Accord Designer

User Guide

HMI

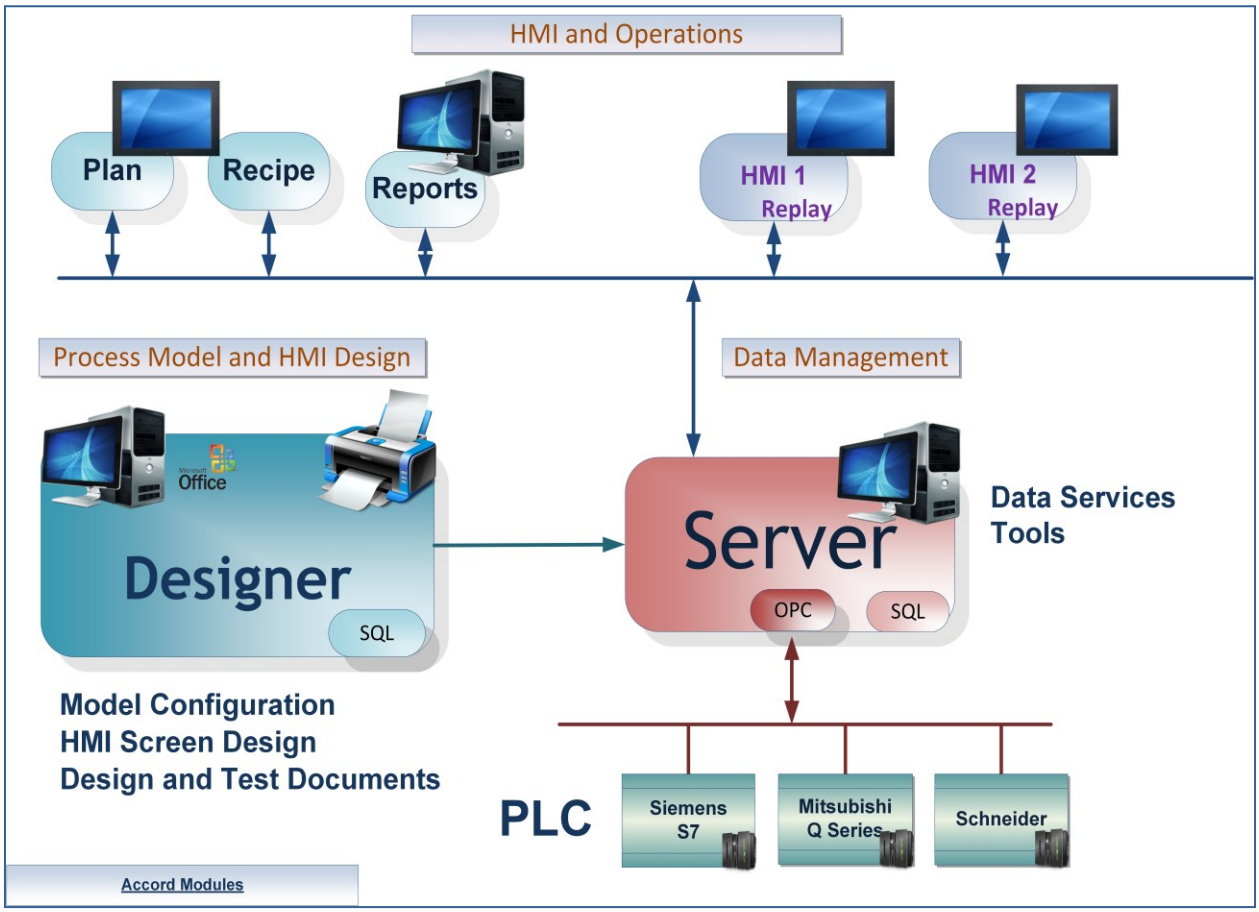
Document: **Accord Designer V4.12 User Guide - HMI.Docx**

Table of Contents

1 Introduction

Accord Designer provides a graphical environment for engineering personnel to develop process models and associated HMI screens for control systems.

Process Model development is carried out by configuring equipment and programs and HMI screens are developed by placing devices and programs onto the screens. All relevant linking and control is implemented automatically by the Accord Server service. Items are available in HMI, Recipe or other modules when initially configured in Designer.



Accord Platform Modules

The Accord Modules may be hosted on single PC or distributed across many PC's.

This document matches Accord 4.10.4.1 with Product Id.

1.1 List of Accord Platform Modules

Designer	Application for configuring Process Model and HMI screens
PLC Library	PLC Runtime Library to implement control of the process in standard PLC.
Server	For management of PLC communications including download to PLC, Data for HMI's and modules, Logging, Redundancy, Security, Recipes and MES functions.
HMI	A runtime application showing the plant and providing device and program control. The screens are set-up and configured in Designer.
Recipe Manager	For generation and management of recipes of Setpoints, Selection Decisions and Step Times.
Plan / MES	This provides scheduling of program starts or other required actions in sequence and at selectable times.
Process Audit	For query of the Server Database to generate time or event based reports, with export to various formats.
Security Audit	For query of all interaction with the control system.
Relay	This provides transfer of Data to and from networked PLC's.
Emulation	This module provides PLC Emulation for multiple PLC's
Simulation	This module provides simulation of Inputs to PLC for Emulated PLC's

1.2 General Definitions

Plant	The process plant or machine to be modelled and controlled.
Database	The information for configuration and documentation of the control system project is contained in a SQL Server Database.
Controller	A container for the setup information for the Controller – either an Emulator or PLC - and the process model information. When a Process Model is deployed to PLC the PLC then controls the Plant using Process Model data and PLC Library. The library is downloaded to the PLC using the standard PLC editor.
Process Model	The configuration of data representing the Equipment and the Programs contained in the Controller container.

1.3 PLC Control and Accord Process Model Terms

These explanations are meant to reflect common industry understanding. These signals may be either electrical or on a bus system.

PLC Control

Digital Output	A Signal, having two states (On/Off, 1/0, True/False) sent from PLC to control a device.
Digital Input	A Signal, having two states (On/Off, 1/0, True/False) received from digital device or instrument.
Analog Output	A Signal from PLC to a modulating item, usually to control the item.
Analog Input	A Signal received from analog instrument.

Process Model Equipment

Valve	Allows material to flow from one part of plant to another. Always has a PLC Digital Output and may have one or more Feedbacks.
Motor (Pump)	Causes material to be transported. Always has a PLC Digital Output and may have one or more Feedbacks.
Digital Output	An Output from the PLC without Feedback, for a Lamp or Signal.
Analog Device - Control Valve	A Valve whose opening is dependent on an PLC analog output.
Analog Device - Variable Speed Drive	A Motor whose rotation speed depends on PLC Analog Output.
Digital Input – Switch	An indication that a physical state has been achieved.
Analog Input – Transmitter	An indication of the value of a physical state. This is a PLC Analog Input.
PID Controller	PID (Proportional, Integral, Derivative) This is a controller for an analog device, which uses common PID characteristics and terminology. Example - Flow Control loop using Variable Speed pump
Unit	This is a group of devices and instruments which form a logical section of plant. Examples; Water Supply Tank, Reactor, Conveyor, CIP Supply Line

Process Model Program

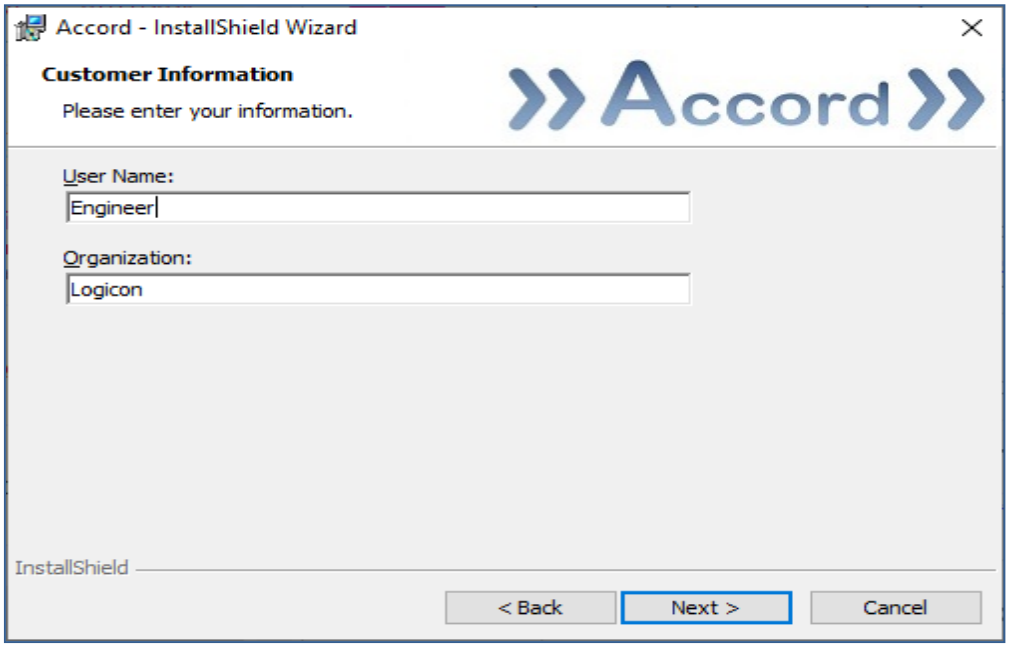
Program	This is a set of items forming a distinct part of the process. It is also known as a program or sequence, as it may consist of a sequence of steps. Example - A Sequential Program to clean a part of plant
Step	This is an individual program stage performing a specific section of the program. This consists of step components. Example - An Initial Rinse step at start of Cleaning Program
Setpoint	This is a value written in Recipe or HMI or which is examined to determine if a condition is met. It is part of the default Recipe for the Program. Example – Rinse Temperature Setpoint
Activation	This is a signal activate a digital device or digital output.
Operation	This is a function for changing a value or a program status or step. Example – Supply Control Valve to Feed Setpoint.
Program Route	This is a pre-configured path that defines how a Program carries out its actions. It consists of a set of Units, with at least one “Receiving” Unit. Any Unit on this Route will be assigned the Product ID associated with the Program.
Comparison	This is a test for status of a single item at a particular point. Example –Water Supply Tank below Empty Level.
Delay	A Wait time for an Event, which goes True when the Event is True for a configured time.
Combination	This allows combined Boolean logic to be applied to items. Example - High Pressure Level Switch AND Pressure High-High Alarm
Alarm	This is a fault in a program due to an operational failure. It may be configured to cause the program to go into Alarm and Hold. Example – Water Supply at Low Level.
Recipe	• Step Times : Time for steps in the Program. • Setpoints : List of setpoints for the program. • Decisions: List of On/Off Selections for the program.
Variable	This value is written by the PLC, usually as mathematical Operation result. Example – Water Volume used in Rinse.
Constant	This value is written only at configuration in Accord Builder for common time and setpoint values.
Product	This is a unique object used in the Program Routing System that can be assigned to both Program & Units. Each Product may also include a “Whitelist” of other Products, indicating acceptable replacements in a Route.

2 Installation

Accord Designer requires a good standard PC. Accord Server may require a high performance PC, depending on applications sizes and system requirements.

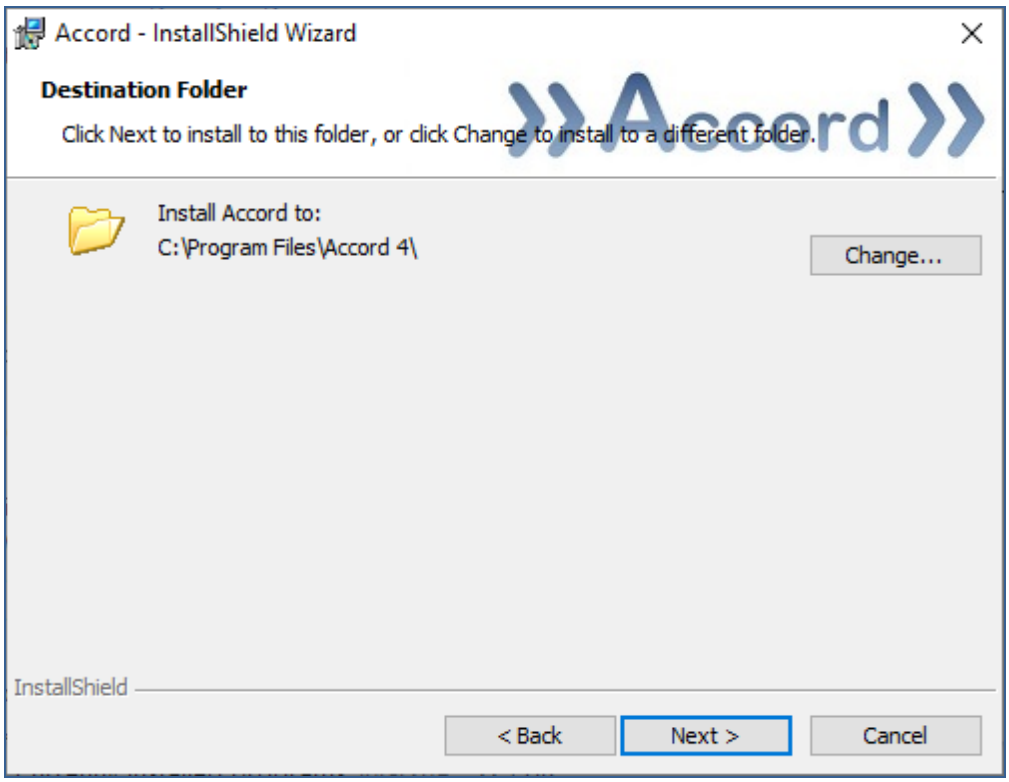
Designer is installed from Accord Setup Installer.

During Accord Setup select Designer, and any other required modules. Server should be installed, either on this or a networked PC, to provide Database management.

