Function
Appearance	
Background Colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Foreground Colour	Specifies the text colour for the control.
Location	Specifies the control's location in report measurement units.
Padding	Specifies indent values that are used to render the contents of a Label.

Style Priority	Specifies the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	Assigns an existing (or newly created) style to the control, and also specifies odd and even styles. For more information on style inheritance, refer to Understanding Style Concepts.

Behaviour

Level Default	Specifies the default formatting options for the hierarchical levels of a Table of Contents.
Level Title	Specifies the formatting options for the title of a Table of Contents.
Levels	Invokes the Table of Contents Level Collection Editor, which allows you to edit and customise formatting options for hierarchical levels of a Table of Contents.
Max Nesting Level	Specifies the maximum number of Table of Contents levels to be displayed. If set to 0, no limitation is applied.
Visible	Specifies whether the control should be visible in a print preview.

Data

Tag	This property allows you to add some additional information to the control; for example, its id, by which it can then be accessible using scripts.

Miscellaneous

Name	Determines the control's name by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).

Favourites

Default List	Levels

9.4.3.4.18 Page Info

The Page Info control is intended to add page numbers and system information (the current date and time or the current user name) into your report. As with many other controls, you can format this control's content.

In the Property Grid, the Page Info control's properties are divided into the following groups:

Property	Function
Appearance	
Background Colour	Specifies the background colour for the control.
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
Font	Specifies the font settings for the control.
Foreground Colour	Specifies the text colour for the control.
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Padding	Specifies indent values which are used to render the contents of the control.
Size	Specifies the control's size, in report measurement units.
Style Priority	Allows you to define the priority of various style elements (such as background colour, border colour, etc.). For more information on style inheritance, refer to Understanding Style Concepts.
Styles	This property allows you to define odd and even styles for the control, as well as to assign an existing style to the control (or a newly created one). For more information on style inheritance, refer to Understanding Style Concepts.
Text Alignment	Allows you to change the alignment of the control's text.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both.
Format	This property allows you to specify the format string for the text displayed in the control. When you click the ellipsis button, you will see the Format String Editor window that will select the predefined format or customise it as needed. For more information about this, refer to Change Value Formatting of Report Elements.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Page Information	You can select the type of information displayed in the control.

Type	Description
None	Displays an empty control.

Page Number	The string, specified by the Format property, is displayed. The {0} combination in the string is replaced with the current page number.
"Current of Total" Page Numbers	The string, specified by the Format property, is displayed. The {0} combination in the string is replaced with the current page number, the {1} combination - with a total number of pages in the report. To display the typical "Page 1 of 11" text, use the format string "Page {0} of {1}".
Page Number (Roman, Lowercase)	The current page number is displayed using Roman numerals in lowercase.
Page Number (Roman, Uppercase)	The current page number is displayed using Roman numerals in uppercase.
Current Date and Time	The string, specified by the Format property, is displayed. The {0: [format]} combination is replaced with the current system date and time formatted according to the [format] string. Use the Format String Editor of the Format property (see below) to select or construct the proper string.
User Name	The name of the current user, which was used to log into the operating system, is displayed.
Page Count	Specifies the number of report pages

Running Band

Specifies the name of the band, from which the Page Info gathers information. This allows you to implement page numbering independently for the report and its groups.

By default, this property is not set to any value, meaning that the entire report is being taken into account.

Scripts

This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.

Start Page Number

Here you can set the start number for page numbering.

Visible

Specifies whether the control should be visible in print preview.

Word Wrap

When this property is set to Yes, text contained in the control is wrapped to the next line if it does not fit the line or comes across a newline character. If the this property is set to No, the text in this case will be displayed on the same line until a newline character is entered.

Data

Data Bindings

This property allows you to bind some of the control's properties (Bookmark, Navigation URL, Tag and Text) to a data field obtained from the report's data source, and to apply a

	format string to it. For more information on this, refer to Displaying Values from DataSight.
Tag	This property allows you to add some additional information to the control; for example its id, by which it can be then accessible via scripts. The Tag property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property and in the Tag.Binding drop-down selector, select the required data field.
Text Format String	Specifies the output format for the control's bound value (provided by the applied expression, data binding or summary). Click **...** to show the Format String Editor.

Miscellaneous

Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Bookmark	These properties are intended for the creation of a hierarchical structure within a report called a document map. For an explanation and help, refer to Add Bookmarks. The Bookmark property can be bound to a data field, obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Bookmark.Binding drop-down selector, select the required data field.
Navigation Target	The web browser displays a page in a window or a frame as specified by the Navigation Target property. Note that a URL should have an appropriate prefix (e.g. "http://"). You can create cross-references within the report by assigning the name of the target control to the Navigation URL property, and setting the Navigation Target property to "_self". For more information, refer to Create Hyperlinks. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Navigation URL	Use the Navigation URL property to specify a URL for web browser navigation, when a user clicks a Label. The Navigation URL property can be bound to a data field obtained from the DataSight database. To do this, expand the (Data Bindings) property, and in the Navigation URL.Binding drop-down selector, select the required data field.
Parent Bookmark	Gets or sets the report control whose bookmark is the parent of the current bookmark.
Right to Left	Specifies the direction of text within a control. Use this option to correctly render text written in right-to-left languages. By default, all report controls have this property set to Inherit, so enabling it for a report will apply this setting to all its controls. The right-to-left layout is preserved when exporting a report to any of the supported formats (e.g., PDF, Excel, or RTF).
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List	Page Information, Running Band, Start Page Number, Text Format String, Word Wrap

9.4.3.4.19 Page Break

The Page Break control's sole purpose is to insert a page delimiter at any point within a report. This control is visually represented by a short line, attached to the report's left margin, as shown in the following image.

The Page Break control is useful when you need to insert a page break between controls within a band - for example, to divide sub-reports, so that the second sub-report starts printing on a new page. Another example of the Page Break's use can be found in Limit the Number of Records per Page.

Note that when you need a page break before or after printing a certain band, you may set its Page Break property to Before the Band or After the Band, instead of using the Page Break control.

In the Property Grid, the Page Break control's properties are divided into the following groups:

Property	Function
Appearance	
Formatting Rules	Invokes the Formatting Rules Editor, allowing you to choose which rules should be applied to the control during report generation, and define the precedence of the applied rules. To learn more on this, refer to Conditionally Change a Control's Appearance.
Location	Specifies the control's location, in report measurement units.
Behaviour	
Scripts	This property contains events, which you can handle with the required scripts. For more information on scripting, refer to Handle Events via Scripts.
Visible	Specifies whether the control should be visible in print preview.
Miscellaneous	
Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.
Favourites	
Default List	Favourite properties are not specified for this report control.

9.4.3.4.20 Cross-band Line

The Cross-band Line control allows you to draw a line through several bands. This can be useful if it is required to visually emphasise a section consisting of multiple band areas. In other aspects, it is similar to a regular Line.

Another cross-band control available is the Cross-band Box.

In the Property Grid, the Cross-band control's properties are divided into the following groups:

Property	Function
Appearance	
End Band	Determines a band, in which the control finishes drawing.
End Point	Determines the end point (from a band's upper left corner) where the control finishes drawing.
Foreground Colour	Specifies the colour of the control's line.
Line Style	You can select a solid (by default), dashed, dotted or mixed style for the line.
Start Band	Determines a band, in which the control starts drawing.
Start Point	Determines the starting point (from a band's upper left corner) where the control starts drawing.
Width	Specifies the line's width in report measurement units.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Visible	Specifies whether the control should be visible in print preview.
Data	
Tag	This property allows you to add some additional information to the control; for example its id, by which it then can be accessible via scripts.
Miscellaneous	
Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.
Favourites	
Default List	Anchor Vertically, Line Style

9.4.3.4.21 Cross-band Box

The Cross-band Box control allows you to draw a rectangle through several bands. This can be useful if it is required to visually encompass a section consisting of multiple band areas.

Another cross-band control available is the Cross-band Line.

In the Property Grid, the Cross-band Box control's properties are divided into the following groups:

Property	Function
Appearance	
Border Colour, Border Dash Style, Border Width and Borders	Specify border settings for the control.
End Band	Determines a band, in which the control finishes drawing.
End Point	Determines the end point (from a band's upper left corner) where the control finishes drawing.
Start Band	Determines a band, in which the control starts drawing.
Start Point	Determines the starting point (from a band's upper left corner) where the control starts drawing.
Width	Specifies the width of the Box, in report measurement units.
Behaviour	
Anchor Horizontally	Specifies the horizontal anchoring style of a control, so that after page rendering it stays attached to the left control, right control, or both. This property defines how a report control is resized to maintain the distance to the left and right edges of its container control.
Anchor Vertically	Specifies the vertical anchoring style of the control, so that after page rendering it stays attached to the top control, bottom control, or both.
Can Publish	Specifies whether or not a report control is displayed in a printed or exported document.
Visible	Specifies whether the control should be visible in print preview.
Data	
Tag	This property allows you to add some additional information to the control; for example its id, by which it can then be accessible via scripts.
Miscellaneous	
Name	Determines a control's name, by which it can be accessed in the Report Explorer, Property Grid or via scripts.
Snap Line Margin	Specifies the margin (in report measurement units), which is to be preserved around the control when it is aligned using Snap Lines, or when other controls are aligned next to it.

Favourites

Default List Anchor Vertically

9.4.3.4.22 Managing Report Controls

In a report, static and dynamic information is displayed using appropriate Report Designer Controls.

Report controls can either display static information or dynamic data fetched from the DataSight database. Data-bound controls are indicated by a yellow database icon in their top-right corner, both in the Design Panel and Report Explorer.

Add a Control to a Report

There are several methods to choose from when to adding a control to a report:

- Double-click an item in the Standard Controls, and the control will be created at the Detail Band's top left corner.
- Drag and drop an item onto the required location within a report.
- Click an item in the Standard Controls, and then click the required location within a report.
- Click an item in the Standard Controls, and then indicate the bounding rectangle by holding the left mouse button.
- Automatically create a control bound to data from the Field list as described in Dynamic Controls.

Delete a Report Control

To delete a report control, select it in the Design Panel or Report Explorer (to select multiple elements, hold down SHIFT while selecting), and then do **one** of the following:

- Press DELETE.
- Right-click the report element, and in the invoked Context Menu, choose **Delete**.

You can cancel the operation by pressing CTRL+Z, or clicking **Undo**.

Use Favourite Properties

The Properties panel displays a Favourite Properties menu item button. The favourite list includes element properties marked with the Favourite attribute. Each of the Report controls have a default Favourites list.

To edit the favourites list for each type of control:

1. Right-Click on the Favourite icon to show the the **Edit Favourite Properties** menu.
2. Select this item to open the Favourite Properties Editor.
3. The editor lists the current report's report controls. The favourite list includes a property if the corresponding check box is enabled.

Search for a Property

Enter the text to search for in the find box and click Find. Properties that meet this criteria are highlighted yellow in the properties view.

9.4.3.5 Customising Appearance

The topics of this section cover contents types and appearance-related information about the Report Designer.

- Static Content
- Dynamic Content
- Mixed Content
- Change the Layout
- Snap Grid and Lines
- Measurement Units
- Change Font and Colours
- Styles
- Store and Restore Style Sheets
- Use Odd and Even Styles
- Conditionally Change a Control's Appearance
- Conditionally Hide Bands

9.4.3.5.1 Static Content

Static information is text or images that are not obtained from a data source, and therefore do not change through the report, and do not depend on the current computer. Static information can be printed only once (e.g. in a Report Header), can repeat on each page (e.g. in a Page Header) or can repeat with every entry in your report's data source (a data-bound label, which is placed onto the Detail Band).

Static information can be either edited in-place, or loaded from an external file.

Change Static Information

Text elements (e.g. Labels and Rich Text Boxes) allow in-place editing of their content. Simply double-click an element and activate the editor.

Note	For in-place editing, you can also utilise the Formatting Groups on the ribbon.

Another way to change a control's static information, is by clicking its Smart Tag. Then, the invoked actions list will contain a link (or, a button) allowing you to edit this control's content.

Load Static Information to Your Report

To load static information to your report from an external file, drop an appropriate control from the Control Toolbox (e.g. Label, Rich Text Box or Picture Box). After it is properly positioned, edit its content using the Smart Tag.

Example: Display a rich text (a formatted text with embedded images) into your report.

Follow these instructions to display static information, such as a rich text, in your report.

1. Drop the Rich Text control from the Toolbox onto the Detail Band.
2. To load content from an external RTF or TXT file, select the created control and click its **Smart Tag**.
3. In the invoked actions list, click the **Load File...** link.
4. Then, in the invoked dialogue, locate the required file, and click **Open**.

9.4.3.5.2 Dynamic Content

Dynamic information is information that changes through a report, such as values from DataSight (which comprise the main report data) or service information (such as current user name or page numbers).

To embed dynamic information to a report, if this information is contained in the report's data source, this can easily be done using one of the following approaches.

Method 1: Using the Field List

1. To bind an existing report control to a data field, click the required field item in the Field List, and then drag and drop it onto the control. The yellow database icon inside it will indicate that it's been successfully bound.
2. To add a new data-bound control, simply drag the required data field from the Field List onto a report band. This will create a Label bound to this data field.
3. A more flexible way to create data-bound elements is to right-click a Field List item, and then drag and drop it onto a report. This will invoke the Context Menu, where you can choose which control should represent your data, and it will be automatically created and bound to the selected data field.

Method 2: Using the Smart Tag

- Click a control's Smart Tag, and in the invoked actions list, expand the **Data Binding** drop-down list, and select the required data field.

Method 3: Using the Property Grid

- Click a control to select it, and in the Property Grid, expand the **(Data Bindings)** branch that holds the bindable options. Specify a data field for the required attribute (e.g. **Text**).

Method 4: Special Capabilities

After a control is bound to data, you may wish to employ additional features, which are listed below.

- After a control is bound, you can apply formatting to its dynamic content (e.g. for it to be treated as date-time content). For details on this, refer to Change Value Formatting of Report Elements.
- It is possible to make a control display a result of a summary function calculated across the data field to which it is bound. For details on this, refer to Add Summaries to a Report.
- Another noteworthy option is to combine both static and dynamic content within the same control (e.g. to append some text prefix or postfix to a value obtained from your data), or even bind a control to multiple data fields at one time. This is detailed in Use Mail Merge in Report Elements.
- If it is required to perform some pre-calculations over the data field to which a control is bound, this can be done by creating a calculated field, and binding the control to it. This is detailed at Add Calculated Fields in a Report.
- In turn, a calculated field may contain both dynamic and static parameters, which can be requested each time a report is being previewed. For more information, refer to Add Parameters to a Report.

9.4.3.5.3 Mixed Content

For labels and other text-oriented controls, you can combine the static and dynamic content within the same control.

With the in-place editor, you can refer to data source fields by enclosing them into square brackets.

e.g. MonitoringDate: [MonitoringDate]

You can format a data field's value by selecting the field in the in-place editor and accessing the Format String editor via the control's smart tag.

Use Mail Merge in Report Elements

The mail merge feature allows you to combine both static and dynamic content within the same control (e.g. to append some text prefix or postfix to a value obtained from your data), or even bind a control to multiple data fields at one time.

Mail merge is available for the following controls.

- Bar Code
- Check Box
- Label
- Rich Text
- Table Cell

To embed dynamic data into a control's static content, type in data field names surrounded by [square brackets].

To learn how values formatting can be applied to the embedded data fields (e.g. for them to be treated as date-time content), refer to Change Value Formatting of Report Elements.

9.4.3.5.4 Change the Layout

Individual controls can be moved, using either mouse or keyboard. They can be precisely aligned to each other using either Snap Gird or Snap Lines. For details on this, refer to Snap Grid and Lines. You can also easily align multiple controls or make them the same size, by utilising the Layout Tab.

Select a Control

- Click a Control to select it.
- To select the next control in tab order, press TAB.
- To select the previous control in tab order, click SHIFT + TAB.

Resize a Control

- To resize a Control using the mouse, select it, and then drag a rectangle drawn on its edge or corner.

Resize a Band

- To resize a band, drag its header strip.

Resize an Element

- To resize an element using the keyboard, press SHIFT+ARROW or CTRL+SHIFT+ARROW.

Select Multiple Elements

- To select multiple elements, do one of the following.
  - Click elements while holding CTRL or SHIFT.
  - Click on a blank space and drag the mouse to create a selection frame. When the mouse button is released, all controls within the selection frame's boundaries will be selected. In this case, the previous selection is cleared.

- To copy, paste and delete controls simultaneously, you can place them within the Panel.

9.4.3.5.5 Snap Grid and Lines

This topic describes how to easily construct professional looking reports, by precisely aligning their elements to each other. For this, the **Snap Grid** and **Snap Lines** are introduced in the Report Designer. You can choose which mode to use for controls alignment within your report, by setting its **Snapping Mode**.

Snap Grid

When a report is being designed in the Design Panel, it is lined up by the **Snap Grid**. This helps to establish the distance between report elements, and to precisely align them to each other.

Align Control to Snap Grid

Right-click a control, and in the invoked Context Menu, click **Align To Grid**. This will align your control to the report's Snap Grid.

Show/Hide Snap Grid

Select your report, and in the Property Grid, select Yes or No in **Draw The Grid** option to show or hide the grid lines.

Adjust Snap Grid Size

Select your report, and in the Property Grid, adjust **Snap Grid Size**, which is measured in the measurement units set for your report.

Enable/Disable Snap to Grid

The **Snap to Grid** option specifies whether controls are snapped to the Grid when they are moved as usual (with no additional keys being hold down). When the **Snap to Grid** option is enabled, the default move behaviour works in the following way.

- For controls to be aligned to the Snap Grid while being moved:
  - Using the keyboard: move them using the ARROW keys.
  - Using the mouse: move them as usual.
- For controls to ignore the Snap Grid while being moved:
  - Using the keyboard: move them using ARROW keys while hold down CTRL.
  - Using the mouse: move them while hold down ALT.

Disabling the **Snap to Grid** option swaps the default manipulation to its opposite (you should press CTRL or ALT, to enable the Grid snapping).

Snap Lines

Instead of the Snap Grid for control positioning and alignment, you can utilise the **Snap Lines**. These are guide lines appearing when a control is being moved, and indicating the distance to other report elements (bands and controls).

For each report element, you can modify its default Snap Line spacing (paddings for bands and Panel, and margins for other controls) using the Property Grid.

To learn how to manage the position of multiple controls at one time, refer to Change the Layout of Report Elements.

Note	When controls overlap, the report may be shown incorrectly when exported to some formats. Red markers and a report tooltip will warn of this situation. You may switch off the red warning marks via the report's Show Export Warnings property.

9.4.3.5.6 Measurement Units

For your report, you can choose its global Measure Units, which can be either **Hundredths of an Inch**, or **Tenths of a Millimeter** or **Pixels**.

Measurement Units define the basic measurement unit for all the unit-related options of a report and its bands and controls (such as location, size, border width, etc.). This also determines the measurement unit of the report's Snap Grid.

This can be specified by doing one of the following:

- Click on the report's Smart Tag. Then change the **Measurement Units**.
- Select the report, and via the Property Grid, scroll down to the **Measurement Units** in the **Behaviour** group.

9.4.3.5.7 Change Font and Colours

To change fonts and colours (as well as paddings, text alignment and other appearance properties) of a report control or band, select this element and do one of the following:

- Use the Formatting Groups on the Home Tab.
- Use the Property Grid, where all appearance-related properties are located under the Appearance category.

Note	The appearance settings of a band are applied to all controls contained within it.

When it's required to apply styles in bulk, we recommend using common style templates, which also can be stored in an external style sheet file, and applied to multiple reports. In addition, this allows you to specify separate odd/even styles, to improve your reports' readability. Another noteworthy option, is the capability to conditionally change the appearance of report elements based on a certain logical expression (e.g. if a control's value satisfies some rule). For more information, refer to Styles and Conditional Formatting.

9.4.3.5.8 Styles

This topic describes how you can provide a professional look to your reports, by effectively adjusting the appearance of its elements.

The Appearance Properties

In the Report Designer, a report and each of its elements (bands and controls) has a complete set of appearance options (such as **Background colour**, **Borders**, **Font**, **Foreground colour**, **Text Alignment**, etc.). By default, these properties aren't specified, meaning that their real values are obtained from a control's (or band's) parent, which is the report itself. So, the appearance, specified for a report, is distributed to all its child elements. Similarly, the appearance of a band is translated to the controls it contains.

In turn, a control's appearance can be adjusted independently from its parent.

When it is required to reset a value assigned to a control's appearance property, you can right-click this property in the Property Grid, and in the invoked menu, click **Reset**. The control will be restored to the appearance of its parent.

