DEEP SEA ELECTRONICS

DSE SCADA
PC Software Manual

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DSE SCADA PC Software Manual

Amendments Since Last Publication

Amd. No.	DSE SCADA Suite software Version No	Comments	Date
1	1.0	Initial release	18/10/2022

Typeface: The typeface used in this document is *Arial*. Care must be taken not to mistake the upper-case letter I with the numeral 1. The numeral 1 has a top serif to avoid this confusion.

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Section **Page**

1 INTRODUCTION

This manual covers the operation of the DSE SCADA software for DSEG86xx series modules. Separate manuals cover the DSE modules supported by the software.

The DSE SCADA software allows the DSEG86xx series of modules to be connected to a PC via Ethernet for remote monitoring and control.

The DSE SCADA software should only be used by competent, qualified personnel, as changes to the operation of the module may have safety implications on the panel / generating set to which it is fitted. Access to the settings in the controller, may be barred by a security code set by the generator provider.
The information contained in this manual should be read in conjunction with the information contained in the appropriate module documentation.

For further information regarding modules (See section 1.2 entitled *Bibliography* in this document).

Clarification of Notation

Clarification of notation used within this publication.

NOTE:	**Highlights an essential element of a procedure to ensure correctness.**
CAUTION!	**Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.**
WARNING!	**Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.**

1.1 GLOSSARY OF TERMS

Term	Description
ADSL	Asymmetric Digital Subscriber Line. A technology for transmitting digital information over standard telephone lines.
AMSC	Advanced Multi-Set Communication
AVR	Automatic Voltage Regulator
IEEE	Institute of Electrical and Electronics Engineers
ISBN	International Standard Bibliographic Description
LAN	Local Area Network
NAPT	Network Address and Port Translation
PLC	Programmable Logic Controller. A programmable digital device used to create logic for a specific purpose.
RTD	An RTD (Resistance Temperature Detector) is a sensor whose resistance changes as its temperature changes. The resistance increases as the temperature of the sensor increases.
SCADA	Supervisory Control And Data Acquisition. A system that operates with coded signals over communication channels to provide control and monitoring of remote equipment
SLD	System Level Diagram
TCP	TCP (Transmission Control Protocol) is a standard that defines how to establish and maintain a network conversation via which application programs can exchange data.
WAN	Wide Area Network

1.2 BIBLIOGRAPHY

This document refers to, and is referred by the following DSE publications which are obtained from the DSE website: www.deepseaelectronics.com or by contacting DSE technical support: support@deepseaelectronics.com.

1.2.1 MANUALS

Product manuals are obtained from the DSE website: www.deepseaelectronics.com or by contacting DSE technical support: support@deepseaelectronics.com.

DSE Part	Description
057-004	Electronic Engines and DSE Wiring Guide
057-045	Guide to Synchronising and Load Sharing Part 1 (Usage of DSE Load Share Controllers in synchronisation / load sharing systems.)
057-046	Guide to Synchronising and Load Sharing Part 2 (Governor & AVR Interfacing)
057-047	Load Share System Design and Commissioning Guide
057-082	DSE2130 Input Expansion Operator Manual
057-083	DSE2157 Output Expansion Operator Manual
057-084	DSE2548 Annunciator Expansion Operator Manual
057-085	DSE9xxx Battery Charger Operator Manual
057-139	DSE2131 Ratio-metric Input Expansion Manual
057-140	DSE2133 RTD/Thermocouple Expansion Manual
057-141	DSE2152 Ratio-metric Output Expansion Manual
057-151	DSE SCADA software PC Software Installation & Operation Manual
057-175	PLC Programming Guide For DSE Controllers
057-176	DSE9460 & DSE9461 Battery Charger Operator Manual
057-312	DSEAssistant PC Software Manual
057-314	Advanced PLC Software Manual
057-323	DSEG8600 Operator Manual
057-325	DSEG8660 Operator Manual
057-327	DSEG8680 Operator Manual
057-350	DSEG0123 AMSC Operator Manual
N/A	DSE GenComm (Modbus protocol for DSE controllers)

1.2.2 THIRD PARTY DOCUMENTS

The following third-party documents are also referred to:

Reference	Description
ISBN 1-55937-879-4	IEEE Std C37.2-1996 IEEE Standard Electrical Power System Device Function Numbers and Contact Designations. Institute of Electrical and Electronics Engineers Inc
ISBN 0-7506-1147-2	Diesel generator handbook. L.L.J. Mahon
ISBN 0-9625949-3-8	On-Site Power Generation. EGSA Education Committee.

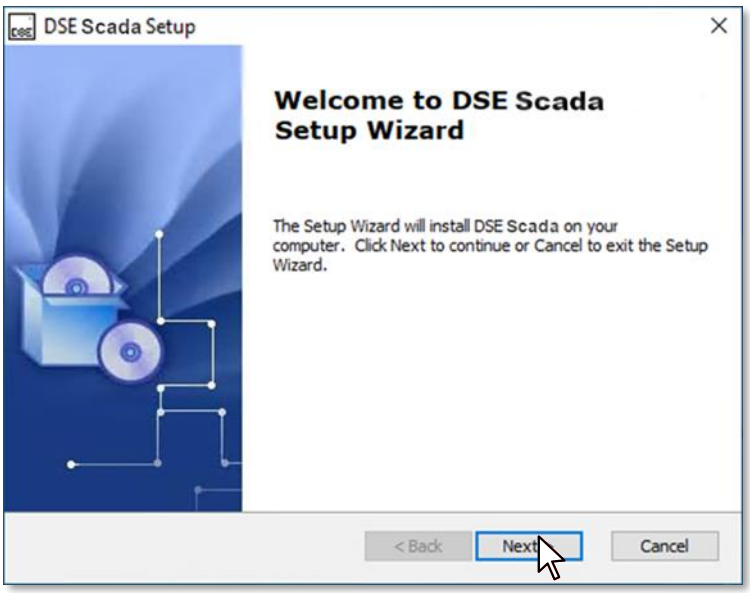
2 INSTALLATION INSTRUCTIONS

2.1 SOFTWARE

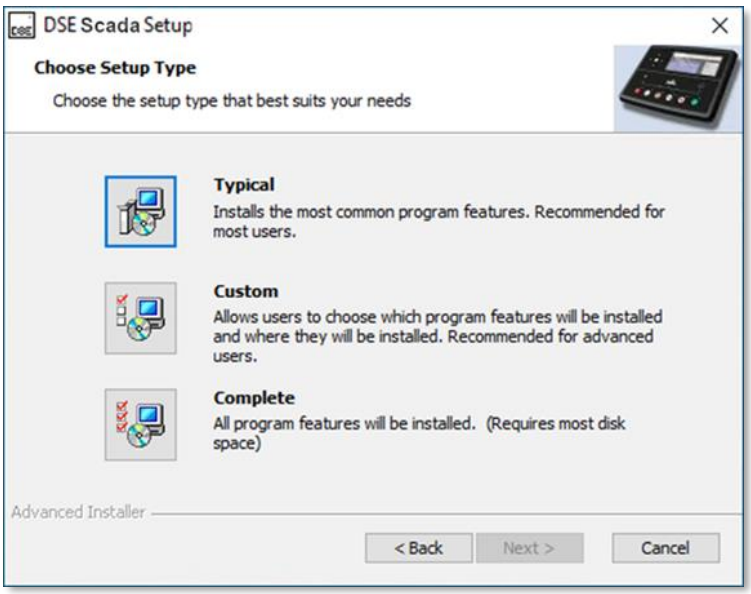
An account for www.deepseaelectronics.com is required to download the DSE SCADA Software. Once the software has been downloaded, run the .exe installer.

The Setup Wizard then guides the user through the installation procedure.

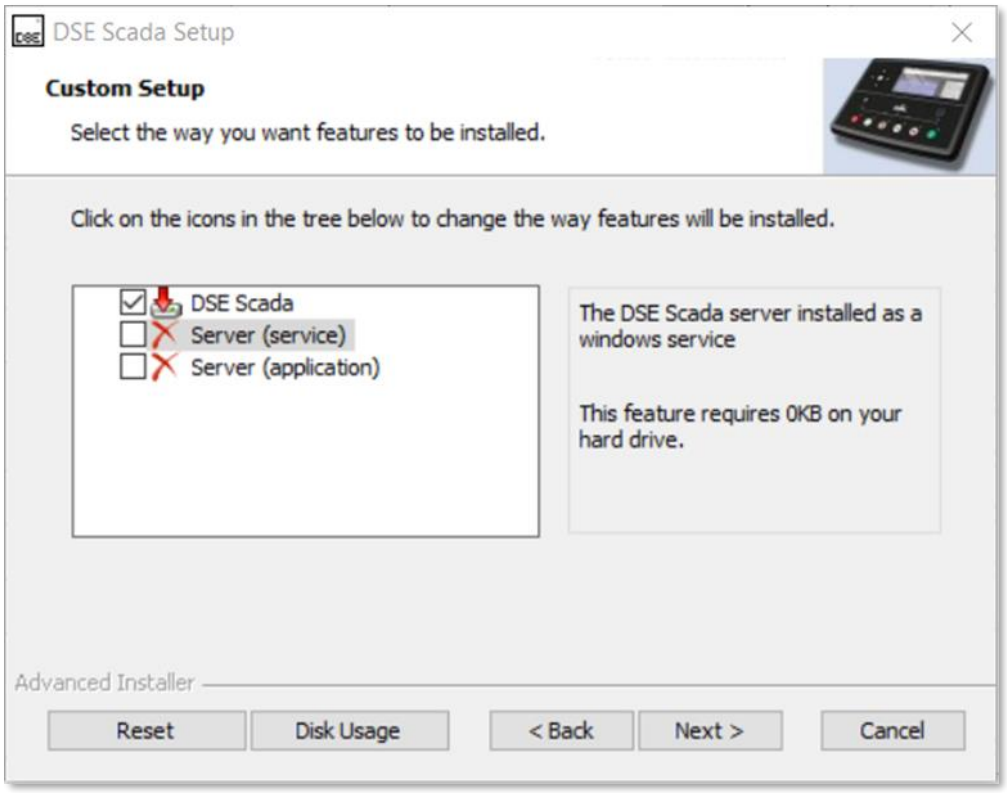
1. Click *Next* to begin.



2. Click the chosen *setup type* from the 3 options.



- **Typical-**Installs the most common features. Recommended by most users
- **Custom-** This allows the user to choose which program feature will be installed and where they will be installed. Recommended for advanced users.



DSE Scada-The core application.

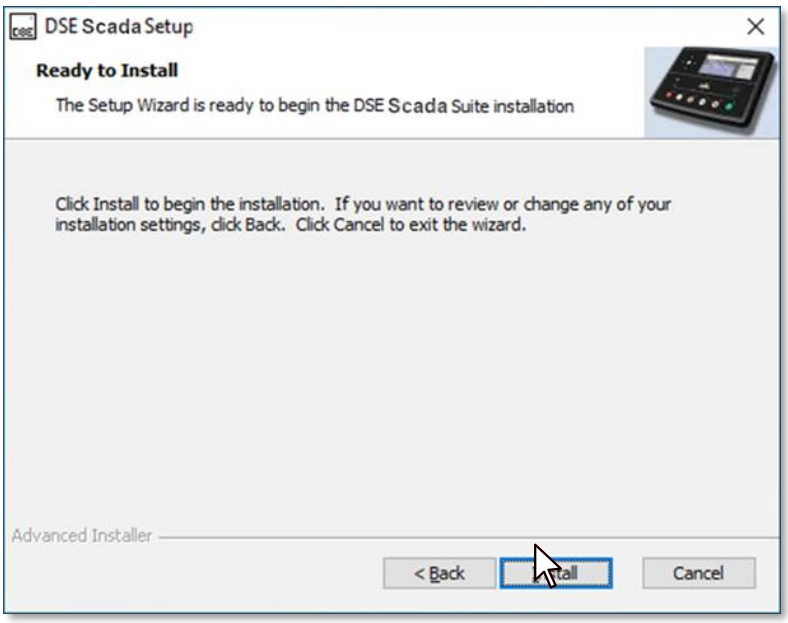
Server (service)- The primary advantage of running the Server as a service is that you can have it start before a user log in and it will continuously run in the background. Multiple applications can communicate with the same service if required.

Service (application)-Runs as a normal application

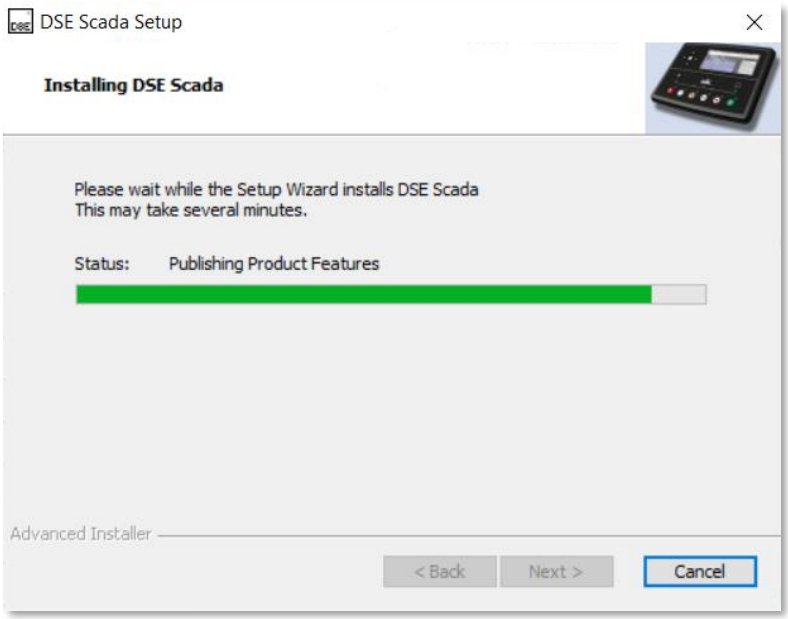
- **Complete**-All program features will be installed.

Once a feature has been selected, Click *Next* to continue.

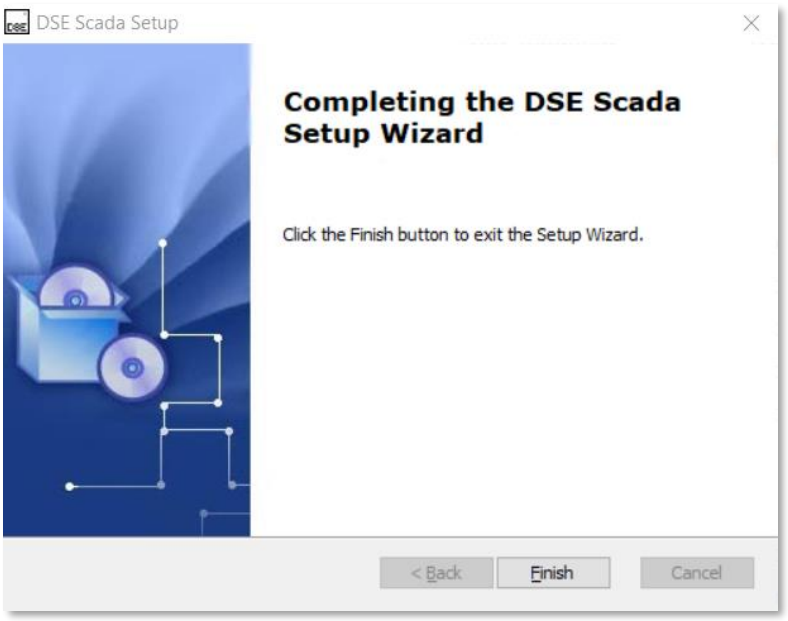
3. Click *Install*.



4. During the installation process the Onboarding Screen (DSE Scada Setup) will appear (See section 3.1).Fill out the server details to complete the installation.



5. Click *Finish* to complete the process

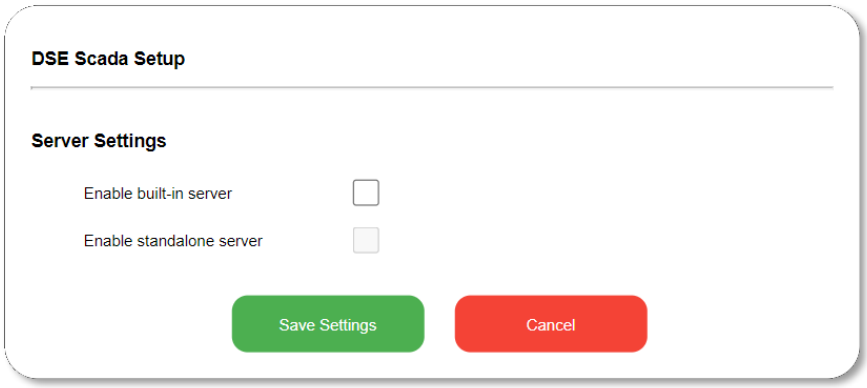


NOTE: During installation a Machine Key is written to the registry to identify the current software installation. This key is important if the user wishes to restore a database to a different server (e.g., in the case of recovery) and to get the license for commissioning, so it is important that it is backed up securely. Without the Machine Key even DSE CANNOT recover the contents of a backup. See the Server/Licencing in section 5.4.1 for further details about viewing the Machine Key.

3 SERVER SETUP

3.1 ONBOARDING SCREEN (DSE SCADA SETUP)

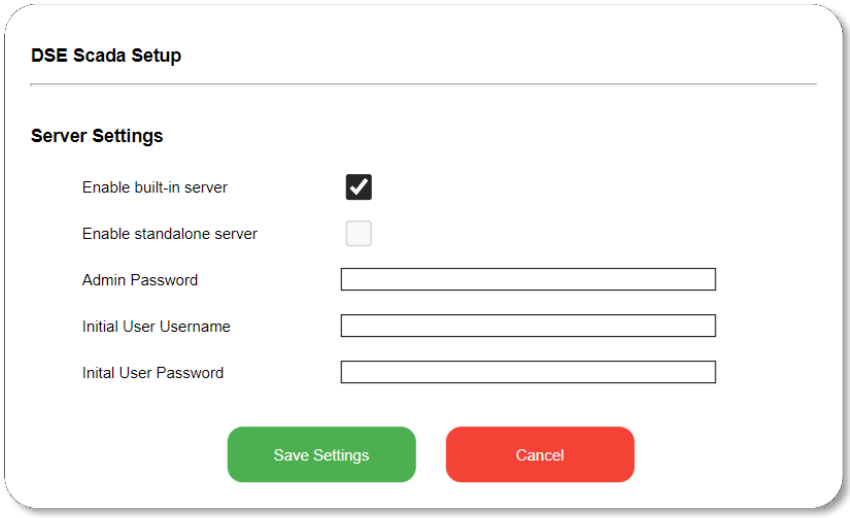
The user is presented with the *Onboarding Screen* the first time the software is run.
A server must be enabled to continue setup.



Parameter	Description
Enable built in server	☐ = Built-in server database disabled. This is a server on the client's computer. ☑ = Enables the built-in server database
Enable standalone server	☐ = Disables the standalone server. This is a server on a separate computer (dedicated server). ☑ = Enables the standalone server if available (greyed out)
Save Settings	Saves the server settings and exits to Login Screen.
Cancel	Cancel exits the software.

⚠NOTE: When viewing the same SLD it is advised that a sever is used on a single machine with a client so that other clients can have access to it.

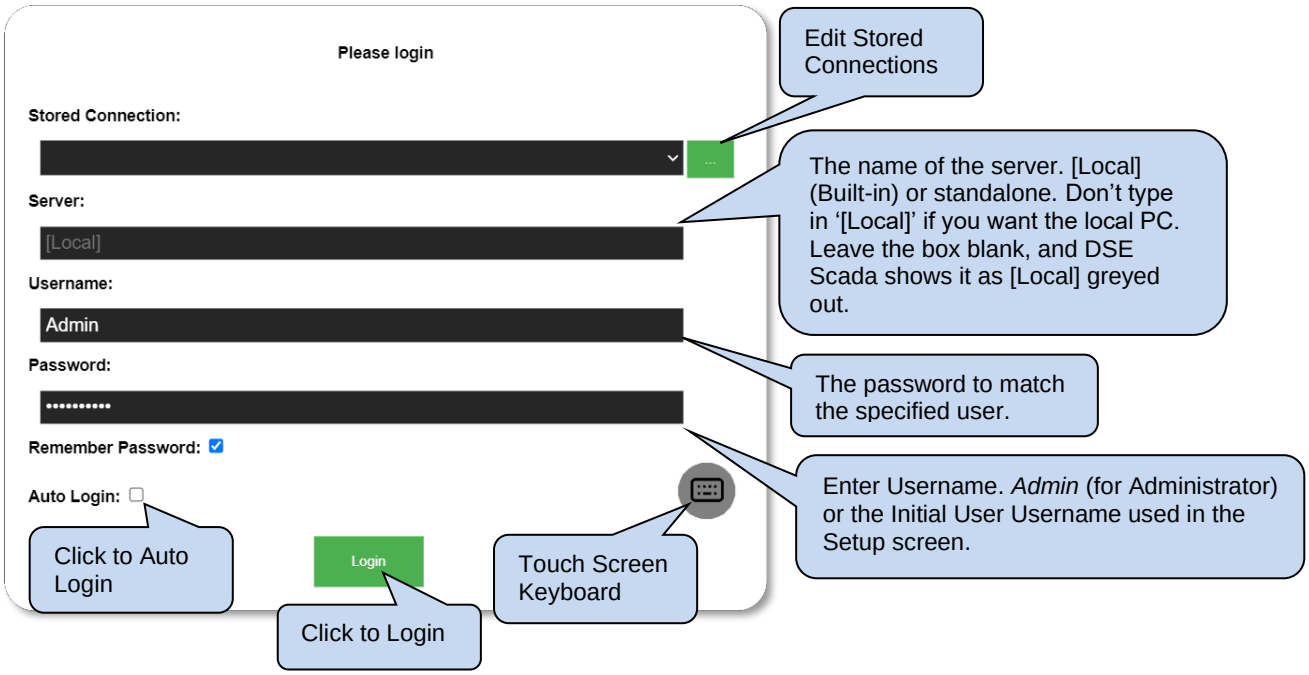
Once a server has been selected the user can enter login details on the following screen.

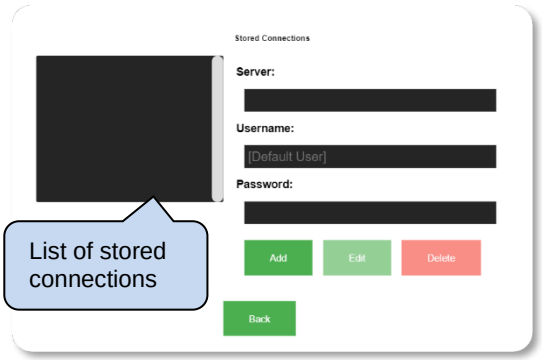


Parameter	Description
Admin Password	Enter a password to be used for the built-in administrator account that has full access to all settings and control.
Initial User Username	Enter the username for a non-administrator user that can be used to view, but not edit or alter, modules and layouts
Initial User Password	Enter the password for a non-administrator user that can be used to view, but not edit or alter, modules and layouts
Save Settings	Saves the server settings and exits to Login Screen.
Cancel	Cancel exits the software.

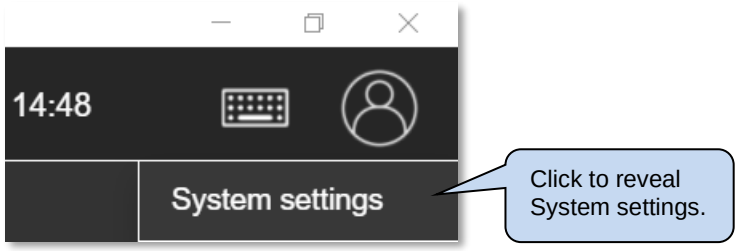
3.2 LOGIN SCREEN

The *Login Screen* is the first screen that is visible once the DSE Scada Setup has been completed. It comprises of several fields that the user must populate to login to the software.



Parameter	Description
Stored Connection	Select the *Edit Stored Connections* button to pick from list or the green menu button on the top right. The client can be used to connect to several different DSE Scada servers if required using this list of connections.  ***Server:*** The IP address of the server. [Local] is used if the server is on the same machine as the client. ***Username:*** The user to be logged in. Either the build-in 'Admin' username, or the non-administrator username specified during initial setup, or any other user added later in the configuration options. ***Password:*** The password to match the specified user. ***Add:*** Click on *Add* to add the new connection ***Edit:*** Edit an existing connection ***Delete:*** Delete an existing connection ***Back:*** Select back to return to *Login Screen*
Server	The IP address of the server
Username	The Username entered at registration
Password	The Standard User Admin Password
Remember Password	Select to remember the password
Auto Login	☐ = Auto Login is disabled. ☑ = Auto Login is enabled

The System Settings screen can be accessed at any time to make any changes to the system by clicking on the User settings icon in the top right corner of the screen. See section 5.4.1 entitled Top toolbar for further information.



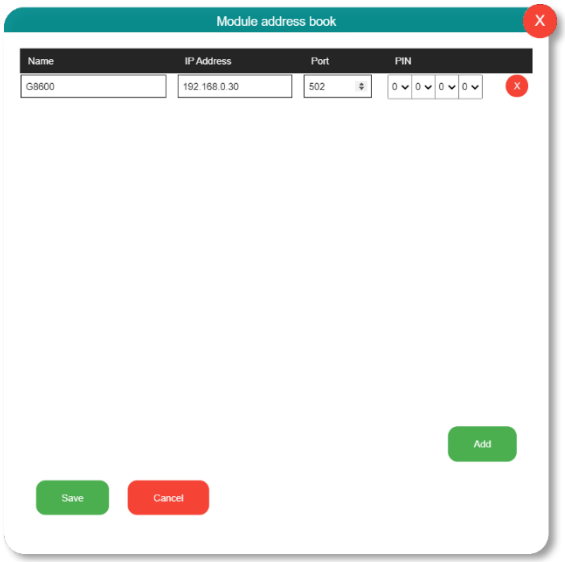
NOTE: If *Initial User* username is selected for Login then the user will only have access to the Main View Mode.

4 DSE SCADA OVERVIEW

There are a few initial steps that are required before creating a System Level Diagram. The Scada software requires a few details about the modules (names, IP addresses etc) so that it can communicate and retrieve data.

4.1 ADDING A MODULES TO THE ADDRESS BOOK

All modules must be registered in the *Address Book* to communicate with the Scada software, so that they can be selected from the *Widget Editor* during creation of a System Level Diagram (SLD).
The *Address Book* stores all IP addresses of each module connected to SCADA as well as the Port number and PIN number of each module.

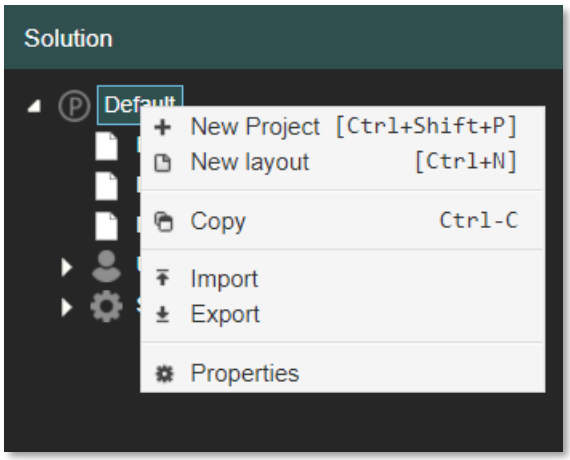


Name: Name" is a name of choice to identify the module. It does not need to match anything in the module itself.
IP Address: IP address of module found on Ethernet page
Port: Modbus port number
PIN: Module Pin (if enabled)
Add: Add another module to the address book
Save: Save all addresses
Cancel

A new project can be created once all modules have been added to the *Address Book*.

4.2 CREATING A NEW PROJECT

To create a new project, move the mouse over to the Solution Explorer. A *Default* project is already created automatically as a starting point.
Right-click to reveal the context menu, click *New Project* and enter a project name.



Once a project has been created the next step is to create the SLD.