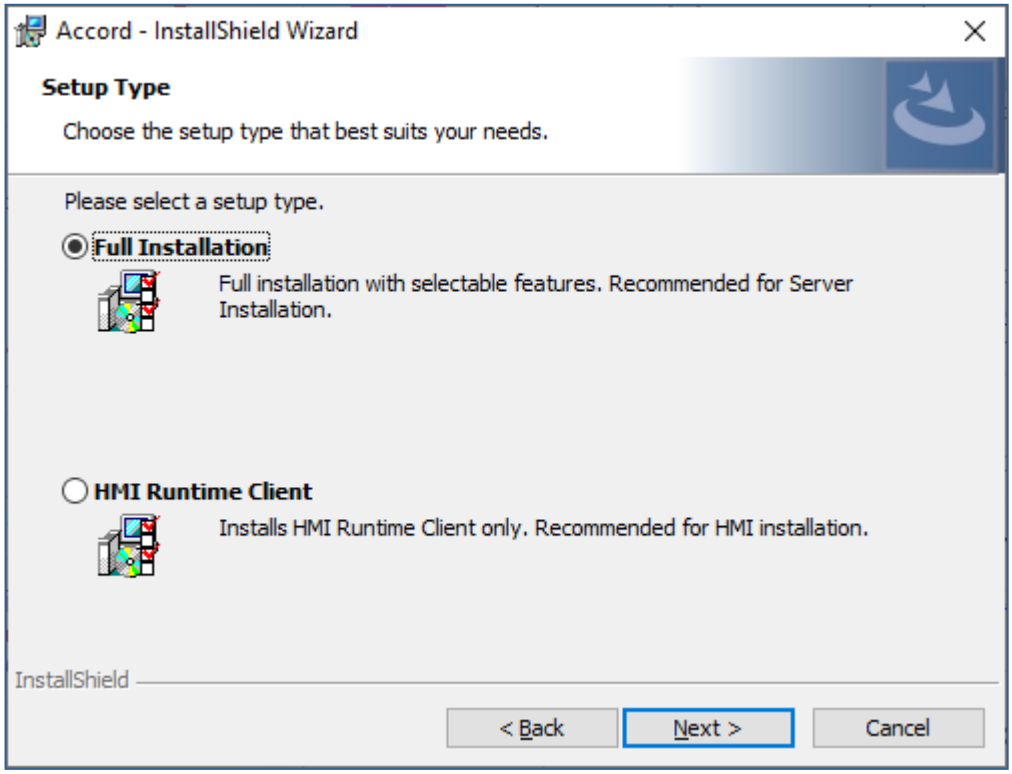


Accord Setup.exe

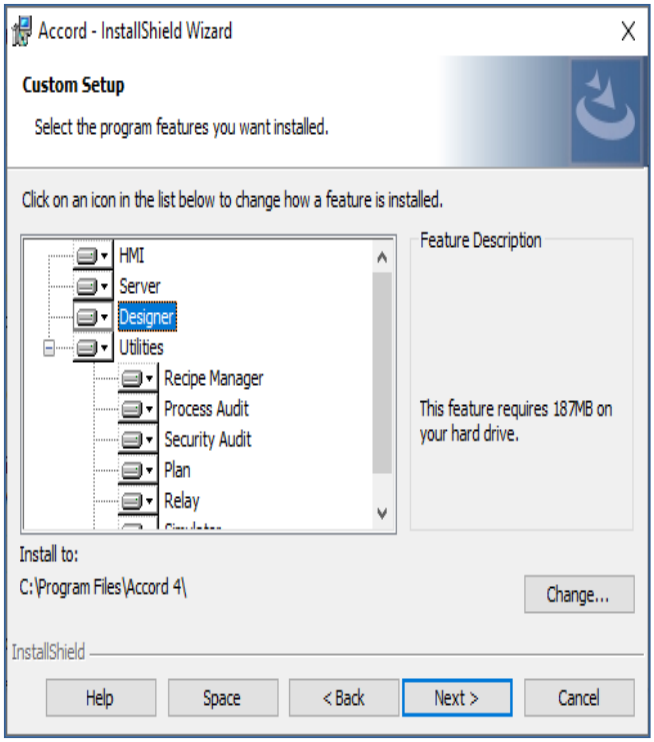
1. Entry of User Name and Organisation

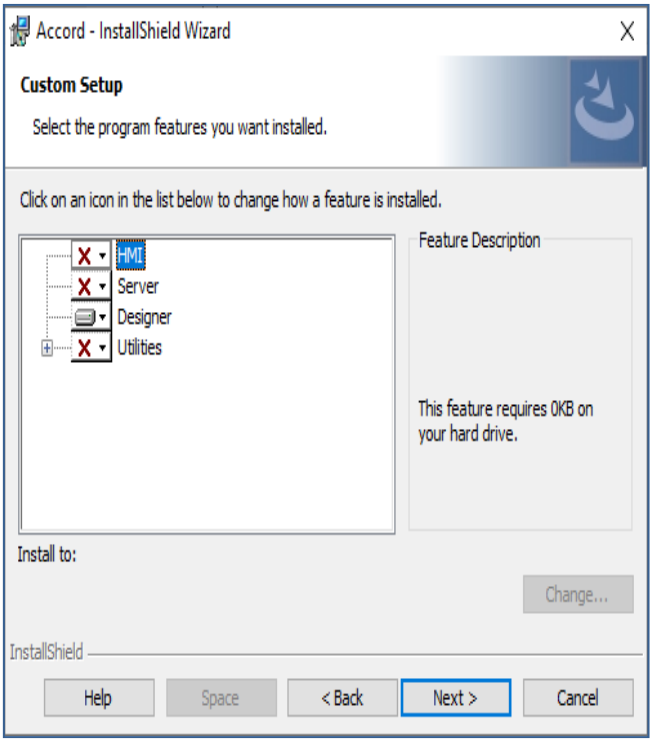


2. Installation Folder selection



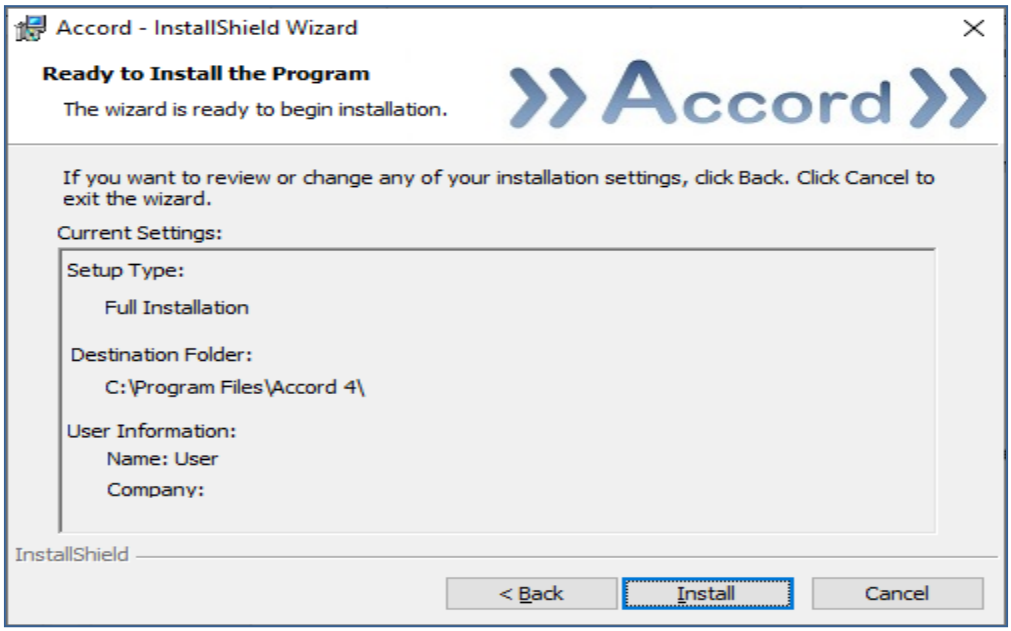
3. Installation selection





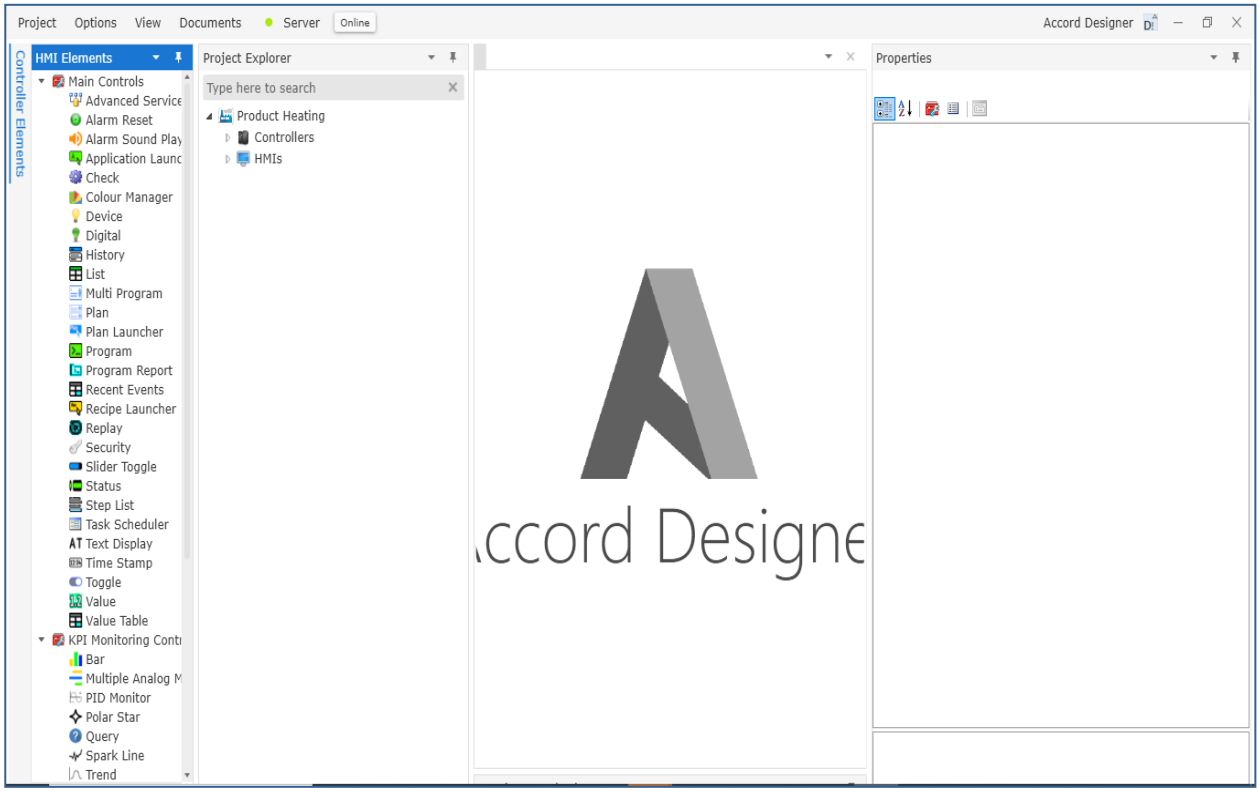
4. Selection of Designer and any other required modules. The installation is to a ProgramFiles folder but may be changed. Server must be installed on this PC or on a networked PC.

Note: Modules are selected to be installed by default. Right-click to deselect installation of a module.



5. Installation is completed on pressing Install.

3 Designer Layout



Initial Designer Screen, showing containers for Plant, Controllers, and HMIs

The Designer window is comprised of the following:

- Top Level with Plant or overall system name
- Containers for controllers (PLC's) and HMI's
- Elements toolbox for HMI and Controller elements
- Centre Panel for HMI Screens
- Properties configuration section
- Consistency Check Section
- Details section under the Plant icon
- A search window accessed by the search icon in lower right side

There is also information along the bottom border of Builder

- Status of Server connection
- Name of the signed in user

Panels may be detached and moved to different areas to suit the users workflow.

3.1 Designer Menus

Designer Menus can be found along the top banner of the Designer application. These menus include:

Project Menu – Used to Open a project or create a new project. The application can also be exited from this menu.

Options Menu – This contains Appearance Customization. This is used to change to look and feel of the Accord Designer Interface.

Documents Menu – to access the I/O List, Equipment SDS, Process Description, Process FDS and SDS documents.

Server – to access Initialisation of Server, Server Settings, Utilities and Configuration Report.

There is an indication for being Online to Server; for Online monitoring.

4 HMI Configuration

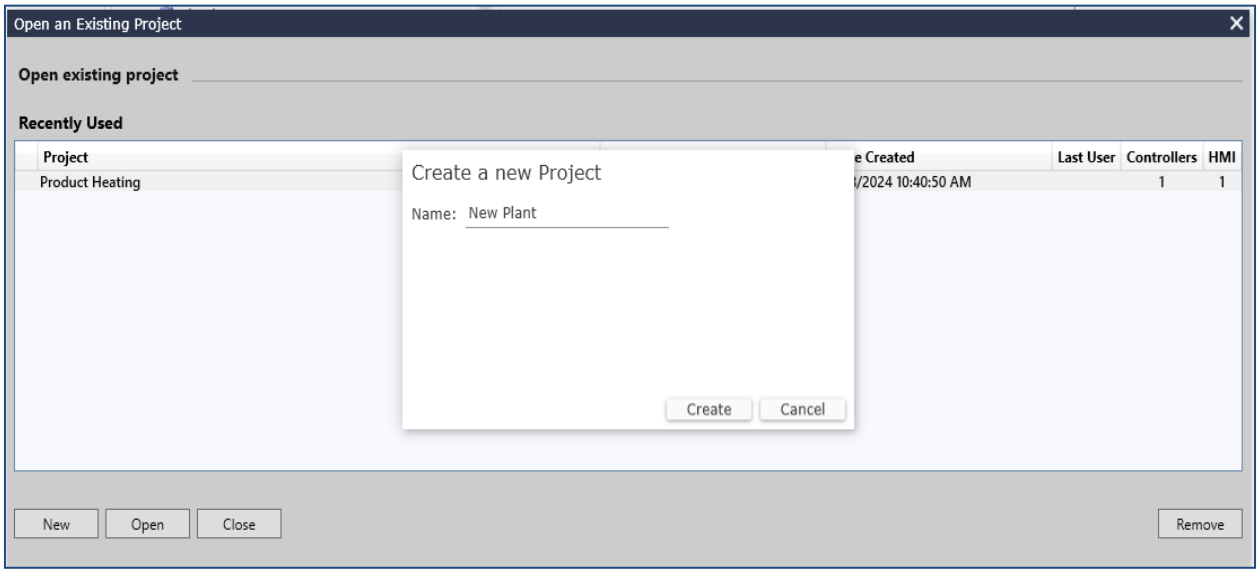
Designer includes full functionality to build Scada screens. SCADAs can be built by arranging and configuring objects. SCADA development is configured based off a pre-developed controller model, this controller model acts as a data source for development, meaning that there is no coding or tagging required to build a SCADA based off an Accord model.

Full flexibility for screen management and navigation is also provided.

HMIs are configured within Projects. Objects for the HMI are obtained from objects in a controller, so there must be at least one controller in the project. This controller information can be developed into a SCADA system using the flexible screen management and navigation provided.
The aim of this application is to make configuration of a Scada system easy and understandable.

4.1 Creation of a New Project.

This prompted appears if there are no existing projects. A new project can be created by adding a name and clicking “Create”. This popup can also be accessed in the top banner: Project-->New.



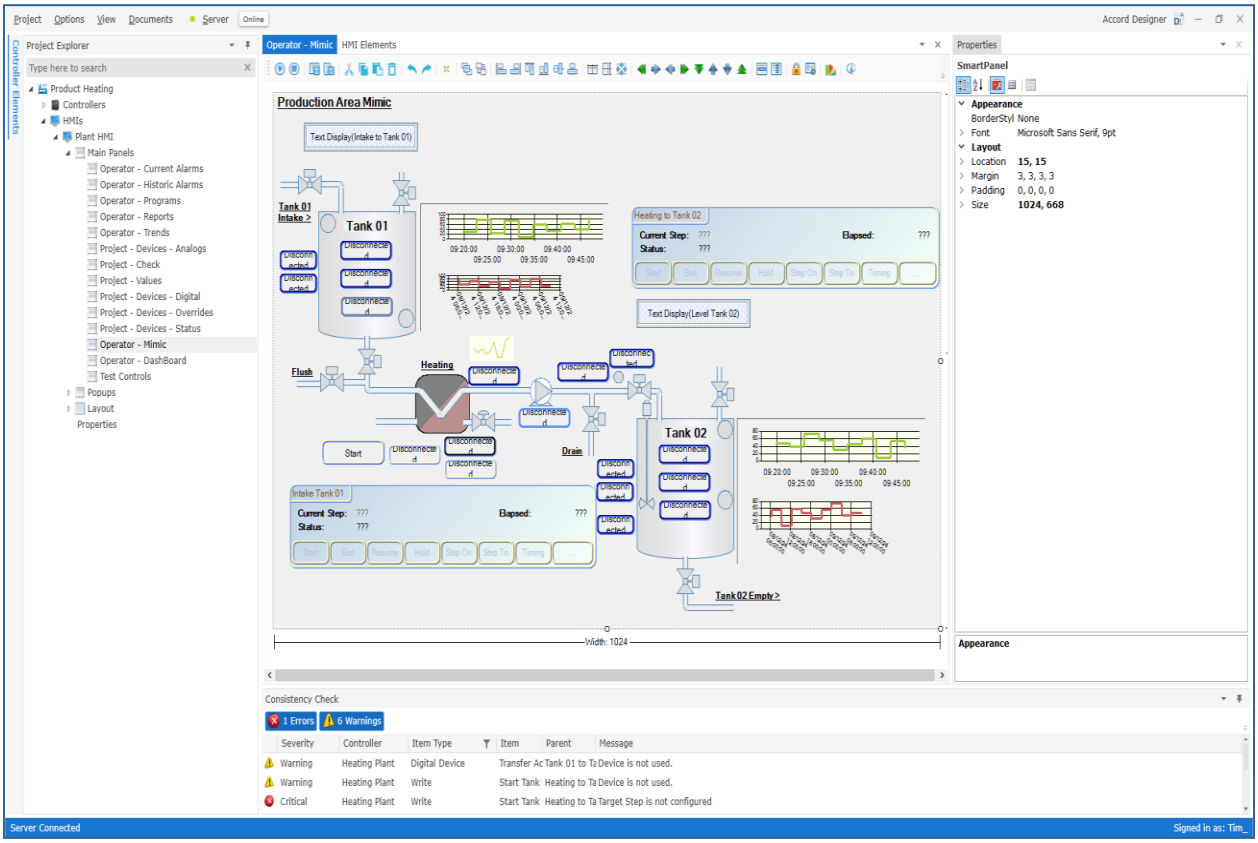
Project List with panel for New Project

If a project has already been created, it will be listed within the “Recently Used” list. This project can by selected by clicking the project name and selecting “Open”.

Note: After a project has been created, it can be renamed at any time.

4.2 Designer Layout

Designer provides a method for configuring Process Models and HMI by defining Equipment Objects (such as Valves) and Programs and Program objects (such as Alarms) and linking these items by listing them in tables to provide required functionality. HMI screens and objects are configured in the same application and linked to the same database for ease of use.