Styles Priority and Inheritance

To differentiate appearance settings in your report, you can create comprehensive styles (which are stored in the report's style sheet), and then can be assigned to individual elements. There are two ways to store a report's styles.

- To save them to external files (with REPSS extension), and then load them to a report via its Style Sheet Path property (this is described at Store and Restore Style Sheets);
- To store the styles within the report, so that they can be easily accessed via its **Style Sheet** property.

Note that if styles contained in a style sheet loaded via the **Style Sheet Path** property have the same names as styles already contained in a report, the latter ones are overridden.

When both styles and individual appearance settings are assigned to an element, you can control the priority of their differing options, via an element's **Style Priority** property.

By default, most of the **Style Priority**'s options (**Use Background colour**, **Use Border colour**, etc.) are set to **Yes**. This means that if any style is assigned to a control, its properties will have a higher priority than the appearance properties of this element or its parent. You can assign a higher priority to an element's appearance property, by disabling the corresponding **Use*** property.

The same principles are applied to the odd-even styles feature, which allows you to alternate the appearance of consecutive data rows in your report. For details on this, refer to Use Odd and Even Styles.

Note	When conditional formatting is applied to an element, its appearance definition has the highest priority.

9.4.3.5.8.1 Store and Restore Style Sheets

This topic describes how you can save a report's style sheet into an external file, and then load it back to the report.

You can store a report's style sheet (containing all the report's styles) in an external REPSS file. This makes it possible to easily restore a report's appearance from this file. For general information, refer to Understanding Style Concepts.

1. Create a new report and bind it to DataSight data.
2. Click the report's Smart Tag, and in the invoked actions list, click the ellipsis button for the **Style Sheet** property.
3. In the invoked **Styles Editor**, use the  button, to create new styles. For them, specify the desired options (e.g. **Background colour**), and click the **Save** button.
4. Then, in the invoked **Save File** dialogue, define a name for the style sheet file (.REPSS), and click **Save**.
5. Then delete the created styles, using the  button, and close the dialogue.
6. Select the report, and in the Property Grid, click its ellipsis button for the **Style Sheet Path** property. In the invoked **Open File** dialogue, load the created REPSS file.
7. When you invoke the **Styles Editor** (via the report's **Style Sheet** property) again, you will see that the styles are read-only, meaning that they are obtained from an external file.
8. If the **Style Sheet Path** property is then set to **None**, and a style sheet is loaded using the **Styles Editor** of the **Style Sheet** property, all these styles will become editable.

To assign styles to report elements, refer to Use Odd and Even Styles.

Note	The styles loaded from a style sheet file have priority over the styles which exist in a report's style sheet. So, if the styles stored in the report have the same names as the styles loaded from a style sheet file, then the styles from the file will substitute for their namesakes.

9.4.3.5.8.2 Use Odd and Even Styles

This topic describes how to apply odd and even styles to report controls, e.g. to alternate the background colour for each record.

1. Create a table report.

2. Select the detail table, and in the Property Grid, expand its **Styles**.
3. Invoke the drop-down list for the **Even Style**, and click **(New)**. This will create a style and assign it to the control's **Even Style**.
4. Expand the **Even Style** property, and adjust the required options, e.g. set the **Background colour** to **ControlLight**.
5. If required, perform the same steps, to create and assign an odd style, as well.
6. Switch to the Print Preview Tab, and view the result.

9.4.3.5.8.3 Conditionally Change a Control's Appearance - Legacy

This topic provides the steps to conditionally change a control's appearance (e.g. make a Label's text red if its value exceeds some threshold). Thanks to the formatting rules feature, to achieve this, no scripts are required, so you shouldn't write any code.

1. Create a data-aware report.
2. Click the report's Smart Tag, and in the invoked actions list, click the ellipsis button for the **Formatting Rule Sheet** option.
3. In the invoked **Formatting Rule Sheet Editor**, create a new formatting rule (by using the  button), and click the ellipsis button for its **Condition** property.
4. In the invoked **Condition Editor**, define the required Boolean condition (which means that its result is returned as either true or false).
5. To save the condition and close the dialogue, click **OK**.
6. In the **Formatting Rule Sheet Editor**, define the formatting to be applied (e.g. specify the desired font colour).
7. To save the changes and quit the dialogue, click **Close**.
8. Select the band or control to which the formatting rule must be applied, and via its Smart Tag, access its collection of **Formatting Rules**.
9. In the invoked **Formatting Rules Editor**, move the rule from left to right (using the > button), for it to come into effect for this band.
10. If multiple rules are applied, it is possible to customise their precedence, by using the up and down arrow buttons at the right of the dialogue. The rules are applied in the same order that they appear in the list, and the last rule in the list has the highest priority.

9.4.3.5.8.4 Conditionally Hide Bands

This topic describes how to hide bands if a certain logical condition is met.

1. Select the Group Header, and click its Smart Tag.
2. In the invoked actions list, click the ellipsis button for the **Formatting Rules** option.
3. In the invoked **Formatting Rules Editor**, click the **Edit Rule Sheet..** button.
4. In the invoked **Formatting Rule Sheet Editor**, click the  button, to create a new rule.
5. Set the rule's **Visible** property to **No**, and click the ellipsis button for the **Condition** property.
6. Construct the required logical expression and click **OK**.
7. To quit the **Formatting Rule Sheet Editor**, click **Close**.
8. In the **Formatting Rules Editor**, move the created rule to the dialogue's right section (**Applied Rules**), to make it active.

9. Repeat for the report's Detail band. That is, click the ellipsis button for its **Formatting Rules** property, and in the invoked dialogue, apply the same rule to this band, as well.
10. Switch to the Preview Tab, and view the result.

9.4.3.6 Shaping Report Data

The topics in this section describe additional data shaping features supported by Report Designer. To begin with, data shaping is performed when providing data to the report such as when using the Query Builder to write an SQL query. Other data shaping methods are available as follows:

- Formatting Data
- Data Filtering
- Grouping and Sorting
- Parameters
- Calculated Fields

9.4.3.6.1 Formatting Data

You can apply value formatting for a data-bound control's content (e.g. for it to be treated as date-time content).

Change the Value Format

1. Locate the control, click its Smart Tag, and in the invoked actions list, click the ellipsis button for the **Format String** entry.
2. In the invoked format string editor, choose one of the predefined formatting styles, or specify a custom one.
3. To quit the dialogue and apply the changes, click **OK**.
4. Similarly, when the mail-merge is employed for a control's dynamic content, to apply a value formatting to an embedded data field, select it in the in-place editor, and click the control's smart tag. Then, in the invoked actions list, specify the required format.

Notes	When a summary function is being applied to a control's dynamic content, the value formatting is applied separately, via the **Summary Editor**, as described at Add Totals to a Report. Independently from the general (or, summary) value formatting, you can specify a native XLSX format string, which is to be preserved when the report is being exporting to XLSX. This can be done via a control's **Xlsx Format String** property.

9.4.3.6.2 Data Filtering

For your report, you can specify a filtering expression (of virtually any level of complexity), to exclude excessive or undesired data.

Filter a report's data

1. Click a report's Smart Tag, and in the invoked actions list, click the ellipsis button for the **Filter String** entry.
2. In the invoked **Filter String Editor**, construct an expression. You can either use the **Visual** expression builder, or specify the expression in **Text**. Note that it is possible to embed parameters into the expression, and also request them each time a report is previewed.
3. To quit the dialogue and save the changes, click **OK**.

Limit the Number of Records

You can filter records displayed in Print Preview via the report's Smart Tag. Use the **Detail Count At Design Time** option to define how many times to print the Detail band in Print Preview.

Cancel Printing if a Report Does Not Contain Any Records

To cancel printing when a report does not contain any records, simply set the report's **Print when Data Source is Empty** property to **No**.

The **Detail Count On Empty Data Source** property allows you to specify how many times to print the Detail band when a report does not have a data source. You can use this property to create static reports that are not connected to a data source and display the same static content several times.

Change an Element's Visiblity

You can show or hide a specific report control in Print Preview based on a logical condition.

1. Select the target label on the report's surface, switch to the Property Grid's Expressions tab and click the **Visible** property's ellipsis button.
2. In the invoked **Expression Editor**, specify the expression that defines when a control should be visible.
3. Add these controls to the Panel and set its **CanShrink** property to true which automatically adjusts the panel's size to fit all the controls and prevent blank areas.

9.4.3.6.3 Grouping and Sorting

You can group and/or sort data in your report. You can also specify the group's settings or sort groups by a summary function result. Please refer to the following topics:

- Group Data in a Report
- Sort Data in a Report
- Specify the Group's Settings
- Sort Groups by a Summary Function Result
- Apply Grouping in Charts

9.4.3.6.3.1 Group Data in a Report

1. Switch to the Group and Sort Panel, and click **Add a Group**.
2. In the invoked list, choose a data member across which the report is to be grouped. Note that grouping across calculated fields is supported, as well.
3. If multiple groups are created, you can specify the priority for each group, by selecting it in the Group and Sort Panel, and using the **Move Up** and **Move Down** buttons.
4. Add a Group Header band to the report, with the specified data member being set as its grouping criterion.
5. Drop the corresponding item from the Field List onto this band, so that it's displayed as a header for each group.
6. If required, you also can apply mail merge to this label.
7. Enable the corresponding Group Footer band by checking the **Show Footer** option in the Group and Sort Panel.
8. To manage the sorting order of the group's items (ascending or descending), use the **Sort Order** drop-down list.
9. Calculate a Total across the group, by placing a Label onto this band, and specifying its **Summary** properties in the following way.
10. Note also that value formatting is applied to a summary independently of the general formatting, and has a greater priority.

11. Switch to the Preview Tab, and view the result.

To learn how groups can be sorted against a summary function result, see Sort Groups by a Summary Function Result.

To learn how page numbers can be added to groups independently from the report's page numbers, refer to Add Page Numbers.

Note	Data grouping can be performed only if a report is bound to a data source.

9.4.3.6.3.2 Sort Data in a Report

1. Switch to the Group and Sort Panel, and click **Add a Sort**.
2. In the invoked list, choose a data member across which the report is to be sorted. Note that sorting across calculated fields is supported, as well.
3. To manage the sorting order (ascending or descending), use the **Sort Order** drop-down list.
4. If multiple sorting criteria are specified, you can define the priority for each one, by selecting it in the Group and Sort Panel, and using the **Move Up** and **Move Down** buttons.
5. Switch to the Preview Tab, and view the result.

Note	Data sorting can be performed only if a report is bound to a data source.

9.4.3.6.3.3 Specify the Group's Settings

You can use the group band's smart tag to customize the group's layout settings:

- Use the GroupHeaderBand.GroupUnion property to keep a group's content on the same page when possible.
- Use the Band.KeepTogether property to print the group header/footer on the same page as the group's contents.
- Use the GroupBand.RepeatEveryPage property to print the group band on each page.
- Use the Band.PageBreak property to start a new page before or after each group.

When you need to display page numbers for individual groups, add the XRPageInfo control to the group header or footer and set its XRPageInfo.RunningBand property to the group header's name.

Accurate page numbering requires that different groups do not appear on the same page. For this reason, you need to set the group header's Band.PageBreak property to AfterBand, or place the XRPageBreak control at the band's bottom. See Adding Page Numbers to learn more.

9.4.3.6.3.4 Sort Groups by a Summary Function Result

1. Select the Group Header band and click its Smart Tag.
2. In the invoked actions list, click the ellipsis button for the **Sorting Summary** option.
3. In the invoked **Group Sorting Summary Editor**, check the **Enabled** option, and specify a field and summary function against which the group should be sorted. If required, you also can change the default sorting order (from descending to ascending), and choose to ignore null values.
4. Click **OK** to apply the changes, and switch to the Preview Tab to view the result.

9.4.3.6.3.5 Apply Grouping in Charts

You can build a report containing charts that repeat for a specified grouped field. Grouping can be undertaken for Levels, Variables or any other field on which you wish to group your data.

1. Create a new report.
2. Ensure that a field is grouped. This may be carried out when preparing a report from the Report Wizard, or a grouped field can be added in the Report Designer.

3. Drop the Chart control onto the report's Grouping Header or Footer.
4. Print Preview the Chart. Replicate charts should be produced for each unique field entry in the grouped field.

- Automatic grouping is provided only if the chart is put in Group Header, Group Footer or Detail band of the main report.
- Automatic grouping is not supported if a chart is present in a Detail Report Band added by the user. This is because in this case it is not clear on what level of grouping is expected by the user.
- If the Group Header is hidden, no grouping will be applied as DataSight reads the grouping information from the header.
- As placing a chart in the Detail band causes multiple charts to be displayed for each data point, it is recommended to put the charts in Group Header or Group Footer.

Note	Prior to Version 3.3; grouping of fields within a chart required scripting. See also Handle Events via Scripts.

9.4.3.6.4 Parameters

You can use report parameters to pass data to a report before it has been published. Parameter values can be specified by end-users in a Print Preview or silently assigned in code.

Report parameters can be used to solve the following tasks.

Filtering

When filtering report data, parameters can be used for providing values to a report's Filter String. When filtering data at the level of a data source, you can link report parameter to query parameters that are used in the SELECT statement of a SQL string (see Add Parameters with a Filter String).

Calculated Fields

Parameters can be used as part of a calculated field's expression. To refer to a report parameter, use the "Parameters." prefix before its name.

Conditional Formatting

A formatting rule's condition can also reference report parameters (see Limit the Number of Records per Page).

Data Binding

You can bind a report control to a parameter and display its value in the report. To create a new label bound to a parameter, drag the parameter from the Field List and drop it onto the required band.

Dynamic Report Layout

You can use parameters to select which table columns are displayed in a report.

Scripting

When processing report data in scripts, you can access a specific parameter in the Report.Parameters collection by its name.

9.4.3.6.4.1 Creating Parameters

To create a report parameter, switch to the Field List, right-click the Parameters node and click **Add Parameter** in the context menu.

This invokes the **Add New Parameter** dialog where you can customize the created parameter. This dialog provides the following options.

Parameter	Purpose
Name	Specifies the unique name by which the parameter can be referred to.
Description	Specifies the text that will be displayed in a Print Preview along with the corresponding value editor.
Type	Specifies the parameter's value type, according to which an appropriate value editor is displayed in a Print Preview. This property can be set to any standard data type matching the expected data type of the parameter value. To learn how to use parameters of other types, see Creating Custom Report Parameters.
Default value	Specifies the default Value.
Show in the parameters panel	Enable this option to request the parameter value in a Print Preview. Otherwise, the default parameter value is silently passed to the report.
Supports the collection of standard values	You can enable this option if the parameter is visible (i.e., its value is to be requested in a Print Preview). In this case, an end-user will be requested to choose a value from a predefined list. You can either manually populate this list with possible values, or specify a data source from where these values will be obtained.
Allow multiple values	When this option is enabled, a parameter can be assigned a collection of values.
Dynamic values	On this tab, you can specify a data source, data adapter (if required) and data member storing parameter values. The value member defines a data field that will provide values to the parameter. The display member defines a data field storing values displayed in a Print Preview. The value type of the specified data member should match the specified Type. You can filter the list of values by specifying the Filter String property. Using this property, you can implement cascading parameters.
Static values	Switch to this tab to specify a static list of possible values. Each value should have a description that is displayed in a Print Preview.

9.4.3.6.4.2 Parameter Editors

The Parameter.Type property determines which values a parameter can accept. The corresponding value editors are created automatically by Rerport Designer for the following standard parameter types:

- String
- Date
- Number
  - 16-bit integer
  - 32-bit integer
  - 64-bit integer

- floating point
- double-precision floating point
- decimal

- Boolean
- GUID (Globally Unique Identifier)

Look-Up Parameter Editors

You can also list a parameter's values in a lookup editor. You can assign:

Static List of Values

A parameter can be provided with a predefined set of static values, without creating a separate data source. Each value is accompanied by a description that appears in the Print Preview's user interface.

Dynamic List of Values

A parameter can obtain a list of values from a specified data source. See Add Parameters with a Filter String as an example.

Multiple Values

A parameter can also be allowed to accept multiple values (by enabling its Parameter.MultiValue property). When creating cascading parameters, the list of values available for one parameter is filtered based on another parameter's current value. See Creating Multi-Value and Cascading Parameters for more information.

9.4.3.6.4.3 Limit the Number of Records per Page

This topic demonstrates how to define how many records should be displayed at each page in a report's Print Preview. Note that no scripts are required to accomplish this task.

1. To add a parameter to the report, in the Field List, right-click the **Parameters** section, and in the invoked menu, choose **Add Parameter**.
2. Select the parameter, and in the Property Grid, set its **Description** to **Rows per Page**:, **Parameter Type** to **Int32** and **(Name)** to **rowsNumber**.
3. From the Standard Controls, drop the Page Break control onto the top of the report's Detail Band.
4. Select the **Page Break**, and set its Visible property to **No**.
5. Click the ellipsis button for its **Formatting Rules** property, and in the invoked **Formatting Rules Editor**, click the **Edit Rule Sheet...** button.
6. In the invoked **Formatting Rule Sheet Editor**, click  to create a new formatting rule. Set its **Visible** property to **Yes**, and click the ellipsis button for its **Condition** property.
7. In the invoked **Condition Editor**, define a logical expression for the rule, (e.g. **([DataSource.CurrentRowIndex] % [Parameters.rowsNumber] == 0) And ([DataSource.CurrentRowIndex] != 0)**).
8. To save the changes and close the dialogue, click **OK**.
9. Click **Close**, to quit the Formatting Rule Sheet Editor.
10. In the **Formatting Rules Editor**, move the created rule to the list of applied rules on the right, using the arrow buttons in the middle of the dialogue.
11. To save the changes and close the editor, click **OK**.
12. In this example the number of rows is specified each time the report is being previewed. However you can make this number secure, by setting the parameter's **Value** option to the desired value, and then setting the report's **Request Parameters** option to **No**.

13. Switch to the Preview Tab, and in the **Parameters** section, define the required value and click **Submit**.

9.4.3.6.4.4 Add Parameters with a Filter String

In the following example two date-time parameters are created to filter data, which does not fall in the specified range, from the report.

Add parameters and filter your report based on their values

1. In the Field List window, right-click over the **Parameters** section and in the invoked menu, click **Add Parameter**.
2. In the invoked window for the created parameter, set its **Name** and **Description**. And, make sure to set its **Type** to an appropriate value.
3. Enabling the **Supports the collection of standard values** option of the parameter allows end-users to modify its value and also activates the **Dynamic values** and the **Static values** tabs of the window:

   - On the **Dynamic values** tab, you can specify a parameter's data source, data adapter and data member. The value member defines a data field that provides values to the parameter. The display member defines a data field that provides display names for parameter values (how these values appear in the user interface available in a Print Preview).

   - On the **Static values** tab, you can manually fill the list of parameter values, with each value having an individual description (specifying how this value appears in the **Parameters** panel).

   Then, repeat the previous steps to create the second parameter, so that every time your report is previewed, you will be asked to specify two dates.
4. Click your report's Smart Tag, and in the invoked actions list, click the ellipsis button for the **Filter String** entry. Then, in the invoked **Filter String Editor**, construct an expression where a data field is compared with the created parameters. To access parameters, click the icon on the right until it turns into a question mark.
5. The parameterised report is now ready. Switch to the Preview Tab, and in the **Parameters** section, define the required values and click **Submit**.

Note	In Print Preview, the report's document is not generated until you have submitted values of all the parameters that have the **Show in the parameters panel** option switched on via the **Parameters** UI.

9.4.3.6.4.5 Creating Multi-Value and Cascading Parameters

This document describes the implementation of multi-value and cascading parameters. Multi-value parameters can accept more than a single value, and cascading parameters display values corresponding to current values of other parameters.

Multi-Value Parameters

To assign a collection of values to a parameter, enable its Parameter.MultiValue property. In the **Add New Parameter** dialog, this option corresponds to the **Allow multiple values** checkbox. Multi-value parameters are useful when you need to filter report data against a list of values.

Cascading Parameters

The list of values available for a parameter in a Print Preview can be filtered based on the current value of another parameter.

To filter the list of parameter values:

1. Click **Add New Parameter**.
2. In the dialog window, click the ellipsis button for the LookUpSettings.FilterString property.
3. Specify a filter string that refers to another parameter.

4. Click the report's smart tag, and in the invoked actions list, click the ellipsis button for the **FilterString** property.
5. In the invoked **FilterString** Editor, construct an expression that uses both parameters.