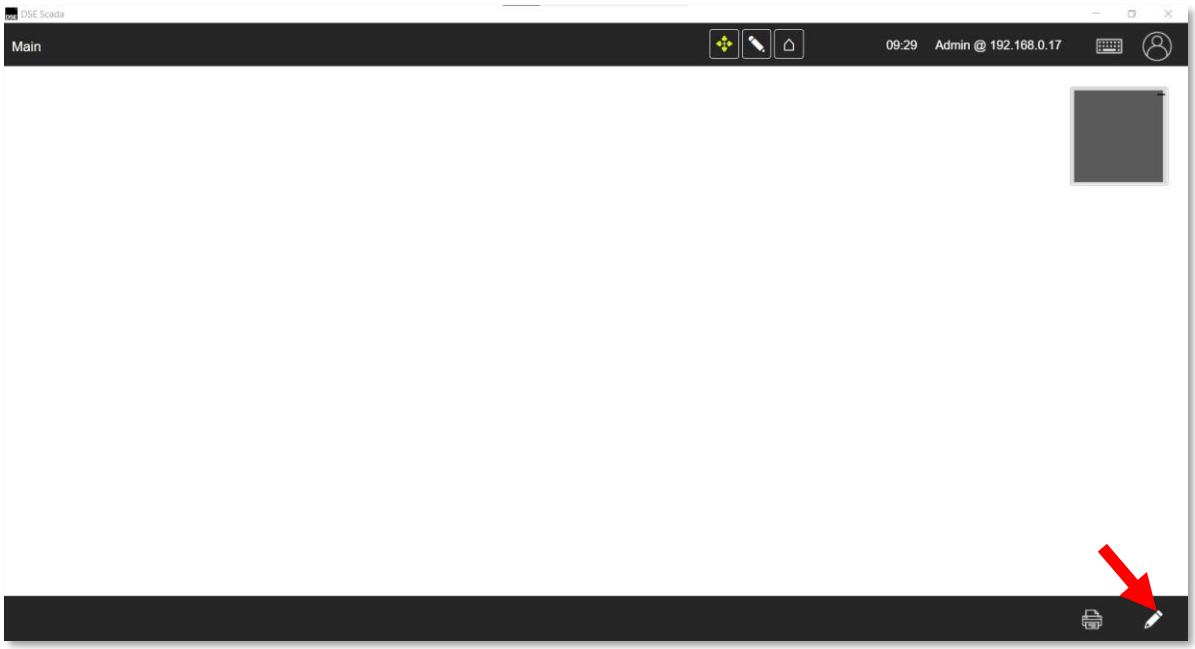
4.3 CREATING A SIMPLE SYSTEM LEVEL DIAGRAM (SLD)

An SLD is an overview of a system which is easily reproduced using the Scada software. DSE Scada has a collection of tools which allows the user to easily create an SLD diagram and communicate with various modules.

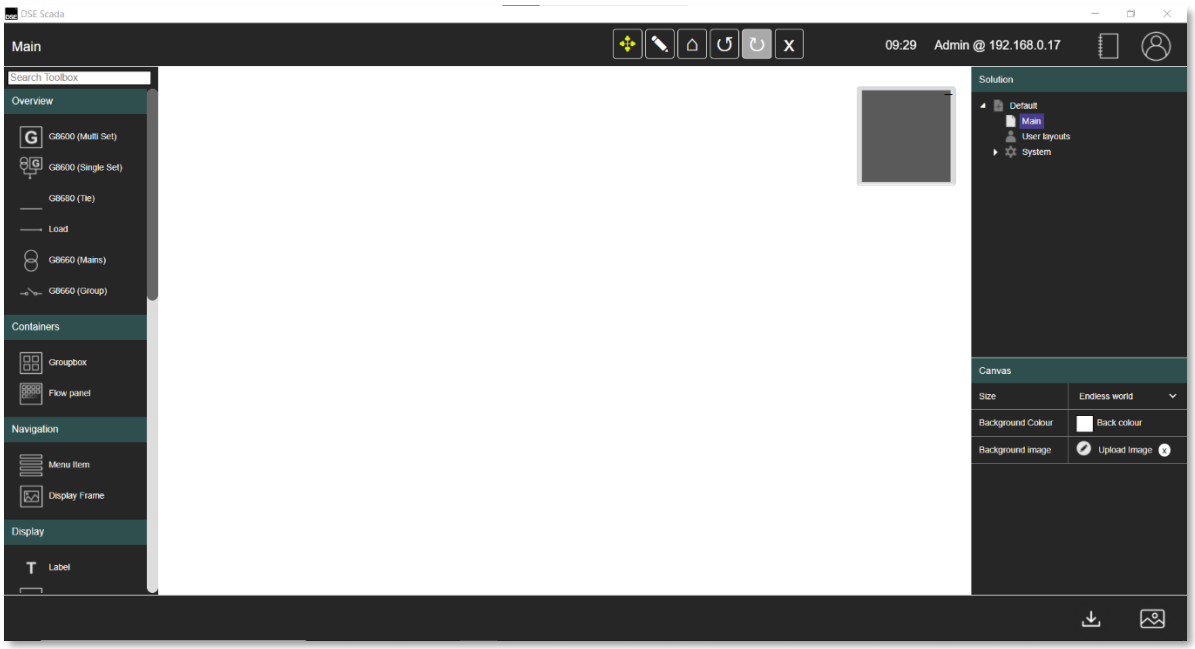
4.3.1 PLACING A WIDGET ON THE CANVAS

1. As soon as the software is run the user is presented with the *Main View Mode* screen.

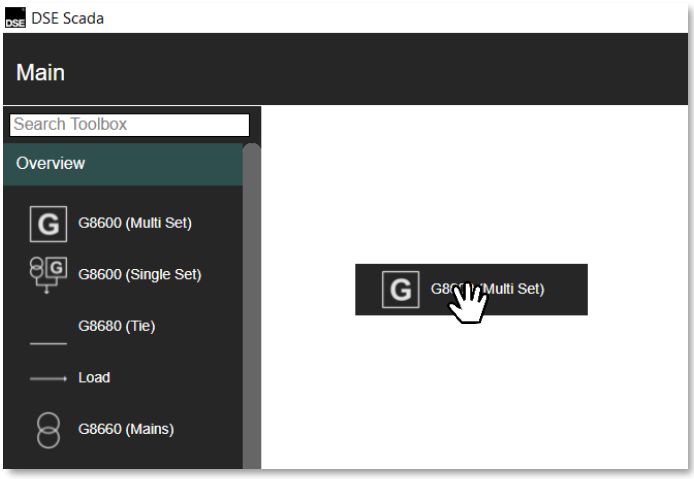
   Access the *Main Editor Mode* by left clicking on the pencil icon on the bottom of the screen.



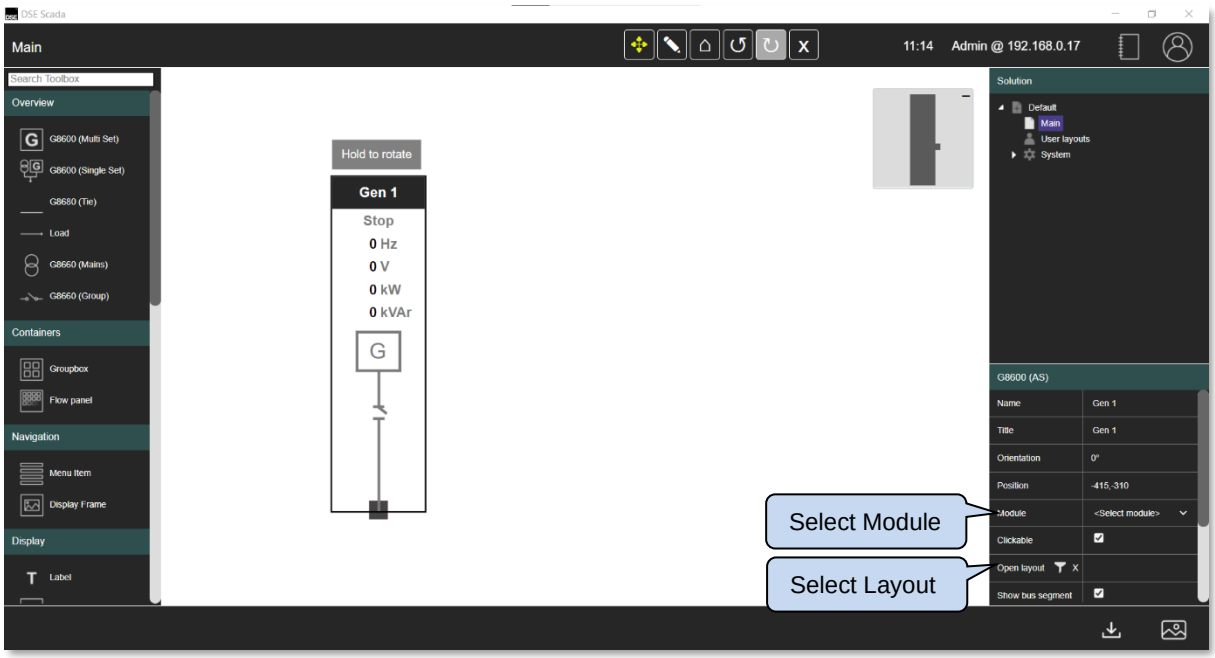
2. The *Main Editor* mode screen appears once the pencil icon has been clicked.



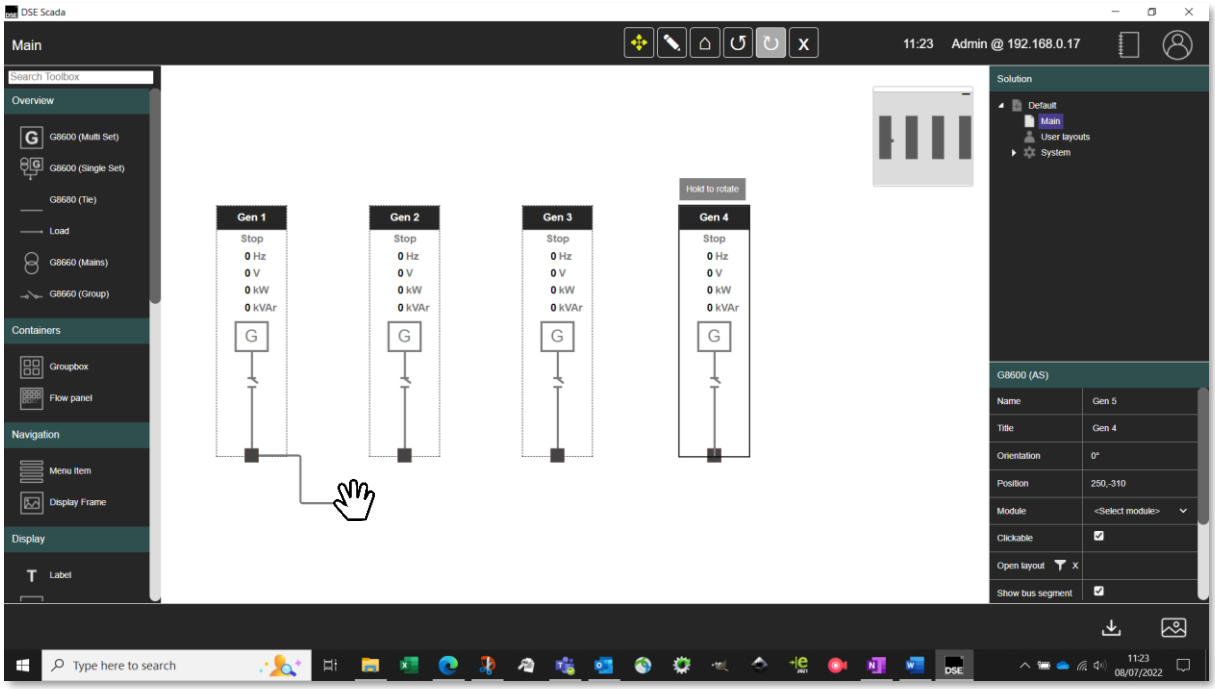
3. Use the left mouse button to click and drag an *Overview* widget onto the screen.



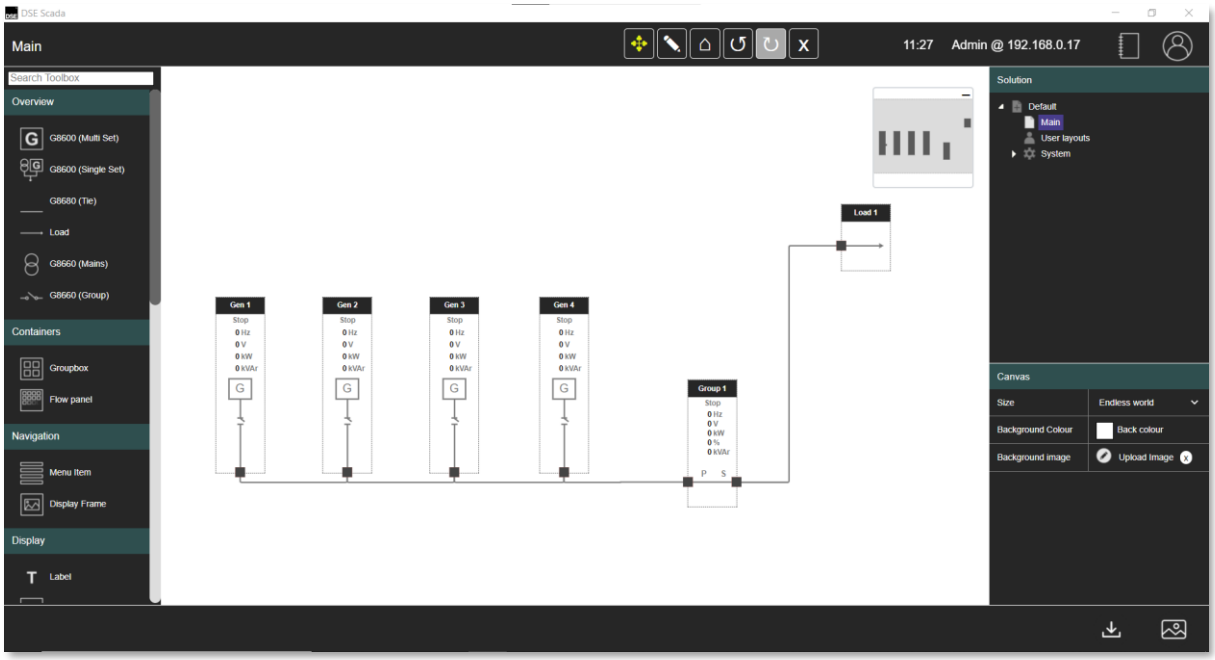
4. Once a widget has been placed on the canvas a *Module* (from the *Address Book*) can be selected from the *Widget Editor* to be associated with the widget. A layout can then be linked to the widget using the *Open Layout* (see section 6.1.5) property. This property allows the opening of system layouts and user-defined layouts to be displayed.



5. More *Overview* widgets can be added to complete the System Level Diagram and also their corresponding modules they are linked to along with layouts.



6. Once the diagram is complete, save it using the save  button.

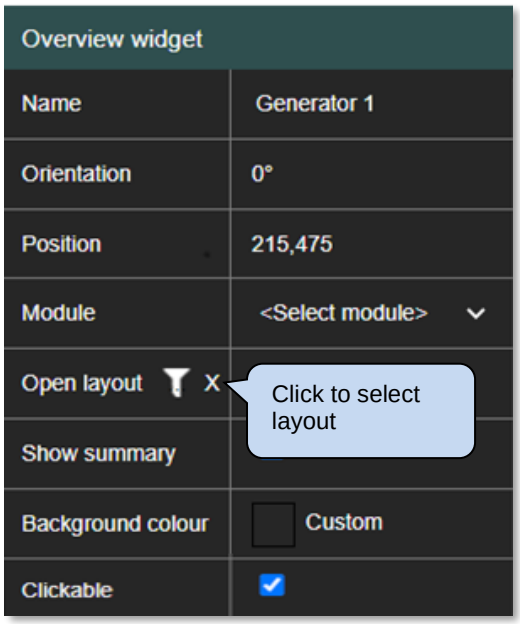


4.4 SELECT OR DESIGN A LAYOUT

The overview widgets on the main page, when double-clicked, will open a sub-layout to display deep-dive information about that module. By default, they use the 'Master' layout. This can be overridden, and another specific layout can be chosen on a widget-by-widget basis, by selecting the overview widget and setting the 'open layout' property. See section 6.1.5 for further details on Creating a User Sub Layout.

4.4.1.1 SELECT A LAYOUT

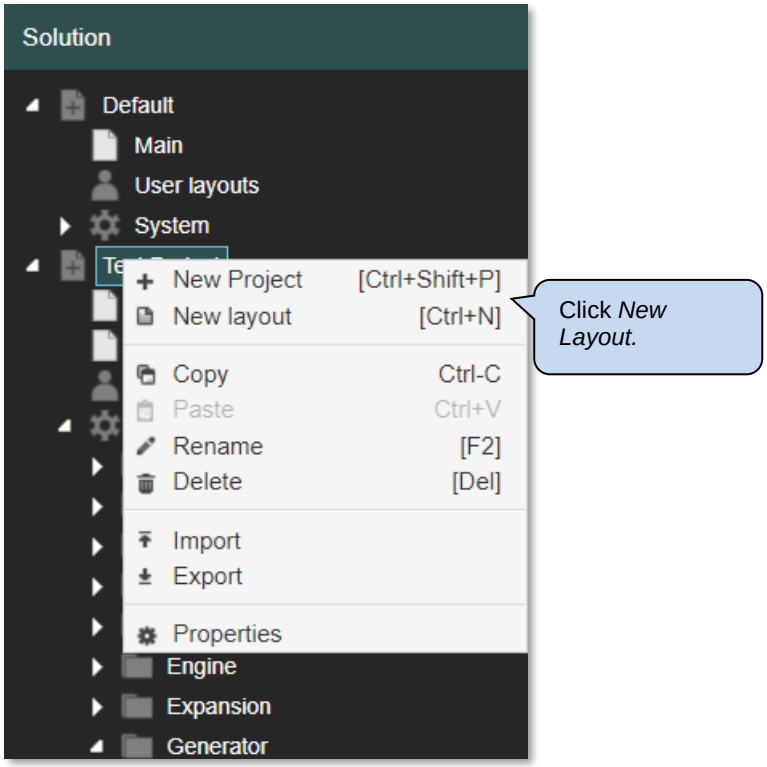
1. Click *Open Layout.*



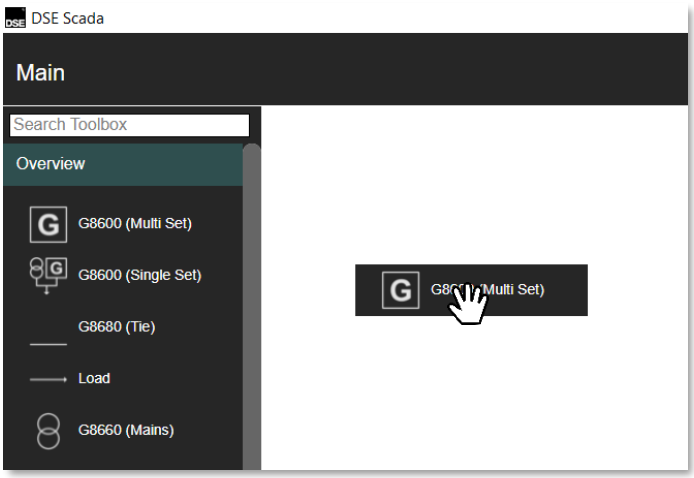
2. Select the layout from the list

4.4.1.2 DESIGN A LAYOUT

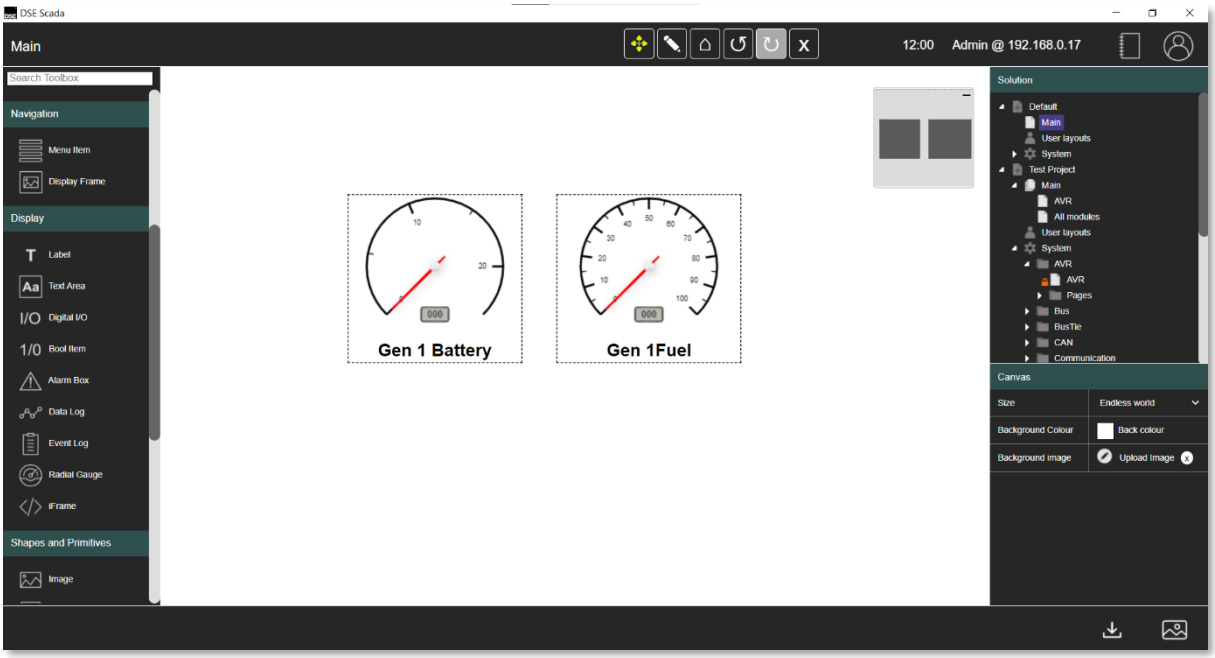
1. Right-clicking on the project name will bring up a context menu where a new layout can be created.



2. Use the left mouse button to click and drag widgets onto the screen.

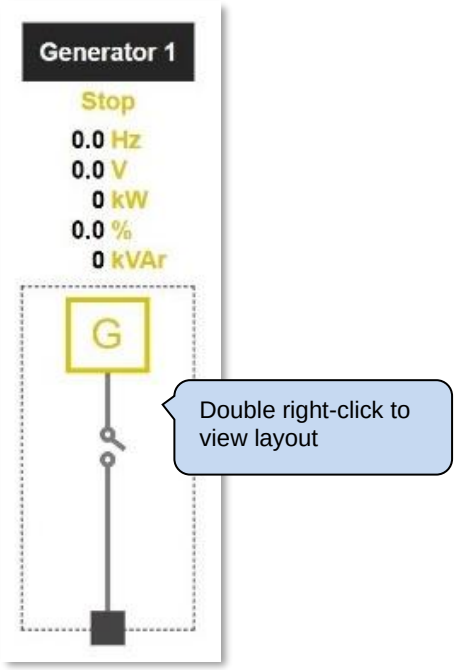


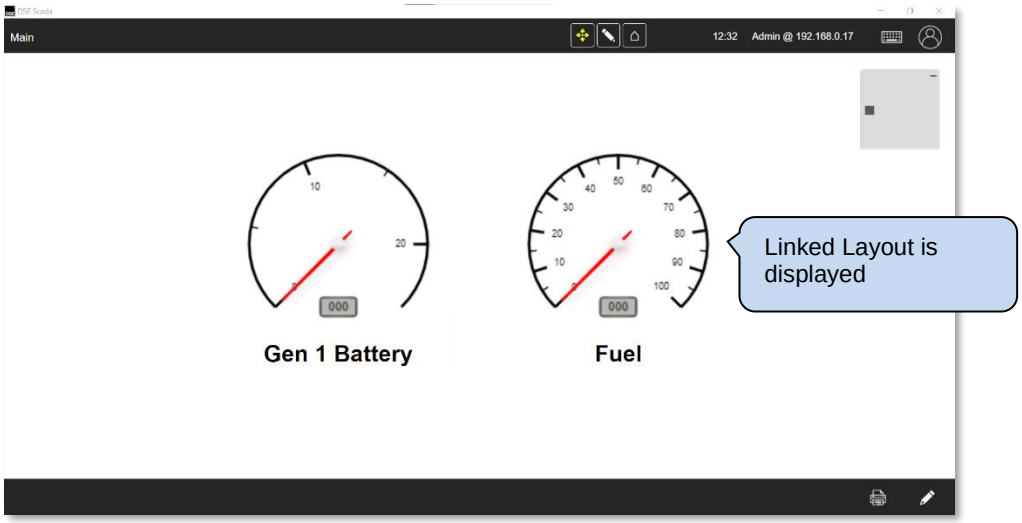
3. Once the layout is created then save the diagram 



4.4.1.3 VIEW LAYOUT

Once a layout has been linked to an *Overview widget* it can be displayed by double clicking on the Overview widget in the *Main View* mode.



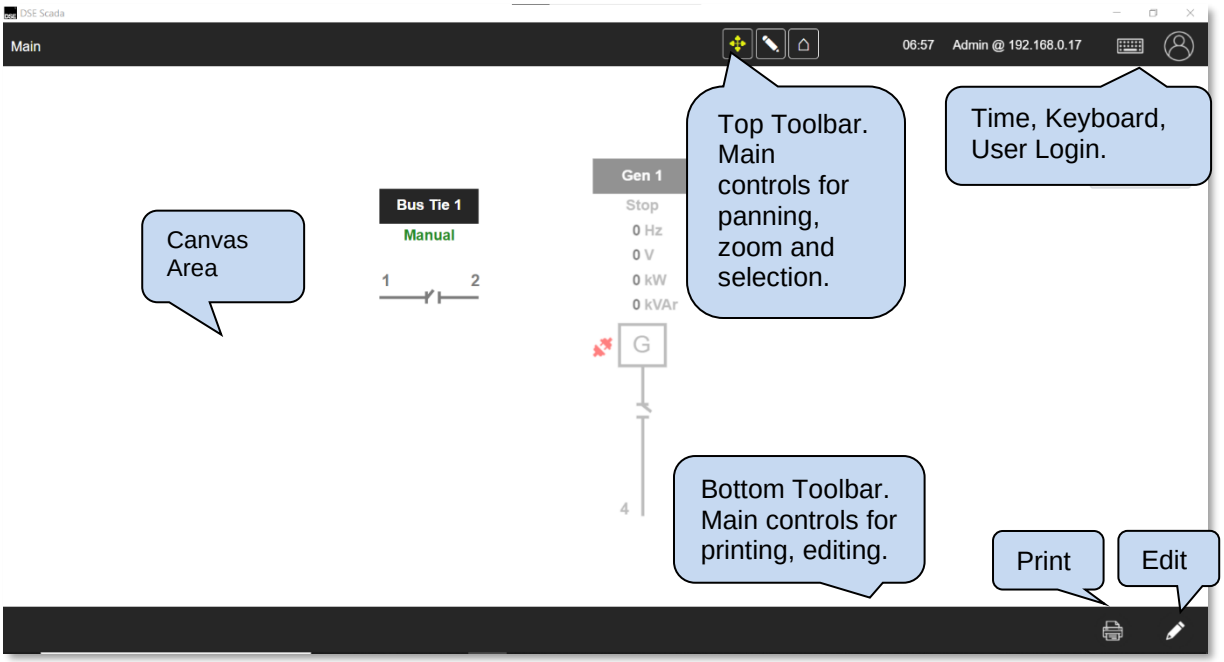


5 USER INTERFACE

The User Interface consists of a Main View Mode and a Main Editor Mode explained further along in this section.
Typically, a top level ‘SLD’ diagram is constructed with all the users’ modules. The user then can click on an active one to retrieve pages of information about that specific module. Everything is editable (Main Editor Screen) so the user can have whatever they want on any page, and pages can be linked to each other and embedded within each other.
The canvas area can be a fixed size (area a set size) or can be configured as an endless world to allow larger SLDs to be created.