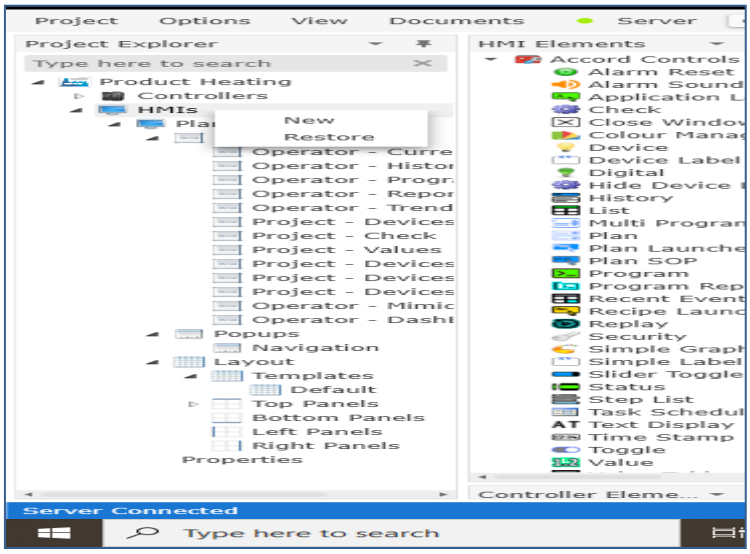
HMI configuration

The Screen shows a HMI configuration with

- a Tree structure for configured screens and popups at left hand side
- a toolbox for HMI Elements as next left hand side
- one Main Panel as a mimic in middle
- a Properties section at the right hand side
- a HMI Toolbox at top of Panel

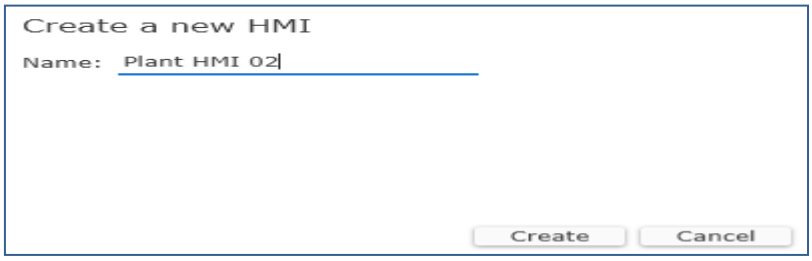
4.3 HMI Top Level Menu (Right-Click)

The top level menu allows creation of a new HMI or restoration of a backup HMI.



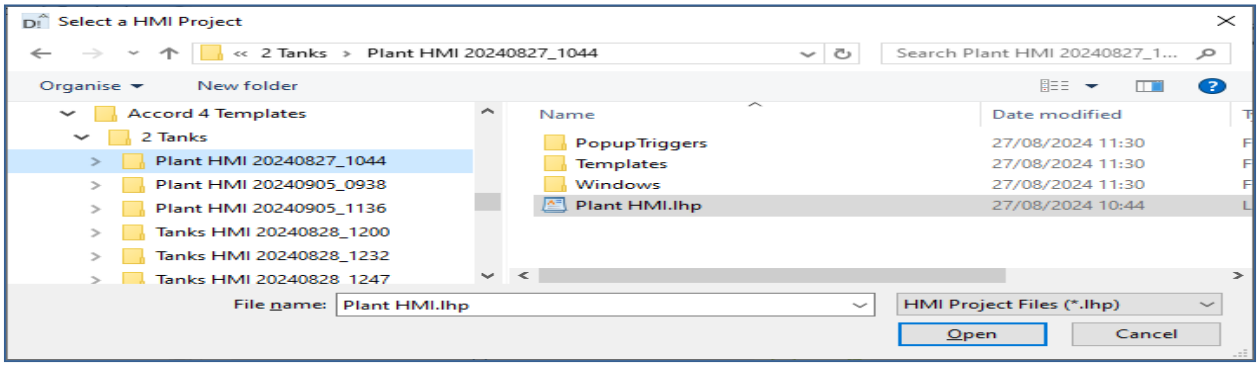
Top Level Right-Click menu

New: The New HMI is created on selection of **New** and entry of a unique name for the HMI.



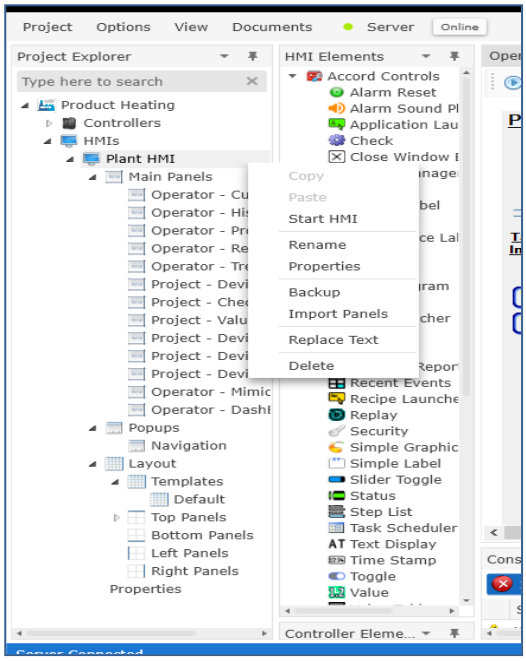
Creating a HMI

Restore: A HMI is Restored on selection of **Restore** and the source folder and lhp file. The HMI will restore to the name of the lhp file, so this must be unique in the project.



Restoring a HMI

4.4 HMI Instance Menu (Right-Click)



HMI Instance Menu

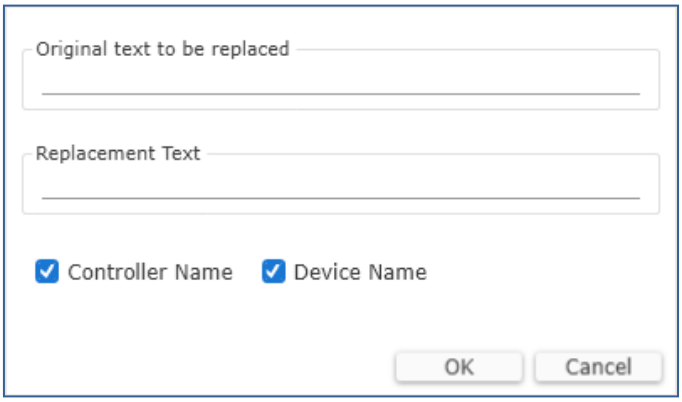
The HMI level allows the following functions for the HMI instance:

Start HMI : This runs the current instance in a hosted version of Accord HMI Runtime, limited to a maximum duration of 30 minutes.

Rename: This allows rename of a HMI instance by entering new text in the Name field.

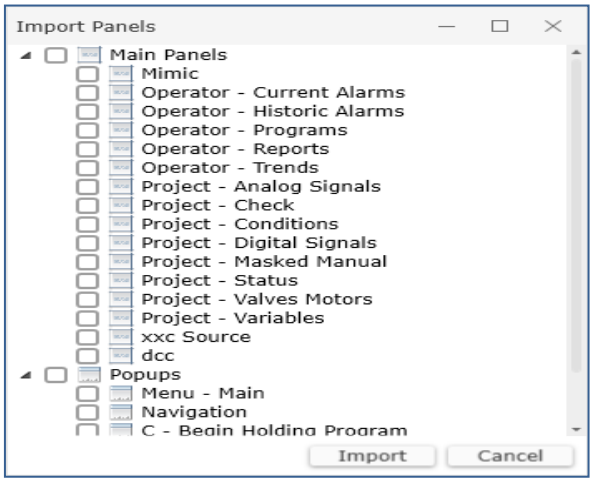
Backup: This allows the HMI to be backed up to a specific folder for storage or later restoration.

Replace Text: This provides a global text replace function. This can be used to reassign all objects in an instance to a new controller or to replace device object names.



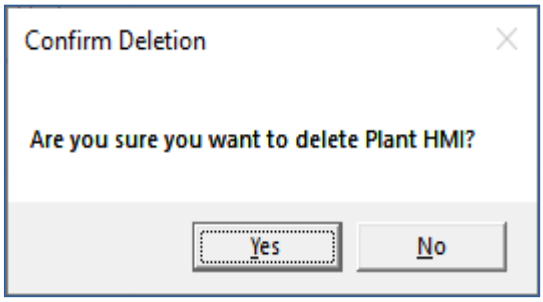
Text Replacement

Import Panels: This allows the import of one or more panels from another application. Select the folder and lhp file to import, then select the desired panels to be imported by tick-box and selecting **Import**. The imported panels will be at the bottom of the list of panels and may need to be renamed and objects in the panel may need to be renamed for project name or item name.



Panel Selection for Import

Delete: This allows deletion of the complete HMI instance.

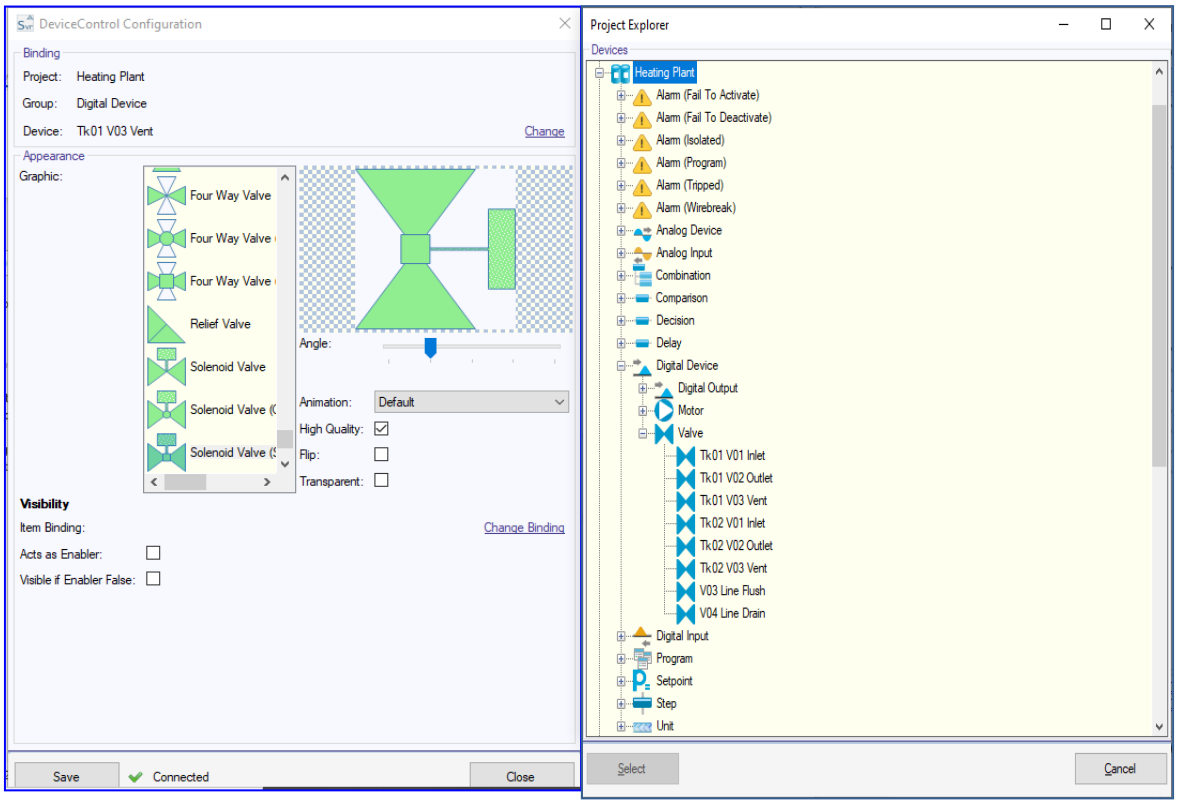


HMI Instance Deletion

4.5 Devices and Project Explorer

The Project Explorer is used for configuration of Device items on the screens. Accord provides direct links to devices from the Process Model. This creates the link between controller, server, and HMI.

To configure an HMI device, the project explorer is required. This is available under 'Change' in Properties, usually in Binding section.



The explorer allows selection of the required controller object by

Project: the Controller or Process Model

Group: the type of Device

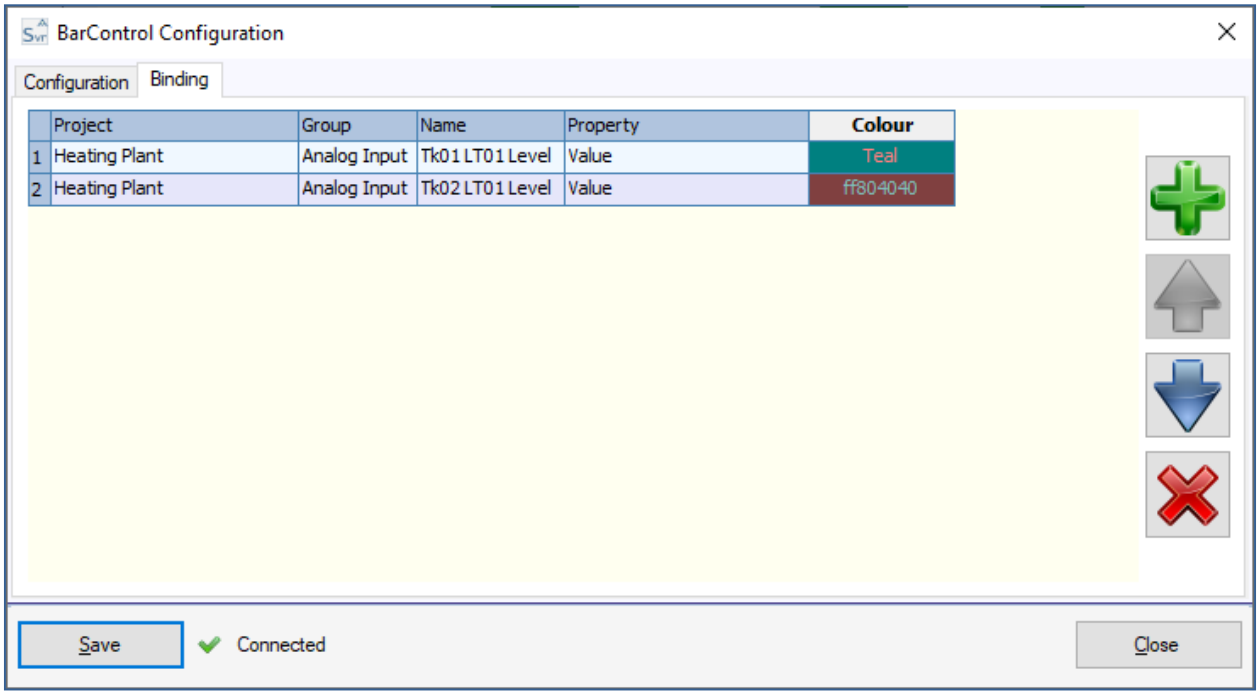
Device: the particular Device being selected.

4.6 Multiple Bindings selection

Some controls allow binding to multiple objects. This is achieved using object selection within the project explorer. Colour selection is available within the object selection for these devices. Bindings for the property / properties of a device or number of devices may be configured in the “Binding” tab.

- Clicking on the green “plus” Button will bring up the Project Explorer window, allowing the desired Device to be added to the control.
- Clicking on the red “x” Button will remove the selected Device from the control.

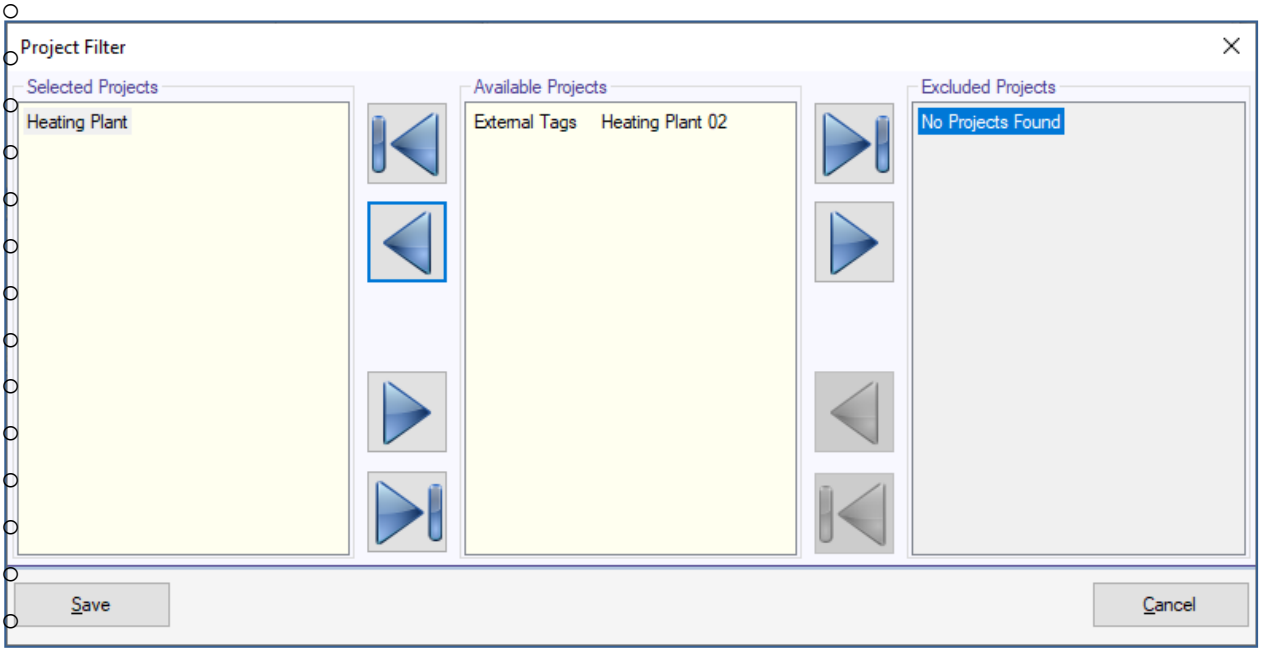
The drop-down list in the “Property” cell will allow the desired property to be bound.
Colours may be selected using the colour picker.