9.4.3.6.5 Calculated Fields

Calculated fields are primarily used in data aware reports. Calculated fields allow you to pre process a report's input data based on a certain expression. So, using calculated fields allows you to apply complex expressions to one or more data fields that are obtained from your report's underlying data source. In the Report Designer, a calculated field is similar to an ordinary data field as you can bind controls to it, and group, sort and filter your report against it.

Calculated fields are easily managed via the **Field List**. The value of a calculated field is obtained by evaluating its expression in the Expression Editor. You can use data fields, report parameters, predefined constants as well as various date-time, logical, math and string functions.

Expression Syntax

A data field is inserted into the expression's text using its name in [square brackets], and parameters are inserted using the "**Parameters**." prefix before their names.

A calculated field's expression can evaluate the values of other calculated fields if you make sure to avoid circular references.

Note	When creating calculated fields, avoid dots in their names, because Report Designer uses them to address data source members.

Date-time constants must be wrapped in hashtags (#) (e.g., **[OrderDate] >= #1/1/2009#**). To represent a null reference (one that does not refer to any object), use a question mark (e.g., **[Region] != ?**). To denote strings, use apostrophes ('), otherwise an error will occur.

To embed an apostrophe into an expression's text, it should be preceded by another apostrophe (e.g., **'It''s sample text'**).

If a calculated field expression involves the use of different types, it is necessary to convert them to the same type.

Although a value that is returned by a calculated field is usually converted to a string (to be displayed in a text-aware report control), it can return a value of any kind (if the CalculatedField.FieldType property is set to **None**). For example, if a database field contains an image, you can set a calculated field's expression to "=...", after which this calculated field can be bound to the PictureBox control.

To construct a valid aggregate expression, use the following format, which consists of four parts.

[<Collection>][<Condition>].<Aggregate>(<Expression>)

<Collection> - Specifies a collection against which an aggregated value should be calculated. It can be the relationship name in a case of a master-detail relationship, or the name of a collection property exposed by the target class. Empty brackets [] indicate the root collection.

<Condition> - Specifies a condition defining which records should participate in calculating an aggregate function. To obtain an aggregated value against all records, delete this logical clause along with square brackets (for example, [].Count()).

<Aggregate> - Specifies one of the available aggregate functions listed in the Aggregate enumeration.

<Expression> - Specifies an expression evaluating values to be used to perform calculation. The Count function does not require field values to count the records, so leave the round brackets empty for this function.

You can refer to the currently processed group using the Parent Relationship Traversal Operator ('^'). This allows you to calculate aggregates within groups using expressions.

9.4.3.6.5.1 Add a Calculated Field

1. To create a calculated field, in the Field List, right-click any data member, and on the invoked menu, choose **Add Calculated Field**.
2. In the Field List, select the created field to show its properties in the Property Grid. Among these options, make sure to change the **Field Type** property to an appropriate value.
3. Create an expression for the calculated field. Click the ellipsis button in the **Expression** section, to invoke the **Expression Editor**. You can also invoke this dialogue by right-clicking your calculated field within the Field List and selecting **Edit Expression**. Click **Fields** to see the field list. Double-click field names to add them to the expression string. Use the toolbar to add operators between field names.
4. To close the dialogue and save the expression, click **OK**.
5. Finally, drag the calculated field from the Field List onto the required band, just like an ordinary data field. The report with a calculated field is now ready. Switch to the Preview Tab, and view the result.

Note	It is also possible to employ parameters in a calculated field's expression.

9.4.3.6.5.2 Calculate an Aggregate Function

1. Create a table report with data in the detail band.
2. Create a new calculated field and set the field name to "AggregateField".
3. Click the ellipsis button in the **Expression** section. The **Expression Editor** dialogue will appear.
4. In this dialogue, double click the relevant data field, then choose **Functions | Aggregate**.
5. Double click the Count() function. Insert your conditional criteria into the square brackets preceding the count function.
6. To construct a valid aggregate expression, use the following format, which consists of four parts.

   [<Collection>][<Condition>].<Aggregate>(<Expression>)

   <Collection> - Specifies a collection against which an aggregated value should be calculated. It can be the relationship name in a case of a master-detail relationship, or the name of a collection property exposed by the target class. Empty brackets [] indicate the root collection.

   <Condition> - Specifies a condition defining which records should participate in calculating an aggregate function. To obtain an aggregated value against all records, delete this logical clause along with square brackets (for example, [].Count()).

   <Aggregate> - Specifies one of the available aggregate functions listed in the Aggregate enumeration.

   <Expression> - Specifies an expression evaluating values to be used to perform calculation. The Count function does not require field values to count the records, so leave the round brackets empty for this function.

   You can refer to the currently processed group using the Parent Relationship Traversal Operator ('^'). This allows you to calculate aggregates within groups using expressions.
7. Click **OK** to close the dialogue and save the expression.
8. Add Labels to the Detail Band and customise their content.
9. Switch to the Preview Tab, and view the result.
10. You can also set formatting rules for the report.

9.4.3.6.5.3 Add Summaries to a Report

With Report Designer, you can force a data-bound control to calculate one of the standard summary functions (**Average**, **Sum**, **Count**, **Running Summary**, **Percentage**, **Max** or **Min**).

Calculate summaries within a report

1. To display the result at the bottom of a report, the Report Footer band should be present. To add it, right-click anywhere over the report's area and in the invoked Context Menu, select **Insert Band | ReportFooter**.
2. Click the field for which a summary will be calculated, to select it.
3. Hold down CTRL and drag the field onto the Report Footer area, to create an exact copy of the Label that will display the summary. You can also create a new label for your total by simply dragging it from the Control Toolbox.
4. Select the newly created Label, click its Smart Tag, and in its actions list, click the ellipsis button for the **Summary** item.
5. In the invoked **Summary Editor**, specify the summary options.
6. If required, Set the **Summary Running** option to **Report** to ensure that all values from the specified data field are taken into account.
7. The **Ignore NULL values** option should be used for functions like Count or Average, because the number of elements counted will depend on it.
8. The **Treat Strings as Numerics** specifies whether or not a summary function should treat strings as numeric values.
9. Note also that value formatting is applied to a summary independently of the general formatting, and has a greater priority.
10. When calculating totals for groups, you can sort the groups against a summary function result.
11. To save the settings and close the dialogue, click **OK**.
12. Switch to the Print Preview Tab, and view the result.

9.4.3.6.5.4 Count the Number of Records in a Report or Group

Count the Number of Records in a Group

1. Select the Label in the Group Footer area, and in the Property Grid, expand its **Summary** category.
2. Set the **Running** option to **Group** and the **Function** to **Count**.

Count the Number of Records in a Report

1. To add a Report Footer band to your report, right-click anywhere on it, and in the invoked Context Menu, choose **Insert Band | ReportFooter**.
2. Place a Label bound to a data field onto it, and in the Property Grid, expand its Summary category.
3. Set the Running option to Report and Function to Count.

Notes	The **Ignore NULL values** option is useful for functions like **Count** or **Average**, because the number of elements counted will depend on it. If required, you can specify the **Format String** (e.g. as **Total Count: {0}**). Note that value formatting is applied to a summary independently of the general formatting, and has a greater priority.

9.4.3.6.5.5 Conditionally Change a Label's Text

This topic demonstrates how to change a label's text if a certain condition is met, without using scripts.

1. Create a new report and bind it to DataSight data.
2. To create a calculated field, in the Field List, right-click any item inside the created dataset, and on the invoked menu, choose **Add Calculated Field**.
3. Select the calculated field, and in the Property Grid, set its **Field Type** to **String**.
4. Click the ellipsis button for the Field Type's **Expression** property.

5. In the invoked **Expression Editor**, define the required logical condition for the calculated field (e.g. if(["data"] == 0, 'None', ["data"]), which means that if the data field's value is equal to 0, the control's text will be replaced with None).
6. To save the changes and close the dialogue, click **OK**.
7. Drop the required data fields (and the created calculated field as well) from the Field List onto the report's Detail band.
8. Switch to the Preview Tab, and view the result.

9.4.3.7 Add Navigation

The topics of this section cover the navigation-related features of the Report Designer.

- Add Page Numbers and System Information to a Report
- Create Hyperlinks
- Add a Cross-Reference
- Add Bookmarks
- Add a Table of Contents

9.4.3.7.1 Add Page Numbers and System Information to a Report

Page numbers and other system information such as current date and time, or user name are generally displayed within the Page Header and Footer or Page Margin bands. To add page numbers or system information to a report, locate the Control Toolbox and drag and drop the Page Info control.

Add Page Numbers

1. Select the **Page Info** control, click its Smart Tag, and in the invoked actions list, expand the drop-down list for the **Page Information** entry.
2. Select whether to display only the page number (Latin or Roman - uppercase or lowercase), or the current page number with total pages.
3. To format the control's text, via its Smart Tag, invoked its actions list, and specify the required format (e.g. **Page {0} of {1}**).
4. Using the control's actions list, you also can specify the starting page number, and the running band (e.g. this option is available when there are groups in a report, and it's required to apply independent page numbering for them).

Add Page Numbers for Groups

1. From the Toolbox, drop the Page Info control onto the Group Footer.
2. Select the control, and set its **Running Band** to **GroupHeader1**.
3. If required, you also can specify its **Format** property (e.g. **Page {0} of {1}**).
4. Force each new group to start on a separate page, otherwise group page numbers will be calculated incorrectly. To do this, select the Group Footer, and set its **Page Break** to **After the Band**.
5. Select the Group Footer, and click its Smart Tag. In its actions list, check the **Repeat Every Page** option.
6. Repeat for the Group Header if required.
7. Switch to the Preview Tab, and view the result.

Add System Date and Time

1. Select the **Page Info** control, click its Smart Tag, and in the invoked actions list, expand the drop-down list for the **Page Information** entry, and select **Current Date and Time**.

2. To format the control's text, via its Smart Tag, invoked its actions list, and specify the required format. You can either type it in the **Format** field, or, click its ellipsis button and use the **Format String Editor**.

Add the User Name

1. Select the **Page Info** control, click its Smart Tag, and in the invoked actions list, expand the drop-down list for the **Page Information** entry, and select **User Name**.
2. To format the control's text, via its Smart Tag, invoke its actions list, and specify the required format (e.g. **Current User: {0}**).

9.4.3.7.2 Create Hyper-links

This topic describes how to embed a hyperlink into your report. Note that a label will behave as a hyperlink in a report's Print preview and when the report is exported to PDF, HTML, MHT, RTF, XLS and XLSX formats.

1. Drop a Label onto the report, and in the Property Grid, change its **Text** to the one required for the link.
2. In addition, to make the Label look like a typical link, you can change its appearance appropriately (e.g. make it blue and underlined).
3. Set its **Navigation Target** to the required value (_blank, _parent, _search, _self, or _top), and define the required **Navigation URL**.
4. Switch to the Preview Tab and view the result.

9.4.3.7.3 Add a Cross-Reference

This topic demonstrates how to add a cross-reference to your report. A cross-reference is simply a link whose target is located within the current document, which allows you to establish easy navigation through a report. In this example, we place a link at the bottom of each group, leading to the beginning of the report.

1. Drop a label onto the created **ReportHeader** band, which will serve as the report's headline.
2. Click the label, to type the desired contents into it.
3. In the Property Grid, set its **Name** property to **reportTop**.
4. To accompany the existing Group Header with the corresponding Footer, in the Group and Sort Panel, check the **Show Footer** option.
5. Drop a label onto it. As it will be the link, change its **Text** to **Top of Report**, and apply the desired formatting to it (e.g. the blue colour and underlined text).
6. Set its **Navigation Target** property to **_self**.
7. Click the drop-down list of the **Navigation URL** property, you can see the controls available in your report. Choose the one named **reportTop**.
8. Switch to the Preview Tab and view the result.

9.4.3.7.4 Add Bookmarks

This topic describes the steps to create a report with bookmarks (a so-called Document Map). This feature allows you to easily navigate through the report during print preview.

1. Click the Label in the Report Header band, to select it, and in the Property Grid, set its **Bookmark** property to the same value as its text.
2. Select the Label in the report's Group Header band. As this control is bound to data, we will bind its **Bookmark** property to the same data field, using the **(Data Bindings)** property.
3. Note that as with other bindable properties, you also can apply value formatting to the **Bookmark** property (e.g. **Category {0}**).

4. Specify the Label's **Bookmark**, and set the **Parent Bookmark** property to the Report Header's label, to define the document map's hierarchy.
5. Switch to the Preview Tab, and view the result.

9.4.3.7.5 Add a Table of Contents

This topic describes how to provide a report with a table of contents that displays page numbers for bookmarked report elements at different nesting levels.

1. Create a master-detail report.
2. Specify the bookmarks for report elements that need to be included in the table of contents.
3. Open the Toolbox panel (by pressing CTRL+ALT+X), select the **TableOfContents** control and drop it onto the report surface. This places the created control on the Report Header band. This band is created automatically if the report does not currently contain it.
4. Customize the table of contents title using the **LevelTitle** property in the Property Grid.
5. When report bookmarks are organized into a hierarchy (by setting the nested elements' **BookmarkParent** property), the corresponding levels are displayed in the table of contents. You can specify each level's text formatting options individually.
6. Access the level collection by clicking the control's smart tag and using the **Levels** property in the Property Grid.
7. In the invoked collection editor, click **Add** to add a new level and adjust its settings.
8. You can limit the maximum number of levels the table of contents displays using the **MaxNestingLevel** property.
9. The **LevelDefault** property allows you to apply common formatting settings to all levels at once (for which you did not assign a specific level previously).

9.4.3.8 Additional Features

The topics of this section cover the navigation-related features of the Report Designer.

- Change Page Settings
- Create Watermarks
- Handle Events via Scripts
- Content Editing in Print Preview
- Sorting a Report in Print Preview

9.4.3.8.1 Change Page Settings

In the Report Designer, page settings of a report can be specified in one of two ways. The first approach forces the default printer settings to be used when the report is printed, while the other one enables you to alter page settings independently.

Method 1: Using settings of the default printer

For the orientation, margins and paper size, you can specify a requirement that applies the corresponding printer settings instead of the report's. In this instance, the page properties in the Property Grid are disabled and displayed as greyed out. This may be useful when the report is printed in several places with different printers and printer settings.

Method 2: Specify the report's page settings

While designing the report, you can specify the page settings via the Property Grid. You can set the page orientation and modify the margins. The margin values are expressed in the report's measurement units.

You can select from the predefined paper sizes (**Paper Kind** property), choose **Custom** and create your own paper size, or select one which is already defined for this printer (**Paper Name** property).

These settings affect the layout of the report's design surface. After their modification, you may notice red warning marks, indicating that the controls go beyond the page width. These warnings can be switched off by setting the **Show Printing Warnings** property of the report to **No**.

You can also modify the page settings from the **Preview** tab.

1. The report's Preview Tab ribbon has a corresponding button that enables you to modify the page settings. Clicking this button invokes the **Page Setup** dialogue, which allows you to adjust the page layout before printing or exporting, and select the printer.
2. The margins can also be set visually by dragging the dashed lines in the Preview Tab as needed.
3. To change the measurement units shown in the margins tool tips, customise the report's **Measure Units** property.
4. To learn about other options available for a report, refer to Report Settings.

9.4.3.8.2 Create Watermarks

You can add a text watermark in a report, or turn a picture into a report's background. Note that watermarks are visible only in Preview mode.

Add a Watermark to a Report

To add a watermark to a report, do the following.

1. Click the report's Smart Tag and in the invoked actions list, click the ellipsis button for the **Watermark** property.
2. In the invoked Watermark dialog, select either the **Text Watermark** or **Picture Watermark** tab, depending on the type of watermark you wish to add.
3. For a text watermark, specify the text, direction and font options.
4. For a picture watermark, you need to specify an image. To do this, click the ellipsis button for the **Load image** option.
5. In the invoked Select Picture dialog, select the file containing the image that you wish to use as a watermark and click **Open**. Next, specify the sizing and alignment options for the picture.
6. Additionally, for both textual and picture watermarks, you can adjust the transparency, position (in front of or behind the document content), and the page range in which the watermark will be printed.
7. Switch to the Preview Tab, and view the result.

Supply a Preprinted Form

You can use a picture watermark as a template, to display an image of the preprinted form on the report's body at design time.

To display a watermark at design time, select the report and set its **DrawWatermark** property to **True** in the Properties window.

Place report controls on the report's body according to the layout of the preprinted form.

9.4.3.8.3 Handle Events via Scripts

Scripting Overview

Scripts are program commands, placed within the event handlers of the required report elements. And, when the corresponding event occurs (e.g. a mouse click), the script code runs. You can write scripts for a report or any of its elements (bands and controls), to be executed when the report is being previewed, printed or exported.

Although when in the Report Designer, virtually any task can be accomplished without scripting (Conditionally Change a Control's Appearance, Conditionally Change a Label's Text and Conditionally Hide Bands), scripting is made available to extend the standard functionality as far as may be required. And, scripting is the only way to calculate custom summaries.

Every report element has an set of script events, which are individual for each element's type. After you click (New) for an event (e.g. the **Before Print**, which is the most used), the Scripts window is switched on, where you can manage and edit all the report's scripts. In this window, for a selected event, a script template is auto-added, in the language specified via the **Script Language** property of the report. You can verify that your report's scripts are valid, by clicking **Validate**. The validation result is then displayed in the Scripts Errors Panel. Note that scripts are saved to a file along with the report's layout. The Report Designer will auto-populate scripts for your report if no scripts have been detected.

Scripting Specifics

1. **Scripting language**: The report scripts may be written in one of the following languages that the .NET framework supports - C#, Visual Basic and J#. Since J# is not installed with the framework installation, by default, make sure it is present before writing code in it. The scripting language is specified via the Script Language property of the Report object. It is set to C#, by default.
2. **Scripting scope**: Script execution is performed in the following way:
    a. The report engine generates a temporary class in memory. The names of the variables are defined by the Name properties of the controls and objects they represent. When the script is preprocessed, its namespace directives are cut from the script code and added to the namespace, where the temporary class is defined.
    b. After preprocessing, all scripts are placed in the code of the temporary class. Then, the resulting class is compiled in memory, and its methods are called when events occur.
    c. Scripting offers many advantages: you can declare classes (they will become inner classes), variables, methods, etc. A variable declared in one script is accessible in another script, because it is, in fact, a variable of the temporary class.
3. **Reference External Assemblies:** The Script References property of the Report object specifies the full paths (including the file names) to the assemblies that are referenced in the scripts used in a report. These paths should be specified for all the assemblies that are included in scripts via the using (C#), Imports (Visual Basic) or import (J#) directives.

Note	Writing Scripts on DataSight usually does not required assemblies to be included as most standard assemblies are already referenced by Report Designer.

Script Events

Scripts can be initaited by events related to any given report control. Events are available and set in a control's properties, and are as follows:

- After Print
- Before Print
- Click in Preview
- Double-Click in Preview
- Draw
- Evaluate Binding
- HTML Item Created
- Location Changed

- Mouse Down in Preview
- Mouse Up in Preview
- Parent Changed
- Print on Page
- Size Changed
- Summary Calculated
- Summary Get Result
- Summary Row Changed
- Text Changed

Example Script to Handle Grouping by Level in a Chart

1. Click on **Scripts** in the Report ribbon and place the following script lines in the window (This script has been developed to group by Level Name):

```
private void chart1_BeforePrint(object sender, System.Drawing.Printing.PrintEventArgs e) {
    XRChart xrc = (XRChart)sender;

    // Gets the current value of the grouping field.
    // For the master-detail report, use DetailBand.GetCurrentColumnValue in the detail band ins
    string filter_value = GetCurrentColumnValue("LEVELNAME").ToString();

    // Clears the filters that may have been set earlier.
    xrc.Series[0].DataFilters.Clear();

    // Creates and adds a new filter to the "TheGroupingField" data field
    // that has the type System.String.
    // The condition is that the data value equals the filter_value parameter.
    xrc.Series[0].DataFilters.Add(new DataFilter("LEVELNAME", "System.String",
        DataFilterCondition.Equal, filter_value));
}
```

2. Click **Validate** to connect the chart to the script.

9.4.3.8.4 Content Editing in Print Preview

When content editing is enabled for a report control (either unbound or data-aware), it is possible to customize the corresponding field values in Print Preview.

To enable content editing for a report control, expand its **EditOptions** property and set the EditOptions.Enabled property to **Yes**.

When the EditOptions.Enabled property is set to Yes and the EditOptions.ReadOnly property is disabled (**No**), the control's content can be edited in Print Preview (clicking a field will invoke the appropriate editor).

To highlight all editing fields available in a document, click the **Editing Fields** button on the Print Preview toolbar. This button is disabled when there are no such fields in a document.