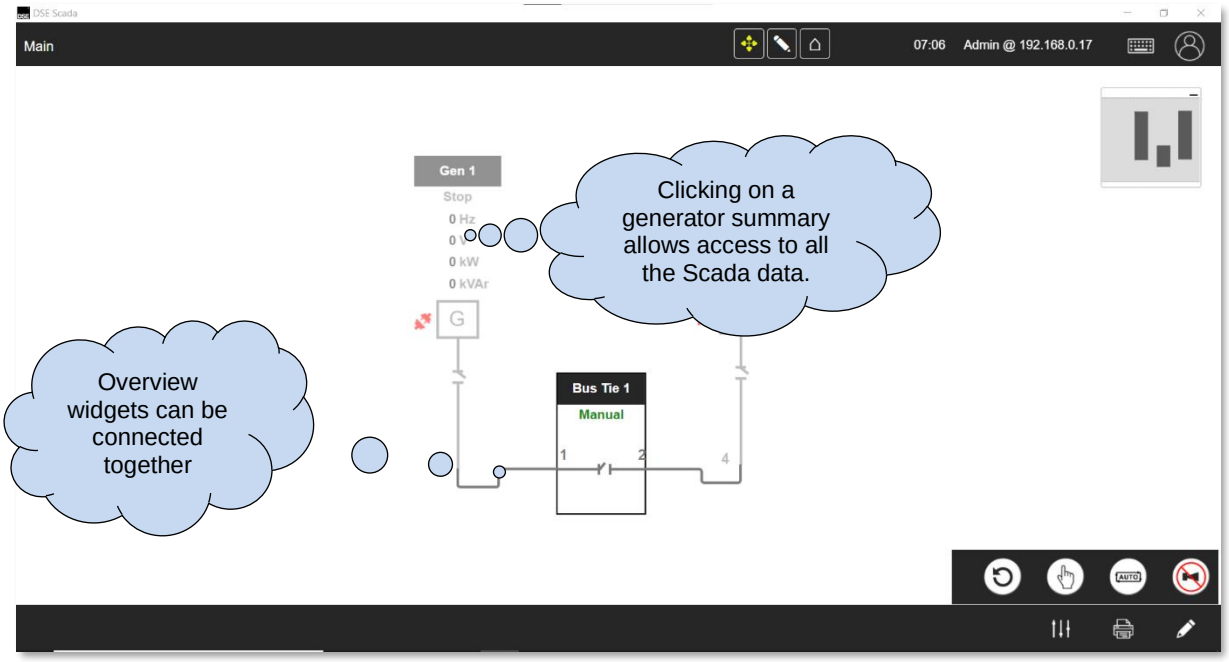
5.1 MAIN VIEW MODE

The Main View Mode is the first screen that the user confronts and is main interaction area between the module and the SCADA PC software. Depending on how each project and layouts are configured will depend on what is displayed on the main screen. There are many variations possible, and it is up to the user to display their requirements. Most users will only ever use the Main View Mode to see the status and interact with any modules.



Example

An example layout is shown with many variations possible to suit project requirements.

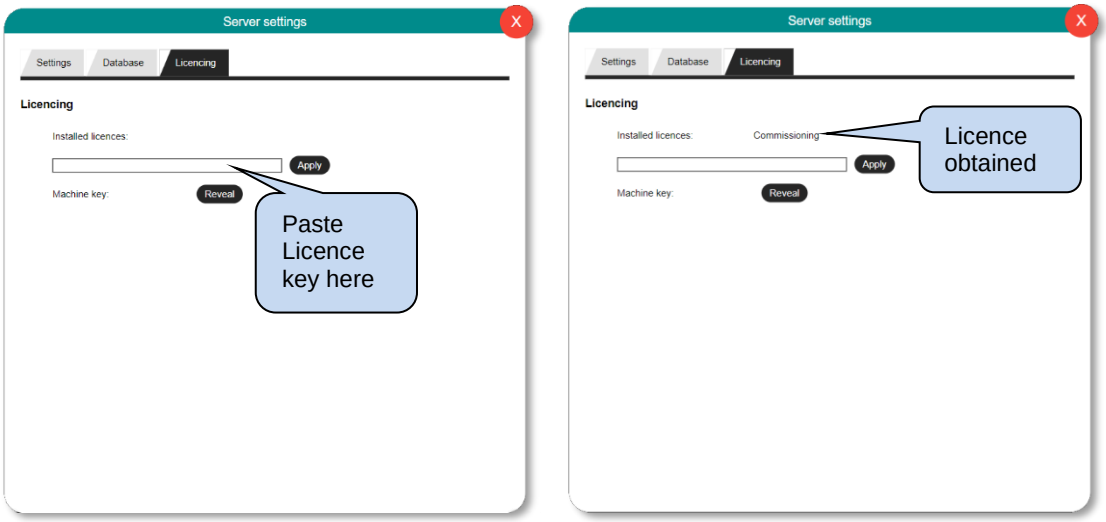


NOTE: The Touchscreen is only available in the Main View Mode. The Main View Mode is available to both Administrators and Initial Users.

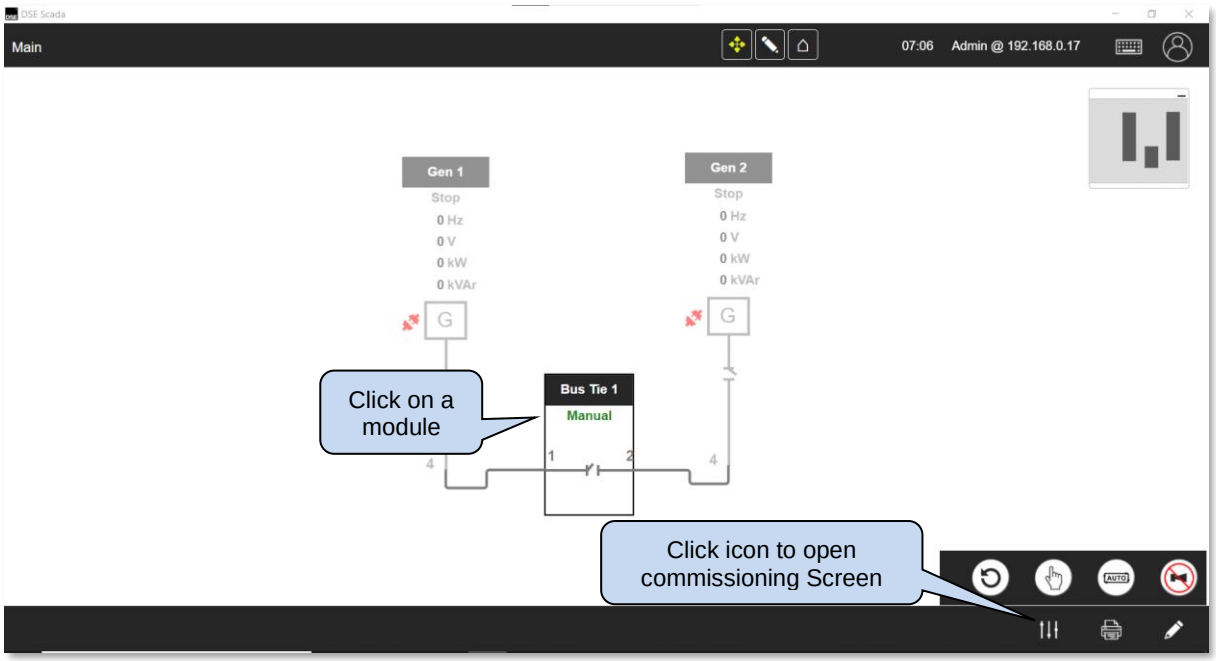
5.2.1 COMMISSIONING SCREEN (OPTIONAL)

The commissioning screen is available by obtaining a licence.
A licence key is required to enable add-on features. See Section 8.2 for further information.

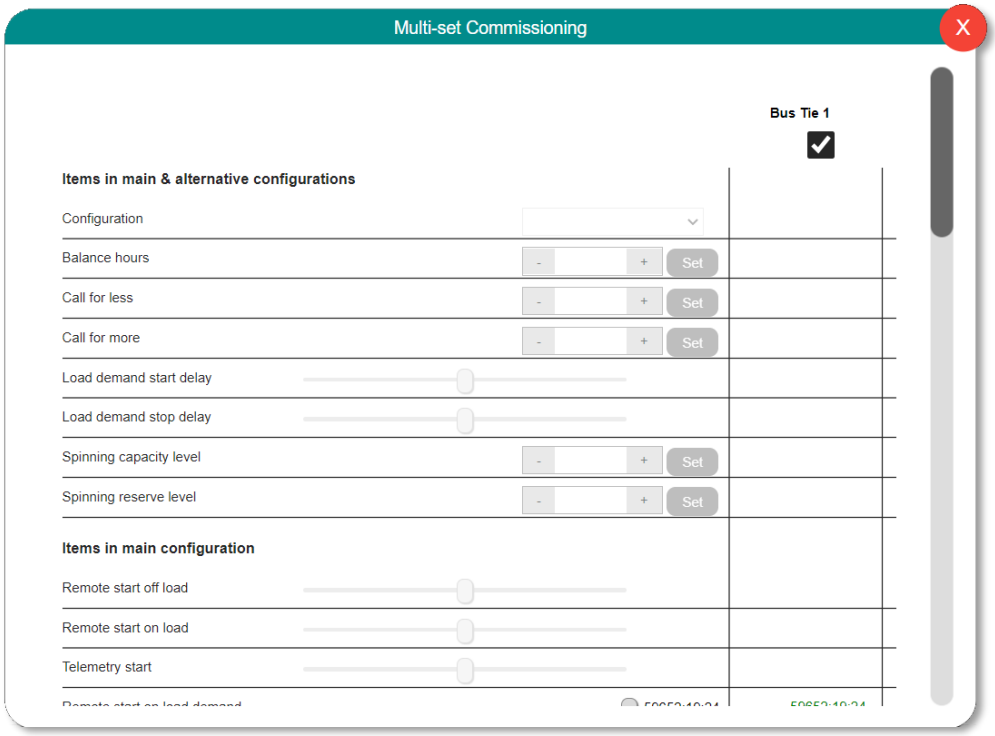
Paste the key into the licence box and select *Apply*. Once the key is accepted the screen will show the name of the licence held.



In the main overview, click to select one or more modules. When a module is selected, click on the icon  at the bottom of the screen.



A new window will appear which allows the user to adjust items in the main and alternative configuration, main configuration, and items in Scada.

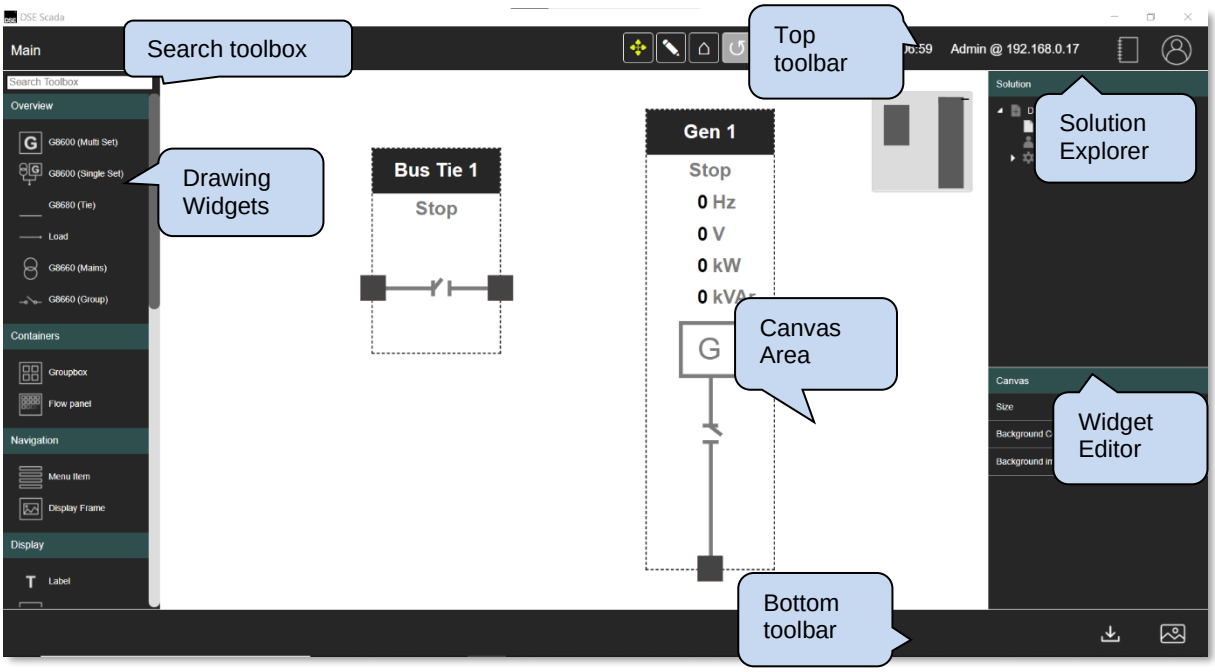


5.3 MAIN EDITOR MODE

The *Main Editor* offers several ways for creating drawings, which can, of course, be combined: using widgets, geometric shape tools and predefined shapes much like a pencil on paper.
To design an SLD top-level diagram the modules are added (using the module address book), then the associated module widgets are dragged on the canvas. Each module is then connected with bus lines to demonstrate the system's topology. Advanced users can create multiple pages each showing different data from one or more modules. Views can be created for different logged in users and different pages for different modules.
There are 7 main areas in the editor as follows:

- Top Toolbar
- Bottom Toolbar
- Canvas Area (centre)
- Solution Explorer (top-right)
- Search Toolbox (top left)
- Widget Editor/Canvas (lower right)
- Drawing Widgets (left sidebar)

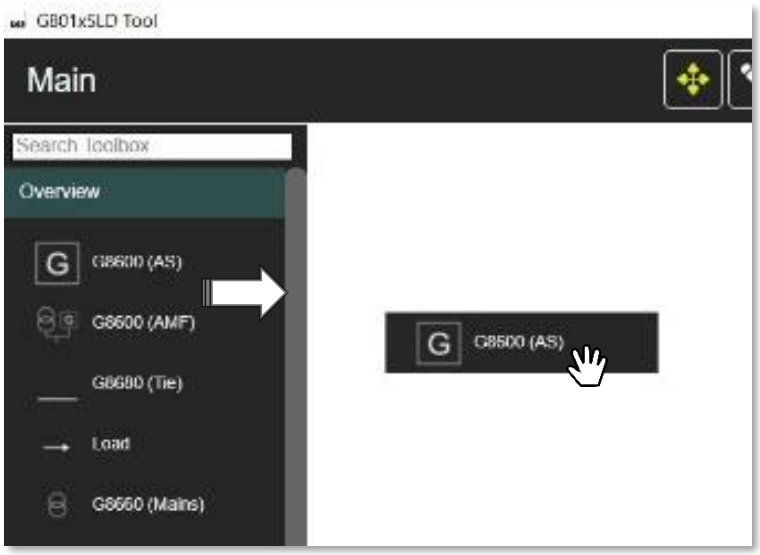
To access the *Main Editor,* click the left mouse button on the  icon on the bottom toolbar.



NOTE: The Main Editor does not current support the Touchscreen and will require a keyboard and mouse for operation. The Main Editor is available for Administrator access only.

Example

To add devices to the system, ‘drag’ the widget from the side bar to the canvas.



5.3.1 MAIN EDITOR SHORTCUT KEYS

Shortcut keys area available in the Main Editor window to offer an alternative to what is typically done with a mouse.

CTRL-S = Save
CTRL-Z = Undo
CTRL-Y = Redo
CTRL-X = Cut
CTRL-C = Copy
CTRL-V = Paste
CTRL-A = Select all widgets
LEFT ARROW = Move widget left by 5px
RIGHT ARROW = Move widget right by 5px
UP ARROW = Move widget up by 5px
DOWN ARROW = Move widget down by 5px
TAB = Tab to next widget (sorted by X-Axis then Y-Axis)
DEL = Delete widget

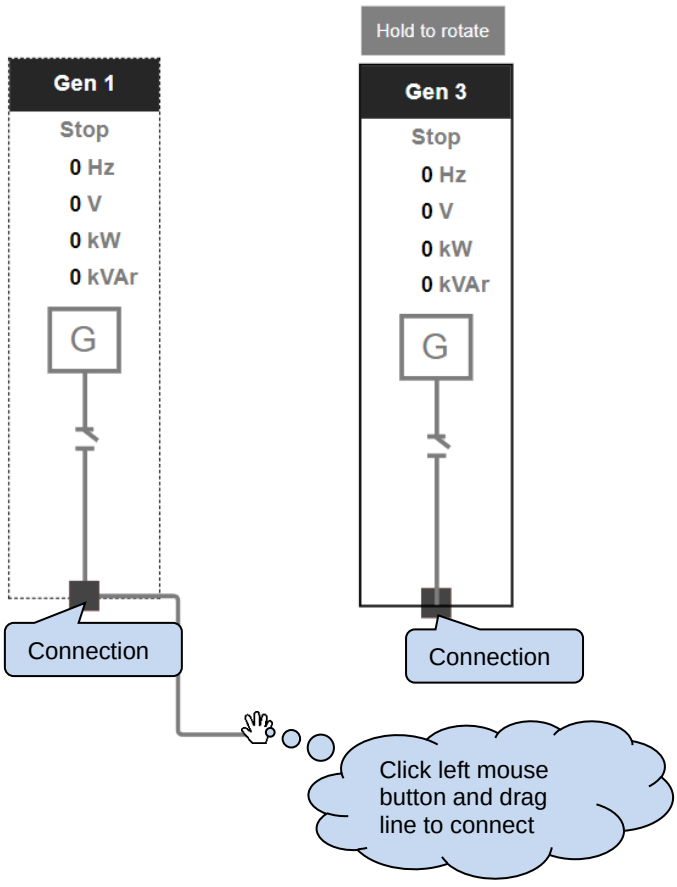
5.3.2 CANVAS

The Canvas is the main drawing area used by the SCADA software. All layouts are designed on the canvas and saved in their respective project folders.

5.3.2.1 USING THE CANVAS

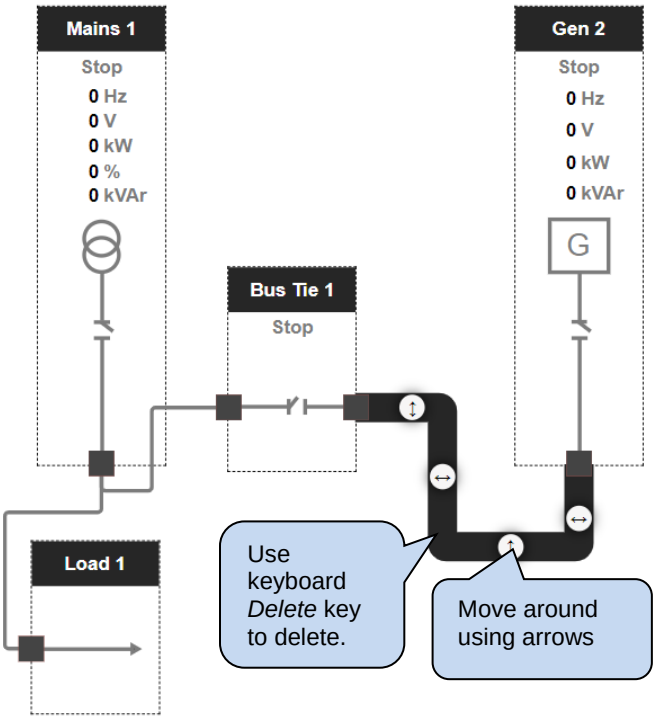
Connecting Widgets

Widgets are connected by using the left mouse button to drag a line from one connection to another connection point. Only *Overview* widgets can be connected together



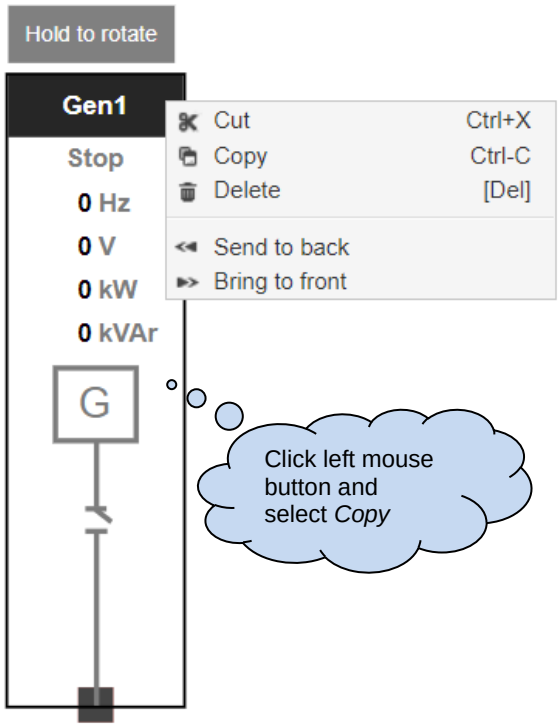
Editing a Line

Connections can be edited using the line editor and left mouse button.it is possible to adjust any route to suit the widgets on the canvass.



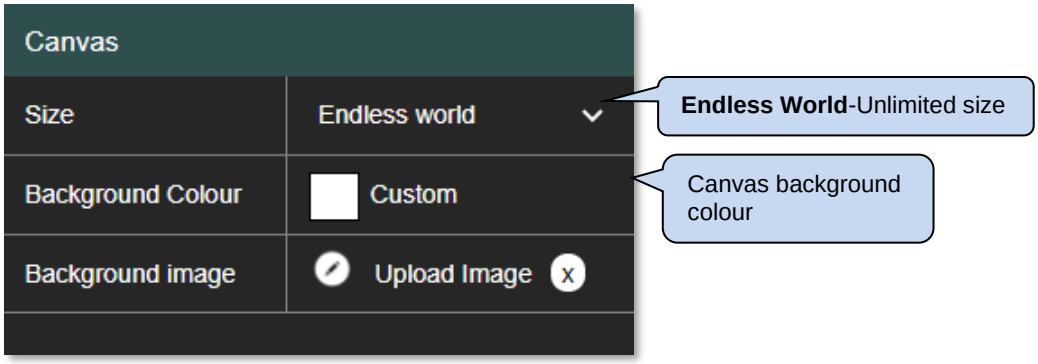
Copying Widgets

Widgets can be copied using the CTRL-C shortcut or right mouse click context menu and placed using the left mouse button.



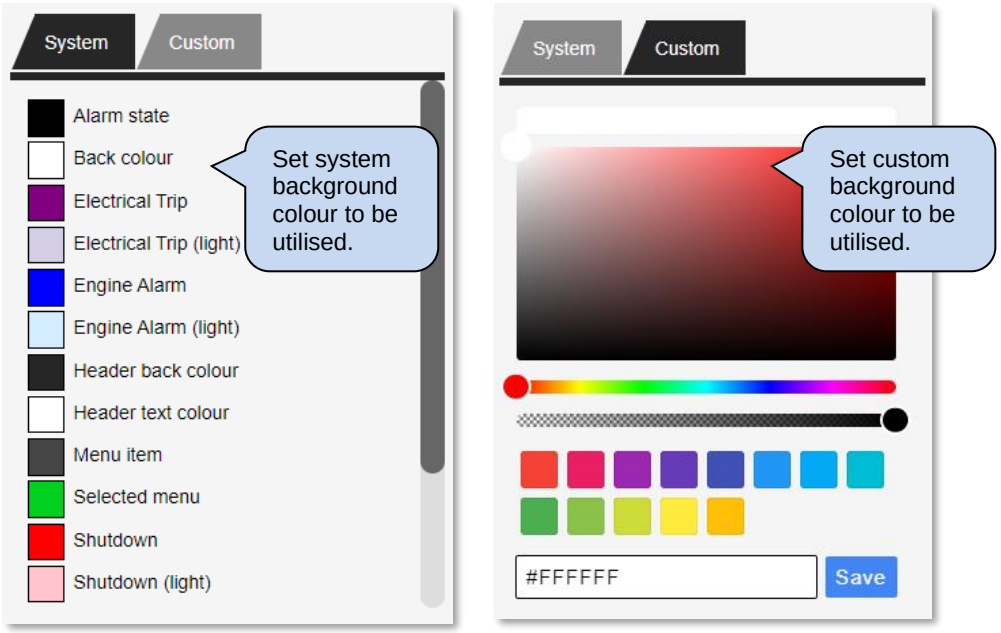
5.3.2.2 ENDLESS WORLD

Endless World allows an unlimited canvas surface size. In this scenario the layout size is also unlimited to the system design.



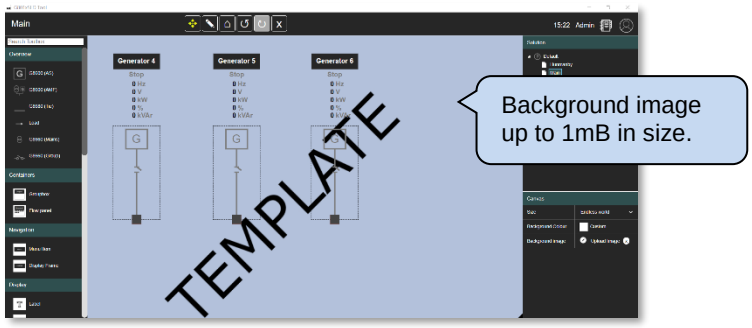
Background Colour

The canvas background colour can be adjusted to a System or Custom user defined colour.



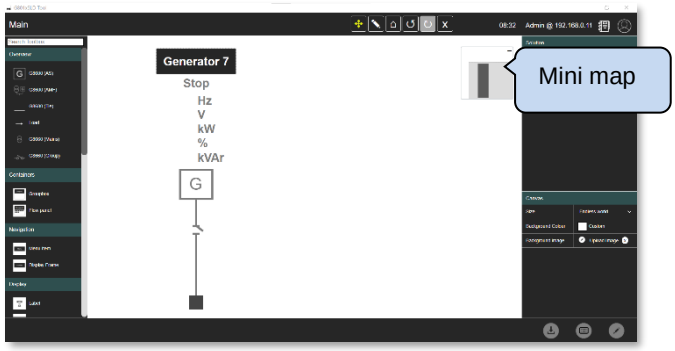
Background Image

An image may be used instead of a background up to 1mB in size.