4.7 Process Model Project Filters

Limit which controllers can interact with the HMI application.

- **Available Projects (Models):** A list of the currently active projects in the Accord Server to which Accord HMI Design is currently connected. Models may be moved from here to one of the other lists.
- **Selected Projects (Models):** A whitelist of Models for which the control will function.
- **Excluded Projects (Models):** A blacklist of Models for which the control will not function. Note: This is only applicable when there are no projects in the "Selected" section.



Projects (Models) Selections

4.8 Common Behaviour States

The following may be used for colours in controls

- **Alarm State:** A Program is in Alarm
- **Active State:** A Program is Active, and Not in Hold, TimeHold, or Alarm
- **Hold State:** A Program is in Hold from Operator command
- **TimeHold State:** A Program is in TimeHold from Operator command

4.9 Designer Tools at Top of Panel

The toolbox at the top of the mimic panel contains tools for Design and Testing.

Designer Tools

The two buttons at the left are to Start and Stop Runtime client within Design.

The next section of tools are standard Copy, Paste, Undo type tools.

The next section of tools are Send to Back and Bring to Front

The next tools are for Alignment Left, Right, Top, Bottom, Centre.

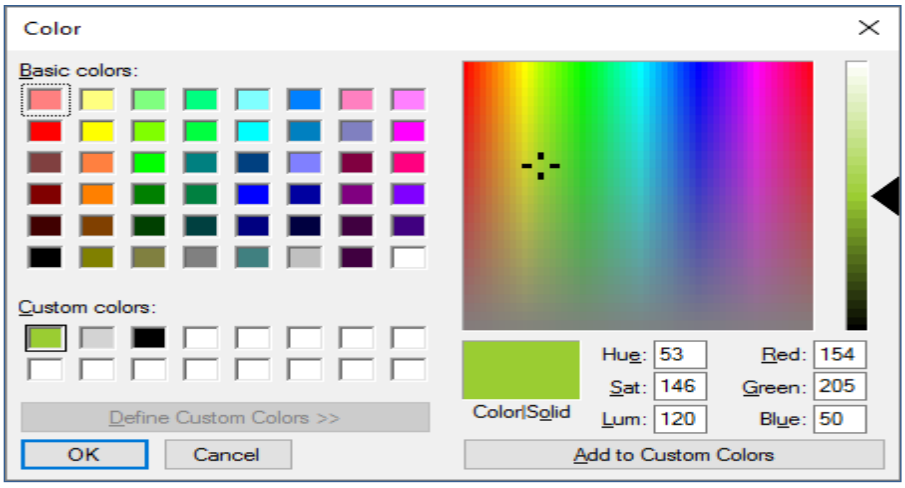
The next tools equalise width, height, and size.

There next tools are for Equalising Spacing.

There is a tool for Colour Management.

4.10 Colour Picker

The Colour Picker allows selection of colours for bindings.



Colour Picker

A colour may be saved as a Custom Colour by clicking on 'Add to Custom Colours'.

4.11 Control Configuration

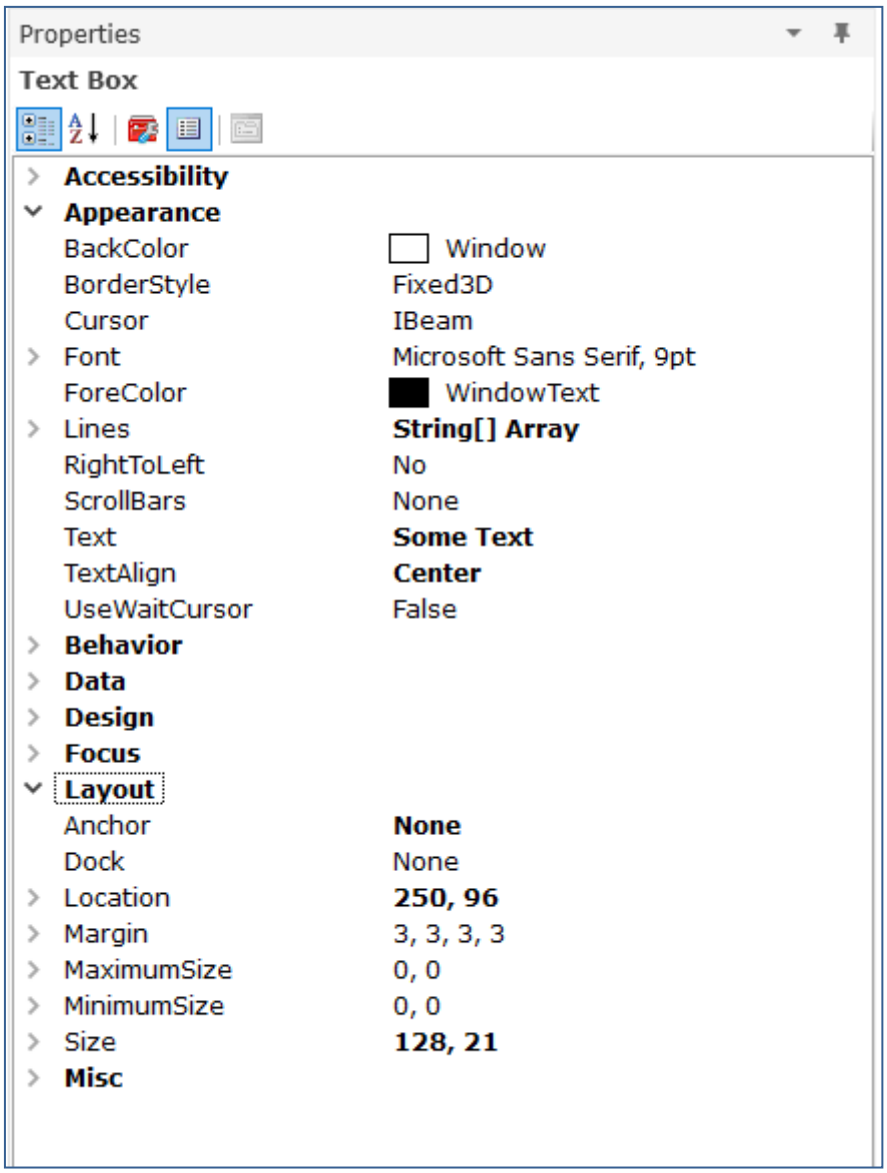
Common configuration options are:

- **Foreground:** The colour of the foreground of the control.
- **Background:** The colour of the background of the control.
- **Button:** the colour of the background of a button.
- **Borders:** The colours of inside and outside borders
- **Hide Border:** Make the item borderless on the screen.
- **Transparent:** Once the background of the control is set to "Transparent," enabling this option will allow the controls within the square border of the control to be visible, otherwise the hosting window will be visible. This is disabled by default and will have no effect in design time for performance reasons.
- **Font:** The style, size and type of the font for the text in the control.
- **Graphic:** The style of graphic used by the control.
- **Angle:** Use the slider to alter the rotation of the control.
- **Animation:** The speed of the animation / blinking of the control (when applicable).
- **High Quality:** Uncheck this to improve performance.
- **Flip:** Used to flip the control 180 degrees.
- **Connection:** By default this is the panel the control is hosted on, which is in turn the connection set in the Service Manager within the Design Application. Any Advanced Service Manager Control hosted in the current panel may also be chosen here.

Properties, such as the text, font and colours displayed on Buttons or Labels or other elements are in the **Appearance** section of the **Properties** panel to the right of the **Design** window.

4.12 Presentation properties

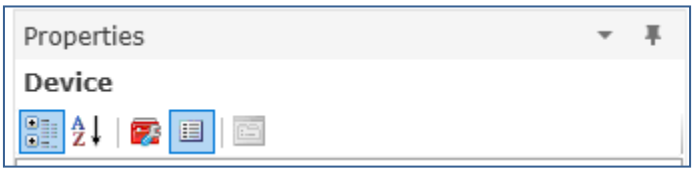
Additional properties for presentation, such as the text, font, location and size may be found in the **Appearance** section of the **Properties** panel to the right of the **Design** window.



Presentation Properties

The buttons at the top change display of the properties in the following display schemes:

Alphabetical: All properties listed alphabetically
Basic: The properties that are mostly used
Full: All the properties by section



The sections for the properties are:
Appearance: This section is used for Colours, Fonts, Graphic Type, Rotation, Transparency.
Binding: This gives details on the Contoller Object that the HMI Device is bound to.
Layout: This section contains Size, Location, Margin, Padding, Dock and Anchor
Dock and Anchor allow item location to be fixed relative to a panel.
Connection: This is the default connection

Accessibility: This section is not used
Behaviour: This section is not used
Data: This section is not used
Design: This section is not used
Focus: This section is not used
Misc: This section is not used

5 HMI Instance Properties:

This show the Properties for the HMI instance.

HMI Instance Setup Properties

5.1 General Instance Properties

The following are the general properties for the instance:

Resolution: Select or set the desired width and height for the HMI.

Primary Connection: This is the default connection used during normal operation. The IP address must be correct.

Redundant Connection: This is the backup connection which is automatically activated when the primary connection fails. The IP address must be correct.

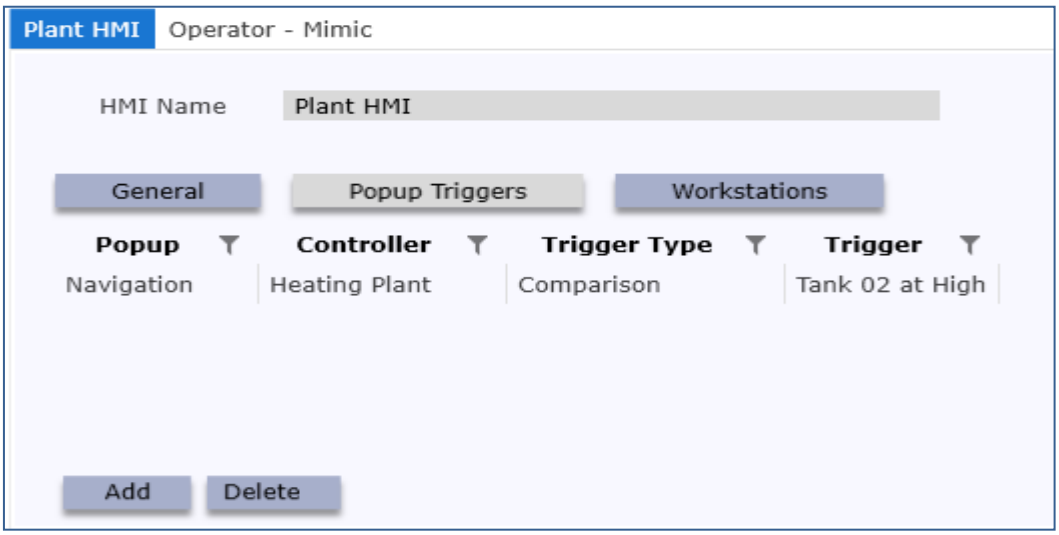
The ports should be left as 8000 and 8001 for both connections.

Startup Panels:

These are the panels the instance will start on. There will usually be a main panel and there may be other side panels selected.

5.2 Popup Triggers

A Popup Trigger causes a Popup Panel to show automatically when a PLC item becomes True.

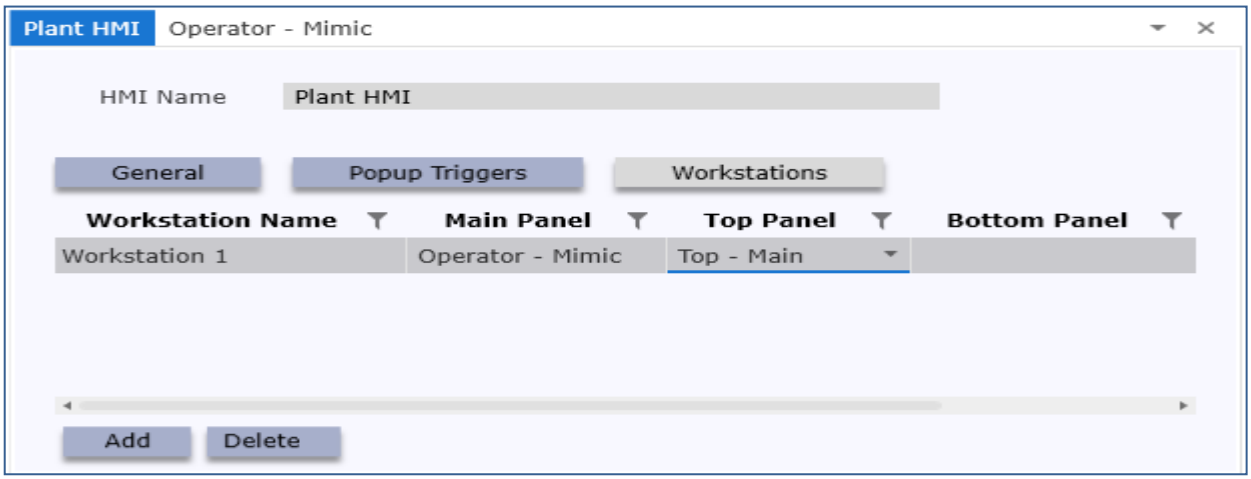


Popup Triggers Configuration

A Trigger is created on Add and selection of Popup, Controller, Trigger Type and Trigger Item.

5.3 Workstation

A HMI may be configured to have setups, called Workstations, with different **start panels** to give restricted navigation options. The required Workstations is selected in HMI Runtime Config when the client HMI application is being started. A Workstation is created on Add and selection of start Panels.



Workstation Configuration

5.4 Performance

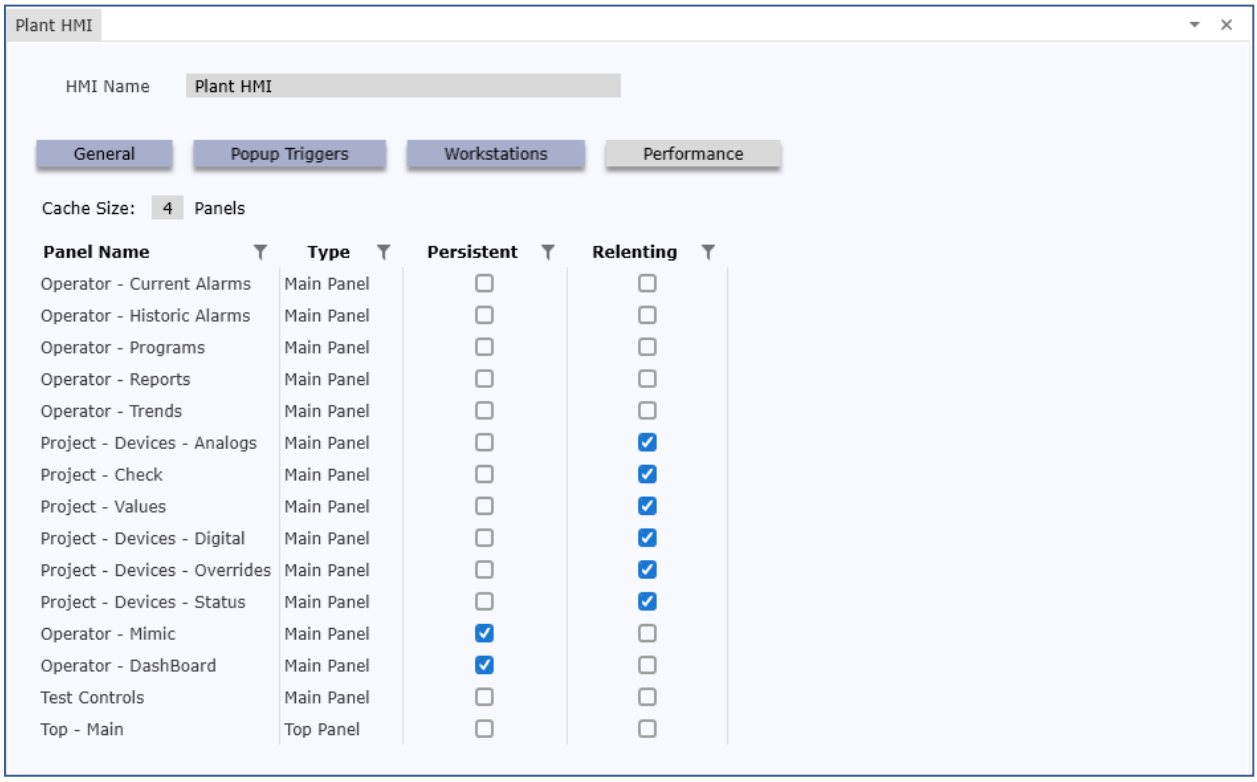
The Screens, or panels in the HMI may be configured to be kept in memory or to be dropped from PC memory when not shown. A panel which is kept in memory will show more quickly when it is reloaded.