To navigate between editing fields in Print Preview, use the TAB and SHIFT+TAB keys.

Content Editing Specifics

When enabling content editing in your report, consider the following.

- The changes made to a control's content in Print Preview have no effect on other parts of the document (e.g., the related summary results, grouping, sorting, bookmarks and other settings that have already been processed before generating the document).
- The CanGrow setting is ignored for editing fields.
- Multi-line values can only be entered when no mask is applied to an editing field. The editing area of a field cannot exceed the original dimensions of a control.
- Values entered into editing fields are reset back to their defaults after refreshing the document (e.g., when submitting report parameter values and expanding or collapsing data in a drill-down report).
- It is impossible to edit content of a control that has its DetailBand.DrillDownControl property specified.
- Field values entered in Print Preview for controls placed onto the Top Margin and Bottom Margin bands are not preserved when the report is exported to TXT or CSV, as well as the following formats as a single file such as HTML, MHT, RTF, XLS, XLSX, image.

Notes	The created report is platform-agnostic and its interactive features are supported by the Print Preview available for all application platforms. Enable the **ExportEditingFieldsToAcroForms** option to automatically convert a report's editing fields to AcroForms on PDF export.

Text Editing

The Label, Table Cell and Character Comb controls can be assigned editors to customize their content in Print Preview. To enable content editing for these controls, expand their **EditOptions** property and set the Enabled property to **Yes**.

The following editors can be used to customize a field's content in Print Preview.

- Default Editor: By default, the **EditorName** is not specified, and a memo edit is used as a standard editor.
- Specific Value Editors: You can assign a specific editor to a control using its **EditorName**.

  The standard editors are divided into the following categories.

  Numeric Date-Time Letters

  Numeric: Integer
  Integer Positive
  Fixed-Point
  Fixed-Point Positive

  Date-Time: Date

  Letters: Only Letters
  Only Uppercase Letters
  Only Lowercase Letters
  Only Latin Letters

  Each value editor corresponds to a specific mask that ensures that only appropriate values can be entered and then formats the edited value.
- Custom Editors: You can implement custom editors and add them to an existing or custom category. This is described in the Register a Custom In-Place Editor section of this document.

Note	If a table cell contains other controls, its editing is disabled (but not the editing of the controls contained in this cell).

A format for a TextEditingField's value is specified differently depending on whether a control's content is static or is supplied from a data source.

- If a control is unbound, the actual field value is obtained from the TextBrickBase.Text property of a corresponding brick. In this case, you can assign a required format directly to the Text property of the brick.
- If a control is bound to data, the actual field value is obtained from the TextBrick.TextValue property of a corresponding brick. In this case, assign a required format to the TextBrick.TextValueFormatString property and update the TextBrickBase.Text property based on the field's TextValue.

Check Box Editing

The Check Box control's value can be edited in Print Preview. To enable content editing for a check box, expand its **EditOptions** property and set the Enabled property to **Yes**.

In Print Preview, the control's behaviour depends on the CheckEditOptions.GroupID setting. When this property is set to null or an empty string value, a check box can be switched either to the "checked" or "unchecked" state (the "intermediate" state is not supported) independently on other available check boxes. Otherwise, the field editor behaves like a radio button, and editors with the same GroupID value belong to a single logical group (i.e., only one option can be selected within a group at a time).

9.4.3.8.5 Sorting a Report in Print Preview

You can implement interactive sorting for in print preview for the detail data and the report groups.

Sort Report Groups

1. Select any label located in a Group Header and switch to the Properties window.
2. Expand the label's **InteractiveSorting** property in the Behaviour Section, and set the **SortingOptions**.The **TargetBand** property should be set to to the associated Group Header and **Group Field** to the Field Name and Sorting Options specified in the GroupField Collection Editor.
3. Select the **FieldName** from the drop down list.
4. Switch to the Preview tab to sort report groups by the selected field. When a mouse pointer hovers over the label, it changes to a hand indicating the sorting capability. The arrow displayed at the element's right edge indicates the sorting order.

Sort Detail Data

1. Select any label located in a Detail band and switch to the Properties window.
2. Expand the label's **InteractiveSorting** property in the Behaviour Section, and set the **SortingOptions**.The **TargetBand** property should be set to to the associated Detail Band and **Sort Field** to the Field Name and Sorting Options specified in the GroupField Collection Editor.
3. Select the **FieldName** from the drop down list.
4. Switch to the Preview tab to sort report groups by the selected field. When a mouse pointer hovers over the label, it changes to a hand indicating the sorting capability. The arrow displayed at the element's right edge indicates the sorting order.

If you provide interactive sorting to multiple fields, clicking another field clears all the previously applied data sorting. Hold the SHIFT key while clicking to preserve the existing sorting settings and thus sort against multiple fields.

To disable data sorting against a specific field, hold the CTRL key on its caption click.

Note	Reports embedded into the current report as Subreports do not support interactive data sorting.

9.4.3.9 Report Examples

The topics in this section provide you the preliminary step-by-step instructions on how to create different types of reports with the Report Designer.

- Static Report
- Table Report
- Multi-Column Report
- Master Detail Report
- Sub-Reports
- Cross-Tab Report
- Parameterised Report
- Chart with Static Series
- Chart with Dynamic Series
- Combination Chart

9.4.3.9.1 Static Report

This topic describes the steps to create a static report, which means that the report is not bound to any DataSight data. Such reports may be useful for announcements, or correspondence that is required as part of your data management.

1. Create a new report.
2. From the Controls Panel, drop the Rich Text control onto the Detail band.
3. Select the created control and click its Smart Tag. In the invoked actions list, click the **Load File...** context link.
4. In the invoked dialogue, define the path to an RTF or TXT file containing a text of the announcement, and click **Open**.
5. To repeat the created report if required, select the Detail band and in the Property Grid set its **Repeat Count when Data Source is Empty** property to the desired repetition.
6. To make the announcement print on separate pages, set the band's **Page Break** property to **After the Band**.
7. Switch to the Preview Tab, and view the result.

Note	You can perform additional text formatting using the Ribbon Menu.

9.4.3.9.2 Table Report

This topic describes the steps to create a table report, which means that the report's data is arranged into a tabular format. This feature should not be confused with the hierarchical master-detail reports nor with cross-tab reports.

1. Create a new report.
2. Bind the report to DataSight data.
3. To print the column headers at the top of every document page, add a Page Header band to the report. To do this, right-click anywhere on the report's surface, and in the invoked Context Menu, choose **Insert Band | Page Header**.
4. To create a table either;
   a. Switch to the Field List and select the required fields by clicking them while holding the CTRL or SHIFT key. Then drag-and-drop them onto the Page Header band with the right mouse button. This will create a Table in which each Table Cell shows a field name.

b. To provide dynamic content to the report, switch to the Field List again and select the same fields. Click the selected fields (while holding the CTRL or SHIFT key) and drag-and-drop them onto the Detail band. This will create a table with the same number of cells as the number of fields selected, with each cell bound to the appropriate data field.

or,

c. Add two Table controls to the report's Page Header and Detail band. In the Controls, click the **Table** icon. In the Page Header's content area, click and hold down the left mouse button while dragging the mouse cursor across the Detail band. As a result, two tables are created. One will be used as a header, and the other for the report's detail information.

d. Type the headers into the upper table's cells, and bind the corresponding cells in the detail section to the appropriate data fields. This can be done by simply dropping these fields from the Field List onto the cells.

5. To select a table, click its handle, which appears when you hover the table with the mouse cursor. To select both tables simultaneously, click their handles while holding the CTRL key.
6. Next, press F4 to switch to the Property Grid and customize common options of both tables at one time. Please refer to the Table Control Properties to understand the selections avaiable.
7. To customise the cells' text options, you can use the Ribbon.
8. You can also specify odd-even styles for the table.
9. Switch to the Preview Tab, and view the result.

9.4.3.9.3 Multi-Column Report

This topic describes the steps to create a multi-column report, meaning that each page of the report document is laid out in a specified number of columns.

1. Select the Detail band, and in the Property Grid, expand the **Multi-Column Options** section.
2. Set the required **Mode**. It determines whether the number of columns is manually specified, or it depends on the fixed column width.
3. If you have chosen to **Use Column Count**, set the **Column Count**, and **Column Spacing**.
4. The **Direction** determines the order in which records of the same group are processed.
5. On the Detail band's surface a grey area appears, delimiting the available column's width. Adjust the controls width, so that they fit within the effective borders.
6. Click the Preview Tab to view the result.

9.4.3.9.4 Master Detail Report

This topic describes the steps to create a master-detail report with hierarchically linked data, using the Detail Report band.

Provide DataSight data with a Master-Detail Relation

1. Identify a table that will be used as the principal DataSight SQL table in the master-detail relation prior to starting.
2. Create a new report.
3. In the invoked Query Builder window, select an item from the list of available tables on the left and drop it onto the list of data tables to be used. This first table will be the **Master** table.
4. Add the **Detail** table(s) to the query and specify the joining column(s) of data in the **Join Editor**.
5. To assign a custom name to a data field, specify its **Alias** in the field list displayed in the bottom panel.
6. Click **OK** to exit the Query Builder.
7. Click **Finish** to exit and open the Report Wizard dialogue window. Step through the Wizard as required.

Design a Master-Detail Report

1. Allocate parts of a master report on the report's Detail Band.
2. Add a detail report band, right-click anywhere on the report's surface, and in the invoked Context Menu, point to **Insert Detail Report**. When the report's data source contains a data relationship, it is displayed in the Context Menu as "Table1".
3. Drop the required data fields from the Field List onto the detail report band. You should drop items from the relation node for the detail report to be generated correctly.
4. Switch to the Preview Tab, and view the result.

Note	Note that these fields must be taken from the Master-Detail joined relationship, and not from the individual table, otherwise the report will display only the first record of the Master Table record, as many times as there are records in each of the Detail table.

9.4.3.9.5 Sub-Reports

Report Designer can be used to create Sub-Reports that are subsequently merged into one final report. This can be useful when calling different data sets for each report section. The use of Sub-Reports requires that you have already prepared and saved a Summary Report, Datasheet Report using the Report Wizard or a Query Report using Report Designer to the Saved Views Panel.

In all cases the data binding for each report is inherited from the Sub-Report. The Master report data does not use or override the Sub-Reports data.

Design a Master Report with Sub-Reports

1. Create a Master Report. This Master report acts as a container of the sub-reports and is able to be edited in Report Designer (i.e. not a Summary Report).
2. In the Report Designer, select the Sub-Report control from the toolbox and drag it on to the main report. The Save Views dialogue window opens.
3. Map the chosen sub-report in the Saved Views window.
4. You can rename the sub-report control to something meaningful (like from "subreport1" to "annualReport" in order to logically link the sub report control to its report source).
5. Save the main report. This will save the mapping of the sub-reports together with the main report information.

Note	The mapping information has to be set when you first add the sub-report control to the main report and it cannot be changed thereafter. In case, the mapping needs to be changed, delete the current sub-report control and add a new one with the correct mapping. You can see his mapping information from the sub-report control's properties (Data-> Parameter binding). To avoid printing blank space when the subreport's height exceeds the height of its content, set the CanShrink property to true.

9.4.3.9.6 Cross-Tab Report

This topic describes the steps to create a cross-tab report using a Pivot Grid control that calculates automatic summaries and grand totals across a large number of grouped rows and columns. This feature should not be confused with the Master Detail Report or Table Report.

1. Create a new report.

2. Drop the Pivot Grid control from the Toolbox onto the report's Detail band. Please note that you cannot place a Pivot Grid within another report control.
3. To bind the pivot grid to a data source, click its Smart Tag, and in the invoked actions list, expand the **Data Source** drop-down selector and select the **NewDataSet**. Its **Data Member** property defines from which table or view of your dataset the grid obtains its data. And, the **Data Adapter** property is auto-defined, as well.
4. Click the grid's Smart Tag, and in the invoked actions list, click the **Run Designer...** link.
5. In the invoked Pivot Grid Designer's **Fields**, click the **Retrieve Fields**  button to obtain fields from the control's data source.
6. Switch to the **Layout** page in the navigation bar on the left.
7. Drag and drop the required fields to the **Row Fields**, **Column Fields** and **Data Items** areas.
8. Click **Apply** and the close the editor.
9. In the last step, you can set your report's **Vertical Content Splitting** option to **Smart**. This will split the grid's columns precisely by their borders in the Print Preview.
10. Switch to the Print Preview Tab, and view the result.

Note	After these steps, the report's Data Source property must be set to None. Otherwise, the grid will be blank at the preview and repeated as many times as there are records in the data source.

9.4.3.9.7 Parameterised Report

This topic describes the steps to create a report with parameters. You are required to add parameters and filter the report based on their values.

1. Create a new report.
2. Bind the report to DataSight data.
3. In the Field List window, right-click over the **Parameters** section and in the invoked menu, click **Add Parameter**.
4. In the invoked window for the created parameter, set its **Name** and **Description**. Make sure to set its **Type** to an appropriate value.
5. Enabling the **Supports the collection of standard values** option of the parameter allows end-users to modify its value and also activates the **Dynamic values** and the **Static values** tabs of the window:

   - On the **Dynamic values** tab, you can specify a parameter's data source, data adapter and data member. The value member defines a data field that provides values to the parameter. The display member defines a data field that provides display names for parameter values (how these values appear in the user interface available in a Print Preview).

   - On the **Static values** tab, you can manually fill the list of parameter values, with each value having an individual description (specifying how this value appears in the **Parameters** panel).
6. Repeat the previous steps to create additional parameters as required, so that every time your report is previewed, you will be asked to specify these parameters.
7. To use parameters to filter your report's data, click your report's Smart Tag, and in the invoked actions list, click the ellipsis button for the **Filter String** entry.
8. In the invoked **Filter String Editor**, construct an expression where a data field is compared with the created parameters.
9. To access parameters, click the icon on the right until it turns into a question mark.
10. Switch to the Preview Tab, and in the **Parameters** section, define the required values and click **Submit**.

Note	In Print Preview, the report's document is not generated until you have submitted values of all the parameters that have the **Show in the parameters panel** option switched on via **Parameters**.

9.4.3.9.8 Chart with Static Series

This topic describes how to create a report with a Chart control bound to data, so that a particular series has its own data source, and other settings. You can add more than one series which can obtain their data from the same or different data sources if necessary.

1. Create a new report.
2. From the Control Toolbox, drop the Chart control onto the report's Detail band.
3. To bind the Chart to a data source, click its Smart Tag, and in the invoked actions list, expand the **Data Source** drop-down selector and select the **NewDataSet**. Its **Data Member** property defines from which table or view of your dataset the chart obtains its data. The **Data Adapter** property is also auto-defined.
4. Click the Chart's Smart Tag, and in the invoked actions list, click the **Series...** link.
5. In the invoked **Series Collection Editor**, create a series of the required view type (e.g. Bar).
6. Switch to the **Properties** tab at the right of the editor's window, and assign the existing data set object to the **Data Source** property of the series. Assign the required data fields to the **Argument Data Member** and **Value Data Member** properties, which determine the coordinates for series points.
7. In addition, you can filter the series data. To do this, click the ellipsis button for its **Data Filters** property, and in the invoked dialogue, create and adjust the filtering criteria.
8. To save the changes and quit the dialogue, click **Close**.
9. Back in the **Series Collection Editor**, click **Copy**, to create a similar series, but change its **View** to **Point**.
10. To improve your Chart's appearance, you can make the following adjustments.

    - Remove the Chart's legend, as it shows the same data for both series. To do this, click the Legend, and in the Property Grid, set its **Visible** property to **No**.

    - Remove point labels from Series1. To do this, select the label and set its **Visible** property to **No**.

    - Customise the appearance of the Series2 markers (e.g. replace the default circle with the upside-down triangle by the **View.Point Marker Options.Kind** property and set its **Size** to **12**).

    - Rotate the X-axis labels for better readability. To do this, select the **AxisX** item in the chart by mouse click, and adjust properties for its labels (via the **Label** property). For instance, if the **Angle** property is **20** and the **Antialiasing** property is set to **Yes**, the labels look neat.
11. It is possible to customise many other properties for the Chart.
12. Switch to the Preview Tab, and view the result.

Note	After these steps, the report's Data Source property must be set to None. Otherwise, the chart will be blank at the preview and repeated as many times as there are records in the data source.

9.4.3.9.9 Chart with Dynamic Series

This topic describes how to create a report with a Chart control bound to data, so that all series are auto-created based on a common template, which specifies universal options for all series. This is possible when the data for all series (their names, along with points' arguments and values) are stored in the same data table. Note that in this scenario, the view type, and certain other settings, will be the same for all series.

1. Create a new report.
2. Bind the report to DataSight data.

3. Drop the Chart control from the Toolbox onto the report's Detail band.
4. To bind the Chart to a data source, click its Smart Tag, and in the invoked actions list, expand the **Data Source** drop-down selector and select the **NewDataSet**. Its **Data Member** property defines from which table or view of your dataset the chart obtains its data. The **Data Adapter** property is also auto-defined.
5. To specify the data field which should provide data for the series names (so that a new series is created for each record in that data field), set the **Series Data Member** property value.
6. Adjust the series template which is accessed via the chart's **Series Template** property. First, set the **Argument Data Member** (which specifies from where the data for points' arguments is obtained). Make sure that the **Argument Scale Type** property is set to an appropriate value. Otherwise (e.g. when your data is of the date-time type, but this property is set to **Qualitative**), the resulting Chart will be seriously affected, and incorrectly represent its underlying data.
7. Specify the **Value Data Members** property, indicating the data field(s) from which the points' values are obtained. As with the argument, make sure to appropriately specify the **Value Scale Type**.
8. At this point, the chart's data options are completely defined, so in this step some additional customisation capabilities are described.

   - **Adjust the Series Name Template**. You can edit the name of a series by clicking on the series in the left panel, and adding a new name in the **Name** field under **Options**.

   - **Customise Axis Labels**. To avoid overlapping axis labels, select an axis. Then click the **Properties** tab. In the **Elements** section, drop down the **Label** property. Then set **Staggered** property to **Yes**.
9. It is possible to customise many other properties for the Chart.
10. Switch to the Preview Tab, and view the result.

Note	After these steps, the report's Data Source property must be set to None. Otherwise, the chart will be blank at the preview and repeated as many times as there are records in the data source. When creating a report with Report Designer, in which you have inserted a Chart control bound to the queried data, the Argument Scale cannot be changed from Qualitative to DateTime from within the Properties Tab. In order to make this change, the MONITORING_DATETIME field must be re-dropped into the Argument Type field from the Data tab on the designer.

See also:

- Report Designer User Interface
- Report Designer Controls
- Report Designer Bands

9.4.3.9.10 Combination Chart

This topic describes the steps to create a Combination Chart within a Report, which means that we can create a Chart Series for one Variable, but replace the Chart Marks with the values from another Variable, provided they have the same datetime stamp.

This can be useful if, for example, you have data for water level recorded at a site, and also have corresponding temperature records for the same site taken at the same time. A Combination Chart can be created to display a Chart Series for the water level, and then replacing the Chart Marks with the temperature values recorded.

Verify Create SQL View option has been enabled

Ensure that Create SQL View has been enabled within DataSight's Options. To verify this:

1. Click the DataSight **Application Tab**.

2. Then click **Options**.
3. Navigate to the Datasheet category and find Create SQL View.
4. Verify that Create SQL View has been enabled. Click the checkbox to enable it if required.
5. Click **Save**.

Create and save your datasheets

Firstly, create and save two datasheets. The first datasheet (Datasheet A) will contain the values of Variable A and used to create the Chart Series. The second datasheet (Datasheet B) will contain the values for Variable B and is used to replace the Chart Marks.

Following the steps in Datasheets and Save a Datasheet for creating your Chart Series as Datasheet A and your Chart Marks as Datasheet B.