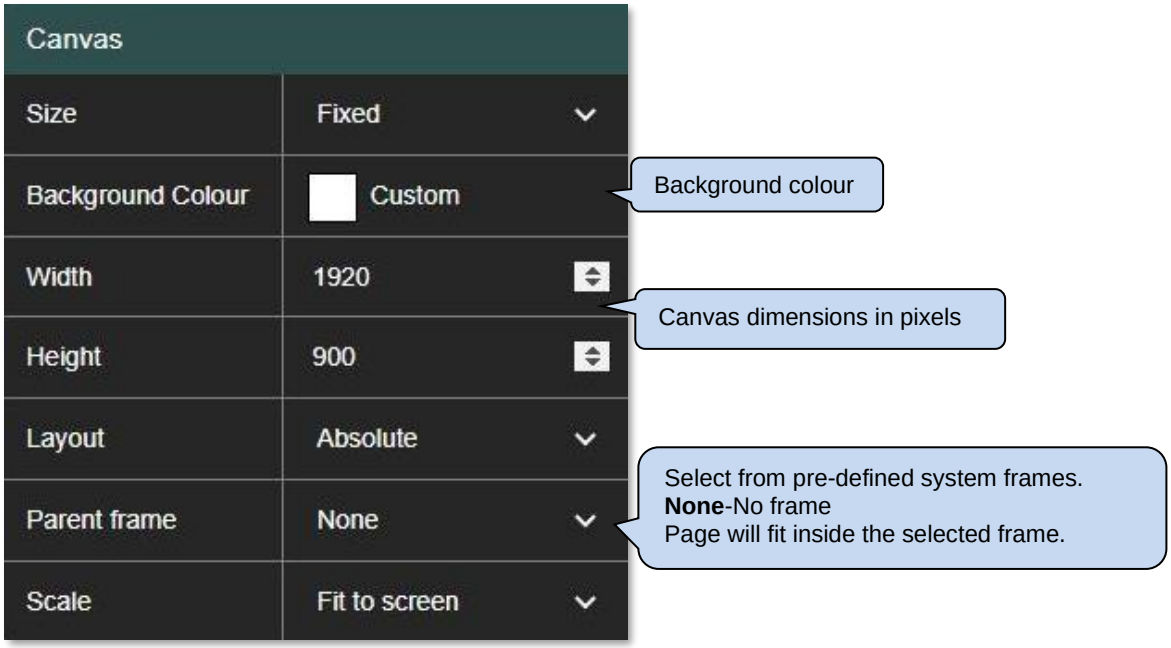
Mini Map

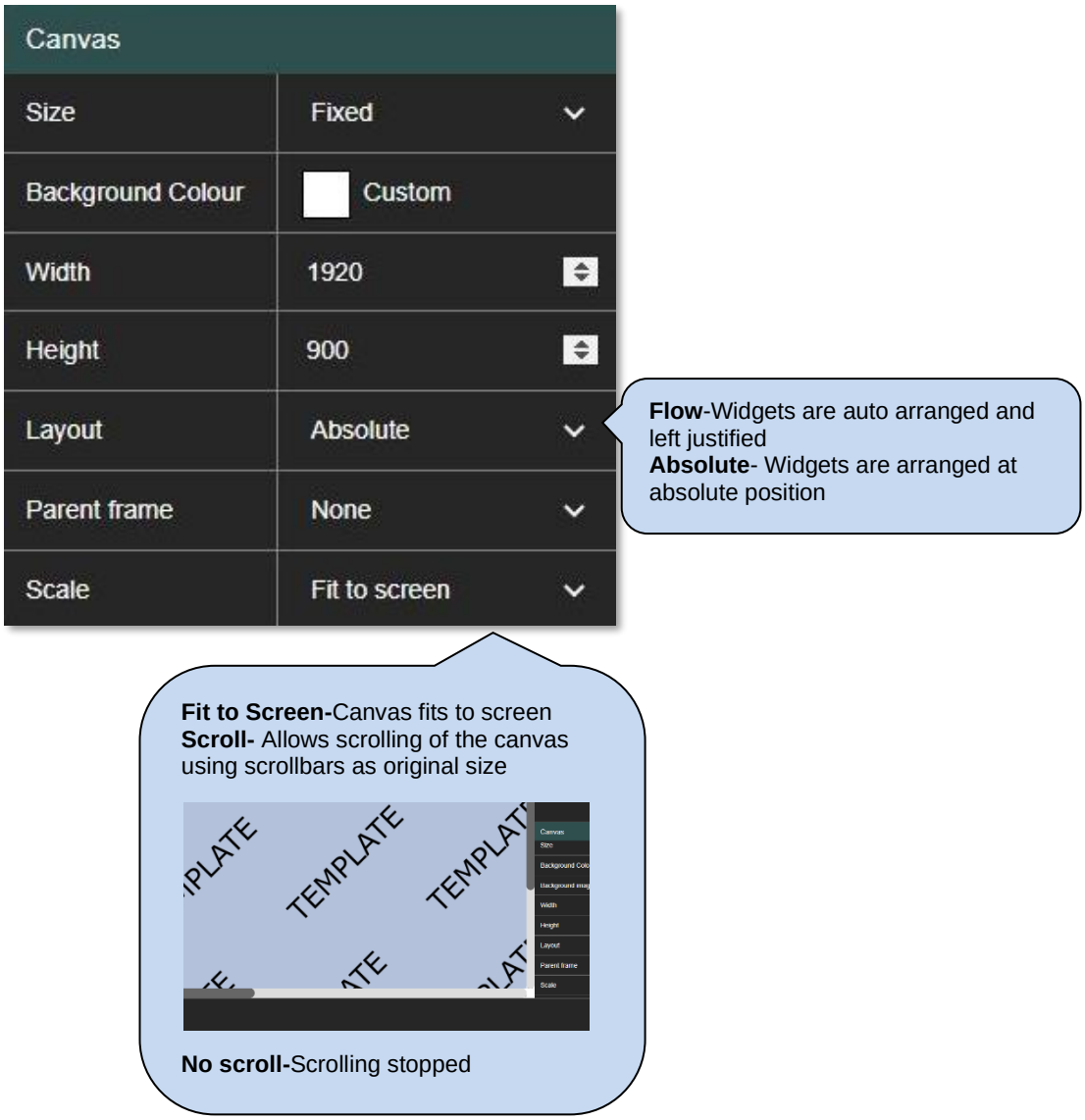
The mini map is a display of the whole canvas area. It can be useful to pinpoint widgets which are not visible in the current view.



5.3.2.3 FIXED CANVAS SIZE

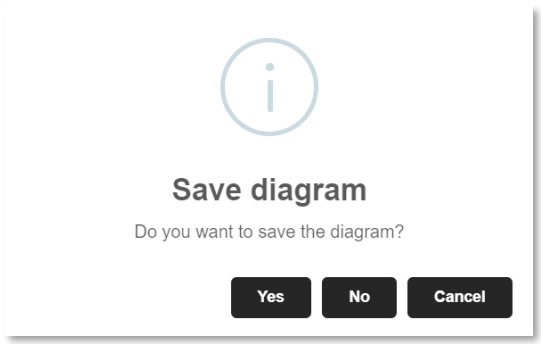
The fixed canvas size is set by the properties window. In this scenario the width and height of the canvas can be set exactly to size. Widgets can also be arranged in an Absolute or Flow position on the canvas.





5.3.2.4 SWITCHING PAGES

Switching between pages in *Edit Mode* automatically detects if changes have been made to the layout diagram.



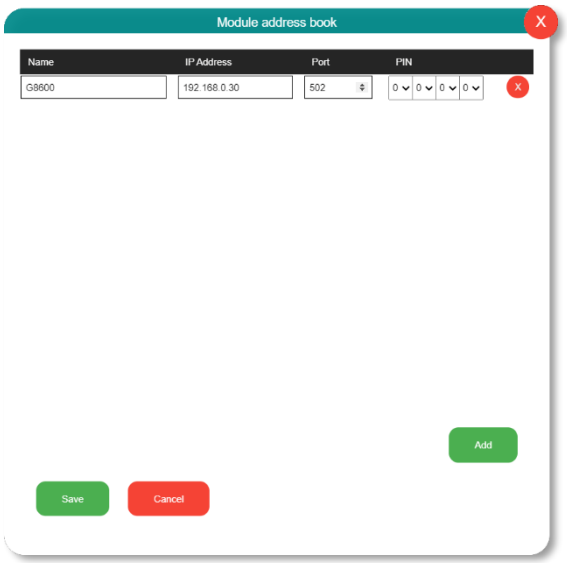
If changes have been made, then a *Save diagram* pop-up window appears and will ask if the diagram requires saving.

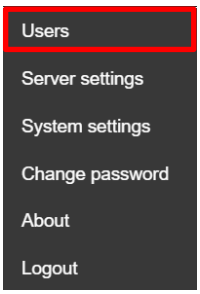
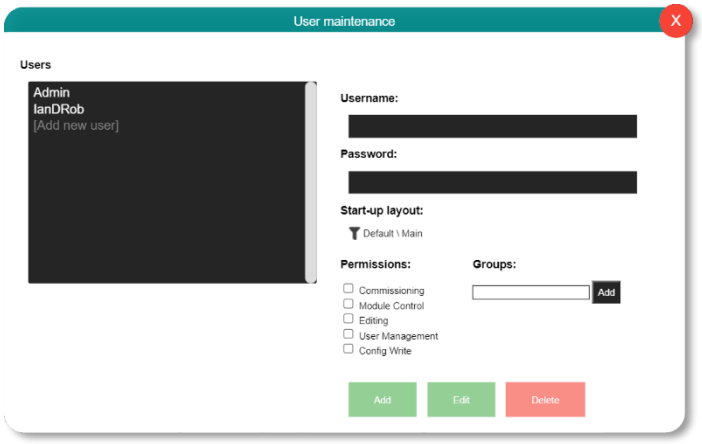
5.4 TOOLBARS

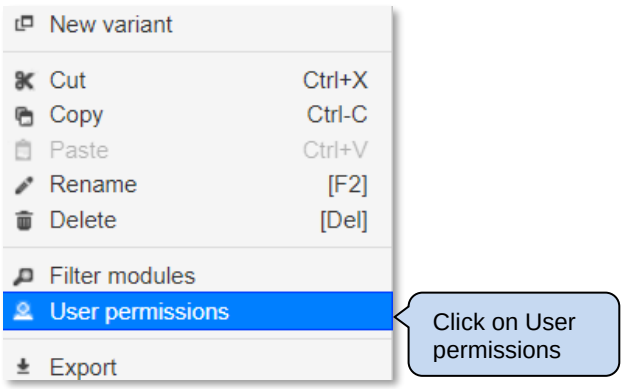
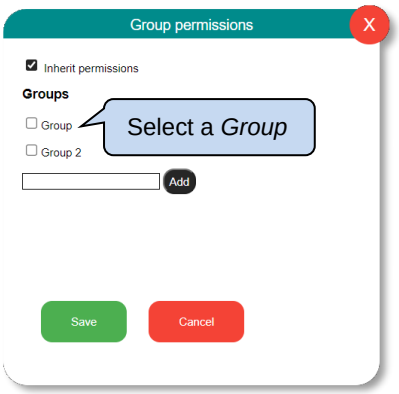
The toolbars are available in the *Main View Mode* and *Editor Mode*. These help to assist the user into performing tasks on the drawing canvas.

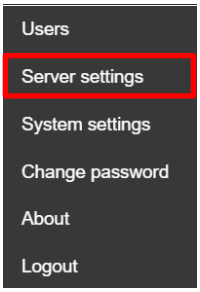
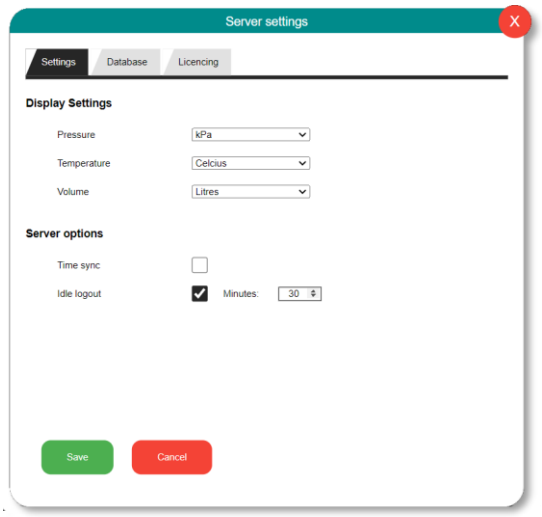
5.4.1 TOP TOOLBAR

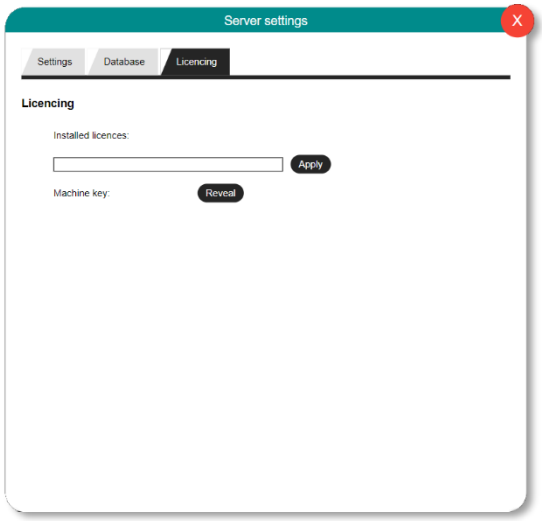
The Main View Mode has a top toolbar with several icons to assist with the viewing of diagrams.

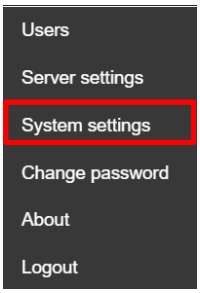
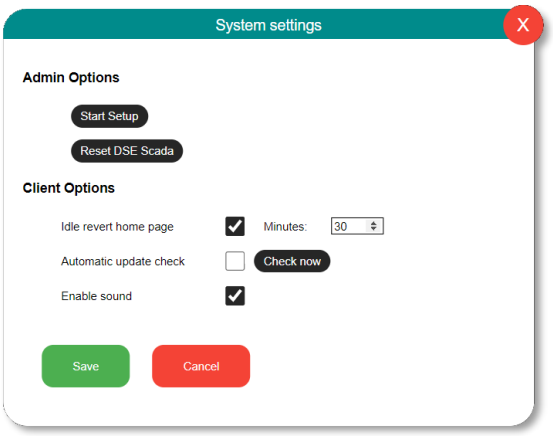
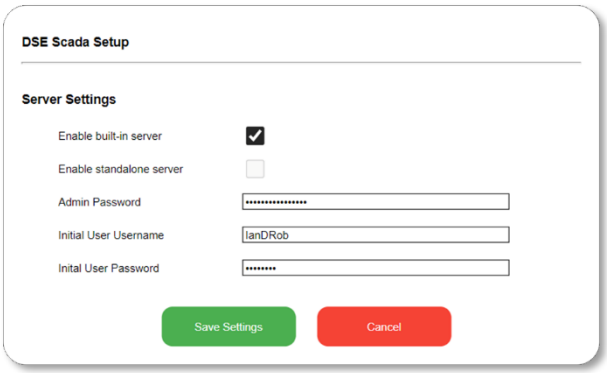
Icon	Description
	**Pan (Available in Endless World)** Use the pan tool to move the canvas are up, down, to the left, and to the right. When the pan tool is active, the Pan cursor (a four-sided arrow) is displayed. Dragging the pointing device moves the model in the same direction.
	**Select Mode (Available in Endless World)** Used to highlight and select multiple widgets. Movement is controlled by mouse or arrow keys.
	**Zoom to Fit (Available in Endless World)** Zooms in so you can see the entire model, assembly, or drawing sheet.
	**Undo (Editor Mode)** Undo last operation. The function of Undo command, just as its name, lets you erase the last change to the document; thus, you can revert file to a previous state.
	**Redo (Editor Mode)** Redo last operation. The Redo shortcut (Ctrl Y) reverses the Undo action. If you mistakenly undo an action, you can use the Redo command to easily restore to a more recent state.
	**Clear Diagram (Editor Mode)** Clear the canvas. All widgets will be deleted from the canvas.
	**Address Book (Editor Mode)** The *Address Book* stores all IP addresses of each module connected to SCADA.  ***Name:*** Name" is a name of choice to identify the module. It does not need to match anything in the module itself. ***IP Address:*** IP address of module found on Ethernet page ***Port:*** Modbus port number ***Pin:*** Module Pin (if enabled) ***Add:*** Add another module to the address book ***Save:*** Save all addresses ***Cancel:*** Cancel operation

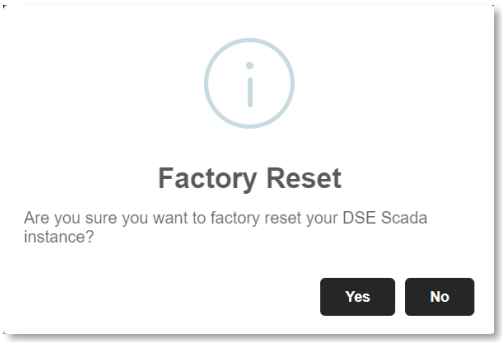
Icon	Description
	**User Settings** The User Settings are settings for users, the system, and the server, and lets you change your password and log out.
	The User Maintenance Screen allows management of all user configurations. The list of users shown refers to the server that the user is connected to. At server setup a non-admin user was created with a name and password. The non-admin user can be deleted, or others can be added. Non-admin users have specific permissions to allow them to perform (or prevent them performing) various tasks. **NOTE: The user Admin is fixed user and cannot be deleted.**  ***Username:*** The username that is being edited. ***Password:*** The password associated with the *Username*. **Start-up Layout:** The default layout displayed at Start-up for a specific user after *Login*. See section 6.1.2 & 7.1.1.3 for further information. **Permissions:** ☐ = Commissioning is disabled ☑ = If *Commissioning* is enabled then it is used for any other 'write' access over GenComm to the module. This includes: - • Scada configuration items such as MSC ID; Gov/AVR settings; Sync settings; Droop; De-rate • The virtual input on/off buttons • [Re]Setting hours run / number of starts • Setting module time/date • [Re]setting accumulated instrumentation • Resetting maintenance due alarms • Sender calibration • Clearing the onboard data log • Any other commands requiring GenComm 'write' access ☐ = Module Control is disabled ☑ = If *Module Control* is enabled then control buttons covered in the Scada screens can be used. This includes the start/manual/auto etc. buttons on a 'mimic' page and any other GenComm page 16 commands. ☐ = Editing is disabled ☑ = If *Editing* is enabled it lets the user into edit mode to create and update layouts. ☐ = User Management is disabled

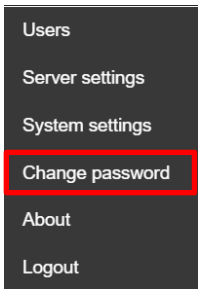
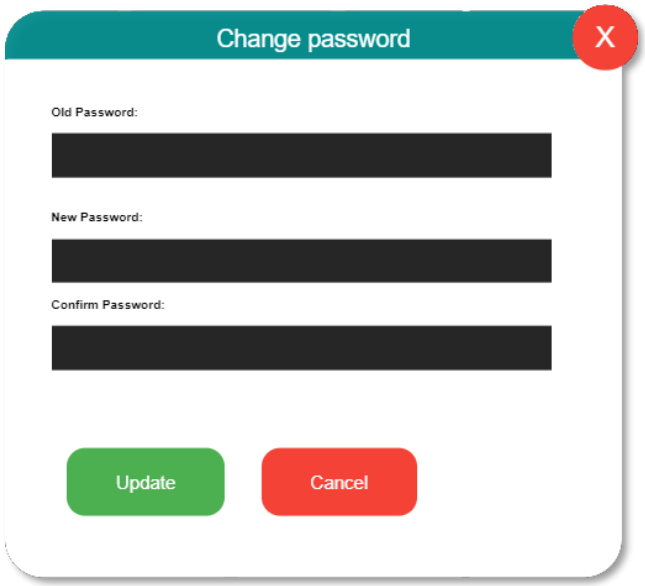
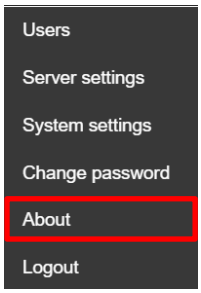
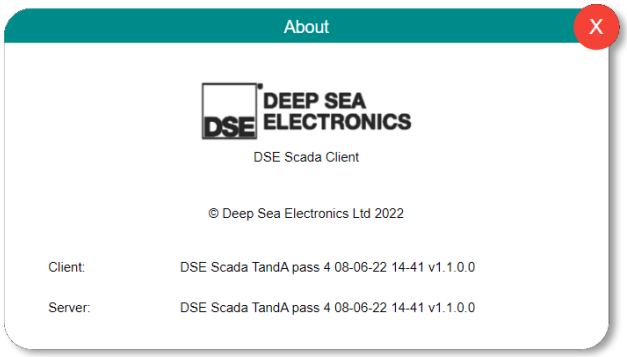
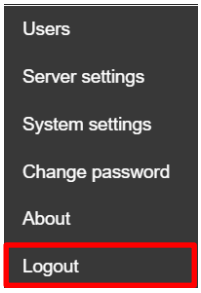
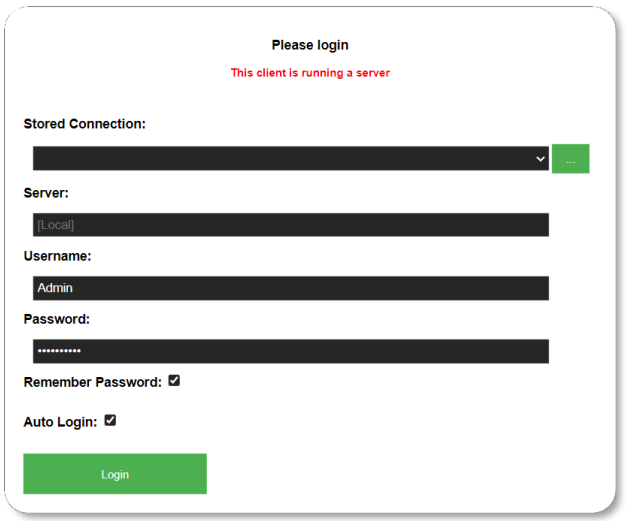
Icon	Description
	☑ = If User Management is enabled then it allows creation and deletion of users. ☐ = Config Write is disabled ☑ = Config Write is enabled **Groups:** Select which groups to add. A new group can be created by typing into the box and clicking *Add*. After clicking *Edit* to save that user, the group will be listed under every other user, and you can tick to enable or disable. Group membership is one of the options as to whether a layout is available to a user or not. When you right-click a user-defined layout, and choose *User permissions*, you can specify that only members of certain groups will be able to see that layout   ***Add:*** Add Username and Password. Click on *Add* to add the new details ***Edit:*** Edit a connection ***Delete:*** Delete a connection

Icon	Description
	The server settings screen allows adjustment of display and server options. **NOTE: The server settings affect the server the user is connected to and for all clients connected to that server.** **Settings**  **Display Settings** **Pressure:** Select unit of pressure **Temperature:** Select unit of temperature **Volume:** Select unit of volume **Server options** ☐ =Time sync is disabled. ☑ =If enabled *Time sync*, periodically sets the time of all connected modules to match that of the DSE Scada server PC. Hence synchronizing all module clocks. is enabled. ☐ =Idle logout is disabled ☑ =If enabled *Idle logout* after a period, logs the client back out to the main login screen **Database** 

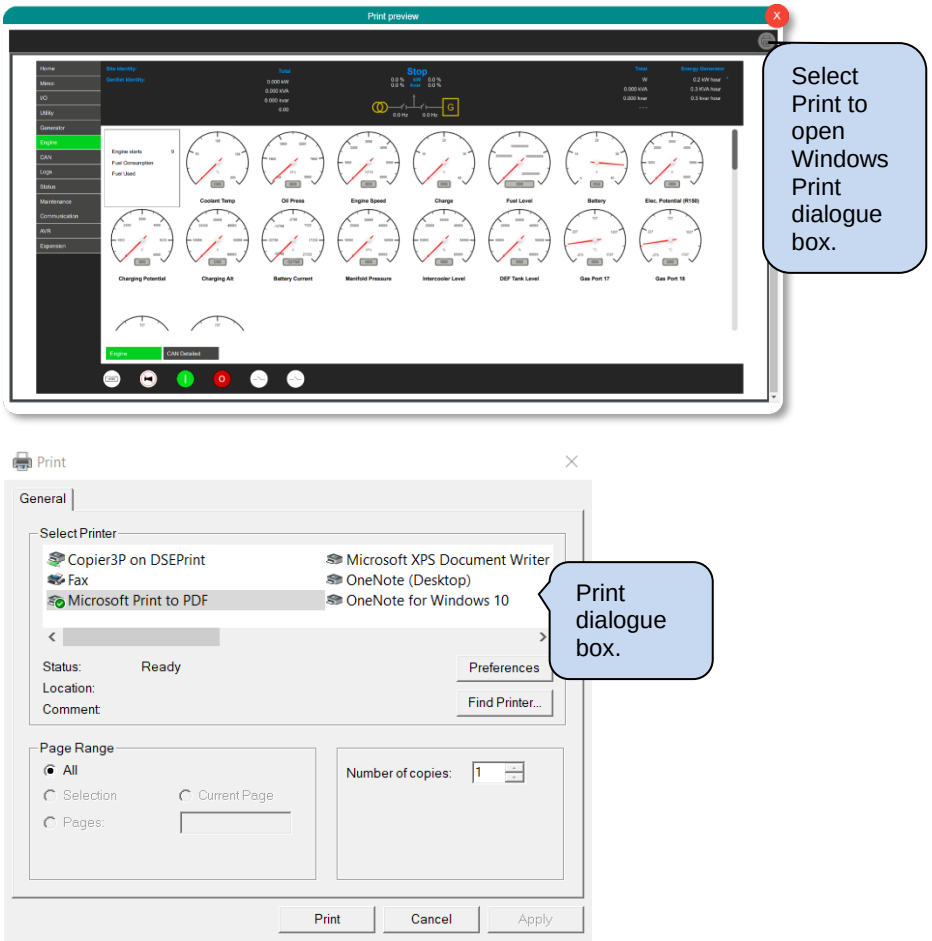
Icon	Description
	Export: Exports the database in database backup (*.dbb format) **Import:** Imports a database backup file in. (*.dbb format) Note: A machine key is optional if importing from another server. **Licencing** A licence key is required to enable add-on features. See Section 8.2 for further details.  **Installed Licences:** This is where the Licence key is applied. **Machine Key:** The machine key is required if importing a .dbb file from another server. It's only optional if importing a file that was previously exported from the current server. Pressing the *Reveal* button will reveal the current machine key.

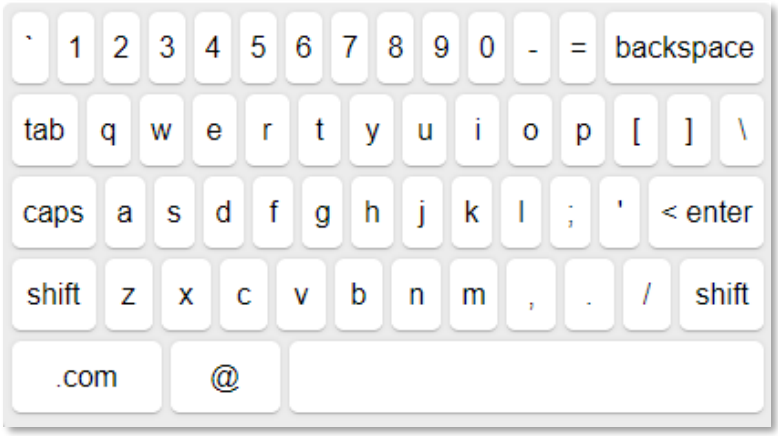
Icon	Description
	These settings are also accessible from the login screen and apply to the current PC. **Admin Options**  **Start Setup** Selecting this option will take the user to the DSE Scada Setup screen if the user wishes the machine to be a server as well as a client. See *First Time Login* in section 4.1.  **Enable built-in server** ☐ =Built-in server is disabled ☑ = Enable the built-in server provided with the application. **Enable standalone server** ☐ =Standalone server is disabled ☑ = Standalone server is enabled. To enable standalone server, you need to have installed the standalone application or service in the initial installer. **Admin Password:** Enter a password to be used for the built-in administrator account that has full access to all settings and control. **Initial User Username:** Enter the username for a non-administrator user that can be used to view, but not edit or alter, modules and layouts **Initial User Password:** Enter the password for a non-administrator user that can be used to view, but not edit or alter, modules and layouts **Save Settings:** Save the settings **Cancel:** Cancel Client settings

Icon	Description
	NOTE: *Database already configured* will be displayed if the Admin, Username and User password have already been setup. **Reset DSE Scada** This allows a factory reset of the Scada software**.** **NOTE: A *Factory Reset* will revert the software back to its original state. This cannot be reversed.**  **<u>Client Options</u>** **Idle revert home page:** ☐ =Stay on current screen ☑ =Current screen reverts to Home page after specified time in minutes. **Automatic update check** ☐ =No updates will be checked. ☑ =Updates to the software will be checked each time the software is run. A DSE username/password is required to apply the update. **NOTE: Updates might be put periodically on the DSE website, and they can be automatically downloaded, or if there is no internet access on the server, an update can be downloaded as a .exe file and run (just like the originally installation** **Check now:** If this button is pressed then the software searches for current updates. **Enable sound** ☐ =System sound is disabled ☑ =System sound is enabled. **Save:** Save the settings **Cancel:** Cancel Client settings

Icon	Description
	Allows the user to reset their password. 
	Shows information about the current Client and Server. 
	Logout reverts to the *Login* screen. 