Each panel may be selected to be

Persistent: These panels will always be kept in memory

Cached: A number of these panels, which are not marked as Persistent, will be retained in memory. The number is given by the cache size. In the example 4 panels, in addition to those marked as Persistent, will be kept in memory. The cached panels are retained on 'last shown' basis, that is that the 5th last panel, which is not selected as persistent, will be released from memory.

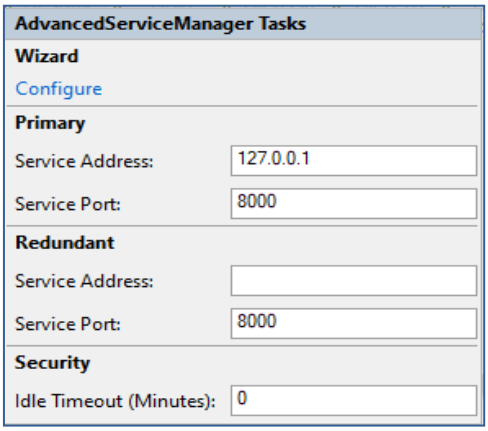
Relenting: These panels will always be released, once they are not shown. They will not be released.



Panels Screen showing 2 Persistent and 6 Relenting Panels; the remainder will be cached.

5.5 Advanced Service Manager

The Advanced Service manager can be used to allow controls with a single HMI application to multiple Accord Server services. This is not normally used, as normally a client HMI only displays from one Accord Server.



Advanced Service Manager

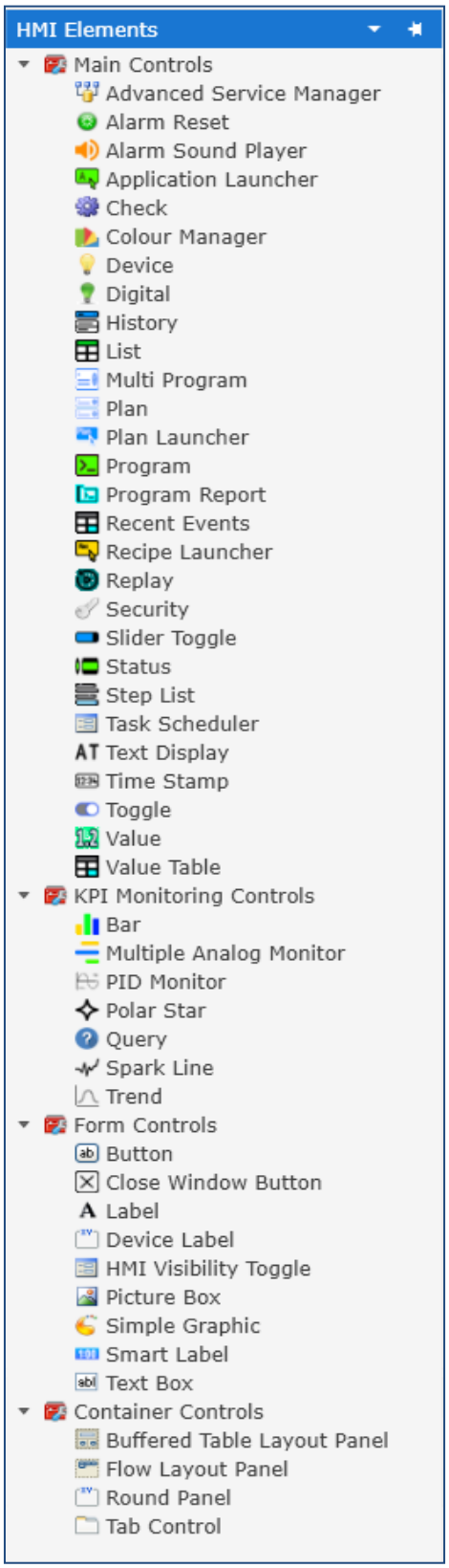
The function is invoked as a control and is dragged into a panel and displayed at the bottom of the panel, and may be accessed and configured from here.

The IP Addresses and IP Port numbers of the Primary and Partner services may be entered.

The Idle timeout for users logged into the Accord Server service may be configured also. The users are logged out if no actions are taken on the HMI for the entered time period. This value can be set to 0 if no idle timeout is required.

Note: This control should only be used in case of having more than one Accord Server service.

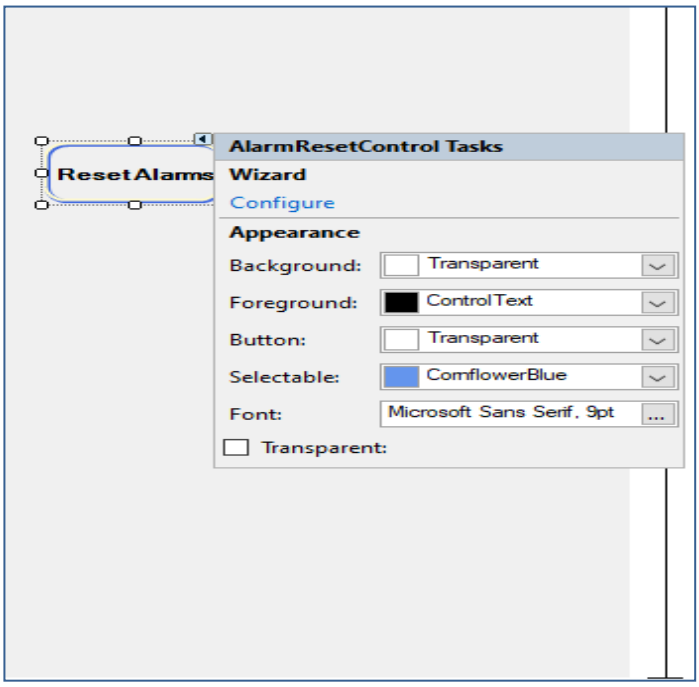
6 Main Controls



These controls may be dragged to Panels Screens and configured there.

This toolkit and all toolkits and sections in Designer may be floating or hidden, for users workflow. If a toolkit is hidden, then it will be available as a tab type at the left hand side.

Controls can generally be configured by clicking on the arrow at top right hand side of the control on the screen and clicking on the configure option.



Initial Configuration on Panel

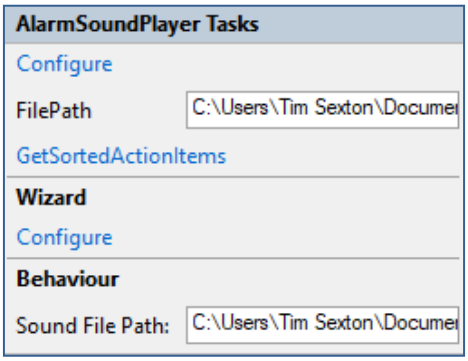
6.1 Alarm Reset

The Alarm Reset Control is used to acknowledge and attempt to reset all alarms within a project or across multiple projects. The setup allows filtering for Projects.

Reset Alarms Button

6.2 Alarm Sound Player

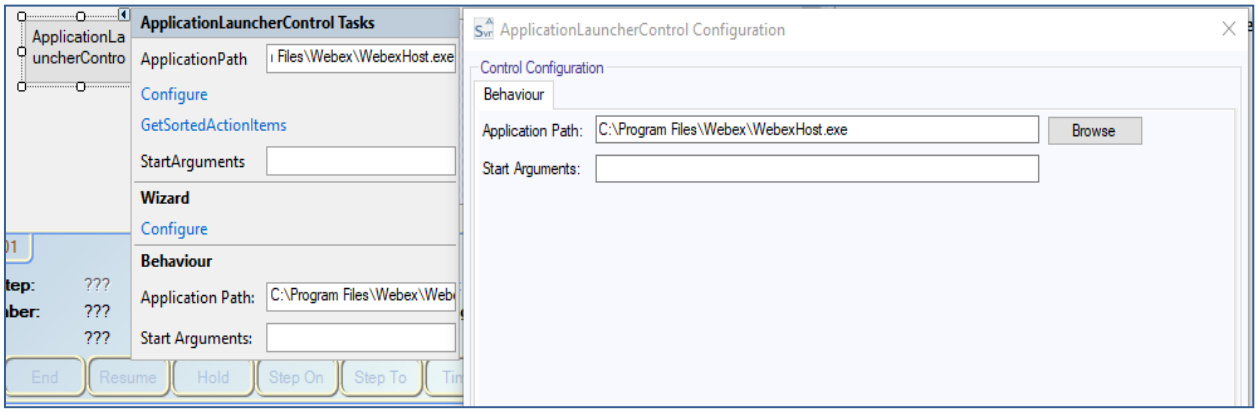
This provides for playing a .wav sound file if an Alarm or Event occurs in the controller. The wave sound file may be selected in the file path and the Alarms for the sound may be filtered.



Alarm Sound Player setup

6.3 Application Launcher

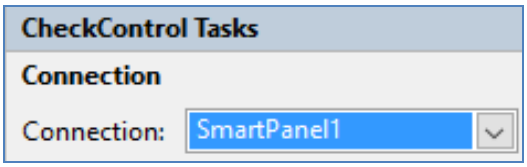
This allows an external application program to be launched on the PC. The application path and any start arguments can be configured. The program must be closed using normal methods.



Application Launcher setup

6.4 Check

The Check Control provides a method of checking logic for activations and other aspects by checking on the states of enablers of items. The control provides a status for items and panels showing the logic for the items and requires a large size in height and width.
The Connection is the only configuration option, and it will be used by the control during Runtime. The Smart Panel selection is the connection in the Service Manager in Design. Another Advanced Service Manager Control may also be chosen.



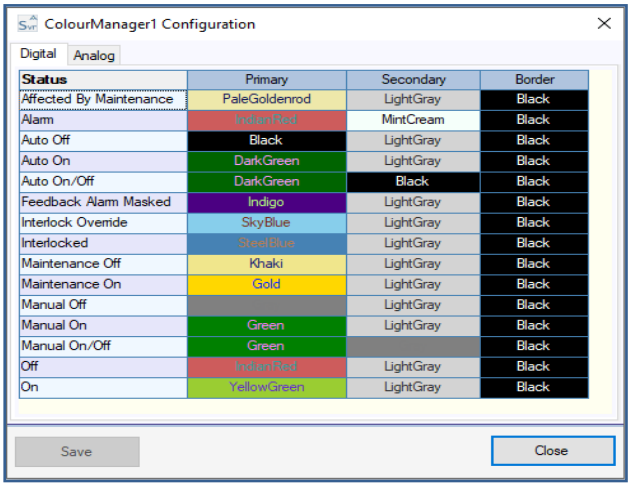
Check Control setup

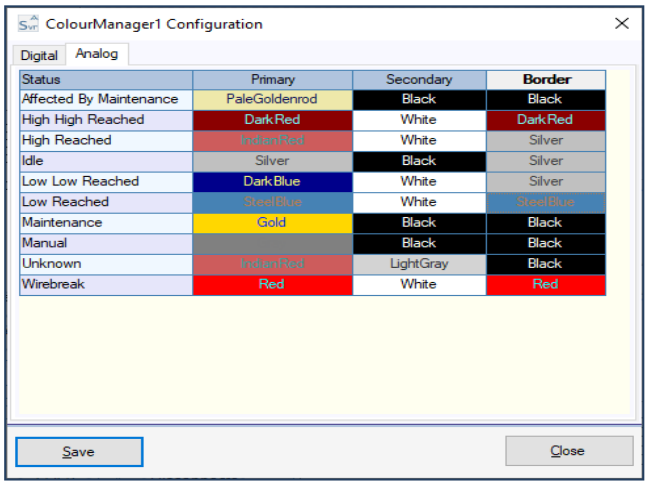
6.5 Colour Manager

A Colour Manager can be added to a panel to provide options for colours for behaviour of the controls hosted on the panel. The Colour Manager appears at the bottom of the panel.

Colour Manager setup

The configuration window for the colour manager allows for the configuration of colours using Colour Picker. There are separate tabs for digit device and analog device statuses.



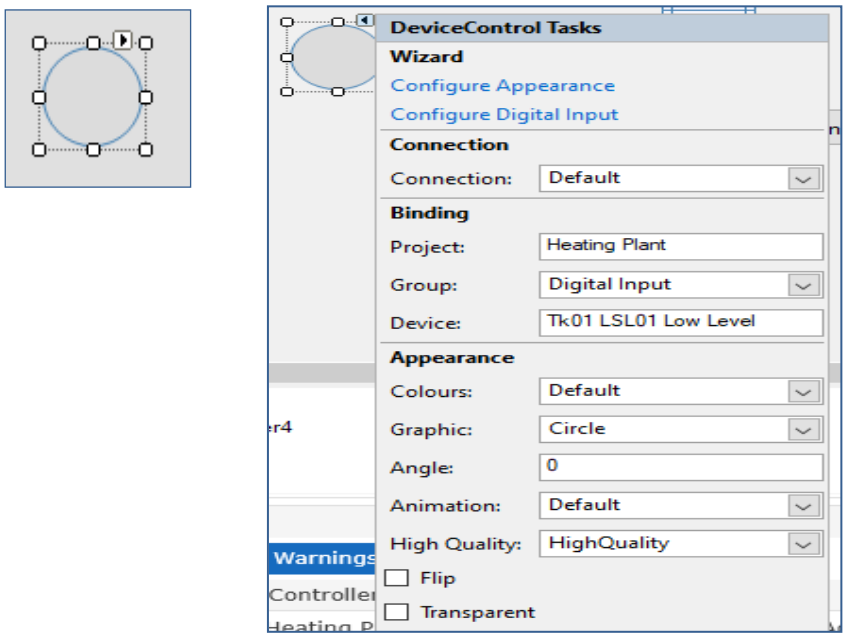


Digital setup **Analog setup**

The colours may be chosen as desired. The border colour for an Analog – Value Viewer wil be the configured colour when the Analog Input is 'Normal', not in any Process Alarm or override.

6.6 Device Control

The Device Control is used to give a graphical representation of a Boolean state.



Device Control initial on Panel and initial setup

Configure Appearance options are for appearance and to change the associated device. Configure is to provide a link to the object in Controller, to allow change of settings.

6.6.1 Binding

The Binding Section allows selection of the Device from the Process Model. Clicking “Change” will show the Project Explorer window, which can be used to select the device to which the control will be bound.

6.6.2 Appearance

Configure Appearance selection allows changing of the Shape of the Graphic, the Colour Manger, the Angle of the presentation, Animation speed. This section also allows configuration of the background of the device being transparent and the shape of the device to be inverted using Flip.

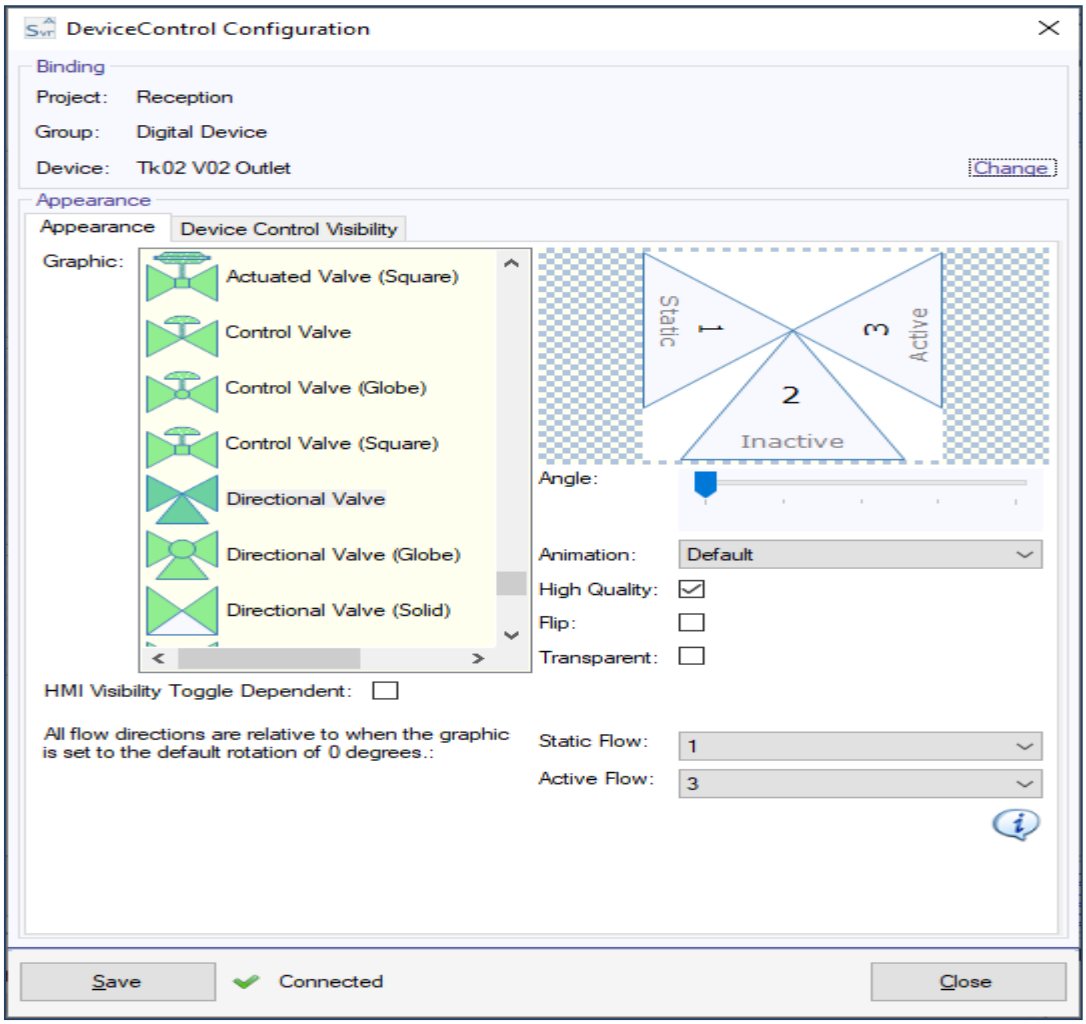
6.6.3 Device Control – Directional Valve

The directional valve has 3 ports. The colours of the valve outlet ports are dependent on the valve activation status.