Our filter for Datasheet A looks like this:

[Level 3] Equals Site

[Date] Is between DD/MM/YYYY and DD/MM/YYYY

[Variable] Equals Variable A

Our filter for Datasheet B looks like this:

[Level 3] Equals Site

[Year] Is between DD/MM/YYYY and DD/MM/YYYY

[Variable] Equals Variable B

Create a report using Report Designer

1. Click **Report Designer** from the Output group on the DataSight Ribbon. This will display the Query Editor window.
2. Click **Run Query Builder...**. This will display the Query Builder.
3. From the list of tables and datasheets on the left of the Query Builder, find your datasheet for the Chart Marks and double-click on it (in our example, **Datasheet A**). Datasheet A is now displayed in the data tables to be used section of the Query Builder.
4. Find and double-click your second datasheet for the Chart Series (in our example, **Datasheet B**). This will invoke the Join Editor window.
5. In order to match-up the datetime stamps of Variable A and Variable B, we need to create an inner join of the MONITORING_DATETIME fields between the two datasheets.
6. The invoked Join Editor window will display [Datasheet B]. <Select a column> = <Select a table>. Click on **<Select a column>** and select **MONITORING_DATETIME** from the list displayed.
7. Click on **<Select a table>** and select your second datasheet, which should be the only option available (**Datasheet A** for our example).
8. The Join Editor window now displays another <Select a column> field. Click the **<Select a column>** field and select **MONITORING_DATETIME** from the list displayed.
9. Click the **OK** button on the Join Editor window. The Join Editor window will close, and you will be taken back to the Query Builder window. Both of your datasheets will be displayed in the data tables to be used section of Query Builder, with a line joining the MONITORING_DATETIME fields of the two datasheets.

10. Enable the **check box** at the top of each datasheet in the tables to be used panel to include all of their fields. Click **OK** on the Query Builder window. You will be taken back to the Query Editor window.
11. Click **Finish**. DataSight will take you to Report Wizard.
12. Step through the Report Wizard as required for any other items you wish to be on your report (See Report Wizard for more details).
13. Click **Finish** to complete the Report Wizard. DataSight will now take you to the Report Designer.
14. Update your report design and content as required.
15. Once you are ready to add the Combination Chart to your report, you will first add a Group Footer band to your report (see Grouping Bands for further information on Grouping Bands). This will ensure that your Combination Chart is not replicated multiple times unnecessarily.
16. Right-click within the **Detail** band within your report, under the Insert Band sub-menu, select **GroupFooter**. This will place a Group Footer band (named GroupFooter1) below the Detail band of your report.
17. Select the **Chart** control from the Standard Controls Panel and click on your report within the newly added **GroupFooter1** band. This will display the Chart Designer window.
18. In the invoked Chart Designer window, click on the **Add** icon ( ) and select **Series...** from the context menu. This will display a window with a list of available Chart Series types (Bar, Line, Point, Bubble, Area etc.)
19. From the list of available Chart Series types, select the type appropriate for your report. A new Series has been added to the chart called Series 1.
20. Now you need to set the data source which will be used to generate the chart. The MONITORING_DATETIME field will be used as the Argument and the VALUE_NUMERIC field will be the Value (see the Chart with Dynamic Series topic for further information on Arguments and Values).
21. Click on the **Data** tab on the far right panel of the Chart Designer. Click and drag the **MONITORING_DATETIME** field from the data source list and drop it over the **Argument (None)** section below the data source list, changing it to **Argument (Table1.MONITORING_DATETIME)**
22. Click and drag the **VALUE_NUMERIC** field and drop it over the **Value (None)** located just below Argument (Table1.MONITORING_DATETIME), changing **Value (None)** to **Value (Table1.VALUE_NUMERIC)**.
23. Click on the **Properties** tab, and change the **Argument Scale Type** under the Behavior group from **Auto** to **Qualitative**.
24. (Optional) Scroll down to the bottom of the Properties tab, and change the **Name** to a name relevant to your Chart Series.
25. Click on one of the **Chart Marks** on your Combination Chart. Within the Properties panel, find the **Text Pattern** property and type in **{Datasheet B.VALUE}**, including the parenthesis.
26. Click **OK** on the Chart Designer window. This will close the Chart Designer and return you to the Report Designer.
27. Move and/or resize your chart as desired for your report layout.
28. Switch to the Preview tab and view the result.

9.4.3.10 Save the Report

To guarantee that you will be able to revert your DataSight report to its original state, you should create a copy of the report for editing. Then, you may restore this saved copy at any point.

Save a new Report Layout to Saved Views

1. Click **Save** in the Report Designer Ribbon and the Save As dialogue window appears.
2. Click on your desired folder in the **Saved Views** folders list. This may be the master Saved Views folder, or an existing folder. The selection will be highlighted.
3. Alternatively add a new folder. Highlight the folder under which the new folder will be created, and select **New Folder**.
4. **Name** the new folder.
5. If you wish to overwrite an existing report click on the report name. Otherwise, **Name** the report.
6. Click **Save**.

Note	It is recommended to save your progress often to prevent losing unsaved changes.

Edit a Saved Report

1. Right-click on the saved report in the Saved View Panel, and select **Design**.
2. Select the applicable filter. The Report Designer will open showing the report template for editing.

9.4.3.11 Designing with Report Gallery

The Report Gallery allows you to store common report controls, styles, data sources and full report layouts, or a combination of these elements and re-use them in different reports.

Manage Report Controls

You can combine report controls residing within the same band into a template. To do this:

1. Select one or multiple controls while holding down the SHIFT or CTRL key.
2. Right-click the selection and choose **Add To Gallery** in the context menu.
3. To change the template name , select **Rename** in the template's context menu
4. Type a new name.

This adds a new template to the Controls section under the name containing control names separated by commas.

To apply a control template to a report, drag and drop the corresponding item from the Report Gallery onto a required band.

Note	Note that the template stores various settings related to its controls, such as binding information, appearance options, etc. All these settings are restored after adding controls to a report.

Manage Styles

To create a style template, right-click a required style in the Report Explorer and select **Add To Gallery**. This adds a related item to the Styles category.

You can then add a style to a report using one of the following ways:

- To add a style to the report's style sheet, right-click the corresponding item in the Report Gallery and select **Add to Report Style Sheet** in the context menu.
- You can also add all styles available in the Report Gallery using the context menu of the Styles node.

To apply a style to a required report control, drag and drop this style from the Report Gallery onto this control. This also adds the selected style to the report style sheet, if it does not already contain this style.

Manage Components

You can add a fully configured data source to a template and use it in other reports without creating the same data source from scratch.

Right-click a required data source in the Report Explorer and select **Add To Gallery**. This creates a new template in the Components category of the Report Gallery.

To add a data source template to a report, do one of the following:

- Right-click the data source in the Report Gallery and select **Add to Report Components** in the context menu.
- Drag and drop the data source from the Report Gallery onto the report.

Manage Report Layouts

The Report Gallery allows you store report layout templates in the Reports category.

To create a new report layout, right-click a report and select **Add To Gallery** in the context menu.

To apply a template to the current report, do one of the following:

- Right-click the template in the Report Gallery and select Apply Layout to Report.
- Drag-and-drop the template from the Report Gallery onto a report.

You will be warned about overriding the current layout. When loading the report layout, all associated styles, formatting rules, and components are added to the report as well.

Load and Save the Report Gallery

You can load templates from a separate file containing gallery items in a special format. For this, right-click an empty space in the Report Gallery and select **Load Gallery**. In the invoked Open dialog, locate the required file and click **OK**.

To save the Report Gallery templates to an XML file, select **Save Gallery As** in the Gallery's context menu and specify a target file in the Save dialog.

Print Preview Reports

Reports can be viewed in a Print Preview window prior to saving, printing or exporting. When you view a Preview window, you will see your report populated with data and broken down into pages, as specified. When in the Preview mode, you can print out your report using the appropriate menu and toolbar commands.

In Preview, you can export your report to files in different formats. The resulting files can either be saved to the hard drive or sent by e-mail.

Print Preview Reports

It is possible to print preview a report.

1. Select a report from the Saved View Panel. See Report Filters for more details.
2. Click **Preview** tab on the designer menu panel.
3. Close **Close** to exit Preview mode.

The following sections describe the capabilities provided by the Print Preview form:

Section	Elements
Print	Print a Document via the Print dialogue

	Print a Document Using Default Settings
Page Setup	Change Printing Settings via the Page Setup
	Specify Page Margins in Print Preview
	Scale Print Preview by Entering a Zoom Factor
	Scale Print Preview by Specifying Width in Pages
Navigation	Navigate Between Pages in Print Preview
	Use the Hand Tool in Print Preview
	Search for a Specific Text in Print Preview
Zoom	Zoom Print Preview In or Out
	Zoom Print Preview by Entering a Zoom Factor
	Zoom Print Preview to Show Whole Pages or Fit Content
	Show Two or More Pages in Print Preview
Page Background	Change Watermark and Background Settings in Print Preview
	Remove a Watermark in Print Preview
Export	Exporting from Print Preview
	Copy to Clipboard
	PDF-Specific Export Options
	HTML-Specific Export Options
	MHT-Specific Export Options
	RTF-Specific Export Options
	XLS-Specific Export Options
	XLSX-Specific Export Options
	CSV-Specific Export Options
	TXT-Specific Export Options
	Image-Specific Export Options

9.4.4.1 File Management

Save Document to Saved Views

1. Click **Save** in the Print Preview Window and the Save As dialogue window appears.
2. Click on your desired folder in the **Saved Views** folders list. This may be the master Saved Views folder, or an existing folder. The selection will be highlighted.
3. Alternatively add a new folder. Highlight the folder under which the new folder will be created, and select **New Folder**.
4. **Name** the new folder.
5. If you wish to overwrite an existing report click on the report name. Otherwise, **Name** the report.
6. Click **Save**.

Save a Print Preview to a File

If you've modified your report, and there's a chance you will need to print out this report version more than once, you can save the report to a file on disk. After that, you can simply load your report and print it out, without having to apply the same changes again.

1. Click the **Save** on the ribbon menu, or press CTRL+S.
2. On the invoked Save As dialogue, locate a folder where you want to store your file, enter the report's name and click **Save**.
3. Your document will be saved with the .prnx file extension. Note that this extension will be added to the file name even if you enter another one.

Load a Print Preview from a File

1. Click **Open** on the ribbon, or press CTRL+O.
2. On the invoked Open dialogue, define the file and click **Open**.

Note	If you open a document previously saved to the hard drive, it is impossible to change its page settings (e.g. page size, orientation, margins, etc.). So, the Page Setup and Scale buttons will be disabled.

9.4.4.2 Print

Print a Document via the Print dialogue

1. Click **Print** on the ribbon. You can also press CTRL+P.
2. The Print dialogue will be invoked.
3. Specify the necessary settings and click **Print**.

Note	If you try to print a document whose margins are outside of the printable area, you will see a warning message. Click Yes to print the document anyway, if you are sure that your printer supports the specified page margins.

Print a Document using Default Settings

To send a document directly to the default printer without customising print settings and invoking the Print dialogue:

- Click **Quick Print** on the ribbon.

Print Selected Content

To print only the selected content of the previewed report:

1. Select the content of the previewed report by holding the left mouse button and dragging the mouse pointer to create a selection box. Expand the selection box to fit all of the content you wish to print. The selected report elements are highlighted.
2. Right-click anywhere within the highlighted area of the report and select **Print** from the context menu.
3. In the invoked Print dialogue, specify the required settings and click **Print**.

See also:

- Copy to Clipboard

9.4.4.3 Page Setup

Scale the Print Preview

1. Click the **Scale** dropdown list button on the ribbon.
2. Either, enter the required percentage value in the zoom selection, or,
3. Specify the required number of pages in the editor.
4. Click **OK** to save changes and close the menu.

Specify Page Margins in Print Preview

To set document page margins, do one of the following:

1. Click the **Margins** dropdown list button on the ribbon, and select a default margin format.
2. Alternatively if a custom margin is required click **Custom Margins...** and enter the required top, left, bottom and right page margins' values into the Custom Margin dialogue.
3. Then, click **OK** to save changes.

Or

4. Use drag-and-drop in the Print Preview window.
5. To use this approach, point to the dotted line indicating the margin's border. When the pointer changes to  drag the pointer to move the margin.

Change Paper Orientation and Size in Print Preview

1. Click the **Orientation** dropdown list button on the ribbon, and select the page orientation (choose Portrait or Landscape).
2. Click the **Size** dropdown list button on the ribbon, and select the paper size.

9.4.4.4 Navigation

Navigate Between Pages in Print Preview

To navigate between pages, use the scrollbars or the navigation buttons on the ribbon. These buttons allow you to switch to the first, previous, next, or last page of a document.

Use the Hand Tool in Print Preview

1. The Hand Tool enables you to scroll content by dragging the document instead of using scrollbars.
2. To activate the Hand Tool, click the **Hand Tool** button on the ribbon.
3. Then, after you click a report's page, the mouse pointer is changed from  to  . Drag the mouse pointer to scroll the document.

Search for a Specific Text in Print Preview

1. Click **Find** on the ribbon, or press CTRL+F. The Find dialogue will be invoked.
2. In this dialogue, you can input the text to find, and specify whether to match case or the whole word during the search, or set the search direction.
3. To start searching, or search again, click **Find Next** or press **Enter**.

9.4.4.5 Zoom

Zoom In and Out of a Report

- To zoom in a report, click **Zoom In** on the ribbon, or press CTRL+PLUS SIGN.
- To zoom out of a report, click **Zoom Out** on the ribbon, or press CTRL+MINUS SIGN.
- To zoom in or out of a report, you can also hold down CTRL and rotate the mouse wheel.

Use the Magnifier Tool

Use the **Magnifier Tool** to switch between 100% and "fit whole page" views. Simply click anywhere in the report, to toggle views.

Zoom Print Preview by Entering a Zoom Factor

1. Click the **Zooming dropdown list** button. The Zooming list will be invoked.
2. Choose one of the zoom factor presets.
3. You can manually enter any value into the Zooming box.

Zoom Print Preview to Fit Content

1. Click the **Zooming dropdown list** button. The Zooming list will be invoked.
2. To zoom to the page width, click **Page Width**.
3. To zoom to the text width, click **Text Width**.

Note	If the preview window will be resized later, the current zoom factor will also be changed, to fit the current page or text width.

Zoom Reports to Display Whole Pages

4. Click the **Zooming dropdown list** button. The Zooming list will be invoked.
5. To display one whole page at a time, click Whole Page.
6. To fit two pages into the current view, click Two Pages.

Note	If the preview window will be resized later, the current zoom factor will be also changed in order to fit one or two pages.

Show Two or More Pages in Print Preview

1. Click **Multiple Pages** on the ribbon.
2. In the invoked dialogue, hover over the page icons, depending on the required number of pages to preview.
3. When the required number of pages has been selected, click the popup window to close it and apply changes to the report view.

9.4.4.6 Page Background

Add a Background colour to a Report

1. Click **Page colour** on the ribbon. The Background colour dropdown list will appear.
2. Choose a colour from the Custom, Web or System palettes.

Add a Watermark to a Report

1. Click **Watermark** on the ribbon. The Watermark dialogue will be invoked.
2. To add a text watermark, open the **Text Watermark** tab.
3. Input the required text, or choose one from the provided options. If required, define other text properties, such as direction, colour, font, size, transparency, etc.
4. To add a picture watermark, open the **Picture Watermark** tab.
5. Load the image and customise its properties, such as size mode, horizontal and vertical alignment, tiling, transparency, etc.
6. Specify the required pages to apply a watermark in the Page Range section of the dialogue.
7. Separate page numbers with commas, or specify page ranges using a dash.
8. Click **OK** to save changes and close the dialogue.

Remove a Watermark in Print Preview

1. Click **Watermark** on the ribbon. The Watermark dialogue will be invoked.
2. Click **Clear All**.
3. Click **OK** to save changes and close the dialogue.

9.4.4.7 Export

Export Report to a File on Disk

1. Click the arrow near the **Export To** button on the ribbon.
2. Choose the required format from the invoked list.
3. You may be prompted to define format-specific options.
4. The **Save As** dialogue appears, allowing you to enter the file name.
5. You will be asked if you want to open this file.
6. Click **Yes**, if you want to preview the exported file.

Send Exported Report via E-Mail

1. Click the arrow near the **Email As** button on the ribbon.
2. Choose the required format from the invoked list.
3. You may be prompted to define format-specific options.
4. The **Save As** dialogue appears, allowing you to enter the file name.
5. Finally, the created report will be attached to a new empty message, created in your default mail program.

Copy to the Clipboard

Aside from exporting a report to a third-party formatted file, you can copy a portion of the report content to the clipboard, and paste it into an editor compatible with one of the supported third-party formats.

1. Select the content of the previewed report by holding down the left mouse button and dragging the mouse pointer, to create a selection box.
2. Expand the selection box to fit all of the content you wish to print. The selected document elements are highlighted.

3. To copy the selected content, press CTRL + C or right-click anywhere within the highlighted area of the document, and select **Copy** in the context menu.
4. When pasted to a third-party editor from the clipboard, the report content will automatically be converted to the target format.

Manually Update Report Output

Sometimes you may need to simply update a couple of values in your report before printing it. In these cases, the simplest way to correct your report is to export it to an editable file (e.g. RTF), then use an appropriate editor tool to edit values and print your report.

9.4.4.7.1 PDF-Specific Export Options

General Options

- **Page range**: Define the pages which will be included in the complete file. Separate the pages with a comma, set a range of pages with a dash.
- **do not embed these fonts**: Define the fonts that will not be embedded in the complete file, to reduce the file size. Separate the fonts with a semicolon.
- **Images quality**: Choose the required report's image quality level. The higher the quality, the bigger the file, and vice versa.
- **Compressed**: Check this to enable compression.
- **Show print dialogue on open**: Check this, if desired.

Password Security Options

These options allow you to adjust the security options of the resulting PDF file (e.g. enable open document, editing, printing and copying protection, and specify which changes are allowed).

Signature Options

If an X.509 certificate is applied to your report, you can maintain its options via the Signature Options property of the report PDF Export Options.

Additional Options

You can also fill the Application, Author, Keywords, Subject, and Title fields.

9.4.4.7.2 HTML-Specific Export Options

- **Export mode**: The following modes are available.

  - The Single file mode allows export of a report to a single file, without preserving the page-by-page breakdown.

  - The Single file page-by-page mode allows export of a report to a single file, while preserving page-by-page breakdown. In this mode, the Page range, Page border colour and Page border width options are available.

  - The Different files mode allows export of a report to multiple files, one for each report page. In this mode, the Page range, Page border colour and Page border width options are available.
- **Page range**: Specify the pages which will be included in the resulting file. Separate page numbers with commas; set page ranges using hyphens.
- **Page border colour**: Choose the colour for the page border from the available palettes.

- **Page border width**: Define the page border width.
- **Title**: Enter the required report title.
- **Character set**: Define the character set for your HTML document.
- Also, using the appropriate check box, you can choose whether to remove carriage returns.

9.4.4.7.3 MHT-Specific Export Options

- **Export mode**: Choose one from the available modes to export a report.

  - The Single file mode allows export of a report to a single file, without dividing it into pages.

  - The Single file page-by-page mode allows export of a report to a single file, divided into pages. In this mode, the Page range, Page border colour and Page border width options are available.

  - The Different files mode allows export of a report to multiple files, one for each report page. In this mode, the Page range, Page border colour and Page border width options are available.
- **Page range**: Define the pages which will be included in the result. Separate page numbers with commas; set page ranges using hyphens.
- **Page border colour**: Choose the colour for the page borders from the available palettes.
- **Page border width**: Define the width of page borders.
- **Title**: Enter the required report title.
- **Character set**: Define the character set, which will be used in the exported report.
- Also, using the appropriate check box, you can choose whether to remove carriage returns.

9.4.4.7.4 RTF-Specific Export Options

- **Export mode**: Choose one from the available modes to export a report.

  - The Single file mode allows export of a report to a single file, without dividing it into pages.

  - The Single file page-by-page mode allows export of a report to a single file, divided into pages. In this mode, the Page range, Page border colour and Page border width options are available.

  - The Different files mode allows export of a report to multiple files, one for each report page. In this mode, the Page range, Page border colour and Page border width options are available.
- **Page range**: Define the pages which will be included in the result. Separate page numbers with commas, set page ranges using hyphens.
- Also, using the appropriate check box, you can choose whether the exported report should include watermarks (if they exist).

9.4.4.7.5 XLS-Specific Export Options

- **Export mode**: Choose one of the available modes to export a report.

  - The Single file mode allows export of a report to a single file, without dividing it into pages.

  - The Different files mode allows export of a report to multiple files, one for each report page.
- **Page range**: Define the pages which will be included in the result. Separate page numbers with commas; set page ranges using hyphens.
- **Sheet name**: Define the sheet name.
- **Text export mode**: Choose whether value formatting should be converted to the native XLS format string (if it is possible), or embedded into cell values as plain text.
- **Show grid lines**: Check if it's required to show grid lines in the resulting XLS file.

- **Export hyperlinks**: Check if it's required to export hyperlinks.

9.4.4.7.6 XLSX-Specific Export Options

- **Export mode**: Choose one of the available modes to export a report.

  - The Single file mode allows export of a report to a single file, without dividing it into pages.

  - The Single file page-by-page mode allows export of a report to a single file, with each shown in a separate sheet.