5.4.2 BOTTOM TOOLBAR

Icon	Description
	**Print** Selecting *Print* reveals the Print preview screen which displays the current view. Selecting the *Print* button again opens the print dialogue box. 
	**Edit** Allows access to the Main Editor tools and canvas.
	**Edit** Allows access to Main View Mode
	**Save** The Save command saves the current diagram but remains in the Editor window
	**Commissioning** Opens the Multi Set commissioning screen (License required) where you can set certain values onto several modules at once.

Icon	Description
	**On Screen Keyboard** Allows a use of a touch-screen keyboard. Also, it can be used with a mouse if necessary. Press to enable or disable. 

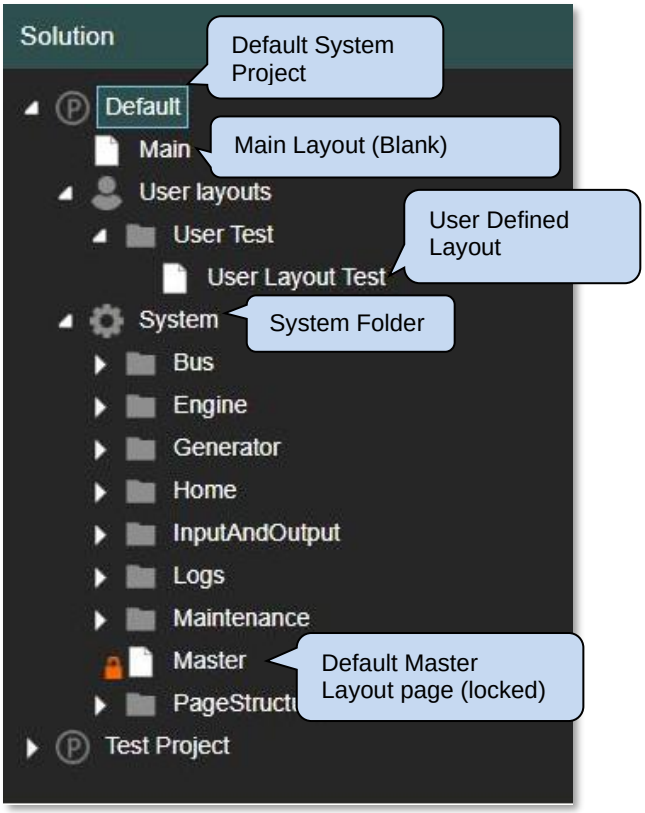
6 USING THE MAIN EDITOR MODE

The software is broken down into separate sections to provide simple navigation whilst editing the module's configuration to suit a particular application.

6.1 SOLUTION EXPLORER

The *Solution Explorer* at the upper right of the screen, is where you can view, navigate, and manage layouts and projects. It comprises of the following:

- ***Default System Project***-This is the initial user-defined project that you'll use. You might want to create other projects if you've got other sites etc
- ***Main Layout-***This is a default blank layout and is the initial first layout page used after entering the Main Editor Mode.
- ***User Layouts***- The user layouts folder is a default folder to store edited versions, or brand-new layouts"
- ***System Folder-*** The system folder allows read-only access to the DSE-supplied layouts
- ***Master Layouts***- This is a Master configuration layout which is locked.



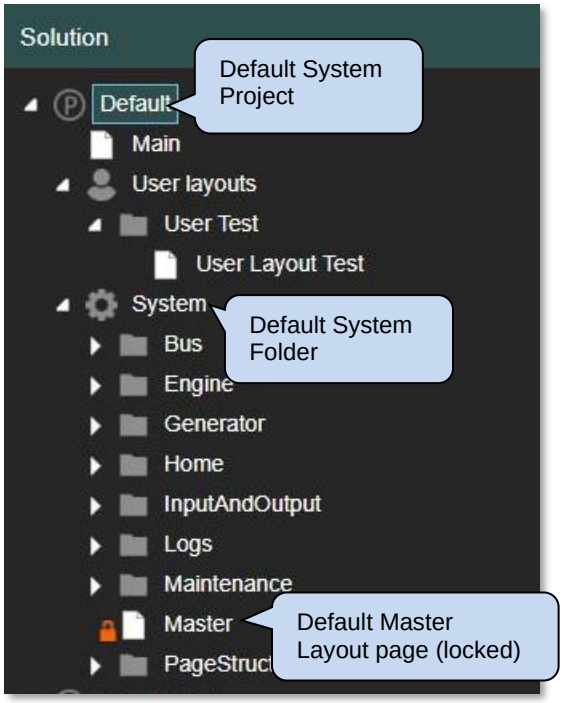
6.1.1 SOLUTION EXPLORER SHORTCUT KEYS

Shortcut keys area available in the Solution Explorer window to offer an alternative to what is typically done with a mouse. The key combinations allow quick access to frequently used commands.

CTRL-SHIFT-P = Create new project
CTRL-SHIFT-N = Create new folder
CTRL-N = Create new layout
CTRL-X = Cut
CTRL-C = Copy
CTRL-V = Paste
F2 = Rename
DEL = Delete
.

6.1.2 DEFAULT SYSTEM PROJECT

Projects are the top-level development area where SLD's are managed. The DSE Scada software has the ability to allow the user to develop projects from scratch or by utilising the *Default System* project.
The Default System project is a permanent template which can be utilised (e.g., New Variant) to produce professional layouts with ease. It has been included to assist layout development.



6.1.2.1 DEFAULT SYSTEM FOLDER

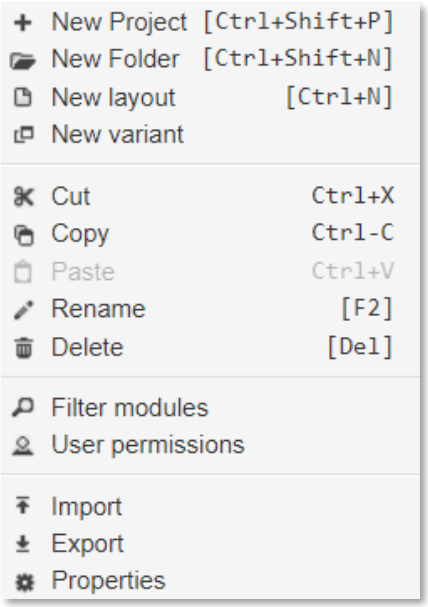
The default system folder contains several sub folders which contain supplied system layouts that cover the main features of the G8xxx modules that are fixed and cannot be edited.
The Default Master layouts within the project are locked but a copy of the layout can be used by creating a New Variant (see section 6.1.7).

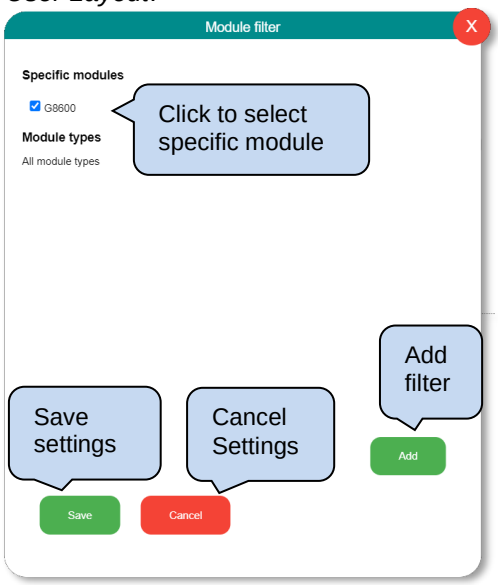
Example 1

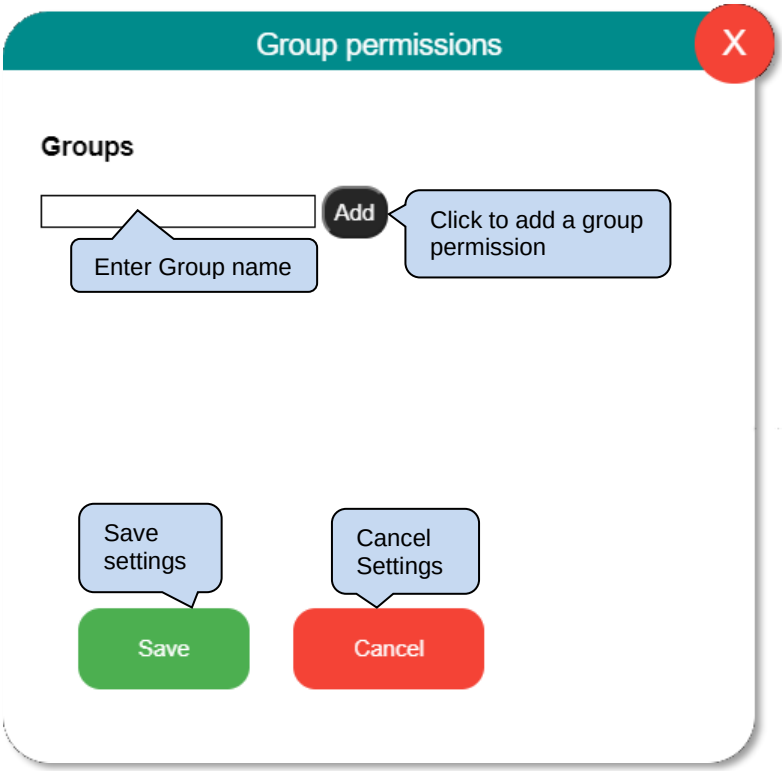
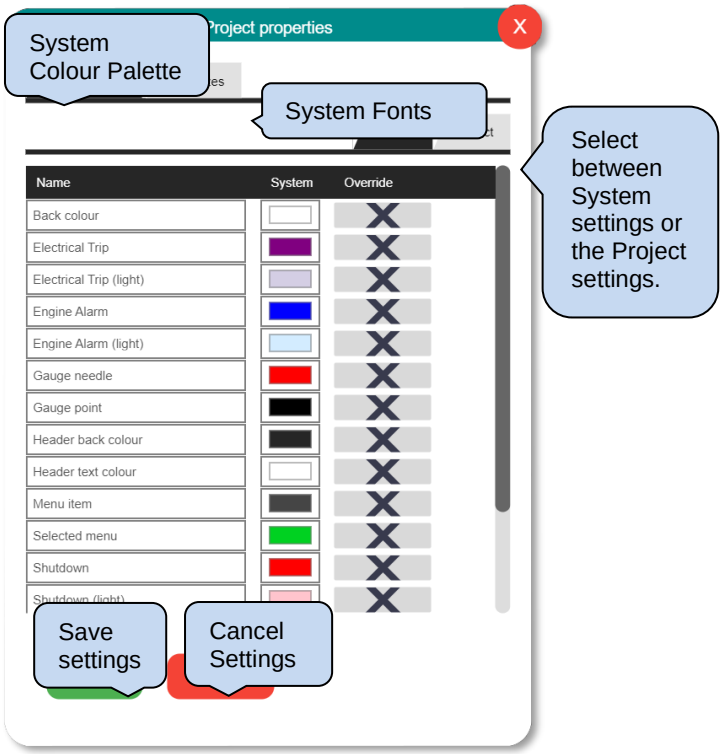
An example of a *Power* layout is shown below.

6.1.3 SOLUTION EXPLORER CONTEXT MENU

The context menu is accessible by a right mouse click. The context menu consists of several project commands and their equivalent shortcut keys. Each command allows manipulation of projects, files, and folders in the *Solutions Explorer* pane.

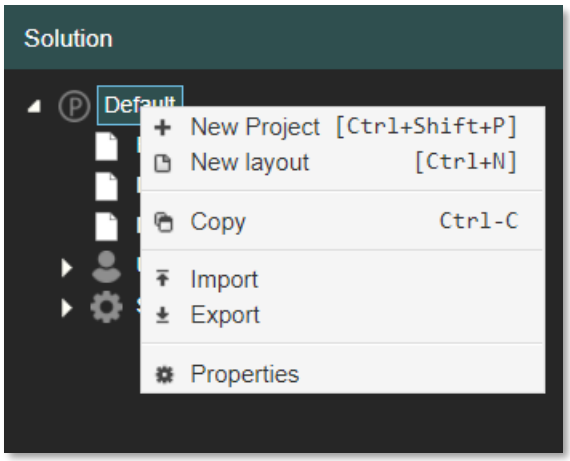


Parameter	Description
New Project	Creates a New Project in the *Solution Pane*.
New Folder	Creates a new folder
New layout	Creates a new layout
New variant	Creates a new variant
Cut	Removes content and saves a copy to the clipboard
Copy	Copies content to the clipboard
Paste	Pastes content from the clipboard
Rename	Renames the file, folder, or layout
Delete	Deletes the file, folder, or layout
Filter modules	Allows selection of a specific module or all module types from a *User Layout*. 

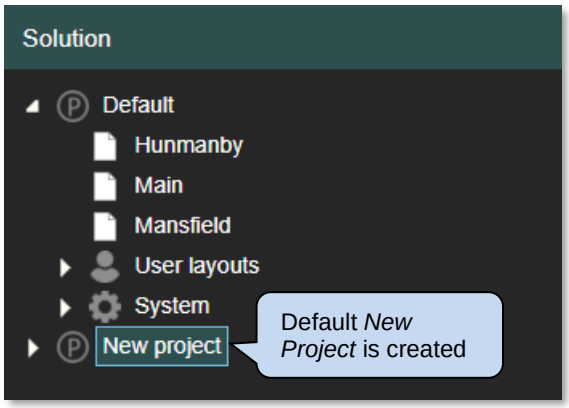
Parameter	Description
User permissions	Allows the user to change editing permissions for the group. 
Import	Imports allow transfer from a file Layout Export File (*.*lef*), so layouts can be moved between different servers.
Export	Exports allow transfer to a file Layout Export File (*.*lef*), so layouts can be moved between different servers.
Properties	Allows editing of system settings such as colour palette and font sizes. 

6.1.4 ADD A PROJECT

From the right-click on the context menu in Solution Explorer, select + New Project.

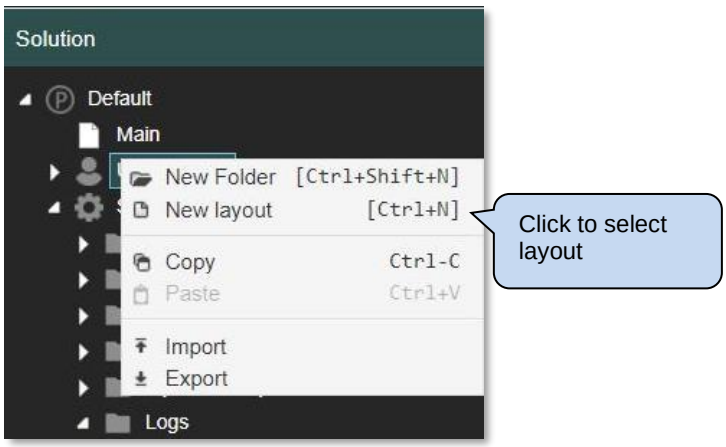


A default *New Project* is created.



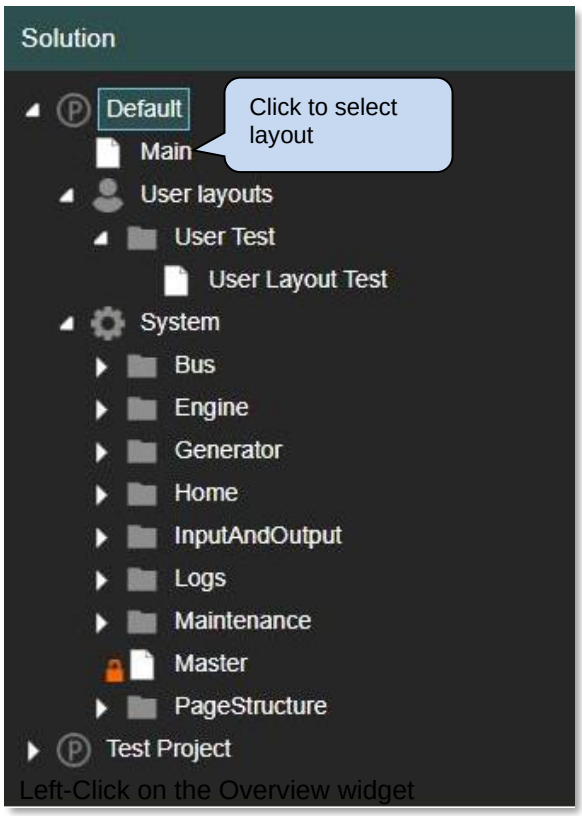
6.1.5 CREATING A USER SUB LAYOUT

The overview widgets on the main page, when double-clicked, will open a sub-layout to display deep-dive information about that module. By default, they use the 'Master' layout. This can be overridden, and another specific layout can be chosen on a widget-by-widget basis, by selecting the overview widget and setting the 'open layout' property.
Create a sub layout in the User Layouts folder. if no "Open layout" is selected then an overview widget will default to using the "Master" layout format in the "System" project (the complete DSE designed Scada templates). Also, sub-layouts can be used within the "Frame Display" widget.

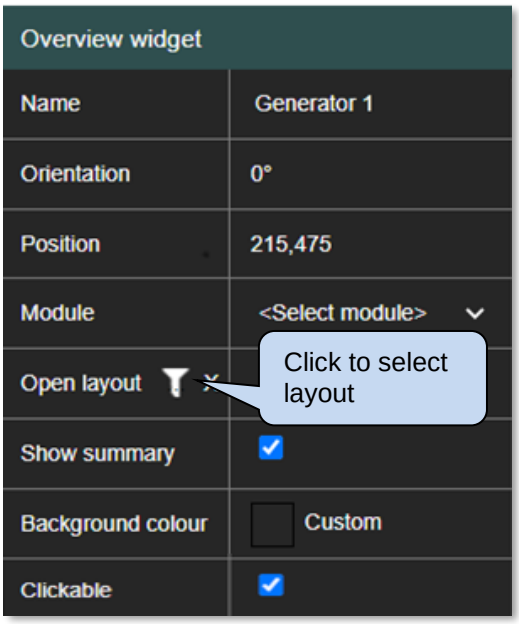


Example Sub Layout

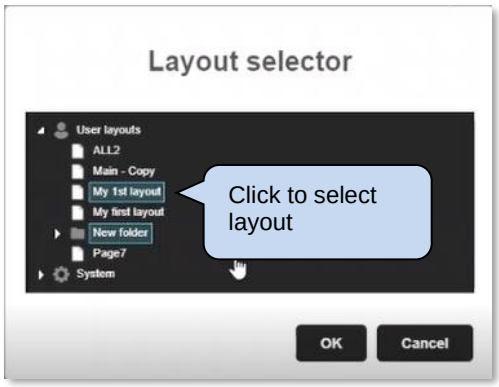
2. Design a layout on the page.
3. Save the diagram 
4. Go to the Main page and double click to view



5. Left-Click on the Overview widget

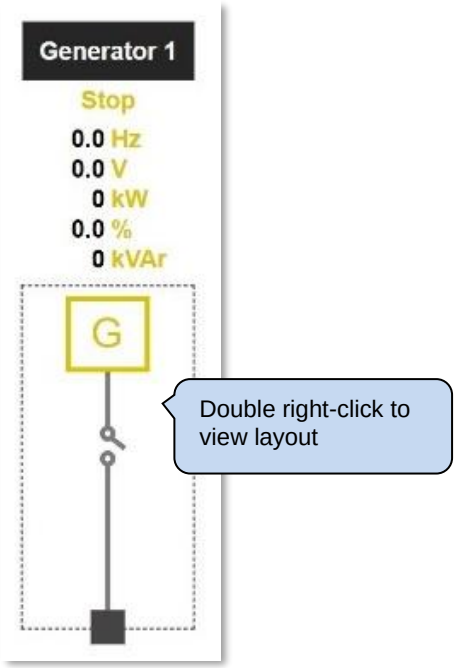


6. Select the layout from the list



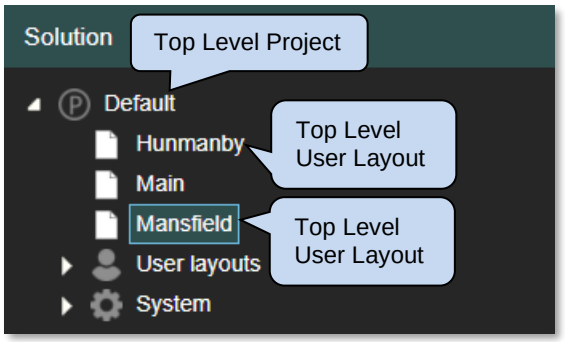
7. Save and go back into view mode.

8. Double clicking on the Overview widget will go to the created layout

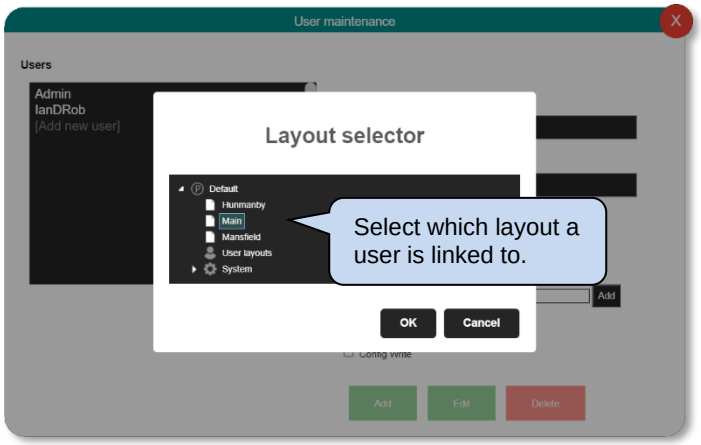


6.1.6 LINKING USERS TO PROJECTS

It is possible to have multiple top-level layouts within the same project. This is where you can link different users to different SLD type diagrams within the same project.

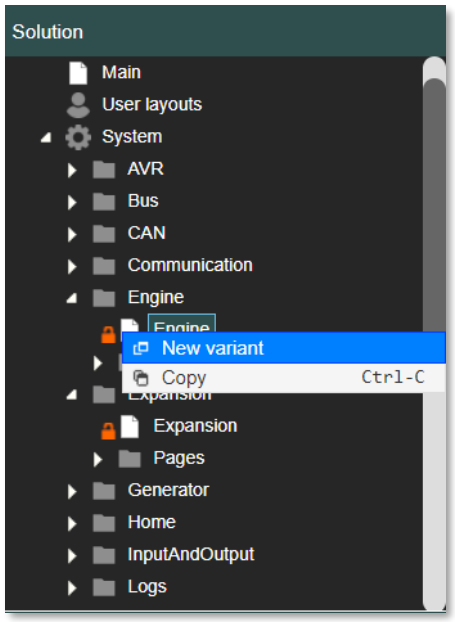


Selecting *Users* will bring up the *User Maintenance* screen where a Start-up layout can be chosen to link to a user.



6.1.7 NEW VARIANT

A variant is a copy of an original system layout page which can be utilised to suit the users own SLD layouts. A variant can be useful for quick development where most of the page formatting is already complete for the user to edit.



A variant can be used for the following: -

- **Module types and/or versions-**Duplicating a module type to use in another layout.
- **User Layout**- Duplicating a User Layout for another user

Selecting the *New Variant* will create a copy of the system variant page/layout and can be used to override system pages. It can also be filtered for different users or modules.
If multiple layouts variants exist, then the software will select the best match based on the following criteria:

1) The current logged in user can only see layouts they have permission to
2) Customer layouts always take precedence over system layouts
3) Specific module layouts always take precedence over module type layouts
4) The highest “From” version, then the highest “To” version.
5) The latest modified layout

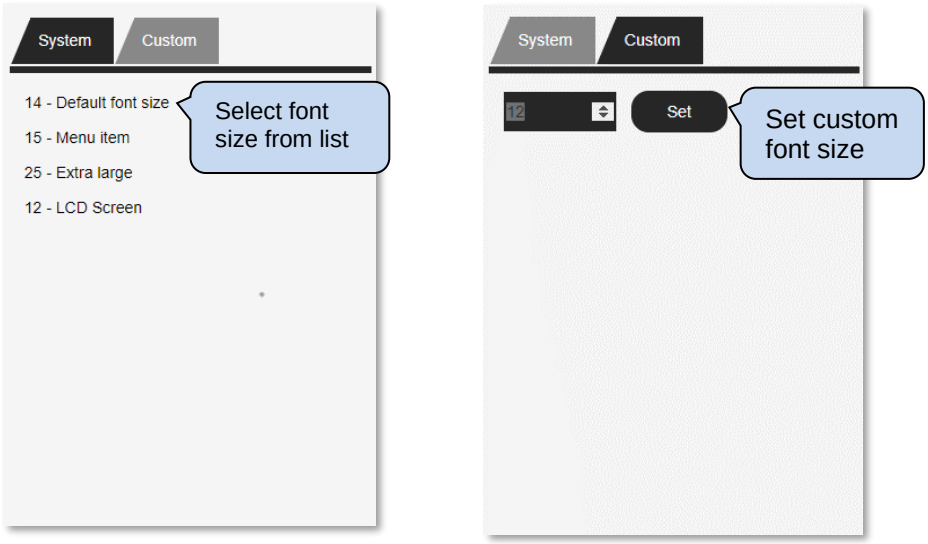
7 WIDGET PROPERTIES

Different widgets have different properties so not all are available for all widgets.
There are standard properties that apply to most widgets namely: -

- Name is just a unique name to identify the widget in the layout”
- Width/Height
- Position
- Module (specific or ‘current module’)
- Colours + fonts

7.1.1.1 FONT SIZE

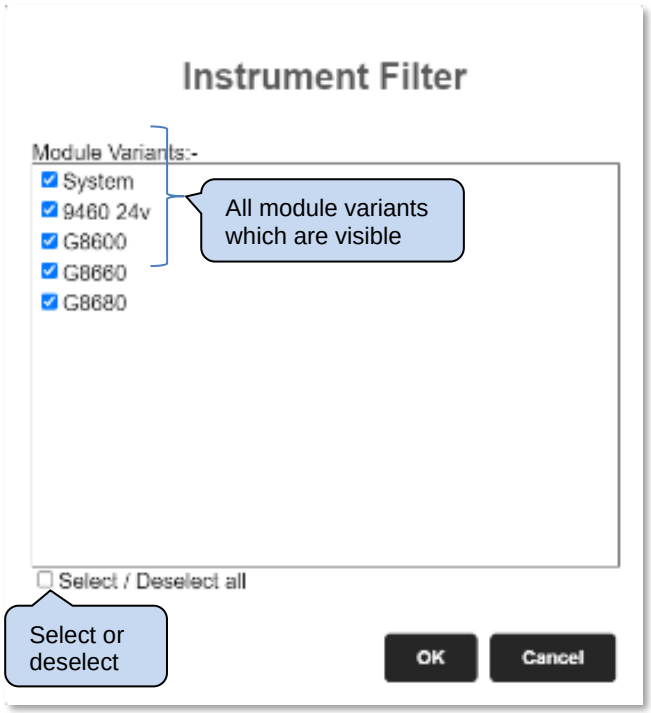
Allows system or custom font sizes to be displayed. Using a system size means that the overall system font size can be changed and will affect all widgets using it. A custom size applies only to that specific widget



7.1.1.2 INSTRUMENT FILTER

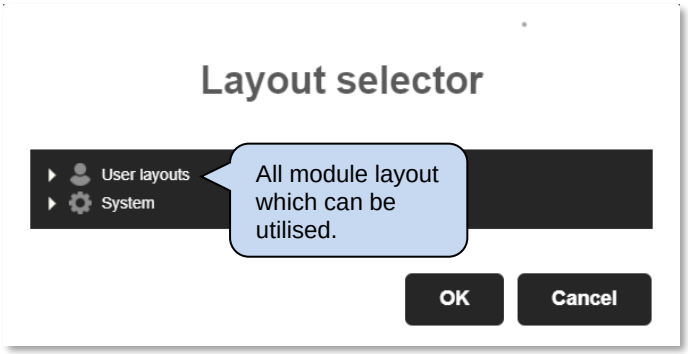
The Instrument filter allows selection of certain module variants to be available.
Most widgets need to specify which instrumentation value they're going to display. (Not all widgets can display all instruments). So, the 'Instrument' drop-down selects that. You can type in the box to filter for instruments containing the text you type and can filter per module type.