The Static Port is the inlet to the valve. The Active port is coloured when Active, and the InActive port is coloured when the valve is InActive.

6.6.3.1 Default Orientation

When initially placed on screen, the directional valve display is that the Static port is on the left, the Active port is on the right and the Inactive port is downwards. This would correspond to the valve showing left to right flow when Active and left to down flow when InActive.



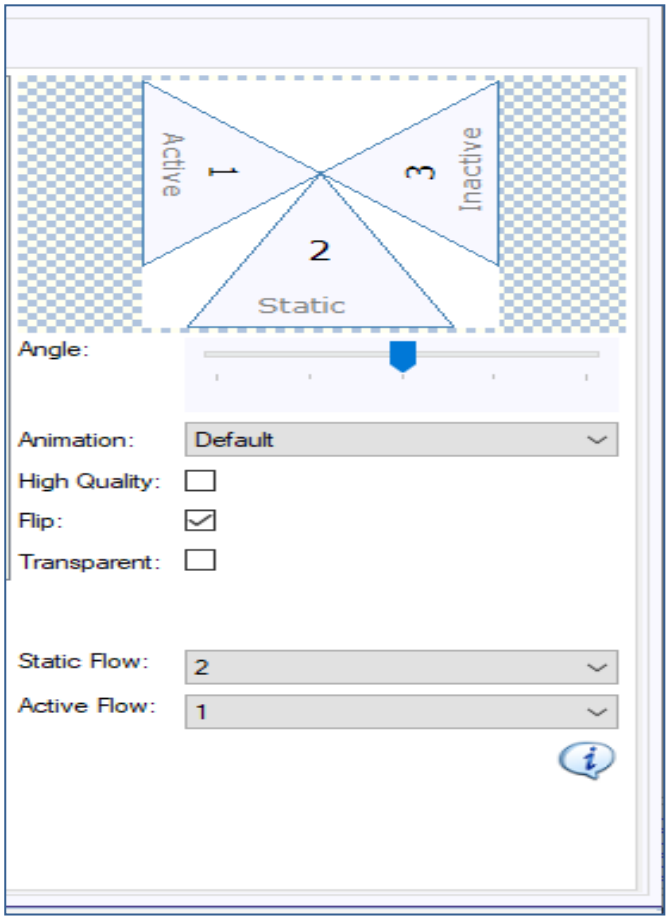
Directional Valve Initial in Designer

6.6.3.2 Other Orientations

The valve can be rotated by 90 degree increments and can be flipped using the Flip selection. This allows the valve to be configured in any orientation.

The ports of the valve are numbered 1, 2, 3. The drop down for ports 1,2,3 for Static Flow and Active Flow allow the configuration of colouring when the valve is Active and Inactive. A port can only be selected for one of Static or Active, the selections in drop down are limited by current selections.

This example shows the Flow from Bottom to Left when Active and from Bottom to Right when Inactive.



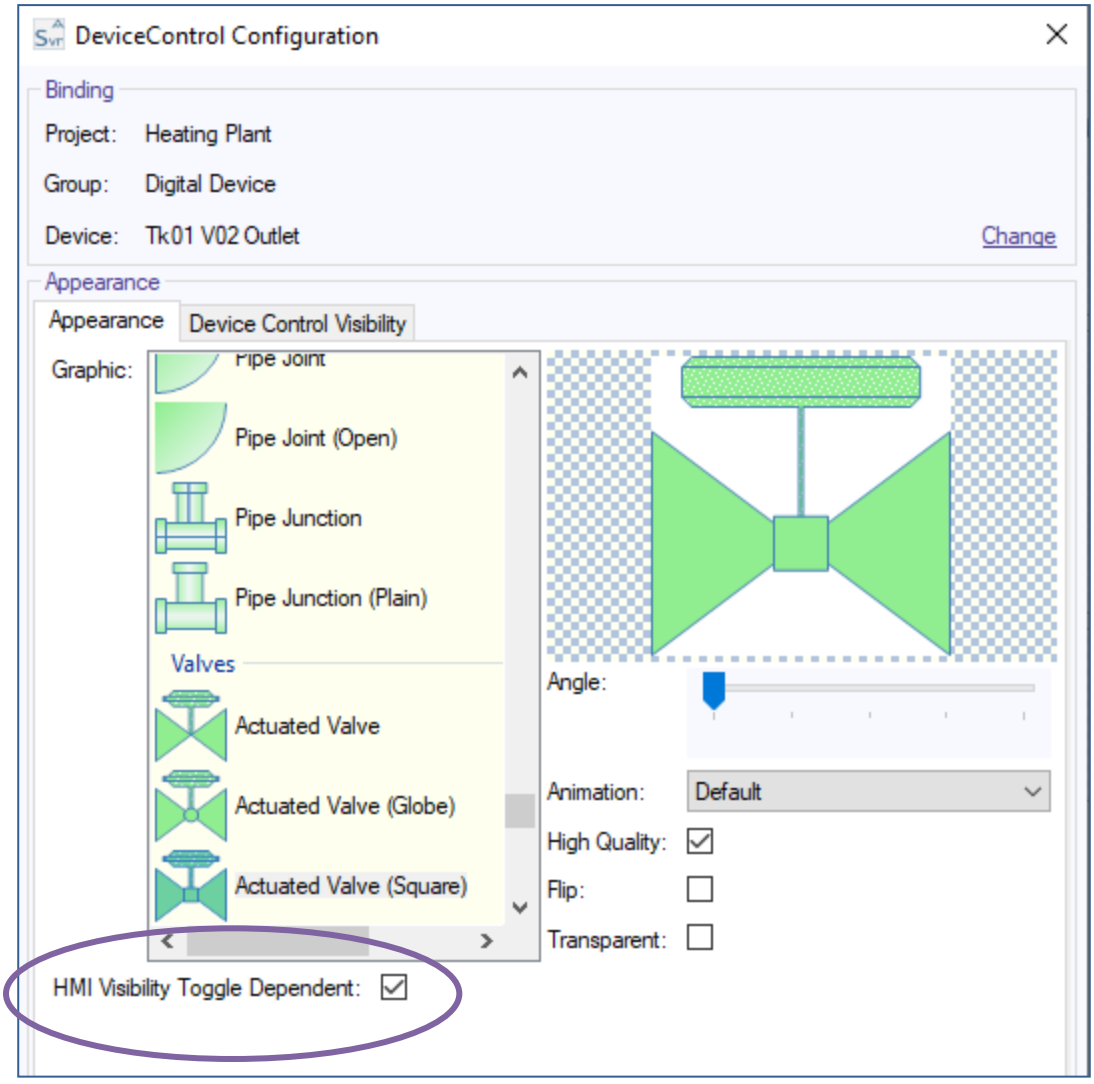
Rotated Directional Valve

6.6.4 Device Control – Visibility

There are 2 types of visibility that are configurable for the device

6.6.4.1 HMI Visibility Toggle Dependent

HMI Visibility Toggle Dependant means that the visibility for the Device is linked to the HMI Visibility Toggle. This Toggle switches between On and Off and the devices that are linked to it then alternate as Visible or Invisible.

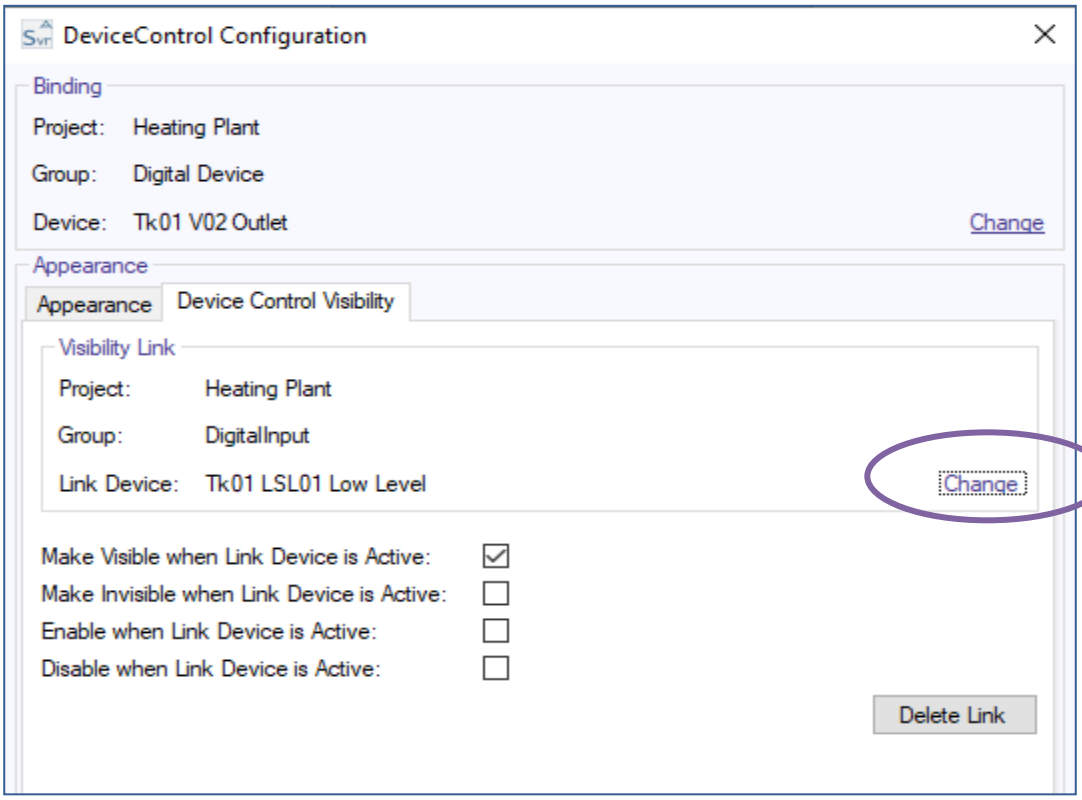


HMI Visibility Toggle selected for a Device

6.6.4.2 Device Control Visibility

This is used to make the Visibility or Enabling of a device dependent on the state of another device.

Any Digital State can be used as the Enabling Item.

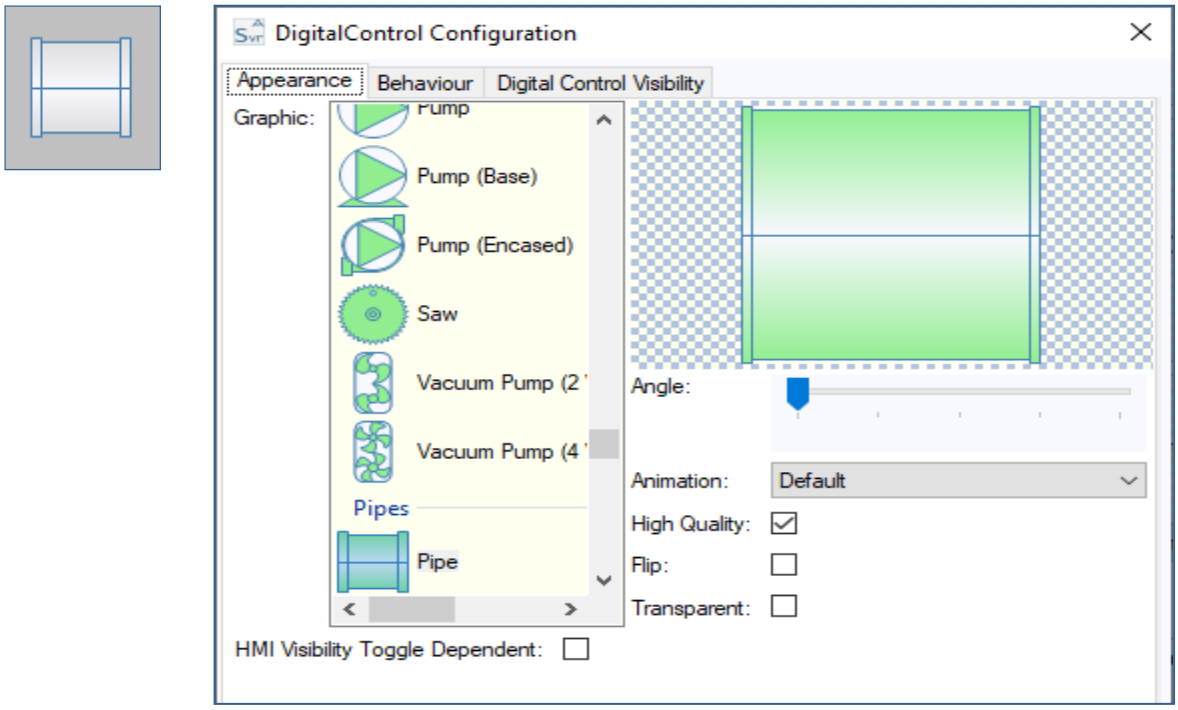


Device Control Visibility configuration

The configured device may be Visible or Invisible or Enabled or Disabled, based on the status of another Digital Device. The Linked, Enabling, Device is selected using the Project Explorer, which is accessed using the Change Button. The Linking may be Deleted by pressing Delete Link button.

6.7 Digital Control

The Digital Control is used to give a graphical representation of the state of a device or multiple devices with digital results.



Digital Control initial on Panel and initial setup

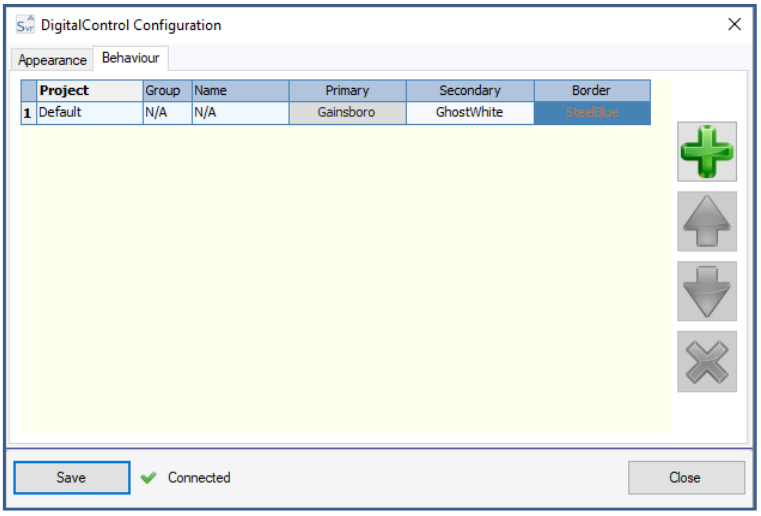
Configure Appearance options are for appearance and to change the associated device. Configure is to provide a link to the object in Controller, to allow change of settings.

6.7.1 Appearance

Configure Appearance selection allows changing of the Shape of the Graphic, the Animation speed. This section also allows configuration of the background of the device being transparent and the device may be allowed to be flipped.

6.7.2 Behaviour

The Behaviour tab is used to add a device or multiple devices to the control, in order of priority, per bindings common method, along with the associated colours. The colours of highest priority device which is active will be shown. If no devices are active then the Default colours will be shown.