  - The Different files mode allows export of a report to multiple files, one for each report page.

- **Page range**: Define the pages which will be included in the result. Separate page numbers with commas; set page ranges using hyphens.
- **Sheet name**: Define the sheet name.
- **Text export mode**: Choose whether value formatting should be converted to the native XLSX format string (if it is possible), or embedded into cell values as plain text.
- **Show grid lines**: Check if it's required to show grid lines in the resulting XLSX file.
- **Export hyperlinks**: Check if it's required to export hyperlinks.

9.4.4.7.7 CSV-Specific Export Options

- **Encoding**: Define the encoding used in the exported report.
- **Text export mode**: Choose whether to use the formatting of the data fields in the bound dataset for the cells in the exported report. Note that if this property is set to Text, all data fields are exported to the CSV file as strings, with the corresponding formatting embedded into those strings.
- **Text separator**: Define a text separator (comma by default).
- You can also specify whether to quote strings with separators.

9.4.4.7.8 TXT-Specific Export Options

- **Encoding**: Define the encoding used in the exported document.
- **Text export mode**: Choose whether to use the formatting of the data fields in the bound dataset for the cells in the exported report. Note that if this property is set to Text, all data fields are exported to the Text file as strings, with the corresponding formatting embedded into those strings.
- **Text separator**: Define a text separator (TAB by default).
- You can also specify whether to quote strings with separators.

9.4.4.7.9 Image-Specific Export Options

- **Image format**: Choose one from the available image formats to export a report: BMP, EMF, WMF, GIF, JPEG, PNG or TIFF.
- **Resolution (dpi)**: Define the required image resolution.
- **Export mode**: Choose one from the available modes to export a report.
- - The Single file mode allows export of a report to a single file, without dividing the output into pages.
- - The Single file page-by-page mode allows export of a report to a single file, divided into pages. In this mode, the Page range, Page border colour and Page border width options are available.
- - The Different files mode allows export of a report to multiple files, one for each report page. In this mode, the Page range, Page border colour and Page border width options are available.
- **Page range**: Defines the pages which will be included in the result. Separate page numbers with commas; set page ranges using hyphens.

- **Page border colour**: Specifies page border colour.
- **Page border width**: Sets page border width.

Reports in Saved Views

Reports saved to the Saved Views may be opened and edited using different filter conditions than those originally saved with the report. This allows you to design a standard template for your reports that you can apply to different sets of data. Saved reports can be created using Summary Reports  , the Report Wizard  , or the Report Designer  .

Preview a Saved Report

1. Right-click on the saved report in the Saved View Panel, and select **Preview**.
2. Select one of the three options shown on the sub-menu to Preview:

   - **With The Saved Filter**: Uses the filter conditions saved with the report.

   - **Use the Current Filter**: If you have selected a Datasheet tab prior to previewing your report in the saved views, the report will use its filter conditions.

   - **Use A New Filter**: Opens the filter editor window with the saved filter conditions. You can edit these conditions as required (refer to Filter Editor).
3. The Preview window will open showing the Report template with the filtered data for printing or exporting (See Preview Reports for more details).

Edit a Saved Report

1. Right-click on the saved report in the Saved View Panel, and select **Design**.
2. Select one of the three options shown on the sub-menu to Design:

   - **With The Saved Filter**: Uses the filter conditions saved with the report.

   - **Use the Current Filter**: If you have selected a Datasheet tab prior to selecting your report in the saved views, the report will use its filter conditions.

   - **Use A New Filter**: Opens the filter editor window with the saved filter conditions. You can edit these conditions as required (refer to Filter Editor).
3. The Report Designer will open showing the Report template with the filtered data for editing.

Note	Summary Reports cannot be edited using the Report Designer.

Sharing Report Templates

You can create customised reports using Report Designer. If the report needs to be re-created in a new database with the same design, this can be done by sharing the report template.

DataSight allows you to save the report, and share its template across any database. You can then simply insert the new datasource and generate the report without needing to design from scratch.

Note	Summary Reports are in-built and by that virtue their templates are shared across all databases.

Share a saved report template

- To share a report template within Report Designer, click **Save All** to save the report template to a given location on your computer or network.

Use a saved report template

1. Connect to another database where you wish to recreate the report (See Connect to a Database).
1. Using the desired data set, step through the process of building a new report until you reach the Report Designer. When you create the initial query, ensure that that you select all the relevant tables that are required in the saved report template.
2. In the Report Designer, click **Open** on the ribbon to load the saved report template from the given location.
3. Click on the Report template you wish to use.
4. Then click **Open**. Your report is now customised.
5. To add/delete fields from your report, use the Field List. It is possible to further customise the report as you wish.
6. To update or save your report in the current database, click **Save** on the ribbon.

Gauging Reports

Two reports have been designed for stream gauging data. These are the **Gauging List** report showing a selection of stream flow measurements and the **Gauging Details** report for an individual gauging, which provides a graphical representation of both the stream and velocity profiles.

View Gaugings Reports

1. Open the Gaugings table in the Main Panel.
2. Select the relevant gauging, click on the Gaugings grouped tab. To select more than one Gauging, click **Multiple Selections** from the Gaugings grouped tab. Then select either **Gauging Details** or **Gauging List** from the Reports section of the ribbon. The report will open in a Print Preview window.

   You can also open a Gauging report from within the Gauging form. Open a Gauging by double-clicking on it. Then click  on the toolbar of the Gauging window.

Gauging Details Report

The Gauging Details report provides summary information for an individual gauging, with chainage details and charts showing the segmental division of the cross-section and velocity profiles along with any Comments noted for the gauging. Figures and summary data are displayed in the same measurement units as the gauging data that has been entered, whether that be metres, cm, feet, inches, etc. The report tabulates the percentage of flow in each panel. Panel flow greater than 10% is highlighted to ensure that it is understood that this may affect the data quality. Only one gauging at a time can be displayed in the report.

Gauging List Report

The Gauging List report provides an overview of a selection of gaugings for a given level 3 site. A tabular summary of the data is displayed in the report, together with a chart of the discharge versus depth for the selected gaugings. Enable **Multiple Selection** to be able to select the required gaugings from the Gauging table. in the Main Panel. Hold down the SHIFT or CTRL key and click on each gauging to include the gauging in the report.

10 Automate Your Tasks

DataSight has a facility for automating tasks based on an existing import template, saved datasheet, saved chart, saved report, calculation template or document.

A task is the scheduled work that can be automated and is performed by the DataSight Service Manager. The Service Manager monitors the time or event criteria that you choose and then executes the task when those criteria are met.

A Task could be the output of a file in a format such as a PDF, RTF, HTML, JPG or XLS, it could involve the addition of new data to your database, or it could email alarm notifications. You can email the DataSight files to a number of recipients, or save them to an FTP server. You can regenerate files periodically with the same file name, or DataSight can automatically increment file names such as Temp 001.jpg, Temp 002.jpg, and so on. You can perform Tasks in sequential order.

When a Task is created by a non Admin user, the account used to create the Task is saved with the Task and subsequently used to execute the Task with the permissions of its creator ensuring security of data is maintained. An Admin user can remove the user account saved with the Task, allowing the Task to be executed with full permissions within the database.

Tasks can be grouped into a Task Group for better sorting / filtering when viewing a large number of Tasks.

Open the Tasks list

- Click **Tasks** in the Automate Group on the DataSight Ribbon. The Tasks grid view will appear in the Main Panel.

Note	Prior to creating tasks, ensure that you have an existing Saved View with appropriate filters on your data, or an import or calculation template, or Document.

Open the Task Group list

- Click **Task Group** in the Automate Group on the DataSight Ribbon. The Task Groups grid view will appear in the Main Panel.

Service Manager

DataSight's Service Manager:

- Enables you to perform automated DataSight tasks on a computer.
- Enables you to schedule DataSight tasks to run at any time or when a specific event occurs.

A Task is the scheduled work that the Service Manager performs. A Task is composed of different components, but a Task must contain a trigger that the Service Manager uses to start the task and an action that describes what work the Service Manager will perform.

The Service Manager monitors the time or event criteria that you choose and then executes the Task, as defined within DataSight, when those criteria are met.

If connection to a DataSight database is not established on the Service Manager, tasks cannot be automated on the database.

Unlike DataSight, the Service Manager is **started by default** when the operating system starts up. For further information regarding the DataSight Service Manager please refer to the **Service Manager Help Guide**.

Configure Tasks

Add a Task

1. With the Task list open in the main panel, click **New** on the DataSight Quick Access Toolbar. The task selection window will appear.
2. Type in a **Description** for the task. This will identify the task to everyone.

3. Use the **Task Type** drop down menu to select the task type. The Task Types possible are Import, Datasheet, Report, Chart, Calculation, WDTF Export, Email Document and DSApp Import.
4. Click the **Active** check box for the Task to become Active when saved.
5. Use the **Task Group** drop down menu to select the task group the Task belongs to.
6. Configure the Task Details according to its Task Type: Import, Datasheet, Chart, Report, WDTF Data Export, Calculation, Email Documents, Email Message, DSApp Import or Alarm.
7. Select the Task Recurrence. Specify the Start Date and Time and then choose from the options of Once, Minutely, Hourly, Daily, Weekly, Monthly or Yearly and multiples thereof.
8. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
9. Click **Save**. The new task will be listed in the Task Main Panel.

   Active tasks are indicated by green text and Inactive tasks are indicated by red text.
10. When on the Tasks list, click **New** from the Quick Access Toolbar to add more tasks. Repeat Steps 1 to 7.
11. Click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks list.

Edit a Task

1. Double-click on a selected task row. You can also click on the **Edit** button against the desired task row. The specific task dialogue window appears.
2. Make any required changes.
3. (Optional as an Admin user) Click the **delete** button on the Run As User field to remove the saved user and allow the Task to be run with full Admin level permissions.
4. Click **Save**.
5. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks list.

Copy a Task

6. Click on a task you would like to make a copy of.
7. Click the **Save As** button from the Quick Access Toolbar. The selected task will be copied, with " - Copy" appended to the end of the Tasks name. The Task will also be opened for editing.
8. Make any required changes.
9. Click **Save**.
10. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks list.

Delete a Task

1. Click the check box in the **Delete** column of the task row to be deleted.
2. Click **Save**.
3. A dialogue box will prompt for confirmation of the record deletion. Click **Yes**, otherwise click **Cancel**.

View logs of the Scheduled Tasks

1. Success or Error status of a Task is displayed in the **Status** column against its task row.
2. Within the **Active** column, click on the + sign of the selected task row.
3. Log(s) of the scheduled task, and their success or otherwise will open.

4. Click on the - button to collapse the Log View.

Run a Task

If you wish to run a task immediately, right-click on the selected task and choose **Run Task**.

When the send email tick box is ticked, or an email task is selected, the Run Task function on the right click menu is disabled (greyed).

See also:

- Automatically Export Data
- Automatically Publish Charts
- Automatically Publish Reports
- Automatically Email Documents
- Automatically Email a Message
- Automatically Import DSApp Files
- Automatically Email Alarm Notifications

Note	Tasks that involve output to email must always be scheduled forwards in time. Email delivery requires the SMTP settings saved within the DataSight Service Manager, and hence cannot be activated without automating the task through the Service Manager. The Service Manager's activation in turn is dependent upon the global time interval set by your IT Administrator. It is not possible to run a task immediately with email output.

Automatically Import Data

Using saved Import Templates, an import routine can be automated as a task.

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button. The **Edit Tasks** dialogue window appears.
2. Select an Import **Template** (See also Import Templates).
3. Enter the **File Name** including the path to the destination folder for the file. It is possible to save a filename with a wildcard * attached, to allow for the importation of related files over a period of time.
4. You can also click **...** to locate the file on your device or within your network. You can also specify an FTP Server or Web Service from which data will be imported.
5. (Optional) Check if an **Appending File**. This will append the incoming file without replacing the previous file.
6. (Optional) Uncheck **Save raw file to Document** if you do not wish to save incoming raw data files. It is recommended that you uncheck **Save raw file to Document** option when automated imports such as Telemetry are carried out frequently. This can prevent the database from growing exponentially.
7. Check your Level 1, Level 2, Level 3 to which you are importing. Please refer to the table below for which options are made available, which is dependant on how the Import Template was designed.
8. After import, select which action you require from **Do Nothing**, **Delete the File** or **Move the File**. In order to **Move the File**, you must specify a **Target Location** where the file will be moved. Allowing for a file to be moved or deleted after importation, means that the DataSight service does not import the same files over and over. You can specify an FTP Server as your Target Location.
    a. (Optional) When **Move the File** is selected, you can archive the imported file into sub-directories within the Target Location, based upon the import file's modification date.

b. Check **Archive Files Using Last File Modification Date - (Creates sub-directories for archiving into your target location)**.

c. You must select one of the sub-directory hierarchy options:

- Check **Year Only** - Archive your files into sub-directories by year; or
- Check **Year\Month** - Archive your files into sub-directories by year, and then within each year by month; or
- Check **Year\Month\Date** - Archive your files by year, month, and then within each month by date.

9. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
10. (Optional) If a Calculation subtask is added in the previous step, then you can choose to **Run Calculation Sub Tasks** on Imported Data only.
11. (Optional) Check **Lock Data on Import** to have the data being imported by the task automatically locked.
12. Set the **Recurrence** interval over which you wish to run the Task and its subtasks (if any).
13. Click **OK**.
14. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Note	When creating an import task for data from a Web Service, the full connection string must also be used on creating the import template. See also Select Your File and Web Service.

Level Selection Options Based on Import Template

The design of the Import Template will define which Level 1, Level 2 and Level 3 selections are made available to you in your Import Task. Three options are available as detailed below.

Option	Import Template Design							Task Level Selections Available		
	Step 2: Filter and Map Your Data				Step 4: Relate Your Data			Task Section: Details		
	Level 1 Name	Level 2 Name	Level 3 Name	Level 3 ID	Level 1	Level 2	Level 3	Level 1 Selection	Level 2 Selection	Level 3 Selection
1	Cannot be mapped	Mapped (Must be mapped if Level 3 Name is mapped)	Mapped (Must be mapped if Level 2 Name is mapped)	Cannot be Mapped if Level 2 Name & Level 3 Name are mapped	Enabled for mandatory user input	Disabled for user input	Disabled for user input	Pre-populated with the Level 1 that was selected from Import Template Step 4. Enabled for user input allowing user to override the Level 1 defined in the Import Template.	Level 2 is determined by the Imported Data. Disabled for user input.	Level 3 is determined by the Imported Data. Disabled for user input.
2	Cannot be mapped	Cannot be mapped if Level 3 ID is mapped	Cannot be mapped if Level 3 ID is mapped	Mapped	Disabled for user input	Disabled for user input	Disabled for user input	Disabled for user input	Disabled for user input	Level 3 is determined by the Imported Data.

										Disabled for user input.
3	Cannot be mapped	Is not mapped	Is not mapped	Is not mapped	Enabled for mandatory user input	Enabled for mandatory user input	Enabled for mandatory user input	Pre-populated with the Level 1 that was selected from Import Template Step 4. Enabled for user input allowing user to override the Level 1 defined in the Import Template.	Pre-populated with the Level 2 that was selected from Import Template Step 4. Enabled for user input allowing user to override the Level 2 defined in the Import Template.	Pre-populated with the Level 3 that was selected from Import Template Step 4. Enabled for user input allowing user to override the Level 3 defined in the Import Template.

10.2.1.1 LoRaWAN Device Automated Import Task

Currently DataSight supports the Sense API for requesting data (i.e. a PULL operation) in an Automated Task, which requests the latest data, downloads it in JSON format, converts it to a Normalised CSV format, and then imports the data into your database.

Detailed below are the pre-requisites and step-by-step instructions for creating an automated Import Task for a LoRaWAN device using NNN Co. Australia's LoRa Network.

Pre-requisites

You must have an Import Template created in order to automate the ingestion of the LoRaWAN device data.

You must have your unique API Key provided to you by NNN Co. Australia.

Creating the Import Task

1. Open the Task grid-view and create a new Import Task:
2. Select your LoRaWAN Import **Template**.
3. Replace the path in the **File Name** field with the following Web API URL string:
   a. https://api:<YOUR API KEY>@<API END POINT>/<DEVICEID>/<COMMAND><OPTIONAL ARGUMENTS>

   e.g. https://api:8a0892e3aedbe2f2ade4bd727d4725e0c639d021@www.nnnco.io/v2/api/sense/devices/532FC45327658E1234/readings?fromTs=last5hours

   b. Configure the remaining settings as required for your Task.
4. **Save** your Task.

Note	Without any optional arguments, the 'readings' command requests the most recent 1,000 records from the last two days (as only the last two days of data is currently available from the N2N DL Server).

	As devices deliver the data in UTC +/- 00:00 time zone, DataSight will convert this to the local time zone of your database during the import process.

Optional Arguments

DataSight supports the following optional arguments for NNN Co. Australia's LoRa Web API, allowing you to refine the dataset being requested for the LoRaWAN device. Due to the 1,000 records / two day limit of data available from the Web API, these optional arguments may be beneficial to ensure that data is not missed depending on the frequency over which the Task has been configured to occur.

Optional Argument	Description
?fromTs=lastXmins	Requests the most recent X minutes of data.
?fromTs=lastXhours	Requests the most recent X hours of data.
?fromTs=lastXdays	Requests the most recent X days of data.
&limit=1000	Limits the requested data to 1,000 records. Can be used on its own, or appended to one of the above optional arguments.

See also:

- Import Templates
- LoRaWAN Device Import Routine
- Automate Your Tasks

Automatically Import DSApp Files

You can use DataSight to automatically import the data from your DSApp Import (DSI) files.

1. Click the **Tasks** button from the Automate group on the DataSight Ribbon.
2. Click on the **New** button from the Quick Access Toolbar.
3. On the invoked New Task window, type in a name for your new task.
4. Select **DSApp Import** from the Task Type. The Task window will expand with available options for the DSApp Import Task Type.
5. Enter the **File Name** including the path to the destination folder for the file. It is possible to save a filename with a wildcard * attached, to allow for the importation of related files over a period of time.
6. You can also click **...** to locate the file on your device or within your network. You can also specify an FTP site or Web Service from which data will be imported.
7. After import, select which action you require from **Do Nothing**, **Delete the File** or **Move the File**. In order to **Move the File**, you must specify a **Target Location** where the file will be moved. Allowing for a file to be moved or deleted after importation, means that the DataSight service does not import the same files over and over. You can specify an FTP Site as your Target Location.
    a. (Optional) When **Move the File** is selected, you can archive the imported file into sub-directories within the Target Location, based upon the import file's modification date.
    b. Check **Archive Files Using Last File Modification Date - (Creates sub-directories for archiving into your target location)**.
    c. You must select one of the sub-directory hierarchy options:

- Check **Year Only** - Archive your files into sub-directories by year; or
- Check **Year\Month** - Archive your files into sub-directories by year, and then within each year by month; or
- Check **Year\Month\Date** - Archive your files by year, month, and then within each month by date.

8. Set the **Recurrence** interval over which you wish to run the Task and its subtasks (if any).
9. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
10. (Optional) If a Calculation subtask is added in the previous step, then you can choose to **Run Calculation Sub Tasks** on Imported Data only.
11. Click **OK**.
12. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Note	A DSApp Import Task will change the extension of your DSApp Input (DSI) files from .dsi to .dsb (DSApp Backup file). This is to ensure that the file is not accidentally imported again if the file is not moved after import.

Automatically Export Data

Automated reporting of a data set in a chosen format can be scheduled using a Saved Datasheet.

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button. The **Edit Tasks** dialogue window appears.
2. Choose the Saved Datasheet from the **Saved View** list.
3. Select the output format required from the **File Format** List.
4. Enter the **File Name** including the path to the destination folder or click **...** to locate or place the file on your device or within your network. You can also specify an FTP site to which data will be exported.
5. If you are scheduling the recurring creation of a Datasheet, check **Overwrite at recurrence** to replace an existing file with the output file in the destination location each time a Datasheet is generated.

   Check **Do not create/overwrite output file if there is no data** to not create an output file if no data is found in the Saved View.

   Check **Send email** to send the output file over email. Then enter the desired email address in the **Recipient(s)** field. To enter more than one email address, separate each address with a comma. Click  to add a Subject and Body to your email.

   Check **Embed Contents** if you wish to embed the datasheet as HTML in the body of the email. The datasheet output file format must be HTML.