NOTE: Not all instruments will work on all modules.



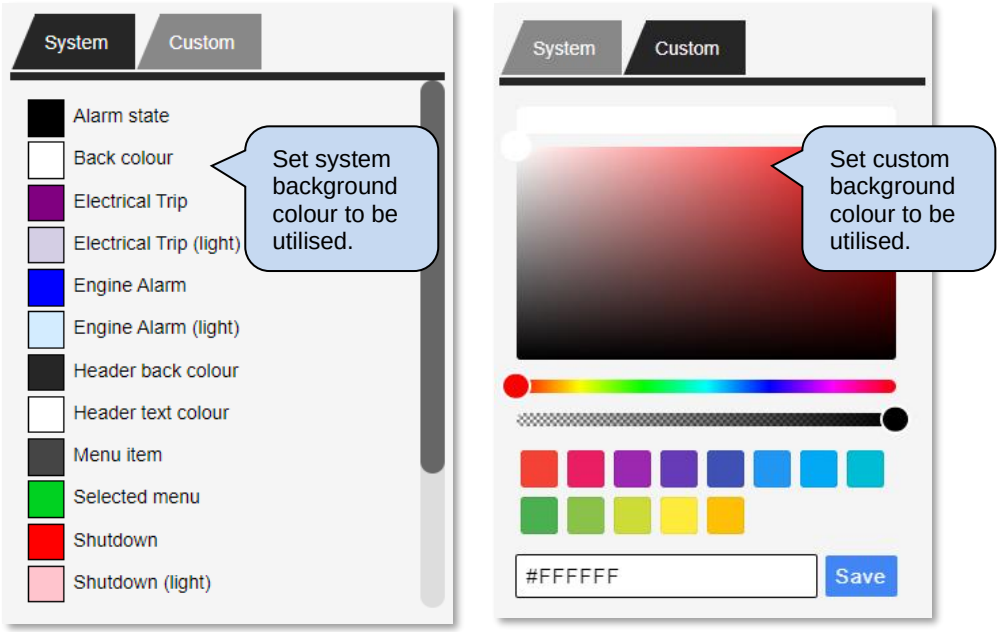
7.1.1.3 LAYOUT SELECTOR

There may be a project requirement that specific layouts are used for different users or projects. The layout selector allows the selection of *User Layouts* and *System* layouts to be selected.



7.1.1.4 BACKGROUND COLOUR

The canvas background colour can be adjusted to a System or Custom user defined colour. Using a *System* colour means that the overall system colour be changed and will affect all widgets using it. A *Custom* colour applies only to that specific widget.

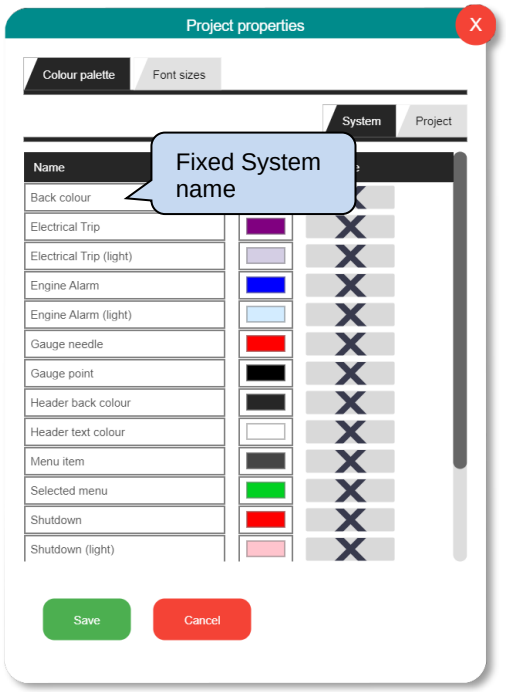


7.1.1.5 PROJECT PROPERTIES

The Project properties is accessed by right-clicking on a project in the solution explorer and selecting ‘properties ‘allows the adjustment of the colour palette and font sizes.

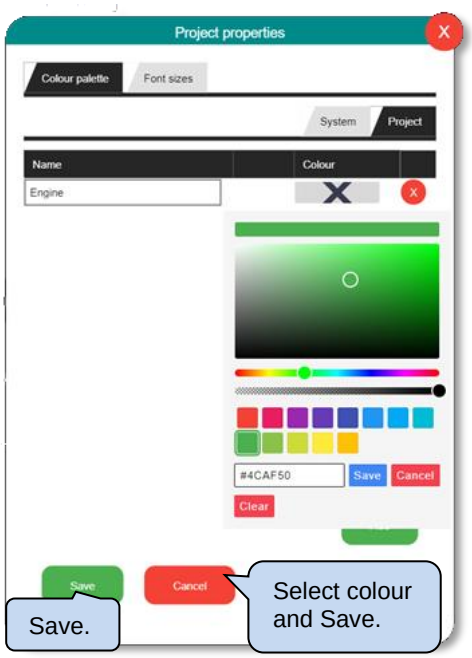
System

The System colour properties are pre-defined but can be overridden by selecting the Override box and selecting a colour. Selecting *Save* will utilise the chosen colour.



Project

A complete *Project* colour palette is also possible. Each part of the layout can have its own name and colour identity. Names can be entered for each colour and can be identified and utilised in the main project.



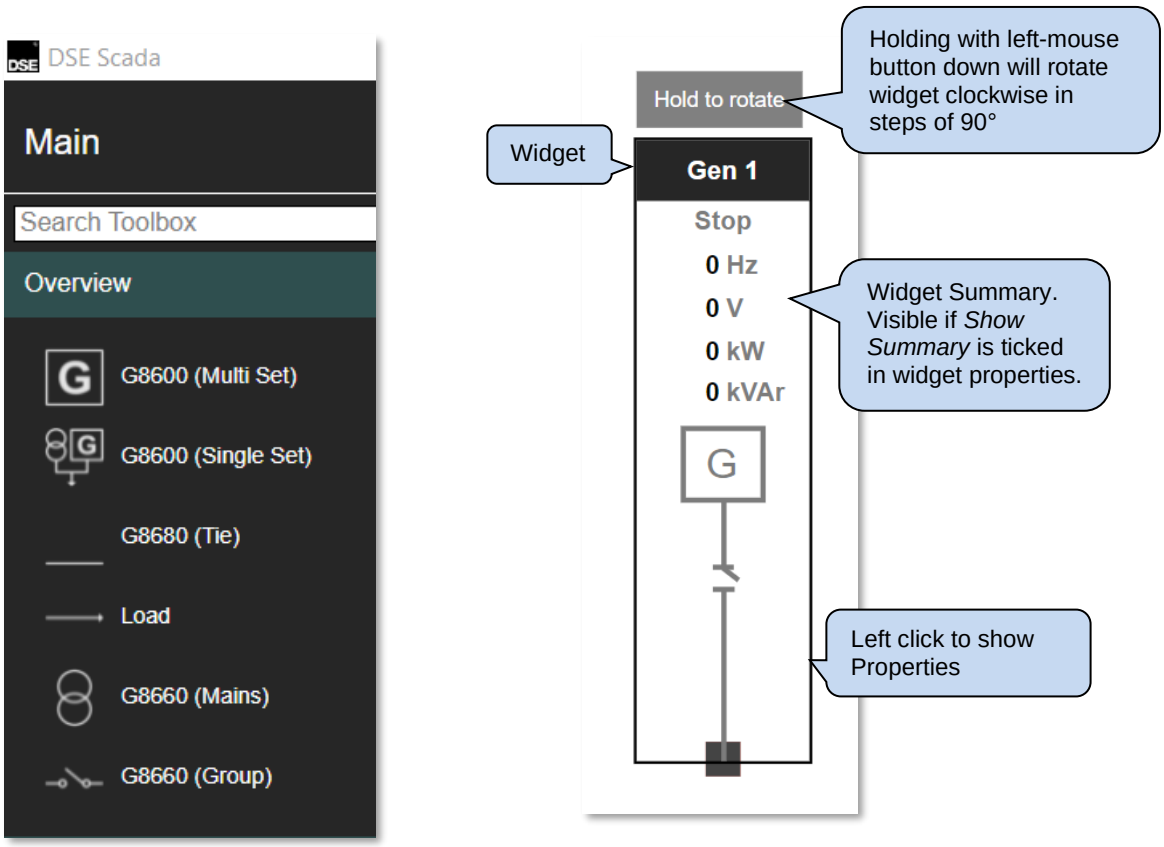
7.2 SEARCH TOOLBOX

The search toolbox allows the user to search for widgets with use of keywords. To search for a specific widget etc, simply type your keyword or words in the search field.

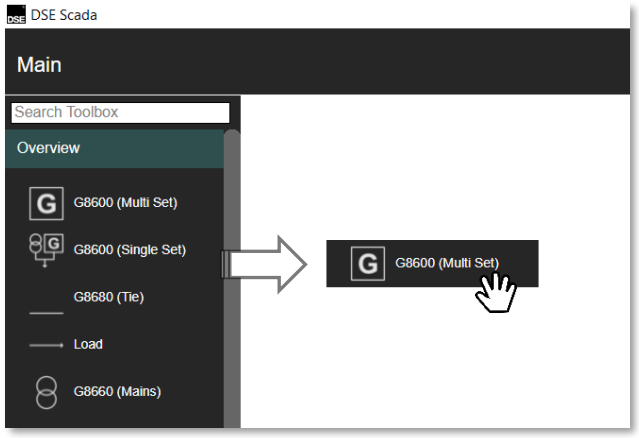
The results will display immediately below the Search box as soon as characters match the search criteria.

7.3 OVERVIEW

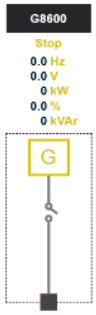
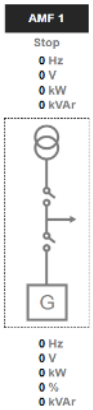
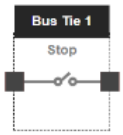
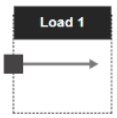
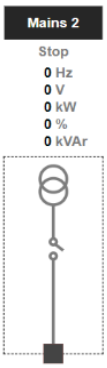
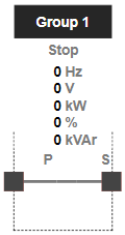
The Overview section contains a collection of widgets which are available for selection and utilising in the main canvas window. Each widget has its own unique features, and each can be adjusted in the Widget Editor window. Widgets can be tied to either a specific module or are left tied to 'current module' which is the module that has been clicked on in the parent layout (typically the top level 'main' layout) in order to get to a widget in a sub-layout. At a minimum, the 'Module' property must be set to one of the modules in the drop-down for the widget to work.



To add a widget, drag from the side bar to the canvas.

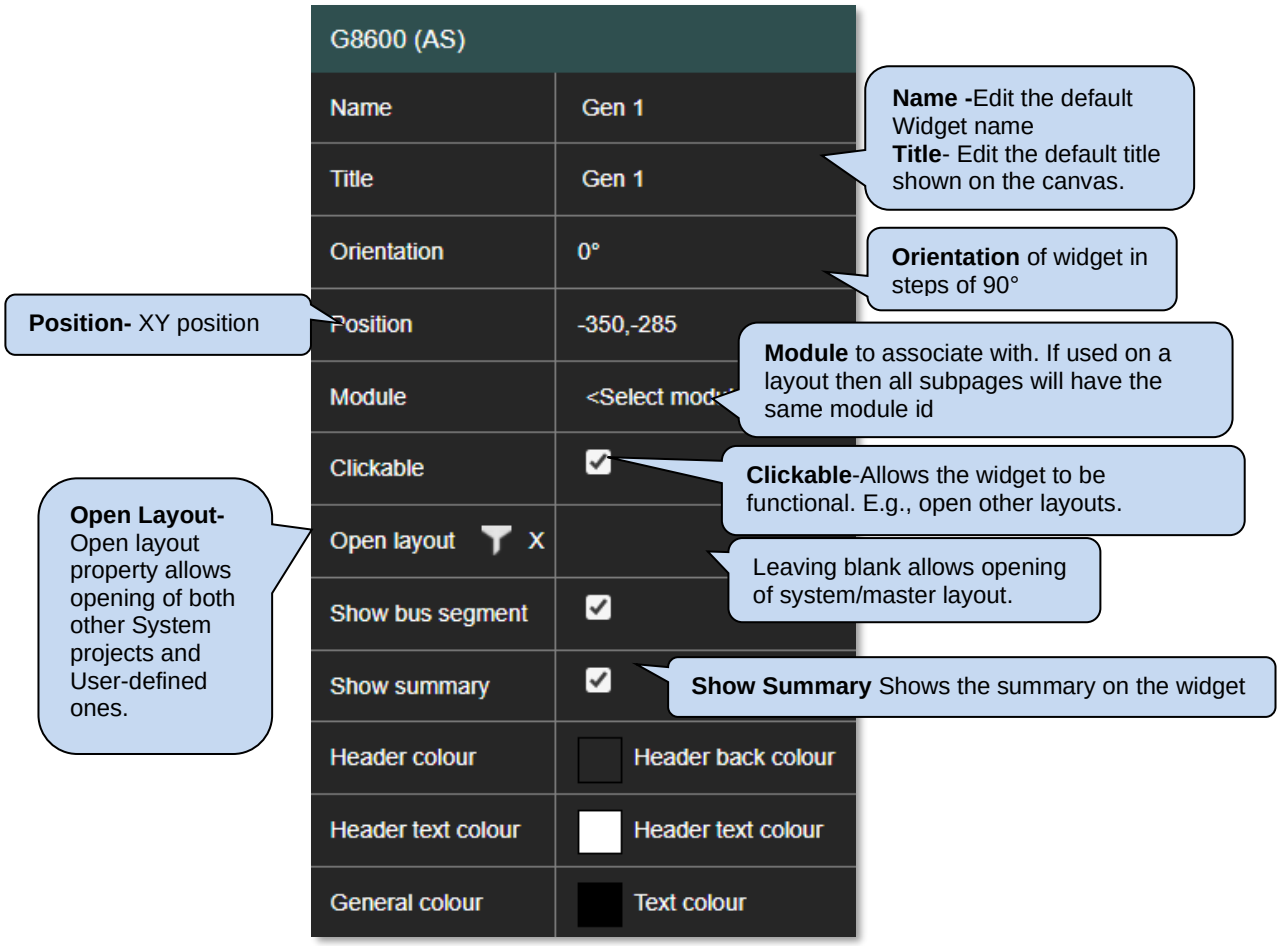


The following Overview widgets are available for selection and utilisation on the main canvas

G8600 Multi Set	G8600 Single Set	G8680 (Tie)	Load	G8660 (Mains)	G8660 (Group)
					

7.3.1 OVERVIEW WIDGET PROPERTIES

Overview widgets are adjustable, and each widgets property can be adjusted.



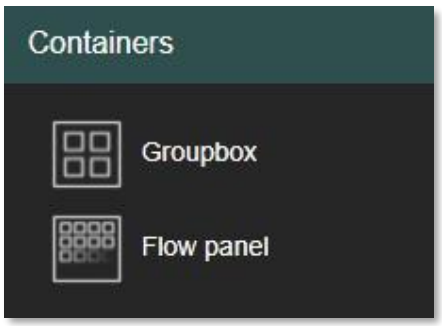
The Overview widgets default to Open Layout system projects.

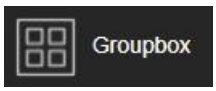
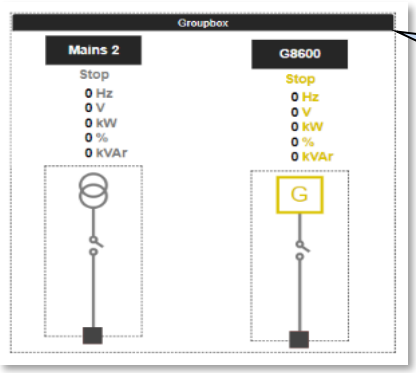
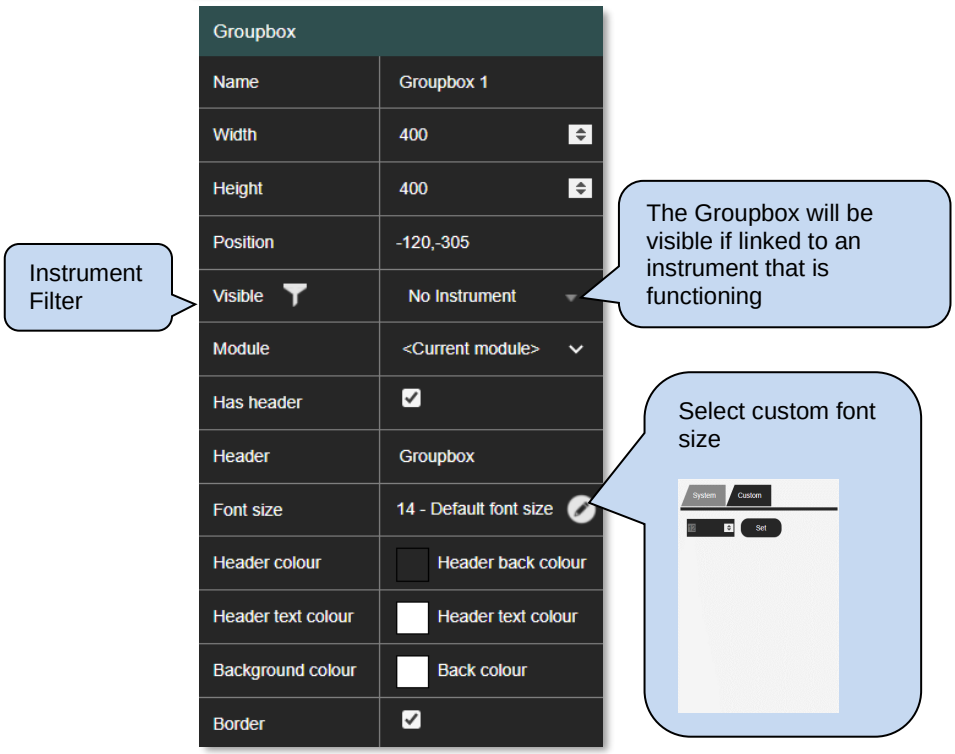
NOTE: An Overview Widget will not function unless it is linked to a module.

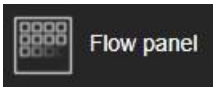
NOTE: If the Module property is left to *Current Module,* then once the Overview widget is double-clicked it will pass the Module Id of the *Overview* widget to the page.

7.4 CONTAINERS

Containers are used to group several widgets on the canvas display. Once a container is used all widgets in the container can be moved and grouped together.

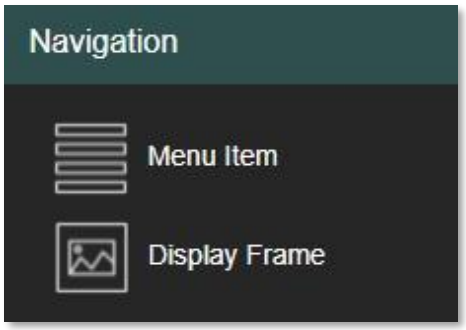


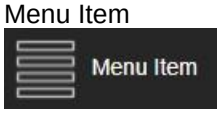
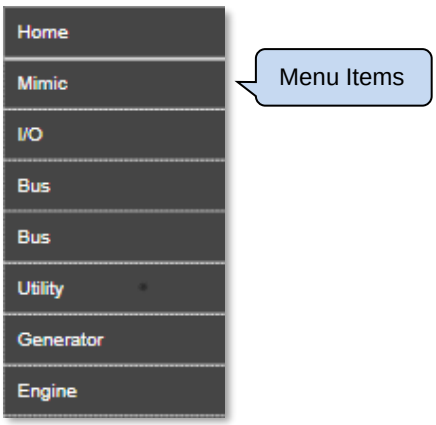
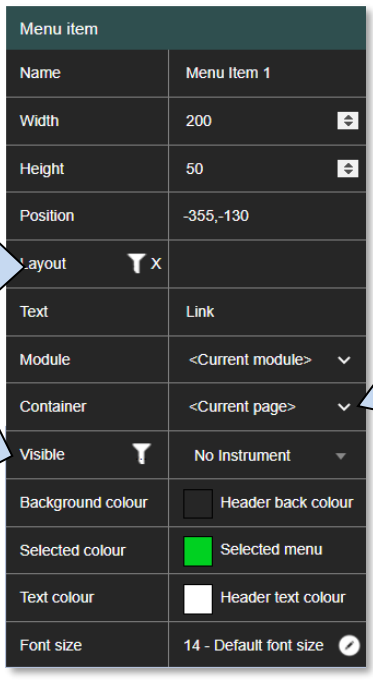
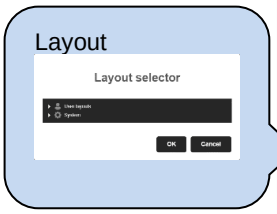
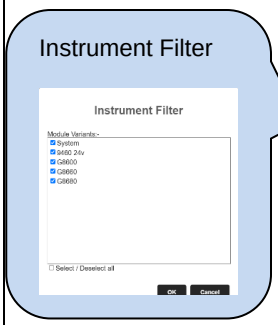
Parameter	Description
Groupbox  	Groupbox allows widgets to be grouped together. A Groupbox acts like a frame where individual widgets can be grouped together independently to the surrounding canvas.  

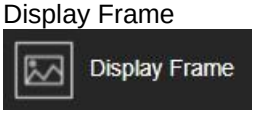
Parameter	Description
Flow panel 	Flow panel allows widgets to be grouped together and organised. Each widget is left justified once placed inside the panel and will auto-arrange accordingly. Any widgets that are hidden (because of their visible property) take up no space, and the other widgets will rearrange to be next to each other.

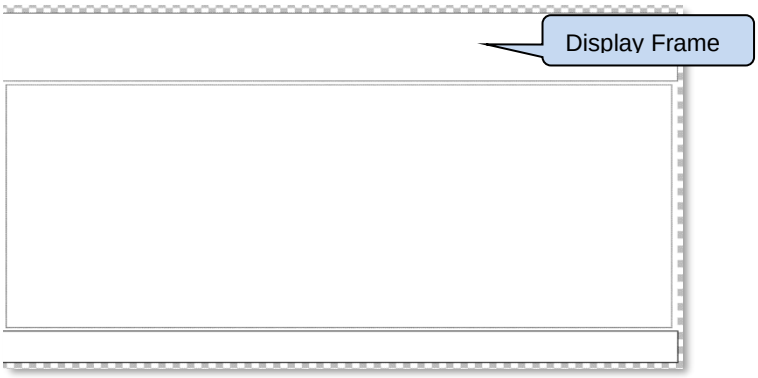
7.5 NAVIGATION

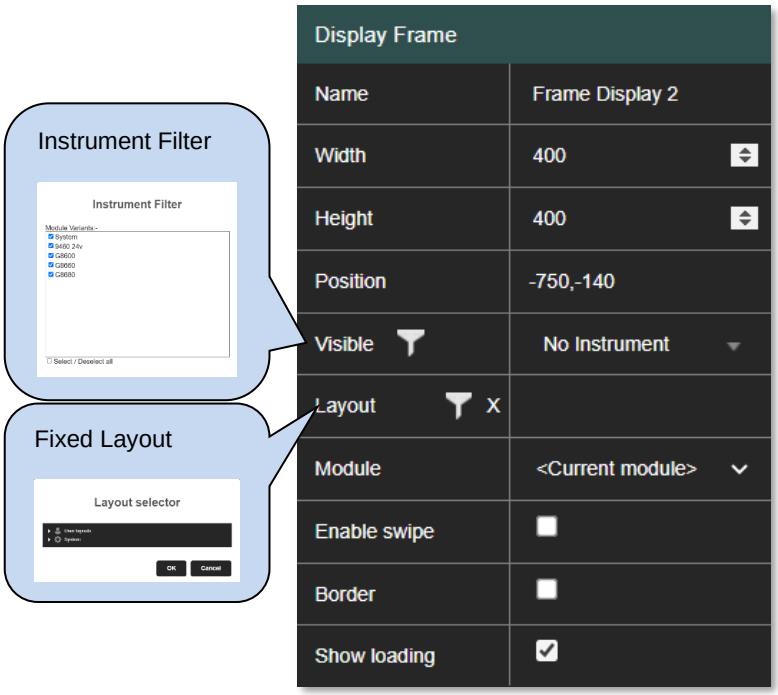
Navigation widgets are used to display menu items and frames for holding labels, widgets, and shapes. Menu Item and Display Frame are used together. When clicked in view mode, a menu item will load a specific layout into a specified display frame on the same page.
Typically, you'll have a row of menu item widgets all pointing to the same display frame but filling it with a different layout depending what is clicked on.
The Display frame can also be used on its own to display another, fixed, layout within the current layout.



Parameter	Description
Menu Item 	Menu items are widgets that can be linked (target Link) to various layouts     It loads the selected layout into the "Container" "Display Frame" widget selected. Otherwise, it replaces the current page.
Menu Items	
Layout	
Instrument Filter	

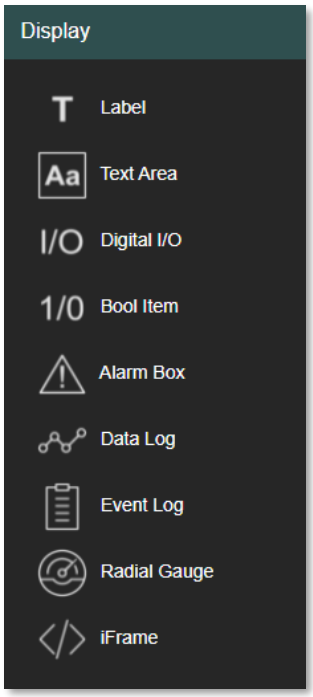
Parameter	Description
Display Frame 	The display frame allows widgets to be grouped together. It either displays a layout which has been fixed using the "Fixed layout" property, or it displays a layout passed into it from a "Menu item" widget using the "Layout" and "Container" properties on the "Menu item" widget.

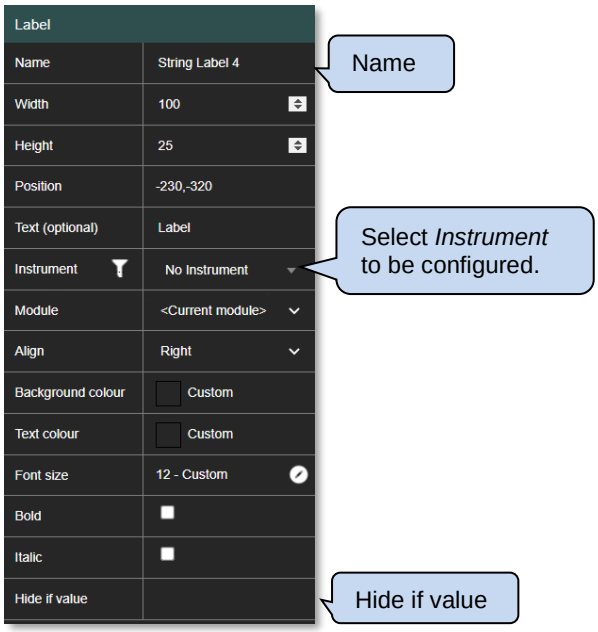


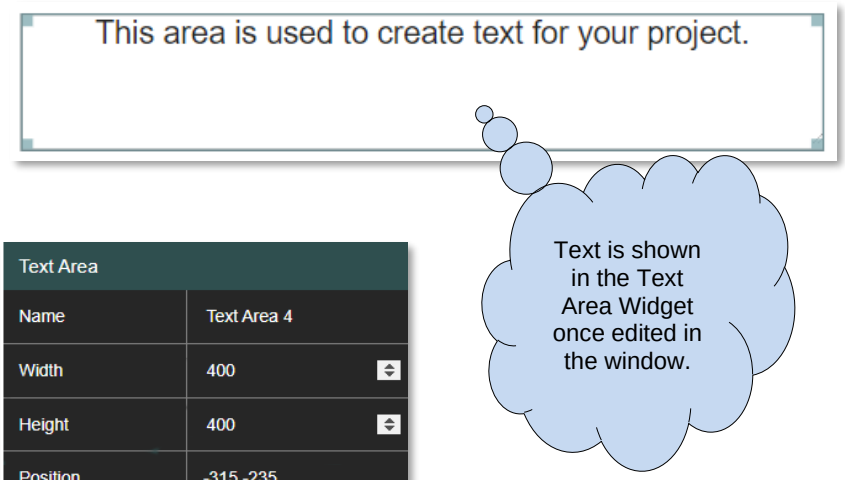


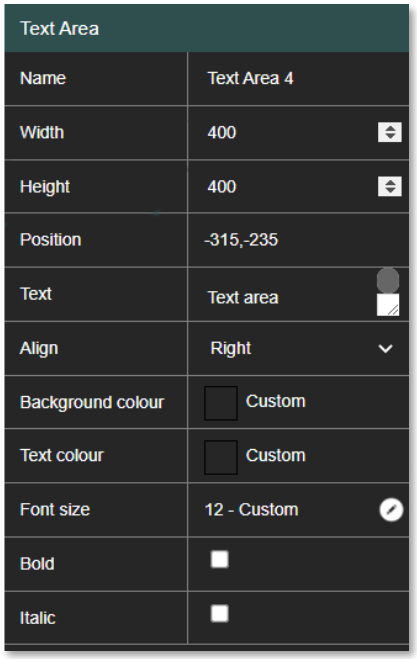
7.6 DISPLAY

The *Display* widgets are primarily used to display user and module information on a drawing.