Bindings for Digital type Control

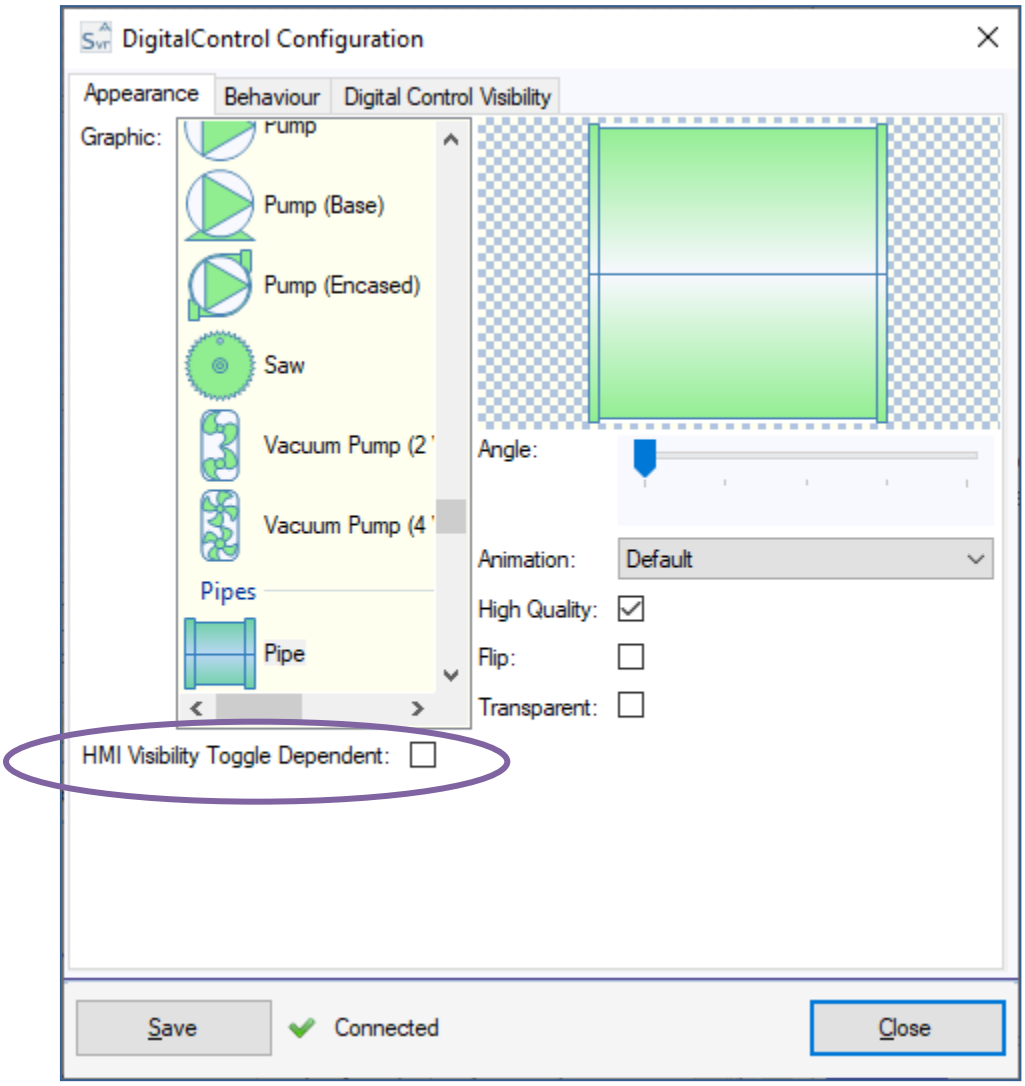
Clicking on the Name cell of a row will bring up the Project Explorer window, allowing selection of a device. The colours may be selected by clicking on the colour cell and using Colour Picker.

6.7.3 Digital Control – Visibility

There are 2 types of visibility that are configurable for the device

6.7.3.1 HMI Visibility Toggle Dependent

HMI Visibility Toggle Dependant means that the visibility for the Digital Control is linked to the HMI Visibility Toggle. This Toggle switches between On and Off and the devices that are linked to it then alternate as Visible or Invisible.

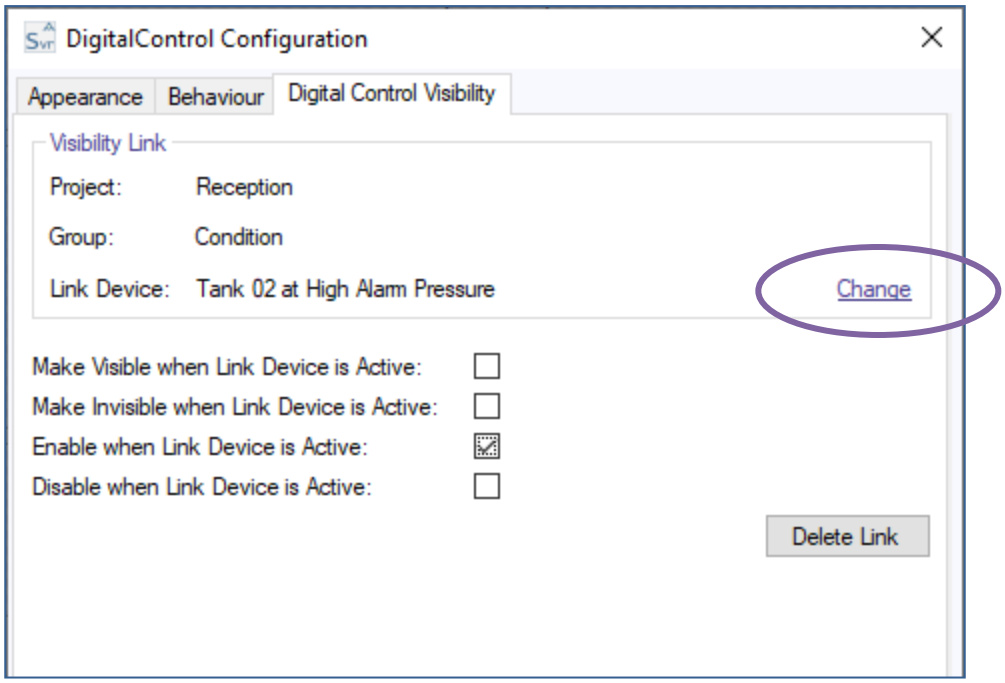


HMI Visibility Toggle selected for a Digital Control

6.7.3.2 Digital Control Visibility

This is used to make the Visibility or Enabling of a device dependent on the state of another device.

Any Digital State can be used as the Enabling Item.

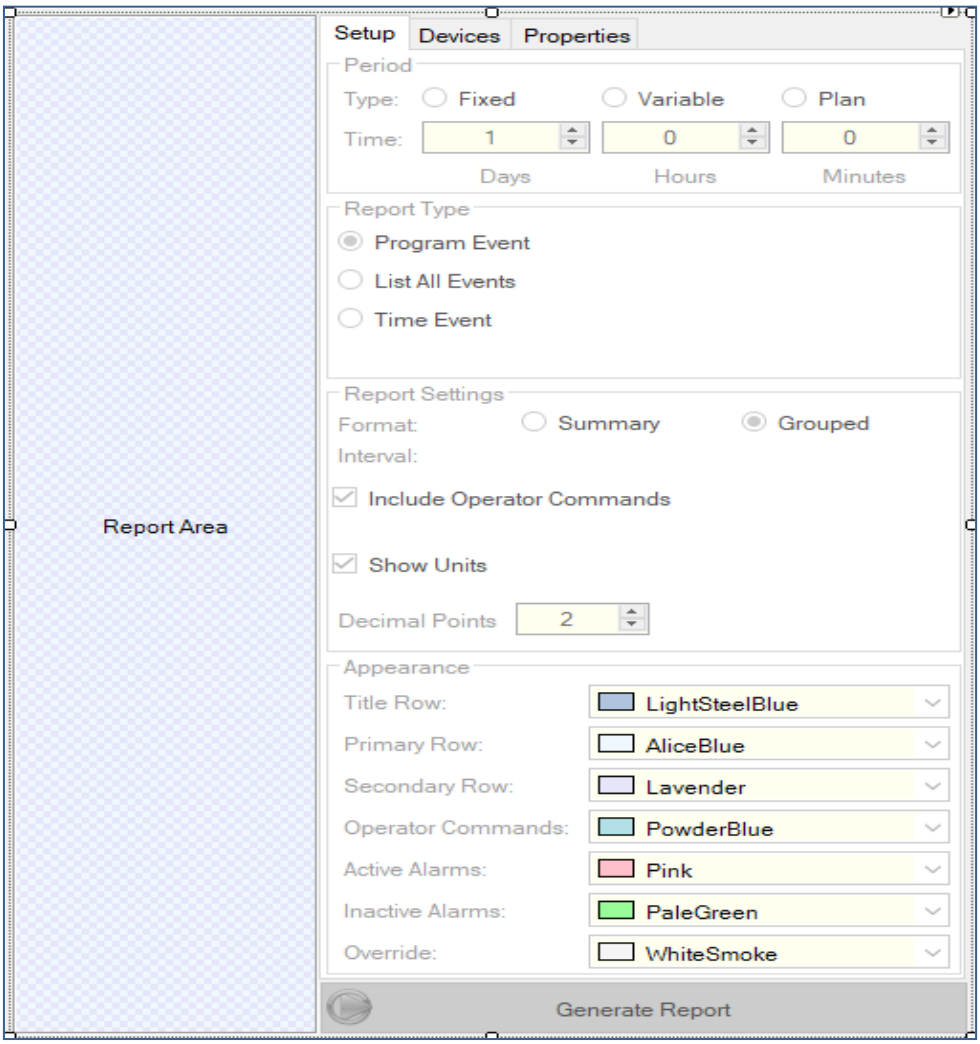


Device Control Visibility configuration

The configured device may be Visible or Invisible or Enabled or Disabled, based on the status of another Digital Device. The Linked, Enabling, Device is selected using the Project Explorer, which is accessed using the Change Button. The Linking may be Deleted by pressing Delete Link button.

6.8 History Control

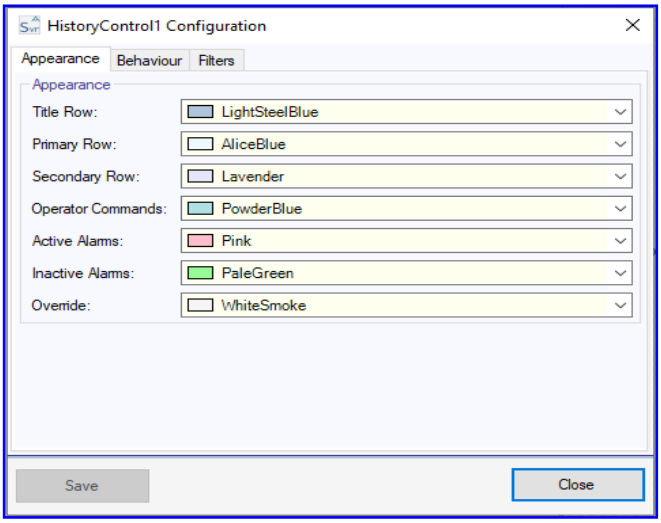
The History Control is used to view a report of historical data. The control can be configured for appearance and function. The Setup tab allows selection of colours, default report type and report settings. These can be changed on the front panel or in the Configure section accessed by clicking on the arrow at top right hand side.



History Control Initial Setup

6.8.1 Appearance

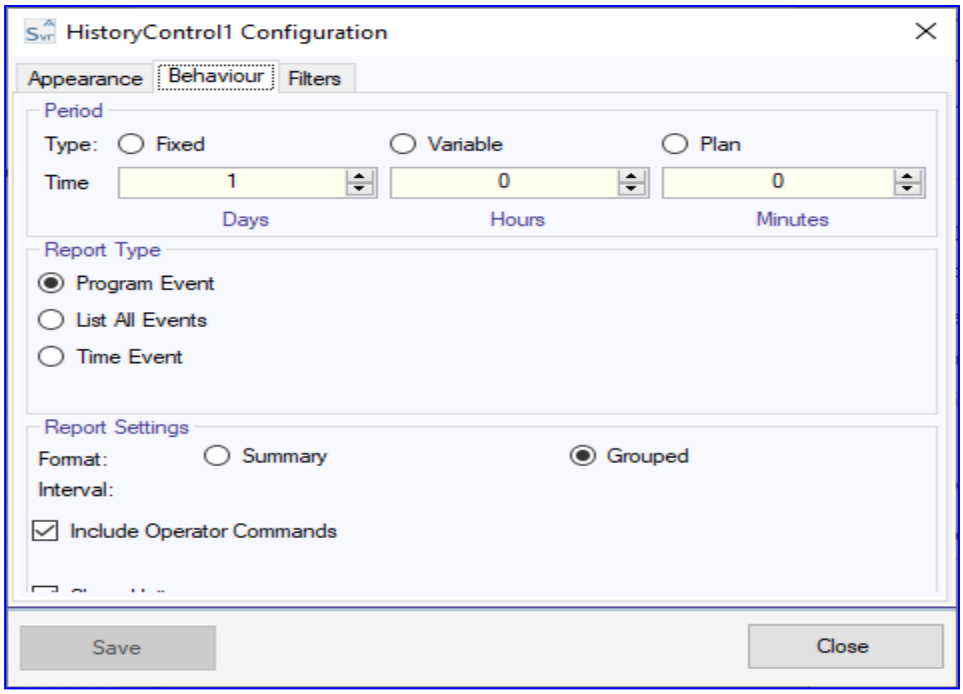
This section is for selecting the default colours for the control.



Appearance Colour Setup

6.8.2 Behaviour

The Behaviour tab is used to select the default behaviour options for the report.



Report Options Setup

The Filters tab is used to select the devices to be included, using the Project Explorer. Please see Accord Process Audit V3.33 User Guide for detailed explanations.

6.9 List Control

The List Control is used to show a list of devices. There are multiple list types and filter options which can be used to customise the control.
The following are the types of list configurations

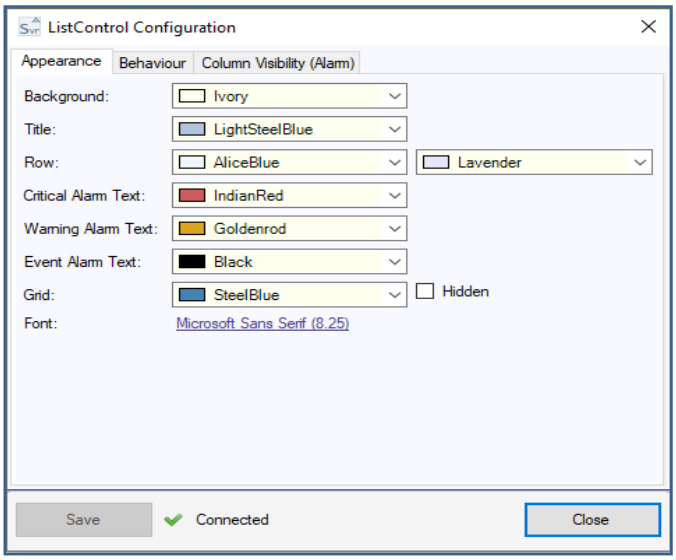
Type	Display
Alarm	Active Alarms
Program	List of Programs
Devices in Maintenance	Equipment in Maintenance Mode
Devices in Manual	Digital and Analog Devices in Manual Mode
Devices in Masked	Digital Devices with Alarm Masked
Devices in Override	Digital and Analog Inputs which are Overridden
Devices Summary	Status of Selected Devices

Each Type can be Configured for Appearance, Behaviour and Column Visibility.

List Controls

6.9.1 Appearance

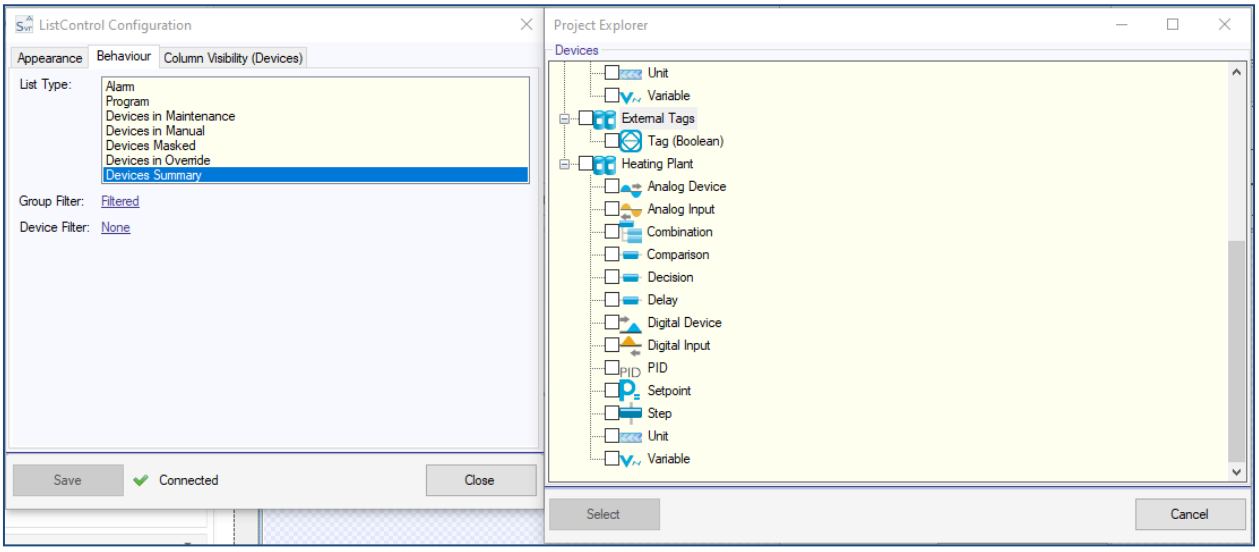
The Appearance tab is used to select the colours used by the various aspects of the control and the type, style and size of the font used.