   Check **Name File with UTC Date/Time** if you wish to have the filename of the export to include the UTC date and time that the file was exported on. The UTC Data/Time will be inserted at the beginning of the filename.
6. Set the recurrence interval over which you wish the Task to run.
7. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
8. Click **OK**.
9. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Checking tasks assigned to a Datasheet

- From within the Saved Views Panel, right-click on any saved Datasheet and select **Properties**. Scheduled tasks are listed.

Note	Ensure the user has entered the correct email server (SMTP) details in the DataSight Service Manager.

	Email addresses must be separated by a comma, otherwise only the first recipient will receive the email with the other recipient email addresses being ignored.

10.2.3.1 WDTF Data Export

DataSight can be used to automate the export of data in the Australian Bureau of Meteorology **Water Data Transfer Format (WDTF)**.

1. Select the **WDTF Export** task type. The **Edit Tasks** configuration window will appear.
2. If you are scheduling the recurring WDTF Export, check **Overwrite the file at recurrence** to overwrite the existing file with the new output file.

   Check **Send email** to send the output file over email. Then enter the desired email address in the **Recipient(s)** field. To enter more than one email address, separate each address with a comma. Click  to add a Subject and Body to your email.
3. Enter a **File Name** with the destination folder.
4. Select the Saved **Datasheet** from the drop down list to filter the data set.
5. Enter your settings for FTP: Type in the **FTP Server**, **Username** and **Password**.
6. Select the **Regulation** format.
7. Select the **Interpolation** method by which you wish your data to be treated.
8. Set the recurrence interval over which you wish the report to run.
9. Click **OK**.
10. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Automatically Publish Charts

Automated visualisation of your data set can be produced in a chosen format using a Saved Chart View.

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button. The **Edit Tasks** dialogue window appears.
2. Choose the Saved Chart from the **Saved View** list.
3. Select the format required from the **File Format** List.
4. Specify the **Width** and **Height** in Pixels.
5. Enter the **File Name** including the path to the destination folder or click **...** to locate or place the file on your device or within your network. You can also specify an FTP site to which the chart will be exported.
6. If you are scheduling the recurring creation of a Chart, check **Overwrite at recurrence** to replace an existing file with the output file in the destination location each time a Chart is generated.

   Check **Do not create/overwrite output file if there is no data** to not create an output file if no data is found in the Saved View.

   Check **Send email** to send the output file over email. Then enter the desired email address in the **Recipient(s)** field. To enter more than one email address, separate each address with a comma. Click  to add a Subject and Body to your email.

   Check **Embed Contents** if you wish to embed the chart as HTML in the body of the email. The chart output file formats allowed are BMP, JPEG, PNG, GIF and TIF. PDF, SVG and XAML are not supported.
7. Set the recurrence interval over which you wish the Task to run.
8. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).

9. Click **OK**.
10. Remember to click **Save** in the Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Checking tasks assigned to a Chart

- From within the Saved Views Panel, right-click on any saved Chart and select **Properties**. Scheduled tasks are listed.

Note	Ensure the user has entered the correct email server (SMTP) details in the DataSight Service Manager. Email addresses must be separated by a comma, otherwise only the first recipient will receive the email with the other recipient email addresses being ignored.

Automatically Publish Reports

Automated publication of reports in a chosen format can be scheduled using a Saved Datasheet.

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button. The **Edit Tasks** dialogue window appears.
2. Choose the Saved Report from the **Report** list.
3. Select the format required from the **File Format** List.
4. Enter the **File Name** including the path to the destination folder or click **...** to locate or place the file on your device or within your network. You can also specify an FTP site to which the report will be exported.
5. If you are scheduling the recurring creation of a report, check **Overwrite at recurrence** to replace an existing file with the output file in the destination location each time a report is generated.

   Check **Do not create/overwrite output file if there is no data** to not create an output file if no data is found in the Saved View.

   Check **Send email** to send the output file over email. Then enter the desired email address in the **Recipient(s)** field. To enter more than one email address, separate each address with a comma. Click  to add a Subject and Body to your email.

   Check **Embed Contents** if you wish to embed the report as HTML in the body of the email. The report output file format must be HTML.
6. Set the recurrence interval over which you wish the Task to run.
7. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
8. Click **OK**.
9. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Checking tasks assigned to a Report

1. From within the Saved Views Panel, right-click on any saved Report and select **Properties**.
2. Scheduled tasks are listed.

Note	Ensure the user has entered the correct email server (SMTP) details in the DataSight Service Manager. Email addresses must be separated by a comma, otherwise only the first recipient will receive the email with the other recipient email addresses being ignored.

Automatically Perform Calculations

Using saved Calculation Templates, calculation can be automated as a task. They need to be associated with a filter setting which can be taken from a Saved Datasheet.

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button. The **Edit Tasks** dialogue window appears.
2. Select a Saved Data Sheet or Chart from the **Filter From** drop down list to apply the Calculation template to.
3. Select the **Calculation** template from the drop down list.
4. Set the recurrence interval over which you wish the Task to run.
5. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
6. Click **OK**.
7. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

See also:

- Save a Datasheet

10.2.6.1 Automate Calculations with References

When Calculation templates contain References, there are different automation scenarios to consider. Tasks may be configured that allow for the automatic and varying assignment of Reference values depending upon the incoming data.

When References have an assigned Equipment and Level, then you must be configure your automations carefully.

Global References

A Global Reference does not have any Level or Equipment assignment and the relationship consists simply of the Variable and its constant value; e.g. Variable (Pi) = 3.14159265359

Its value is set for each iteration; it is not dependent upon the Level or Equipment of the input data record.

A Calculation template containing **only** Global References can be automated across multiple Levels and Equipment.

You need to produce only:

- A Saved View (Data Sheet, Chart or Pivoted Datasheet) which determines the Filter Query to produce the incoming data set.
- **One** Calculation template with **Repeat The Calculation For All Levels** selected, to run that Calculation across all Levels founds within the input data set.
- **One** Task created that refers to both the Saved View and the Calculation Template.

Static Reference Selection - Multiple Calculation Templates and Tasks

To ensure that the correct Reference is used in each and every Calculation, you can produce a Calculation template for each and every Reference change that is required. These Calculation templates must then be automated as individual Tasks and should never be set to run across multiple Levels. **DO NOT** set the Calculation Template to Repeat The Calculation For All Levels.

You need to produce:

- A Saved View (Data Sheet, Chart or Pivoted Datasheet) which determines the Filter Query to produce the incoming data set. Multiple Levels and or Equipment can be present.
- **Distinct** Calculation templates for every Level or Equipment expected within the input data set, where the specified Reference in the template is used.

- **Distinct** Tasks created that refers to both the Saved View and all the distinct Calculation templates.

This method is the more labour intensive to establish and will produce a multitude of templates and tasks.

Dynamic Reference Selection - Single Calculation Template and Task

DataSight has been programmed to be smart about Reference selection when automating Calculations. When you set a Calculation template to **Repeat The Calculation For All Levels,** and use this in a Task, DataSight's Service Manager reads the Level and Equipment in the incoming data record and uses this combination to determine which Reference is most applicable.

To use this method you must ensure:

Each Reference does not have the same Level, Variable and Equipment assignment as another Reference. Each Reference is unique is this respect.

Each Reference must have Equipment and all Levels assigned.

Every Master Variable A data record must have Equipment assigned. DataSight does not enforce that you must have Equipment mapped upon import, but this will be critical to getting the most out of automated calculations with References.

You need to produce:

- A Saved View (Data Sheet, Chart or Pivoted Datasheet) which determines the Filter Query to produce the incoming data set.
- **One** Calculation template with **Repeat The Calculation For All Levels** selected, to run that Calculation across all Levels founds within the input data set.
- **One** Task created that refers to both the Saved View and the Calculation Template.

Note	Ensure Master Variable A data records have Equipment values. Other Added Variables do not need to have equipment mapped, so if you require an automated calculation to be performed on system generated variables, just add the original Master Variable A to subsequent calculations for automation purposes. The References will still be matched with the corresponding data record using Equipment.

See also:

- Set Variables
- References
- Set References
- Add References

Automatically Email Documents

Documents stored in DataSight can be scheduled for email. This may be of use when you are routinely required to distribute supporting documentation such as methodologies or sampling schedules as saved calendar files.

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button. The **Edit Tasks** dialogue window appears.
2. Select the **Level** in your database to which the document(s) are assigned. All documents in the Level are listed with options to select the required documents.

   (Optional) Multiple documents can be selected from the list, and all the selected documents will be sent as attachments in the email message.
3. Select the desired **File Type** of the output file.
4. Enter the **File Name** including the path to the destination folder or click **...** to locate the file on your device.

5. Select the **Document Name(s)** from the List.
6. Check **Send email** and then enter the desired email address in the **Recipient(s)** field. To enter more than one email address, separate each address with a comma.

   Click  to add a Subject and Body to your email.
7. Set the recurrence interval over which you wish the Task to run.
8. Set the **Recurrence** interval over which you wish the report to run.
9. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
10. Click **OK**.
11. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Note	Please allow sufficient time for the list of documents to populate when selecting your Level. Ensure the user has entered the correct email server (SMTP) details in the DataSight Service Manager. Email addresses must be separated by a comma, otherwise only the first recipient will receive the email with the other recipient email addresses being ignored.

Automatically Email a Message

You can use DataSight to automatically email a message at some point in the future.

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button. The **Edit Tasks** dialogue window appears.
2. Select the **Email Message** task type.
3. Enter the desired email address in the **Recipient(s)** field. To enter more than one email address, separate each address with a comma. Click  to add a Subject and Body to your email.
4. Enter the **Subject** and **Email Body**.
5. Set the **Recurrence** interval over which you wish the report to run.
6. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
7. Click **OK**.
8. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Note	Ensure the user has entered the correct email server (SMTP) details in the DataSight Service Manager. Email addresses must be separated by a comma, otherwise only the first recipient will receive the email with the other recipient email addresses being ignored.

Automatically Email Alarm Notifications

You can use DataSight to automatically email an Alarm notification either when no data has been received or as defined by the severity levels in an Alarm calculation template.

Once an Alarm Task executes, and the trigger conditions have been met, an email notification is issued.

By default, an Alarm Task will issue an email notification upon every activated Alarm execution. This behaviour can be configured so that subsequent notifications are only sent after a set number of task executions (iterations) have occurred.

Specifically, to configure an Alarm Task you will need to set:

- how often the Task is executed.
- how often to re-send the email notifications.

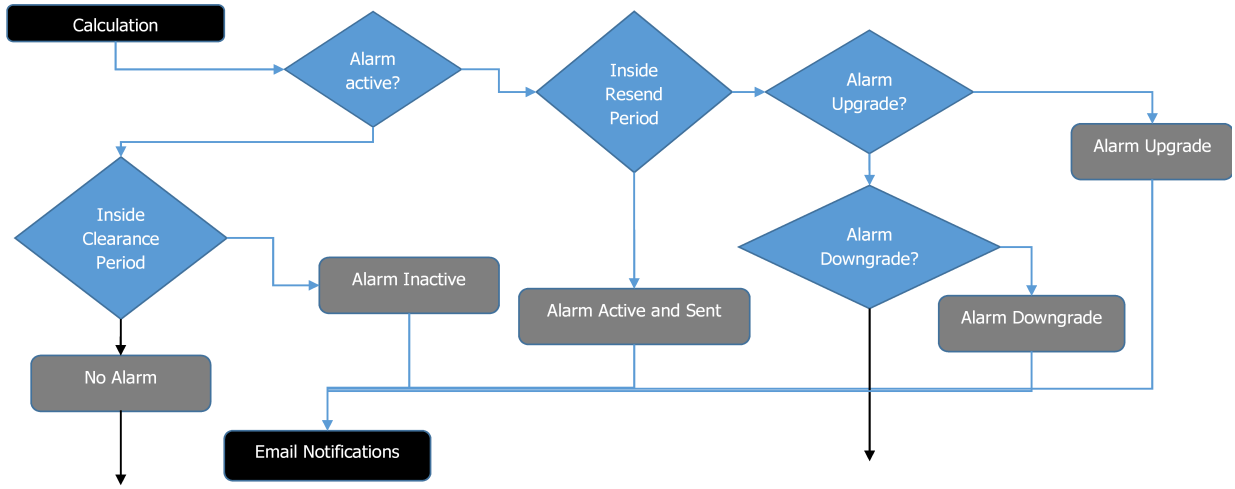
- a reset period for clearing the alarm after it is no longer active, and before a new alarm is generated.

To coordinate notifications, DataSight Alarm Tasks log the Date and Time of the Alarm sent, and categorises the Alarm Event as follows:

Alarm Event	Alarm Severity
Not Active	Alarm conditions not met
Active/Resend	Alarm conditions met/Resend if specified
Upgrade	Alarm Severity level has increased
Downgrade	Alarm Severity level has decreased
Inactive	Alarm conditions not met/Inside clearance period
Clearance	Alarm conditions not met/End of clearance period

An email notification is sent when the Alarm transitions between Alarm Severity levels, regardless of the notification re-send period.

You can also define a reset period (in minutes) after which the Alarm is cleared.



The email notification issued by the Alarm Task will contain specific information in the Email Subject Line and Body.

The Subject line will contain combinations of the:

- Alarm Event
- Alarm Name, as defined by the Alarm calculation template's Alarm Severity, in brackets.
- Level 3 name the alarm relates to.

The Email Body will contain the following (applicable) information:

- A summary header row, notably highlighted with the currently active Alarm Severity's assigned colour.
- Level 3 name the Alarm relates to.
- Date and Time the email notification was issued.

- Alarm Name, as defined by the Alarm calculation template's Alarm Severity.
- Variable being monitored, its Value and Units of measurement.
- Variables and References used in the Alarm calculation template, as well as their Values.
- Date and Time the Alarm was originally triggered at, as well as the monitored Variable's value at that point in time.

Send an Email Alarm Notification

1. With Tasks open in the main panel, click **New** on the DataSight Quick Access Toolbar. The task selection window will appear.
2. Type in a **Description** for the task. This will identify the task to everyone.
3. Select the **Alarm** task type.
4. Select either **Alarm if NO DATA** or **ALARM based on Calculation Result** for the Alarm Activate Condition.
5. Select a Saved View datasheet from the **Filter From** drop down list.
6. Select a saved calculation template from the **Calculation** drop down list. A calculation template will only be displayed in the drop down list if Alarm has been selected as the calculation template's Output.
7. (Optional) Enter the **Resend email every # iterations** number. The time in brackets will be updated to reflect when the next email notification will be issued based on the number of iterations and the Task recurrence period values you have entered.
8. (Optional) Enter the **reset period** for how many minutes must elapse before a new Alarm notification will be issued.
9. Enter the desired email address in the **Recipient(s)** field. To enter more than one email address, separate each address with a comma.
10. Set the **Recurrence** interval over which you wish the report to run.
11. (Optional) To add sub tasks, click **Add Sub Tasks** (See Add Sub Tasks for more details).
12. Click **OK**.
13. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Note	Ensure the user has entered the correct email server (SMTP) details in the DataSight Service Manager. Email addresses must be separated by a comma, otherwise only the first recipient will receive the email with the other recipient email addresses being ignored. There is no need to define the email Subject or Body as these are automatically set by the Alarm Task.

See also:

- Alarm Severity
- Alarm Calculations

Add Sub Tasks

Using Sub Tasks, it is possible to sequentially perform many tasks in a desired order.

When tasks are chosen as Sub Tasks, they are executed in the order that they are saved with the parent Task, regardless of their individual due dates and times. A Sub Task can be added uniquely to a main Task and is only executed *after* its parent Task and other preceding Sub Task(s) have been completed.

Any task can be added as a Sub Task provided that it is saved as a main Task first and does not contain its own Sub Tasks.

Add Sub Tasks

1. Set up your desired Sub Tasks as Tasks if they do not already exist in the Tasks grid view (See Set Tasks for more details).

   Click **Save** in the Quick Access Toolbar to save the Tasks set.
2. Create or edit the Task you wish to add these Sub Tasks to. The **Edit Tasks** dialogue window opens.
3. In the Edit Tasks window, click **Add Sub Tasks**. A list of the Tasks from the Main Panel that can be added as Sub Tasks appears.
4. Select the Sub Task(s) by checking the respective box(es) against them.
5. Then click **OK**.
6. Click **OK** again to implement your changes.
7. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view. Your Sub Tasks have now been added.

Note	Greyed out tasks in the Tasks grid view list indicate that they are sub tasks. A newly created Task must be saved prior to adding Sub Tasks.

Remove Sub Tasks

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button of the Task that you wish to manage the Sub Tasks of. The **Edit Tasks** dialogue window appears.
2. Expand the **Sub Tasks** section. This will bring up a list of existing sub tasks of the current Task.
3. To remove a sub task, check the box in the **Remove** column against its row.
4. Then click **OK**.
5. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Manage the order of Sub Tasks

1. From within the Tasks grid view, either double-click on a selected task row, or click on the **Edit** button of the Task that you wish to manage the Sub Tasks of. The **Edit Tasks** dialogue window appears.
2. Expand the **Sub Tasks** section. This will bring up a list of existing Sub Tasks of the current Task.
3. To change the order of a Sub Task, click on its row and use the Up/ Down arrows on the right.
4. Repeat Step 3 as required.
5. Then click **OK**.
6. Remember to click **Save** in the Quick Access Toolbar to save the entire Task set, prior to closing the Tasks grid view.

Set Task Groups

Create a Task Group

1. With the Task Groups list open in the main panel, click **New** on the DataSight Quick Access Toolbar. A new Task Group row will be added to the Task Groups grid view.
2. Type in a Name for the Task Group in the Task Group field.
3. Click **Save** in the Quick Access Toolbar to save the Task Group.

11 Link DataSight

DataSight has been designed to ensure that data stored within DataSight can easily be shared or disseminated to other systems. Our design focuses on data management and pulling data in human readable format from instruments and other systems to reduce the complexity and increase the connectivity of DataSight. All of DataSight's data tables have data stored in human readable formats, while meta data, such as video's and photographs are stored in industry standard electronic formats with all file properties intact.

DataSight easily links to many third-party products simply by using industry standards such as XML and ODBC connectivity. DataSight is not a replacement for a statistical package or a fully featured GIS product, however it has been designed to create leverage off these software products.

You can elect to create native Microsoft SQL Views of your saved datasheets, as set in DataSight Options. Industry based database connections such as OLE and ODBC can then be connected directly to the back end of DataSight Microsoft SQL Tables, provided you have the correct permission to do so.

DataSight can also be linked to proprietary DataSight systems, DSWeb and DSApp. DSWeb is used for the dissemination of your DataSight data to any stakeholder through a web browser, while DSApp can be used capture field measurements on a mobile device.

See also:

- DataSight Options
- Link DSApp
- Link Excel
- Link URL String

Link DSApp

This topic contains the default settings for the Saved Views and automated Tasks used to link DSApp to your DataSight database.

When DSApp is provisioned for your DataSight database and upgrades are run specific to DSApp, the requisite DSApp files and tasks are created automatically by DataSight Administrator for your convenience (Default DSApp Configuration).

By creating a Default DSApp Configuration, you are automatically undertaking the steps listed hereafter.

There is some scope to manually create and update these elements and it is worthwhile taking the time to understand what must be preserved to ensure data flows seamlessly between DataSight and DSApp.

Note	Please contact Seveno or your reseller for access to the requisite DSApp upgrades to your DataSight database. DSApp itself is downloaded from the Google Playstore or Apple App Store.

Generate a DSApp Report

1. Click **Report Designer** from the Output group on the DataSight Ribbon.
2. On the bottom-left of the invoked Query Editor window, click **Run Query Builder...**.

3. In the invoked Query Builder window, locate and double-click **GetDataSightAppData** on the list of available tables on the left. This will add GetDataSightAppData to the list of data tables to be used on the right.
4. Enable the check box for *** (All Columns)** on the added GetDataSightAppData table and click **OK**. You will be taken back to the Query Editor window.
5. Click **Finish**. This will open the Report Wizard.
6. On the invoked Report Wizard, click the **>>** button to move all the items listed under Available Fields to the Fields to Display in a Report section and click **Finish**. This will open the Report Designer.
7. In the Report Designer, click **Open** from the Report group on the Report Designer Ribbon.
8. Navigate to the location where you have downloaded the DSApp report template to and select **DSAppReport.repx** and click **Open**.
9. Report Designer will adjust the layout of the report to match the requirements of DSApp.
10. Click **Save** from the Report group of the Report Designer Ribbon.
11. Enter a name for your report and click **Save**, (DSAppReport is the recommended default name).