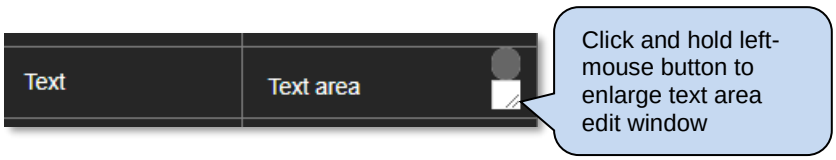
Parameter	Description
Label 	The widget can be used for text or linked to an instrument  

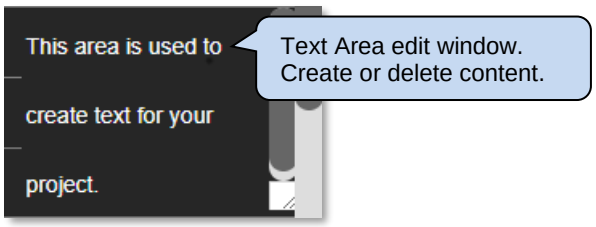
Parameter	Description
Text Area 	



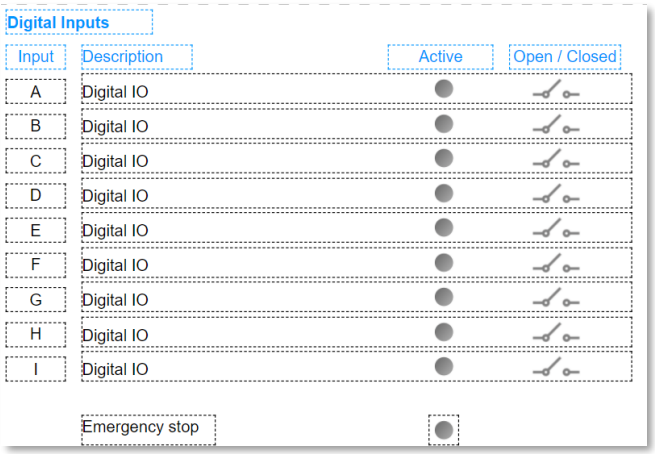
Text Area

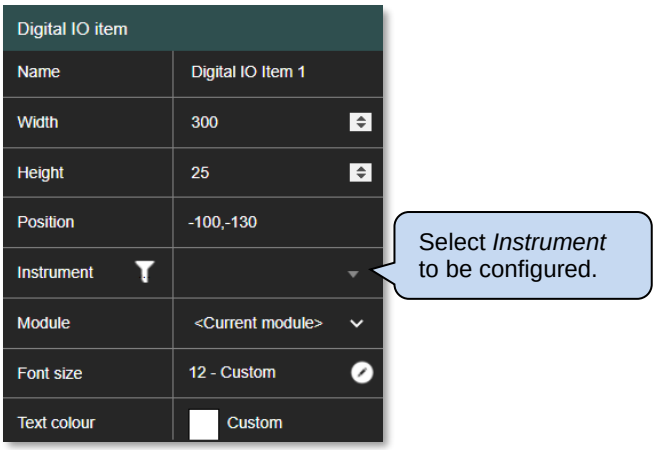
This is the Text Area Widget where text can be edited in the text area window.



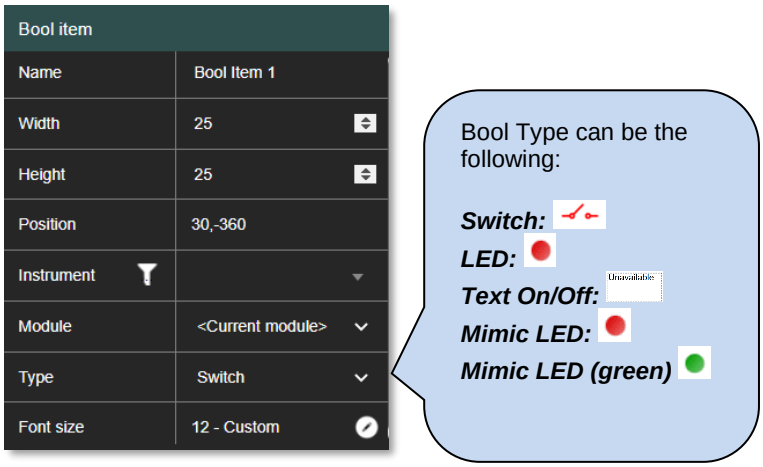


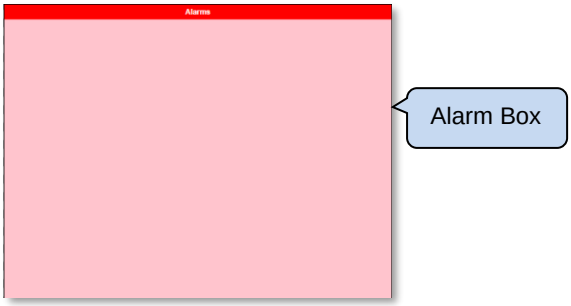
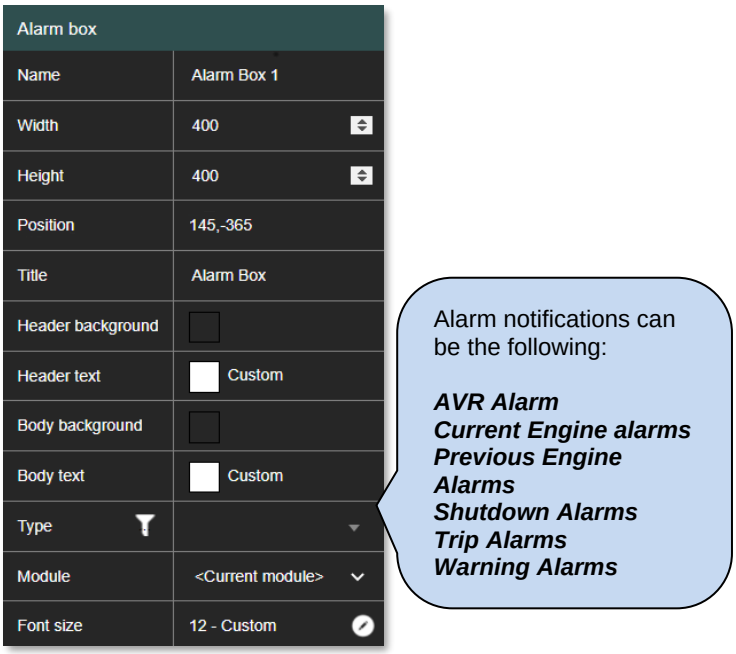
Parameter	Description
Digital I/O I/O Digital I/O	This widget displays the status of the module's digital outputs and inputs configured to a selectable *Instrument.*

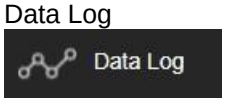
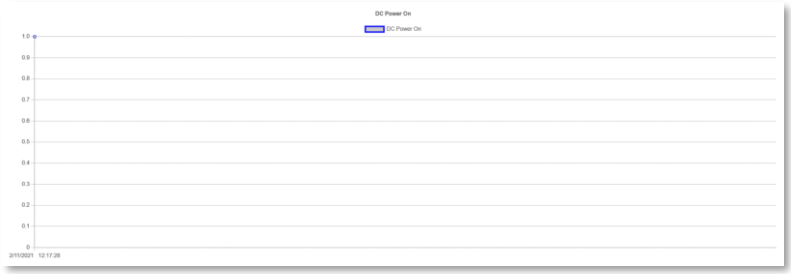
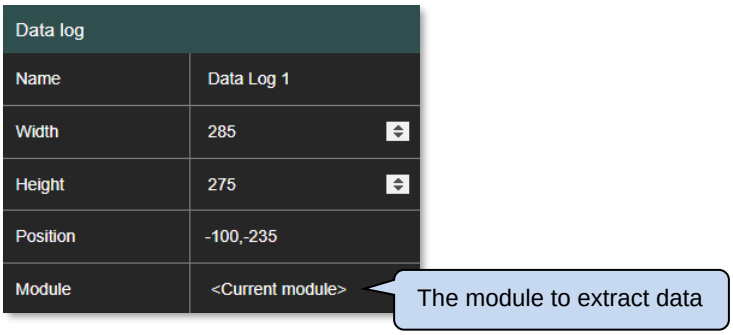
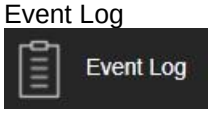
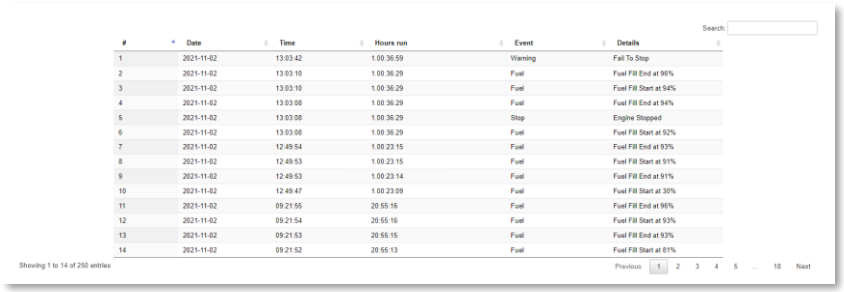
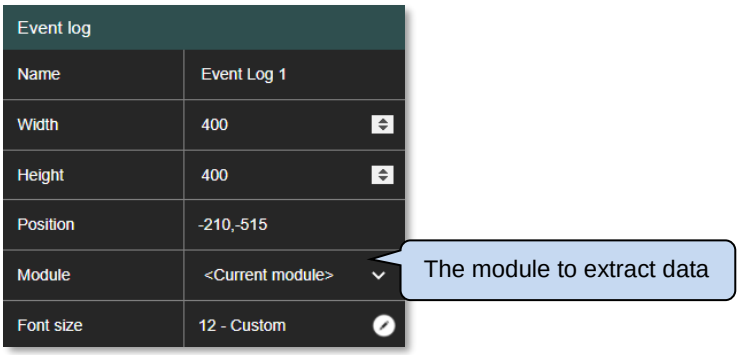




Bool Item I/O Bool Item	Shows one of two values of an instrument.



Parameter	Description
Alarm Box 	The protection included with the DSE control modules provides increasing levels of notification, depending upon the severity of the situation:   **Example** Alarm boxes can be arranged to show status of all module alarms in the example below. 

Parameter	Description
Data Log 	This widget displays and temporarily records the instruments configured within the module's *Data Logging* facility to the PC  
Event Log 	The widget displays what the *Date and Time* was when the *Event* was logged.  

Parameter	Description
Radial Gauge 	This widget displays a Radial Gauge which can be used to display instruments and their values.

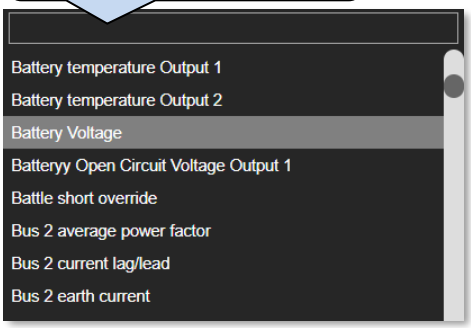
Select *Instrument* to be configured.

Check to hide Gauge if unimplemented

Use system settings. If this is selected then half of the properties disappear (e.g., min/max/units, etc). We provide these for the user. We calculate min, max etc based-on over/under alarms etc in Config Suite.

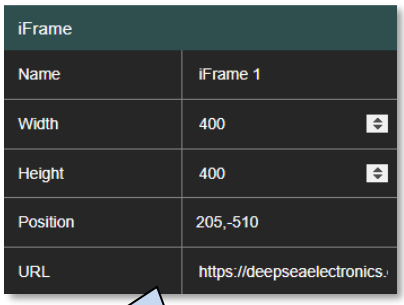
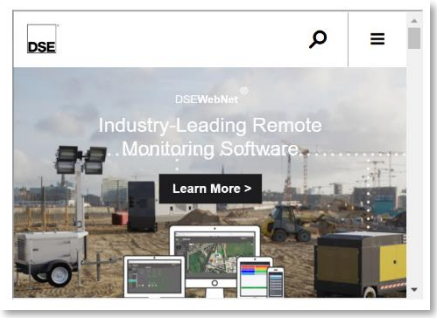
Colour setting configuration

Use search box to search for Instrument



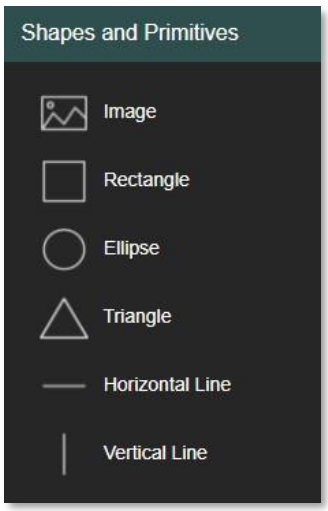
Gauge	
Name	Gauge 4
Width	200
Height	200
Position	-485,245
Instrument	
Module	<Current module>
Label	
Hide Unimplemented	☑
Use System Settings	☐
Show Value Box	☑
Show Borders	☐
Min	0
Max	100
Units	
Major Ticks	20
Danger Area (from)	90
Danger Area (to)	100
Danger Colour	Shutdown
Warning Area (from)	0
Warning Area (to)	0
Warning Colour	Warning
Background Colour	Back colour
Number Colour	Gauge point
Needle Colour	Gauge needle
Needle End Colour	Gauge needle
Major Tick Colour	Gauge point
Minor Tick Colour	Gauge point
Border Colour	Back colour
Bar Colour	Gauge needle
Label Colour	Text colour

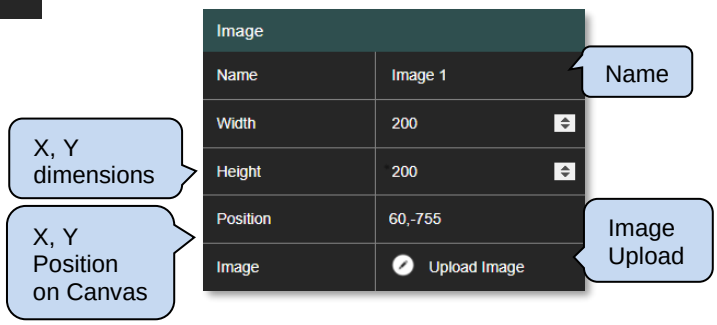
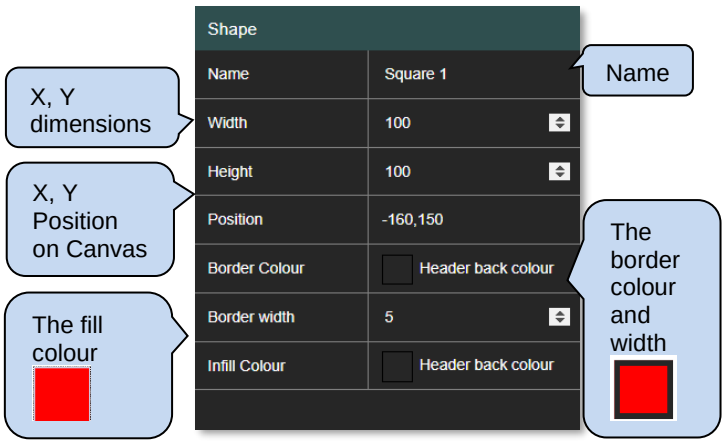
NOTE: Some instruments can only use system settings and some instruments can never use system settings and must have min/max etc. values specified by the user.

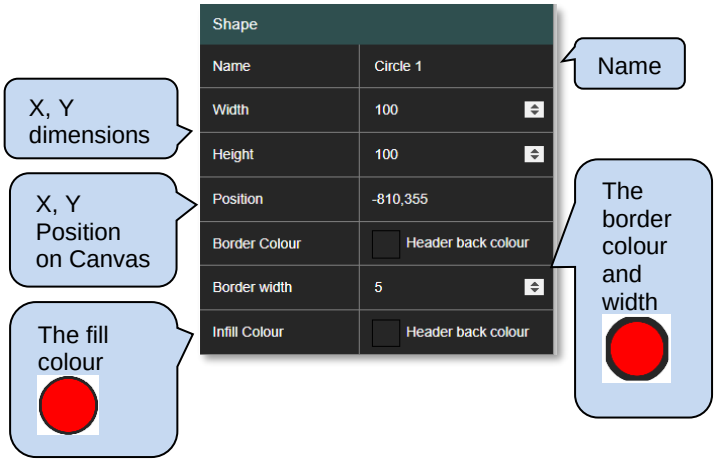
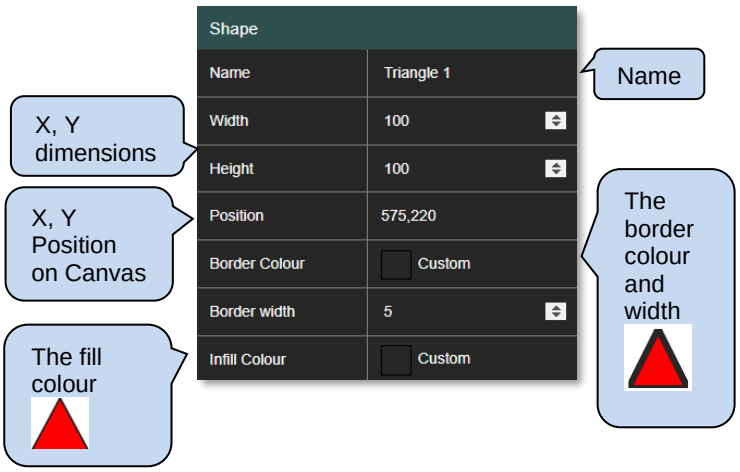
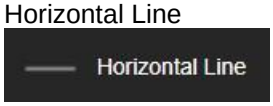
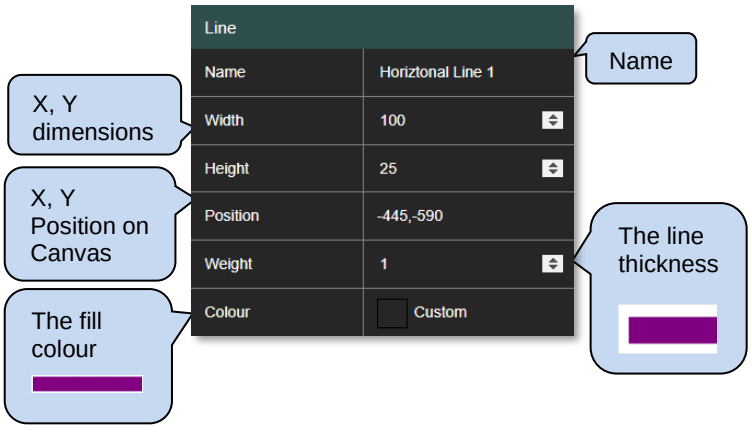
Parameter	Description
iFrame 	This widget displays a web page within a frame.   Enter the URL of the page to be displayed in the frame. **Example**  **NOTE: The URL needs to be accessible by each client. It is not accessed by the server.**

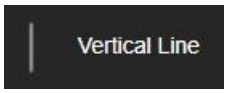
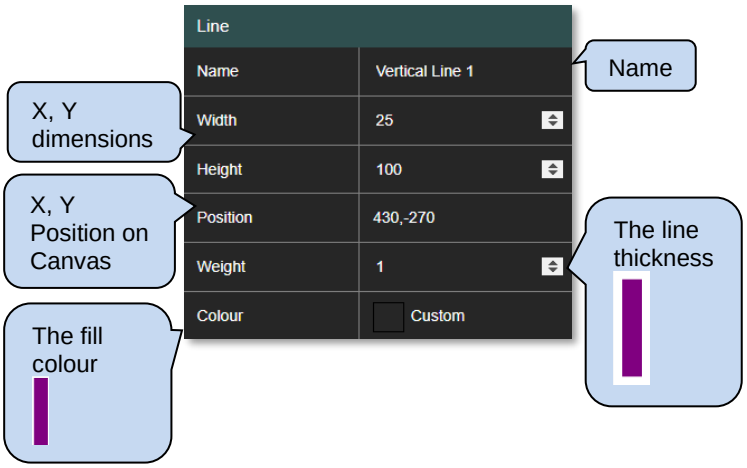
7.7 SHAPES AND PRIMITIVES

Several drawing tools are available to enhance the appearance of the layout. These are general primitives and image tolls found in most drawing packages.



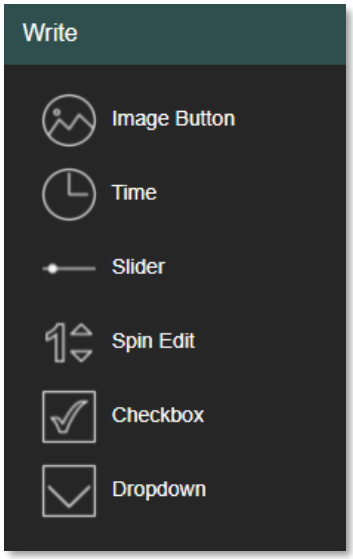
Parameter	Description
Image  	This widget allows an image to be displayed on the canvas up to a maximum of 1mB in size. 
Rectangle  	To draw a rectangle, click and drag the widget onto the canvas using the same motion as when dragging a selection box. The rectangle will appear immediately after you release the mouse button. 

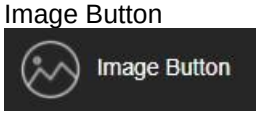
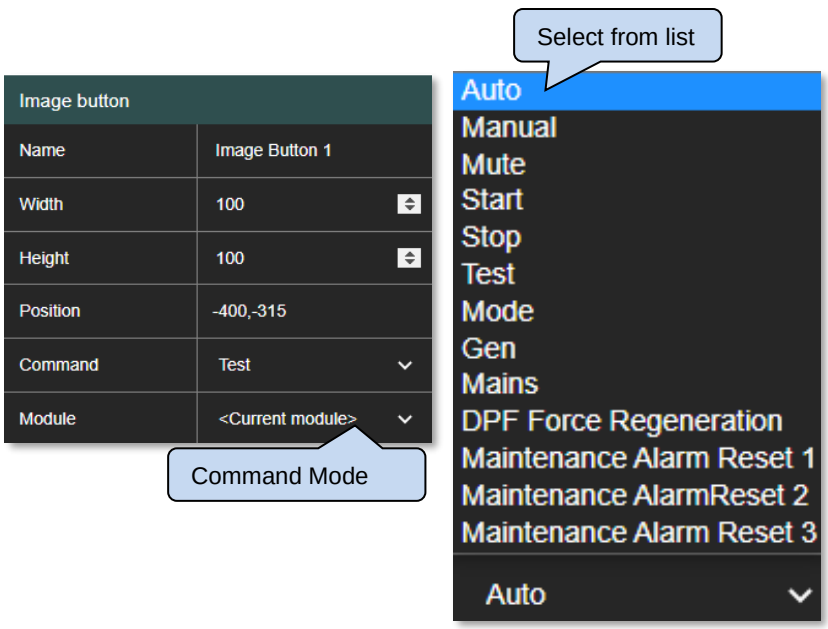
Parameter	Description
Ellipse 	To draw an ellipse, click and drag the mouse diagonally, using the same motion as when dragging a selection box. The ellipse will appear immediately after you release the mouse button. 
Triangle 	To draw a triangle, click and drag the mouse diagonally, using the same motion as when dragging a selection box. The triangle will appear immediately after you release the mouse button. 
Horizontal Line 	To draw a horizontal line, click and drag the mouse diagonally, using the same motion as when dragging a selection box. The horizontal line will appear immediately after you release the mouse button. 

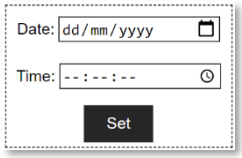
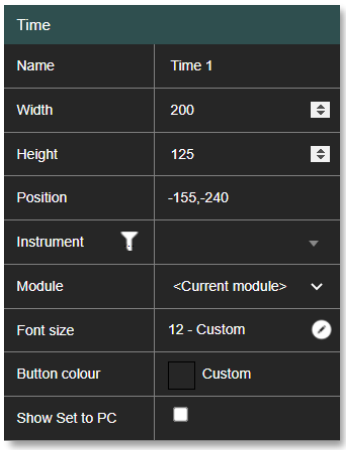
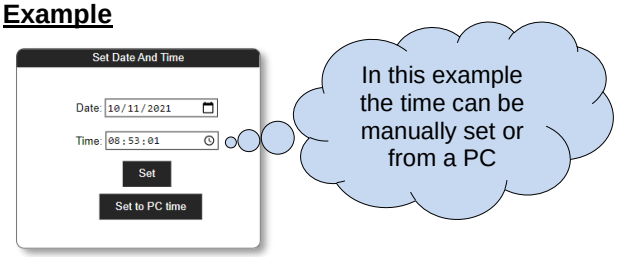
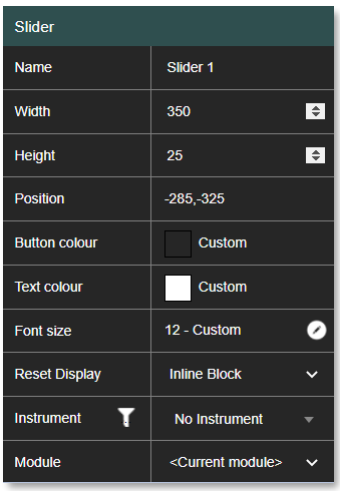
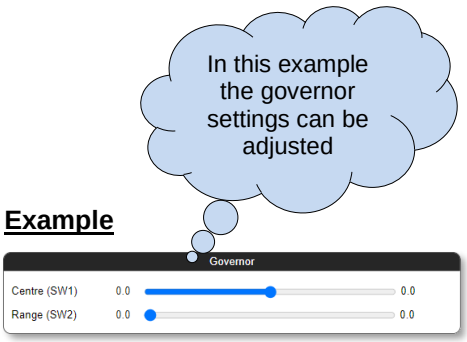
Parameter	Description
Vertical Line 	To draw a vertical line, click and drag the mouse diagonally, using the same motion as when dragging a selection box. The vertical line will appear immediately after you release the mouse button. 