Automatically Publish the DSApp Report

1. From within the Tasks grid view, click the **New** button from the Quick Access Toolbar. The New Tasks dialogue window appears.
2. Enter a name for your Task, and select **Report** as the Task Type.
   a. The default task name is 'Generate DSApp Report'.
3. Choose the saved DSAppReport from the **Report** list.
4. Select **CSV** as the format from the **File Format** List (in order for DSApp to be able to load the report file, it **MUST** be exported in CSV format).
5. To the right of **File Name**, click **...** to specify the FTP site to which the report will be exported and has been set up for use by DSApp.
   a. The default folder for the task is the FTP user's home folder.
   b. The default filename is in the format 'ftp://FTP_SITE@USERNAME:PASSWORD/DATABASE_NAME_Report.csv', where:
      i. FTP_SITE is the URL or IP address of your FTP Server;
      ii. USERNAME is the username of the FTP user account;
      iii. PASSWORD is the password of the FTP user account; and
      iv. DATABASE_NAME is the name of your DataSight database.
6. **Schedule** the recurring creation of the report, based upon how often you may alter your associated MDE templates.
   a. The default schedule is for the task to run once per hour.
7. Check **Overwrite at recurrence** to replace the existing file with the output file in the destination location each time the report is generated.
8. Click **OK**.
9. Remember to click **Save** in the Quick Access Toolbar.

Create a DSApp Datasheet

1. Click the Datasheet button from the View group on the DataSight Ribbon. The Datasheet grid-view is displayed in the main panel.
2. Click the **button** (next to **And**) in the Filter Panel, to add new filter condition.
3. Click the 1st part and select **Day** from the drop down list of all fields.
4. Click the 2nd part and select **Day - Last Day(s)**.
5. Click the 3rd part and type **7**.
6. Click **Save** from the Report group of the Report Designer Ribbon.
   a. The default name for the datasheet is 'DSAppDatasheet'.

Note	Changes made to the datasheet will not be reflected within DSApp until the 'Generate DSApp Datasheet' automated task has been run, and the file updated in DSApp.

Automatically Export the DSApp Datasheet

1. From within the Tasks grid view, click the **New** button from the Quick Access Toolbar. The New Tasks dialogue window appears.
2. Enter a name for your Task, and select **Datasheet** as the Task Type.
   a. The default task name is 'Generate DSApp Datasheet'.
3. Choose the saved 'DSAppDatasheet' from the **Saved View** list.
4. Select **CSV** as the format from the **File Format** List (in order for DSApp to be able to load the datasheet file, it **MUST** be exported in CSV format).
5. To the right of **File Name**, click **...** to specify the FTP site where the datasheet will be exported and has been set up for use by DSApp.
   a. The default File Name is in the format 'ftp://FTP_SITE@USERNAME:PASSWORD/DATABASE_NAME_Datasheet.csv' where:
      i. FTP_SITE is the URL or IP address of your FTP Server;
      ii. USERNAME is the username of the FTP user account;
      iii. PASSWORD is the password of the FTP user account; and
      iv. DATABASE_NAME is the name of your DataSight database.
6. **Schedule** the recurring creation of the datasheet, based upon how up-to-date you wish data in DSApp to be.
   a. The default schedule is for the task to run once per hour.
7. Check **Overwrite at recurrence** to replace the existing file with the output file in the destination location each time the datasheet is generated.
8. Click **OK**.
9. Remember to click **Save** in the Quick Access Toolbar.

Create a DSApp Import Task

1. From within the Tasks grid view, click the **New** button from the Quick Access Toolbar. The New Tasks dialogue window appears.
2. Enter a name for your Task, and select **DSApp Import** as the Task Type.
   a. The default task name is 'Import DSApp Data'.

3. To the right of **File Name**, click **...** to specify the FTP site where DSApp files will be imported from.
   a. The default File Name is in the format 'ftp://FTP_SITE@USERNAME:PASSWORD/*.dsi' where:
      i. FTP_SITE is the URL or IP address of your FTP Server;
      ii. USERNAME is the username of the FTP user account; and
      iii. PASSWORD is the password of the FTP user account.
4. Select Move the file as the **After Import** action.
5. Enter the **Target Location** where DSApp files will be moved to after import.
   a. The default Target Location is in the format 'ftp://FTP_SITE@USERNAME:PASSWORD/Archive/'.
6. **Schedule** the recurring import, based upon how often you may submit your DSApp files to your FTP Server.
   a. The default schedule is for the task to run once per hour.
7. Click **OK**.
8. Remember to click **Save** in the Quick Access Toolbar.

See also:

- DSApp
- Configure DSApp
- Set DSApp Variable Groups and Variables
- DSApp Import
- MDE Templates and DSApp
- Report Designer
- Automatically Import DSApp Files
- Automatically Publish Reports

Link Excel

DataSight has been designed to use Microsoft SQL as the fundamental database behind the application. This provides real benefits for DataSight users.

The following procedure shows you how to link DataSight with Microsoft Excel. The same procedure can be used to link any other software product that has the capability to link to external databases. This includes statistics packages such as Statistica and SigmaPlot.

Link Microsoft Excel to DataSight

1. On DataSight, go to Options from the application tab on DataSight.
2. In the Options window, check **Create SQL View** under the Datasheet section. Once you have done this then every time you save a datasheet in DataSight, a native Microsoft SQL View will be saved based on the filters for the datasheet. These views are **not** tables of data but are **SQL Queries** that are activated when you open them. DataSight saves the DataSight datasheet saved views as Microsoft SQL Views.
3. After saving a view on DataSight, open **Microsoft Excel** to link to DataSight.
4. Open a blank spreadsheet. Then go to the **Data** tab from the Menu ribbon.

5. From the Get External Data group, select **From Other Sources** and then click **From SQL Server**.

   A Data Connection Wizard runs.

6. In the Wizard, enter the server **name**.

7. Select *one* of the following modes to verify your **Log on credentials**.

   - If you normally log into DataSight using Windows Authentication then simply click **Next**.
   - If you use SQL Security log on details, then click **Use the following user name and password** radio button, enter the user name and password provided by your IT Administrator and then click **Next**.

8. Select the database that you wish to connect to from a dropdown list. As soon as you select the database(s) you will be able to see the tables directly from DataSight. Within these tables are Microsoft SQL views.

9. Highlight the name of the view you wish to open.

10. (Optional) Unselect **Connect to a Specific Table** to link data from all the tables.

11. (Optional) Select **Enable selection of multiple tables** to select more than one table.

12. Click **Next** to continue.

13. (Optional) You can click **Back** to change your preferences or **Cancel** the process at any time.

14. Set a File Name, Description, Friendly Name, and Search Keywords as you wish, or do nothing to use default settings.

15. Click **Finish** to complete the wizard. Once you have selected your View, select how you would like Microsoft Excel to import the data in the **Import Data** window.

16. In the Import Data window, select how you wish to view your data.

    You can elect to view data as:

    - Table
    - PivotTable Report
    - PivotChart
    - Or you can choose to Only Create a Connection

17. Select where you want to put your data.

18. (Optional) Click on **Properties** to update data.

    In the Properties window, you can configure the connection to automatically refresh the data.

    Then click **OK**. You will be returned to the Import Data window.

19. In the Import Data window, click **OK** to finish your import routine. Your data will now be displayed in the specified location.

Note	To find out your server name, login to DataSight and look at the Status Bar.

Link URL String

You can link DataSight to systems, either local or on the cloud, via a URL string in any File Dialog window within DataSight. This allows you to download human readable files for import, or upload data and reports to these systems.

The types of systems DataSight can communicate with via a URL string include:

- FTP Servers.
- Web Services.
- Web APIs.

Note	When operating in the Microsoft environment, you will use/see a forward slash within the URL string. It is only a Windows convention that shows a backslash when you type the location of a local folder specifically in

	a Microsoft Windows environment.

See also:

- FTP Server
- Web Service
- Web API

FTP Server

You can link DataSight with an FTP Server, which allows you to:

- Import data files from the FTP Server.
- Export your data to the FTP Server.
- Generate and save Reports to the FTP Server.

FTP URL String

When entering a **File Name** and path, or **Target** location, the FTP URL string should be specified in one of the following two ways:

1. For access using a supplied username and password:
   a. ftp://<username>:<password>@<host>:<port>/<path>/<filename.extension> (e.g. ftp://TestUser:TestPassword@ftp.seveno.com:1234/ExampleFolder/TestData.csv).
2. For access using anonymous credentials:
   a. ftp://<host>:<port>/<path>/<filename.extension> (e.g. ftp://ftp.seveno.com:1234/ExampleFolder/TestData.csv)

Where:

- <username> is the username of the user account being used to access the FTP Server (TestUser).
- <password> is the password for the user account (TestPassword).
- <host> is the server hosting the FTP service (ftp.seveno.com).
- <port> is the TCP port used for accessing the FTP Server, and is only required to be specified if you are not using the standard port (TCP Port 21). If you are using the standard port, omit the preceding semicolon from the FTP URL string (1234).
- <path> is the folder location being accessed (ExampleFolder).
- <filename.extension> is the name of the file being accessed (TestData.csv).

It is possible to specify a file name with a wildcard (*) attached, for example: ftp://TestUser:TestPassword@ftp.seveno.com/ExampleFolder/*.csv).

Note	Some FTP Servers may not allow the use of a wildcard, please check this with your FTP Service Provider if you require this. When using the 'After Import: Move' option for Automated Import Tasks accessing an FTP Server, a copy of the imported file is created in the new location, and then the original file is deleted. This is different from locally accessed locations (e.g. C:\...), which moves the original file and does not create a copy.

Web Service

Data can be automatically ingested into DataSight from a Web Service.

Web Service URL String

When entering your **File Name** or **Target** location, the Web Service URL string must be in the format of:

http://<websiteaddress> or https://<websiteaddress>.

Where <websiteaddress> is the URL string for the Web Service which will return to DataSight:

- a file (i.e: https://seveno.com/downloads/SampleData.xlsx).
- a custom output file.
- raw output data.

Web API

DataSight supports ingesting data from Web APIs. An API key is required to connect to the API Server in order to request the data. Currently DataSight supports requesting data (ie. a PULL operation) in an Automated Task, which requests data from the Web API, downloads the data file, and then imports the data into your database.

Third-party products, such as Postman®, can connect to for instance a LoRaWAN device using your API key and a Web API URL string to request and save data. This is useful for creating an Import Template if you do not already have a data file from the Web API available.

Web API URL String

When entering your **File Name** or **Target** location, the standard Web API URL string is in the format:

https://api:<YOUR API KEY>@<API END POINT>/<DEVICEID>/<COMMAND><OPTIONAL ARGUMENTS> (e.g. https://api:8a0892e3aedbe2f2ade4bd727d4725e0c639d021@www.nnnco.io/v2/api/sense/devices/532FC45327658E1234/readings?fromTs=last5hours)

Where:

- <YOUR API KEY> is your unique API Key provided to you by the Web API hosting provider.
- <API END POINT> is a combination of the address of the server hosting the API, and the version and type of API being 'called' (www.nnnco.io/v2/api/sense/devices).
- <DEVICEID> is the ID of the LoRaWAN device you are requesting data for (532FC45327658E1234).
- <COMMAND> is the command sent to the API for what data is being requested (readings).
- <OPTIONAL ARGUMENTS> are optional arguments allowing you to further refine the dataset you are requesting (?fromTs=last5hours).

Note	Optional arguments may be beneficial to ensure that data is not missed depending on the frequency an automated Task has been configured to occur when ingesting data. Please contact your Web API hosting provider for a list of optional arguments available for their system. When using a third-party product, such as Postman®, to request data from a Web API, it may be required for you to omit the 'api:<YOUR API KEY>@' section of the Web API URL string as this may be required to be entered separately.

See also:

- LoRaWAN Device Import Routine

- LoRaWAN Device Automated Import Task

12 Glossary of Terms

Find the definitions of commonly used terms in DataSight.

BMP

BMP

Files with the file extension .bmp are known simply as a bitmap. They are bitmap image files or have a device independent bitmap (DIB) file format and are a type of raster graphics image file format used to store bitmap digital images, independently of the display device (such as a graphics adapter), especially on Microsoft Windows and OS/2 operating systems.

Chart Axes

Chart Axes

Axes are the scales that can be placed on a chart to orientate the data. In standard terms these axes have either an X, Y or Z component. In DataSight there are five principal axes; left, top, right, bottom and depth. Different data series can be related to different axes permitting different axis scales for these series on the same chart. Left and right axes refer to a Y-axis, top and bottom axes refer to an X-axis and the depth axis refers to the Z-axis.

Chart Canvas

Chart Canvas

The chart canvas is the visible area enclosed by the chart panel boundary. All chart axes and data are plotted on the chart canvas.

Chart Legend

Chart Legend

The chart legend is the explanatory table or list of the symbols and/or colours for a given series appearing on the chart. The legend has four default positioning options; left, top, right and bottom but you may move the legend to place it anywhere on the chart panel including inside the chart rectangle. The Legend has many supporting properties and events to allow customisation and/or interactive display.

Chart Marks

Chart Marks

Marks refer to the labels associated with each data point of a series on a chart. Marks may be displayed in several ways; as the data value, as a text description of the point or as a percentage related to the value of all points taken as a whole. Marks are normally displayed alongside, above or below the Series point. An alternative and complementary data related labelling scheme is the axis labels which label key scale points on the Axis.

Chart Panel

Chart Panel

The chart panel is the backdrop to the chart.

Chart Rectangle

Chart Rectangle

The chart rectangle is the area contained within the principle five chart axes (left, top, right, bottom and depth). The chart data series and grid are plotted inside the chart rectangle. Some chart series types do not require and do not install by default any axes. Setting the chart frame to visible enables the chart rectangle to be highlighted by the selected colour.

Chart Series

Chart Series

Chart series are the data display method type, e.g. Line Series, Bar Series, Pie, etc. You can mix different series types in a chart according to your requirement.

Chart Walls

Chart Walls

The chart walls are boundaries that can be placed at the side, bottom and back of the chart rectangle to accentuate the charted area. Chart walls are a visual component not containing any data scale related information. DataSight charts have four walls; left, right, bottom and back. Each wall may be coloured and changed dimensionally.

CSV

CSV

Files with a .csv file extension are comma-separated values files. A CSV file is one in which each value in the cells of a table row is delimited by and separated from the next value by a comma. The beginning of a row is indicated by a new line character.

HCS

HCS

Files with a .hcs file extension are treated as comma-separated values (CSV) files with the default settings applied for Date Format, Text Qualifier, Date Delimiter, First Title Row and First Data Row. A CSV file is one in which each value in the cells of a table row is delimited by and separated from the next value by a comma. The beginning of a row is indicated by a new line character.

Data, Equidistant

Equidistant Data

Many modern measurement techniques provide continuous data with equidistant data points. Herein all data points have the same distance according to the time axis.

Data, Non-Equidistant

Non-equidistant Data

In some measurement techniques, data is in the form of a sequence of values that correspond to non-equidistant data points. Herein data points do not have the same distance according to the time axis.

Datasource

Datasource

The datasource for a chart or report refers to DataSight database sourced data.

Datum

Datum

Datum *(singular of 'data')* is a fixed point to which complete information about a variable is attributed.

Delimited

Delimited

Delimited files use a special text character to separate each data value in a record. Typically the delimiter is either a tab or a comma, but any character may be used. The field delimiter denotes the beginning and ending of a data field e.g. ;123450; with a semi-colon (;) as the field delimiter identifies 123450 as the data value in that field.

Dependent Variable

Dependent Variable

A variable whose value is determined by the value of an independent variable. For example in a graph of temperature at different depths for a water body, temperature is the dependent variable. Any depth from the surface to the bottom can be chosen to see what the corresponding temperature at that depth is. By convention a dependent variable is plotted on the y axis but with DataSight you can choose the x axis if you wish.

DSI

DSI

Files with a .DSI file extension are comma-separated values files created by DSApp and are also referred to within this Help Manual as DSApp Import files. A DSI file is one in which each value in the cells of a table row is delimited by and separated from the next value by a comma. The beginning of a row is indicated by a new line character.

EMF

EMF

EMF is a file extension for Enhanced MetaFile, a spool file format used in printing by the Windows operating system. When a print job is sent to the printer, if it is already printing another file, the computer reads the new file and stores it, usually on the hard disk or in memory, for printing at a later time.

Fixed Width

Fixed Width

A fixed-width file contains data in columns, where each column is a certain width, and all values in that column are the same width.

Footer

Footer

Footers are fields that follow the main file content and describe characteristics of the file.

GIF

GIF

Files with a .gif file extension are Bitmap (CompuServe) GIF, or Graphic Interchange Format files. GIF is often an animated raster graphics file and is the second most common image format used on the World Wide Web after JPEG. GIF uses the LZW compression algorithm and is owned by Unisys.

Header

Header

Headers precede the main file content and describe the length of the content or other characteristics of the file.

HTML

HTML (HyperText Markup Language)

Files with a .html file extension have been created for use within a web browsing interface.

Import Template

Import Template

A file that contains specified DataSight parameters for importing data (including the mapping decisions).

Independent Variable

Independent Variable

A variable whose value determines the value of other variables. It is called independent because within a certain valid range any independent value can be chosen to see what the dependent value is. For example in a graph of temperature at different depths for a water body, depth is the independent variable. Any depth from the surface to the bottom can be chosen to see what the corresponding temperature at that depth is.

By convention an independent variable is plotted on the x axis but with DataSight you can choose the the y axis if you wish. This can be be helpful in producing depth profiles for example.

JPG

JPG (or JPEG)

Files with a .jpg file extension are JPEG files, which is a commonly used standard method of compression for graphic images. The name JPEG stands for Joint Photographic Experts Group.

JSON

JSON

Files with a .JSON file extension are JSON files, which is a commonly used to store simple data structures and objects in JavaScript Object Notation (JSON) format.

Currently, only JSON files obtained from NNN Co. Australia's LoRa network for LoRaWAN Devices are supported.

Level 1

Level 1

An organizational level of data naming, which will be determined by the type of data you are working with. In the case of freshwater quality data, for example, an appropriate Level 1 may be Lakes, Rivers, Reservoirs etc.

Level 2

Level 2

The first data grouping level (with Level 1 being the organizational Level). For example, in the case of freshwater quality data an appropriate Level 2 may be the name of a particular water body.

Level 3

Level 3

The defined physical point at which data is collected. This forms the 2nd level in the hierarchy of data grouping underneath Level 2 and contains Level 6 data.

Level 6

Level 6

A Level 6 is an occurrence of data sampling which occurs at a Level 3 site. Each sampling event (Level 6) is differentiated by its date.

MHT

MHT

Files with a .mht file extension have been created for use within a web browsing interface. mht is short for MIME HTML or MHTML (Multipurpose Internet Mail Extension HTML) and is primarily associated with Microsoft Corporation.

Node

Node

Node is a point of redistribution at which information intersect or branch.

Parse

Parse

To define something in an orderly way. In DataSight, parsing the data enables DataSight to identify the different features of the data, eg Title Row, Number of Title Rows etc.

PDF

PDF

Files with a .pdf (Portable Document Format) file extension are created for easy document exchange between users. Documents can be viewed in the free Adobe Reader program.

PNG

PNG

Files with the file extension .png are Portable Network Graphics. It's a lossless bitmap image format that is popular on the World Wide Web and elsewhere. PNG was largely developed to deal with some of the shortcomings of the GIF format and allows storage of images with greater colour depth and other important information.

RTF

RTF

Files with the file extension .rtf (Rich Text Format) are created for easy document interchange as most word processors are able to read and write rtf documents.

Text Qualifier

Text Qualifier

Denotes that a text value is enclosed within, eg the data field "Blue-greens" within a text qualifier of double quotes (") identifies the value Blue-greens as a text value rather than say a numeric value.

TIF

TIF

Files with a .tif file extension are TIFF files (Tag Image File Format). TIFF is the format of choice for archiving important images and is the leading commercial and professional image standard. TIFF is the most universal and most widely supported format across all platforms, Mac, Windows, Unix.

TXT

TXT

Files with a .txt file extension are text files. They may contain text and numeric characters.

WMF

WMF

Windows Metafile (WMF) is an image file format originally designed for Microsoft Windows in the 1990s. Windows Metafiles are intended to be portable between applications and may contain both vector graphics and bitmap components.

XLS

XLS

Files with a .xls file extension have been created using Microsoft Excel. .xls is the default file format for the 2003 version of Excel and older, is a proprietary binary format, and supports macros.

XLSX

XLSX

Files with a .xlsx file extension have been created using Microsoft Excel. .xlsx is for versions since 2007, is only readable by versions 2007 and later, is based on Office Open XML format and is not able to support macros.

XML

XML

Files with a .xml (Extensible Markup Language) file extension can be used for sharing structured data, such as database information, between users - particularly via the Internet.

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