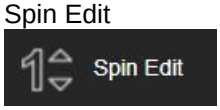
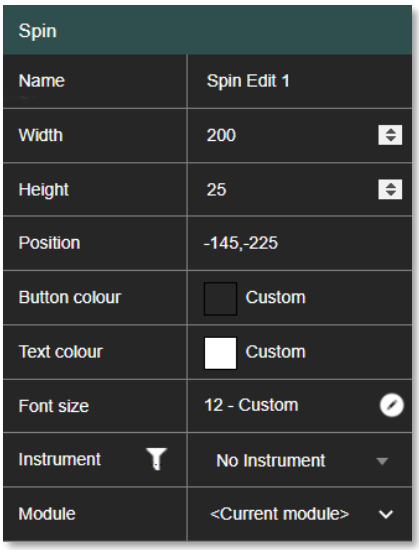
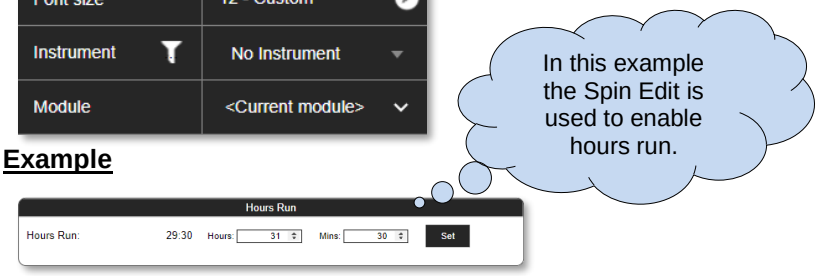
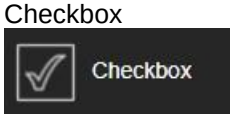
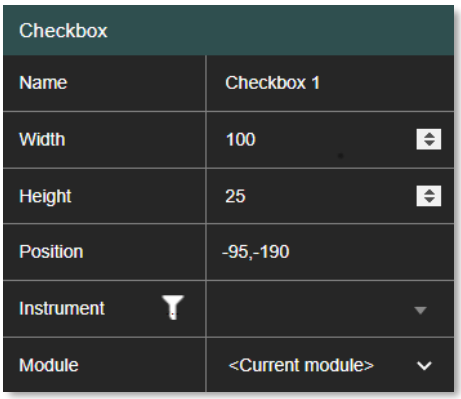
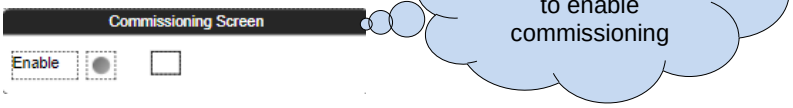
7.8 WRITE

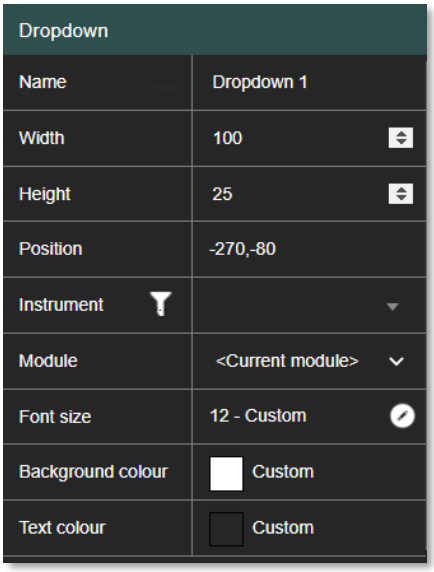
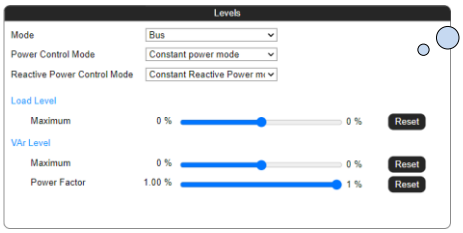
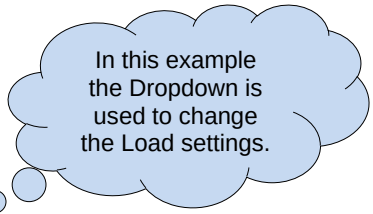
These controls allow modification to various parameters in the module. The correct user permission will be required for them to work.



Parameter	Description
Image Button 	This widget is used as a control button.  

Parameter	Description
Time Widget 	The Time widget allows the display of the current date and time. If required, it can utilise the time clock in a PC. It can also be used to set other date/times on the module. E.g., "engine run time"   **Example** 
Slider 	The slider widget can be used to Reset a value or to set a value   **Example**  **NOTE: The *Reset* is not available on all instrument types and the button is automatically shown when available**

Parameter	Description
Spin Edit 	The Spin Edit displays the current value of the setting in the group box. Clicking the mouse over the Spin box will change its colour to an active state. During the active state text can be entered using the keyboard, changed using the mouse pointer or the up and down arrows on the keyboard.   **Example** 
Checkbox 	The checkbox widget is used to set an on/off or yes/no Boolean value.   **Example** 

Parameter	Description
Dropdown 	The drop-down widget is used to select a predefined value or action.   **Example**  

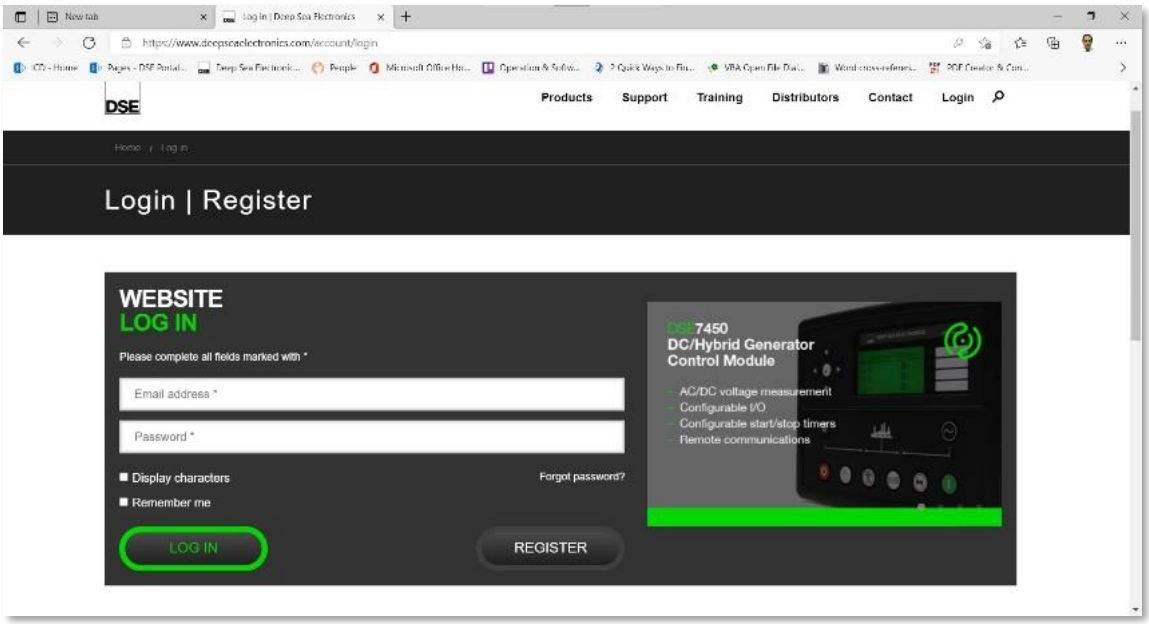
NOTE: If the Module property is left to *Current Module*, then once the Overview widget is double-clicked it will pass the Module Id of the *Overview* widget to the page.

8 APPENDIX

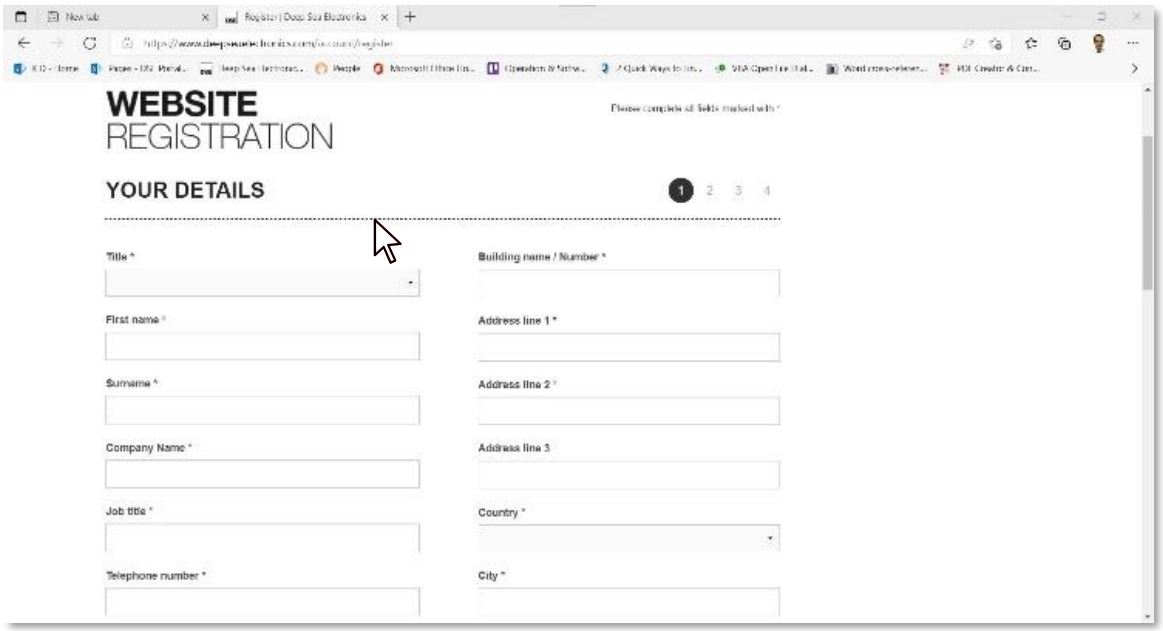
8.1 WEBSITE REGISTRATION

An account for www.deepseaelectronics.com is required to download the DSE SCADA software.

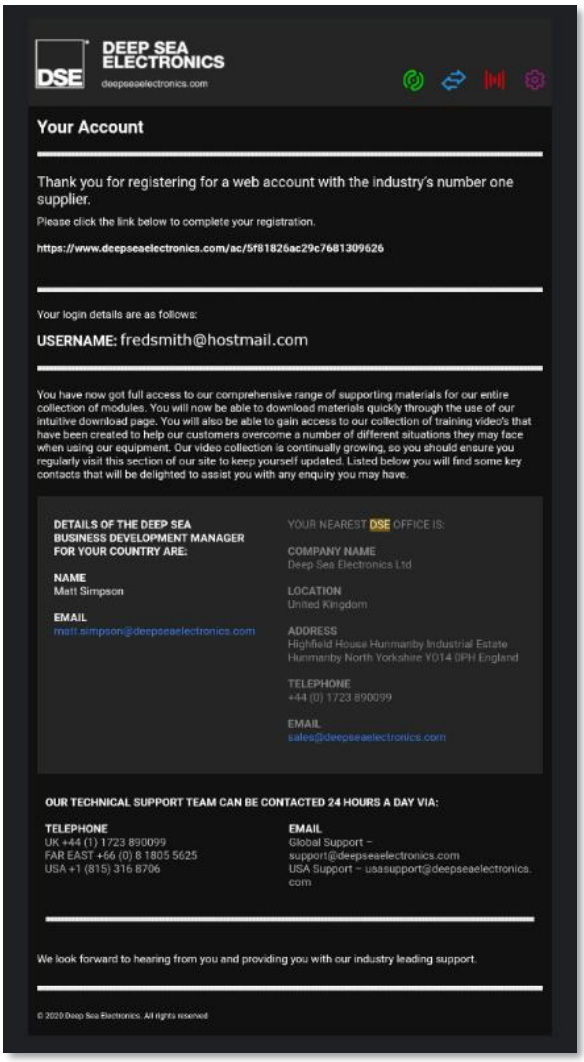
1.Click *Register* to begin.



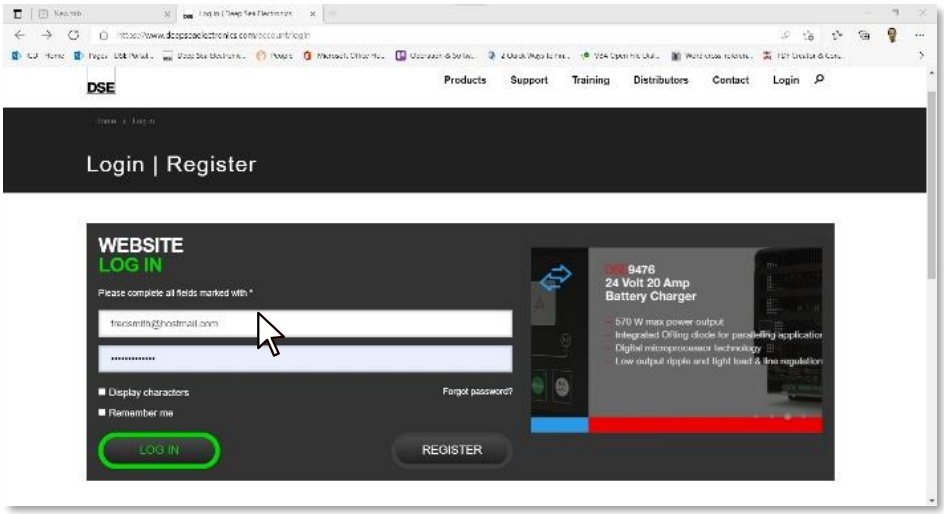
2.Fill out all entries to complete the registration.



3.Follow instructions on confirmation email to complete the registration.



4.Enter your details and press *Login* to access website.



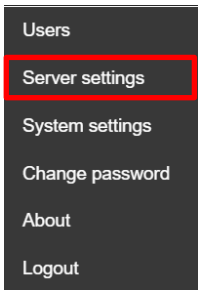
5.Click on *Support* on the toolbar and download *Scada*-software.

8.2 OBTAINING A LICENCE KEY

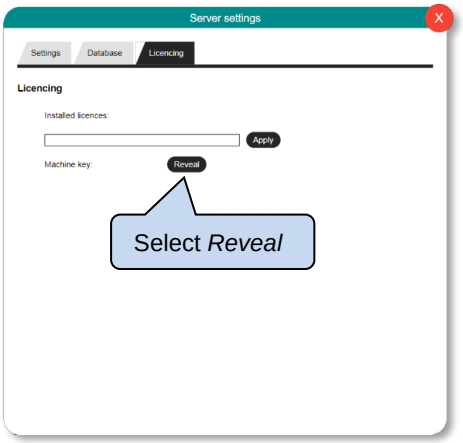
The Licence key can be obtained using the following procedure.

1) Install the software
   a) Download the software from the DSE Website: www.deepseaelectronics.com.
   b) Log into the software (see section 3.2)

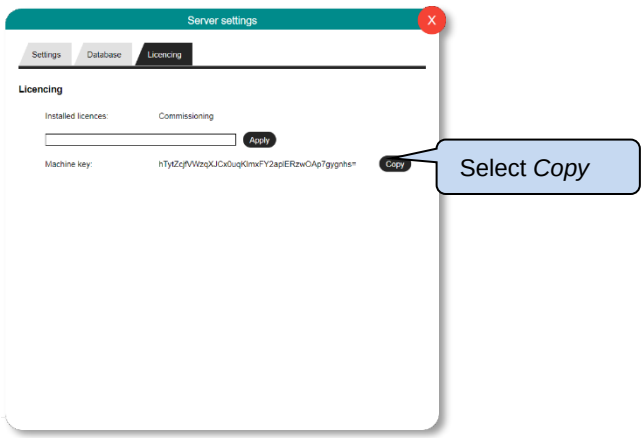
2) Obtain a Machine Key
   a) Navigate to the *Server Setting* by pressing the *User Settings* button.



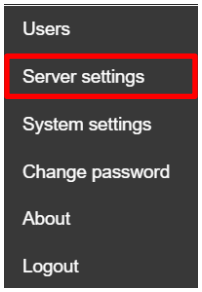
   b) Select the Licencing tab and select *Reveal.*



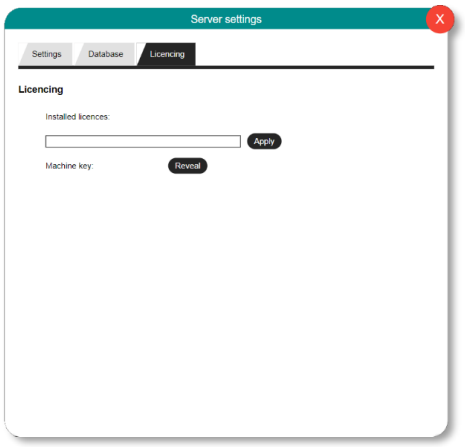
   c) Copy Machine key, either by selecting or pressing the *Copy* button.



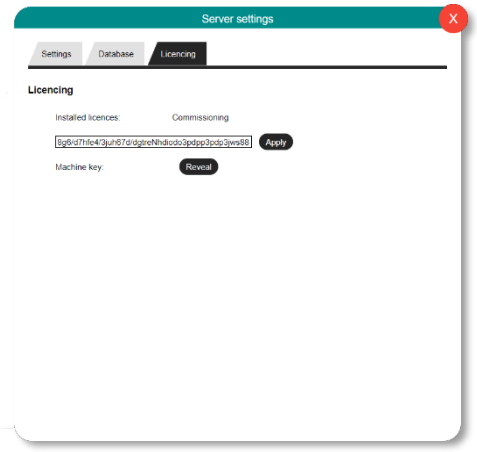
3) Order a Licence
   a) Licenses can be obtained from DSE. Raise an order with the DSE sales team sales@deepseaelectronics.com and send the Machine Key when requested.
   b) Once the licence has been supplied by the DSE sales team via email, navigate to the *Server Setting* by pressing the *User Settings* button. 



   c) Select the Licencing tab.



   d) Paste the licence key supplied by DSE and click on *Apply*. The software is now unlocked.



8.3 HARDWARE

8.3.1 CLIENT/SERVER ASPECT OF THE SOFTWARE

- Server needs to have access to the G86xx/G89xx modules on whatever ethernet connections it has
- Client(s) need to only have access to the server. They don't need direct access to the modules.
- The server ideally should be close to the modules. The ideal scenario would be a private, fast mini-LAN with minimal switches/routers
- Using remote (e.g., internet) modules are possible, but would compromise system response times and reliability
- The clients can be local (ethernet or Wi-Fi Lan) or remote (even over the internet)
- The client can be running on the same machine as a standard server but does not need to.
- The user needs to distinguish between PCs that are a server, client, or both

8.3.2 SERVER MODES

The Server has three modes

- Standalone server running as an application-This means you've got to run the separate application from the start menu, and it'll drop into the taskbar at the bottom of the screen. And you can close it from there if required.
- Standalone server running as a windows service-This means it's started automatically when windows starts and will restart if it fails for some reason.
- Built into a running client-This means the server's only running when the client is running.

8.3.3 FIREWALL CONFIGURATION FOR INTERNET ACCESS

NOTE: Refer to the modules DSE SCADA software manual further details on configuring. This configuration is referring to communications between the server and the modules. Default port per module is 502 but can be changed (by changing both module and DSE server configuration)

As modem/routers differ enormously in their configuration, it is not possible for DSE to give a complete guide to their use with the module. However, it is possible to give a description of the requirements in generic terms. For details of how to achieve the connection to your modem/router you are referred to the supplier of your modem/router equipment.

The module makes its data available over Modbus TCP and as such communicates over the Ethernet using a Port configured via the DSESCADA software.

You must configure your modem/router to allow inbound traffic on this port. For more information you are referred to your WAN interface device (modem/router) manufacturer.

It is also important to note that if the port assigned (setting from software “Modbus Port Number”) is already in use on the LAN, the module cannot be used, and another port must be used.

Firewall Rules (Client/Server)

Your firewall rules are an important part of your network security policy.

However, with any firewall rule you need to:

- Assess the risk of the firewall’s policy
- Manage firewall changes
- Maintain optimized firewall rulesets
- Demonstrate regulatory and policy compliance

As networks become more complex and firewall rulesets grow, it is difficult to identify and quantify the risk that is introduced by misconfigured or overly permissive firewall rules.

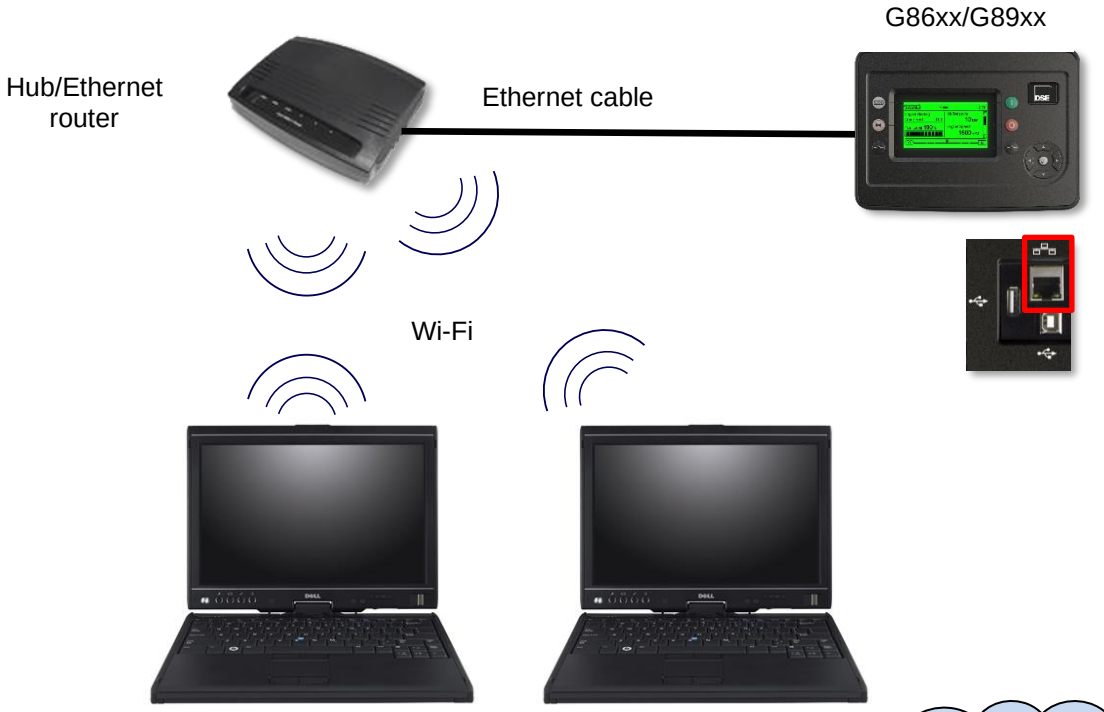
Firewall rules are required at both ends to allow outgoing and incoming traffic for local network that’s set up by the installer. The external firewall and NAPT needs to be configured to allow internet access to the server. Windows Firewall is designed as a security measure for your PC. To put it simply, a firewall analyses incoming and outgoing connections to determine whether they're threats. If you suspect that your Windows Firewall is causing connectivity issues, you can open a port for incoming traffic. The Incoming port number is 12399

8.3.4 CONNECTION TO BASIC ETHERNET

NOTE: DSE Stock a 2m (2yds) Ethernet Cable – Part number 016-137. Alternatively, they can be purchased from any good PC or IT store.

Requirements

- DSE module with the ability to connect to Ethernet
- Ethernet cable (see below)
- Working Ethernet (company or home network)
- PC with Ethernet port



Ethernet cable wiring detail

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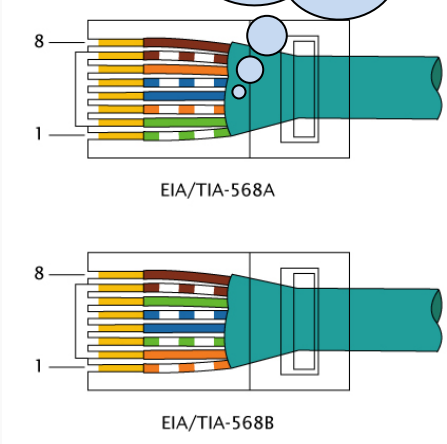
10baseT/100baseT

Pin	Connection 1 (T568A)	Connection 2 (T568A)
1	white/green stripe	white/green stripe
2	green solid	green solid
3	white/orange stripe	white/orange stripe
4	blue solid	blue solid
5	white/blue stripe	white/blue stripe
6	orange solid	orange solid
7	white/brown stripe	white/brown stripe
8	brown solid	brown solid

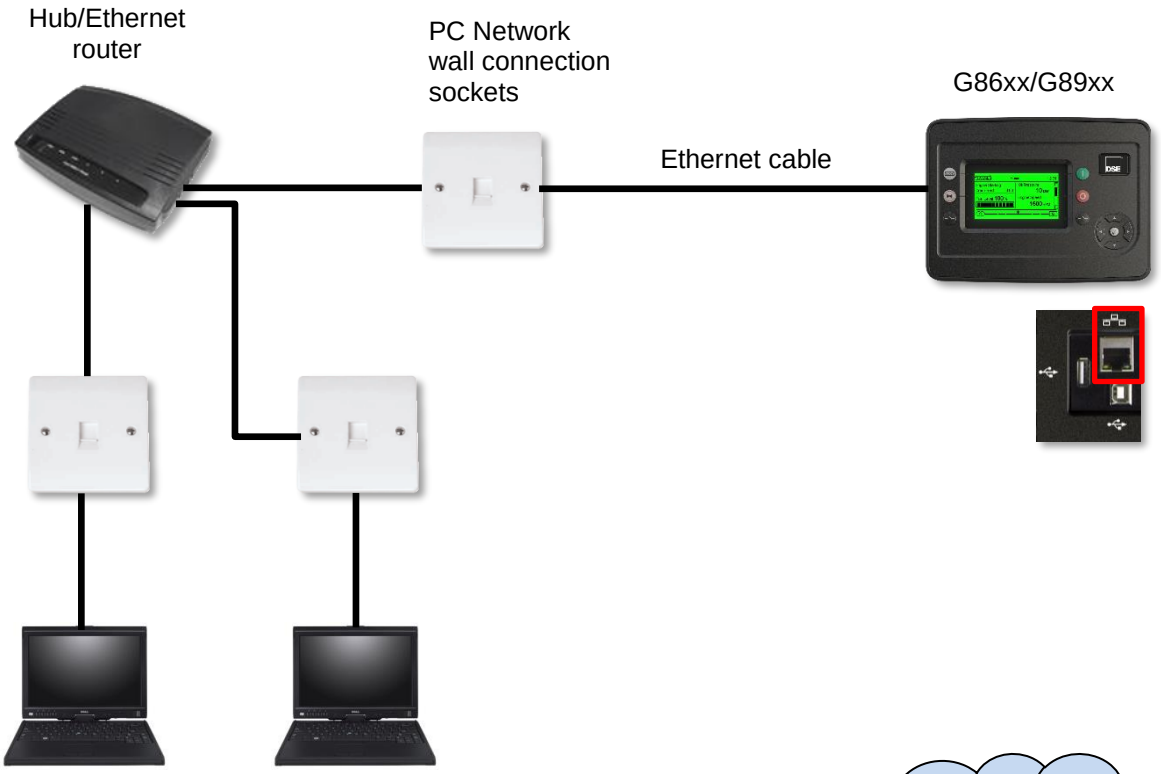
For the advanced Engineer, this cable has both ends terminated as T568A or T568B.



8.3.5 CONNECTION TO COMPANY INFASTRUCTURE ETHERNET

Requirements

- DSE module with the ability to connect to Ethernet
- Ethernet cable (see below)
- Working Ethernet (company or home network)
- PC with Ethernet port



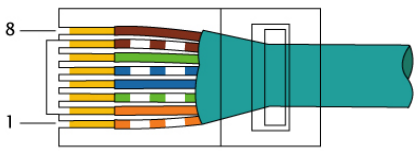
Ethernet cable wiring detail

10baseT/100baseT

Pin	Connection 1 (T568A)	Connection 2 (T568A)
1	white/green stripe	white/green stripe
2	green solid	green solid
3	white/orange stripe	white/orange stripe
4	blue solid	blue solid
5	white/blue stripe	white/blue stripe
6	orange solid	orange solid
7	white/brown stripe	white/brown stripe
8	brown solid	brown solid

For the advanced Engineer, this cable has both ends terminated as T568A or T568B.

EIA/TIA-568A



EIA/TIA-568B

NOTE: DSE Stock a 2m (2yds) Ethernet Cable – Part number 016-137. Alternatively, they can be purchased from any good PC or IT store.

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