Appearance Colour Setup for Alarms List

6.9.2 Behaviour

The Behaviour tab is used to select the type of list shown by the control, along with configuration of various filters used.



Configuration of List Control for Devices Summary with Group Filter

The types of Filters are

Group Filter: Shows all the devices of selected Types or Groups,

Device Filter: Shows only the particular devices that are selected.

Group Filter List controls, or controls with no filters will automatically show all devices, and will update after new downloads or deployments to Controller, but List controls configured using Device Filter will only show the Devices selected in the Filter.

6.9.3 Column Visibility Configuration:

The Column Visibility tab will allow for selection of columns for the selected list type.
Checking the check box next to each column Name will specify whether or not the column is displayed in Runtime.

Alarm List Control Columns:

Date	The time stamp for when the alarm was detected
Project	The name of the project to which this alarm belongs.
Type	The severity of the alarm, as configured by the engineer.
Parent	The item to which the alarm belongs.
Name	The name of the alarm.
Status	The current status of the alarm, i.e. Active / Inactive.
Description	A short description relating to the alarm.

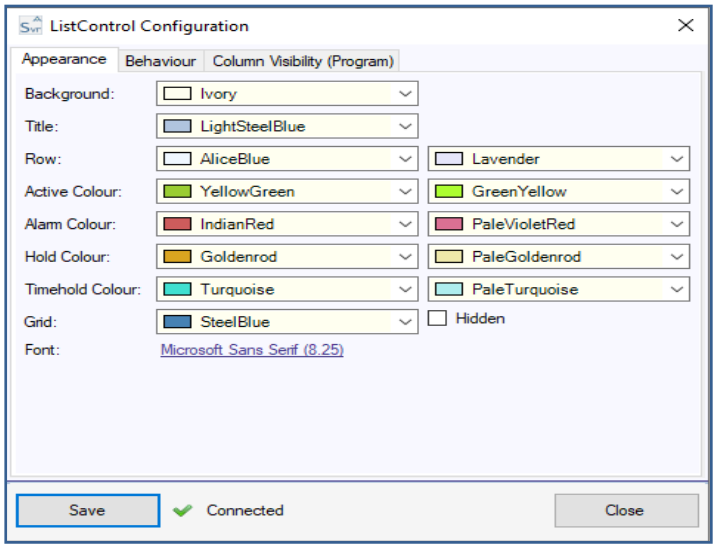
Status List Control Columns:

Project	The name of the project to which the device belongs.
Type	The type of the device.
Name	The name of the device.
Status	The current default display value for the device.

Program List Control Columns:

Project	The name of the project to which this program belongs.
Program	The name of the program.
Current Step	The current step (if any) being executed by the program.
Remaining	The planned time remaining for the current step.
Elapsed	The time that has passed since the program entered the current step.
Step Time	The planned time for which the current step is intended to execute.
Status	The current execution status of the program.
Product	The current Product (if any) set to the program

When a List Control is selected as a Program List, additional appearance options become available to customise the colours of each row depending on the status of each Program in the list.

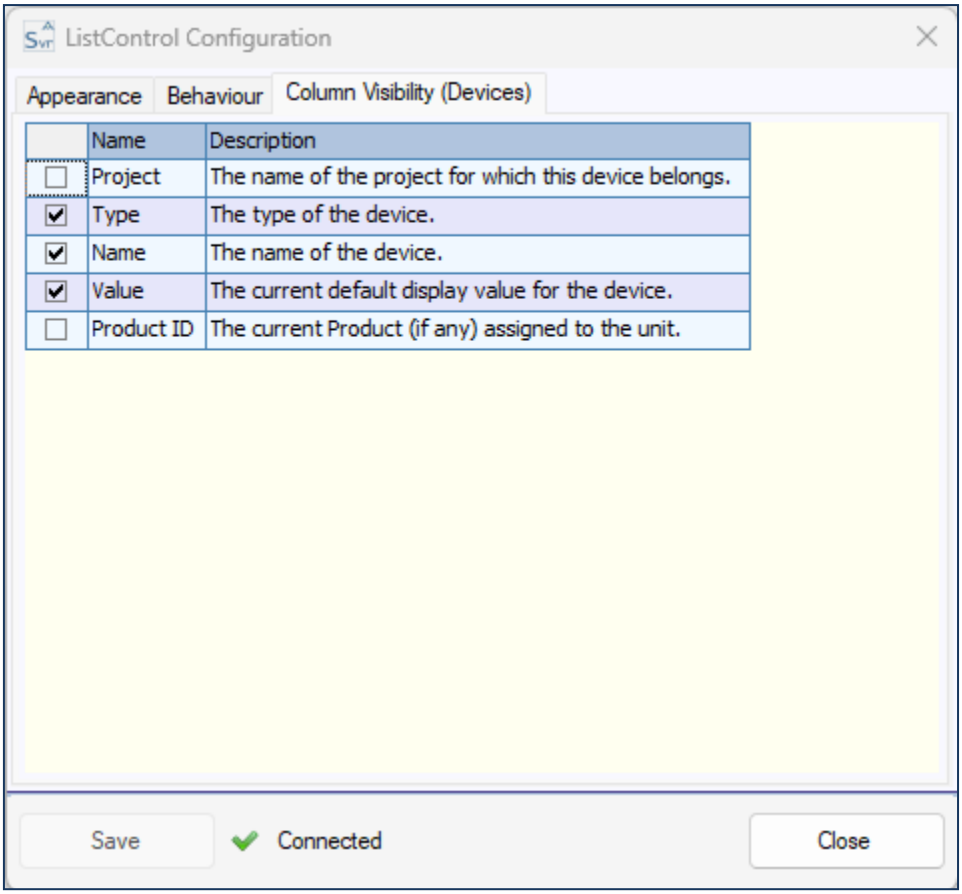


Appearance Colour Setup for Programs Type List

Device List Control Columns:

Project	The name of the project to which this device belongs.
Type	The type of the device.
Name	The name of the device.
Value	The current default display value for the device
Product	The current Product (if any) assigned to a Unit Device *

Note: The Product column is only visible if the selected device is a Unit.

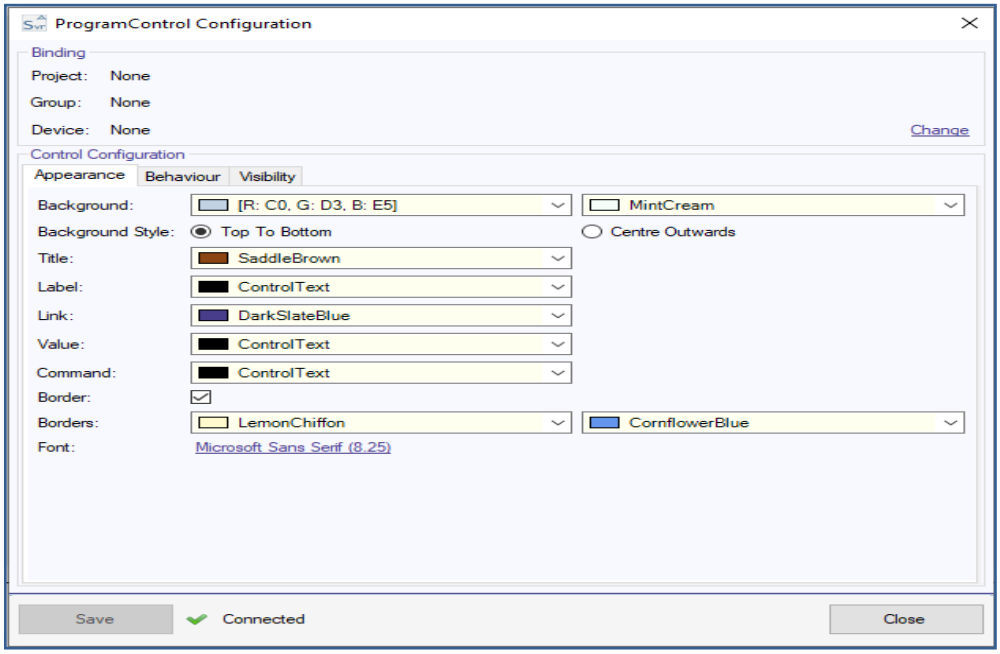


6.10 Program

The Program Control is used to send commands to and display information for a Program.

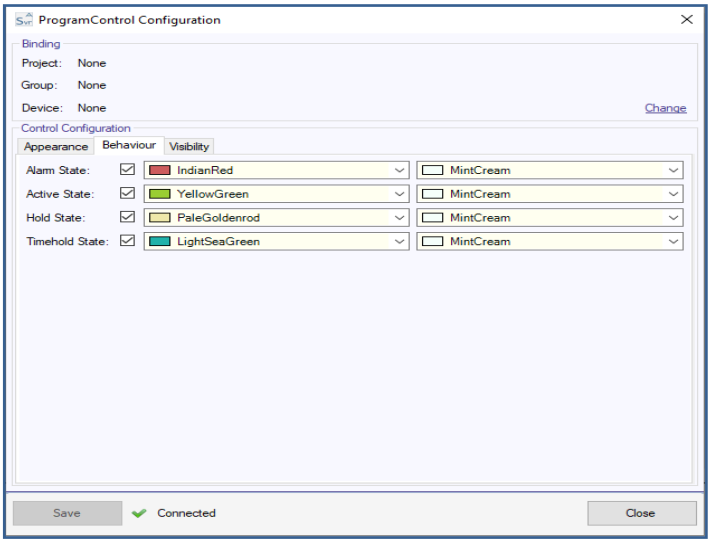
Program Control Initial Setup

The Configure Appearance section is used to arrange colours and font for the control. Clicking "Change" in the Binding section will show the Project Explorer window, for selection of the required program.



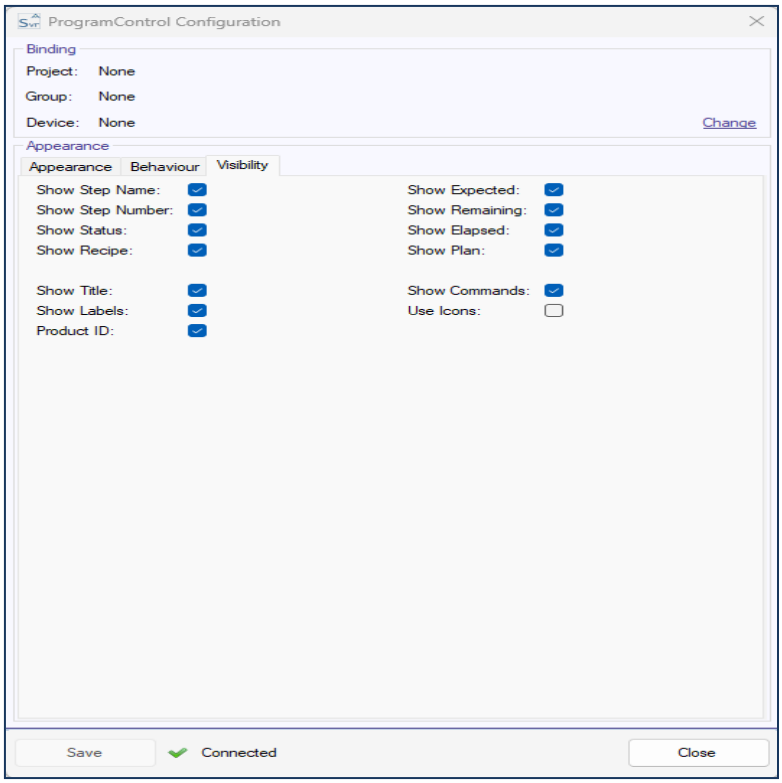
Appearance Colour setup for Program Control frame

The Behaviour section is used to select the colours for Program States.



Appearance Colour setup for Program Control status

The Visibility section is used to select which aspects of the control are visible.



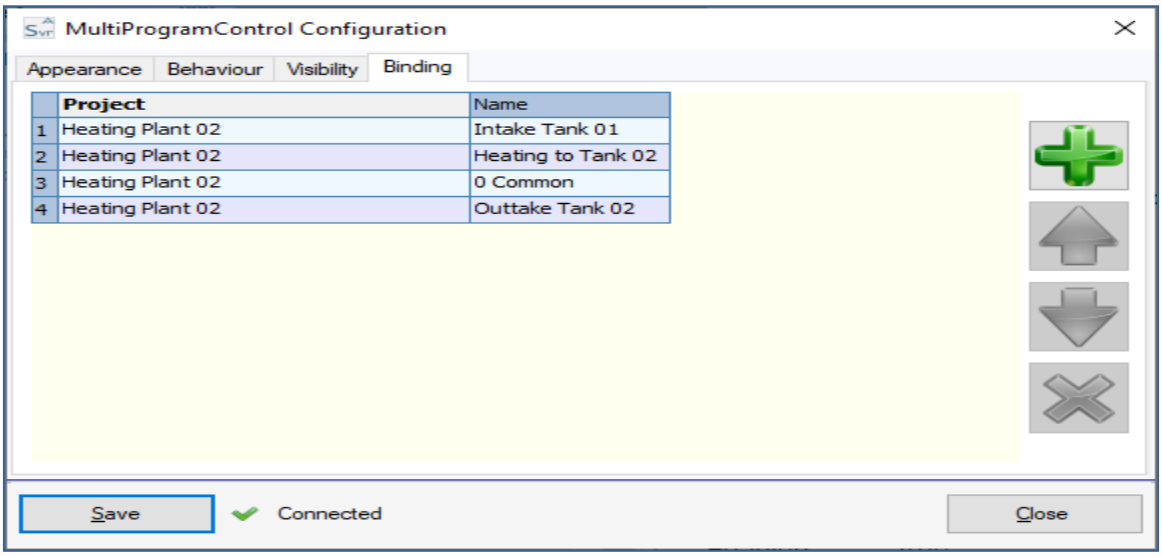
Visibility for aspects of Program Element

6.11 Multi Program

The MultiProgram Control is used to display status and control one of a list of arranged Programs.

MultiProgram Control Initial Setup

The required programs are selected using Project Explorer, accessed using the '+' button.



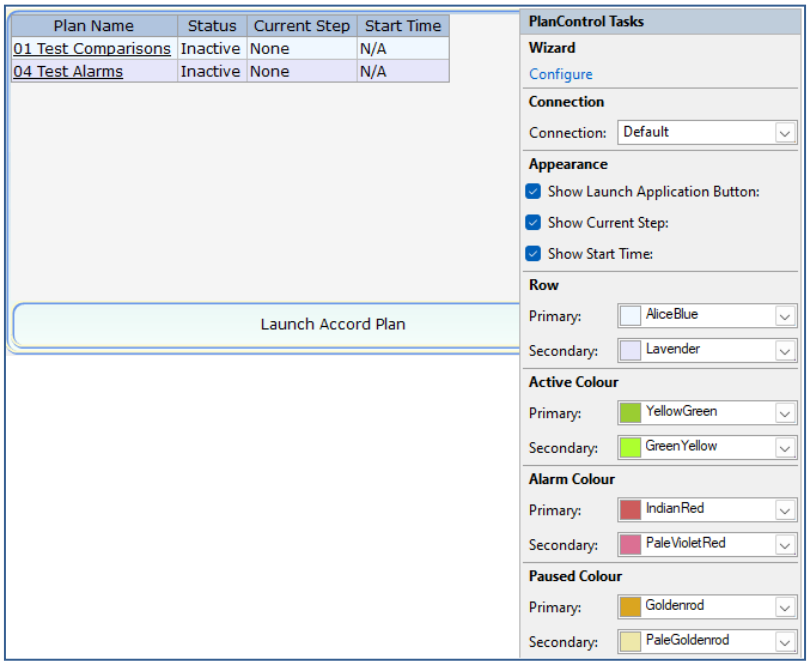
MultiProgram Control Program Binding

The Programs will display in terms of a Priority and the Priority can be changed using the Up and Down arrow buttons. The 'X' button is used to remove a Program from the list.

See also the Program Control.

6.12 Plan

This provides access to the Plan / MES scheduler, to start and control Plans from the HMI.



Plan Control Setup

The control can be configured for the colours used to indicate the status of Plans and includes Buttons for Start, Pause / Resume and End of Plans.

There are also 3 options for

- Showing a button to enable starting or launching the Plan module.
- Showing the current step of the Plans.
- Showing the time the Plans were started at.

6.13 Plan Launch

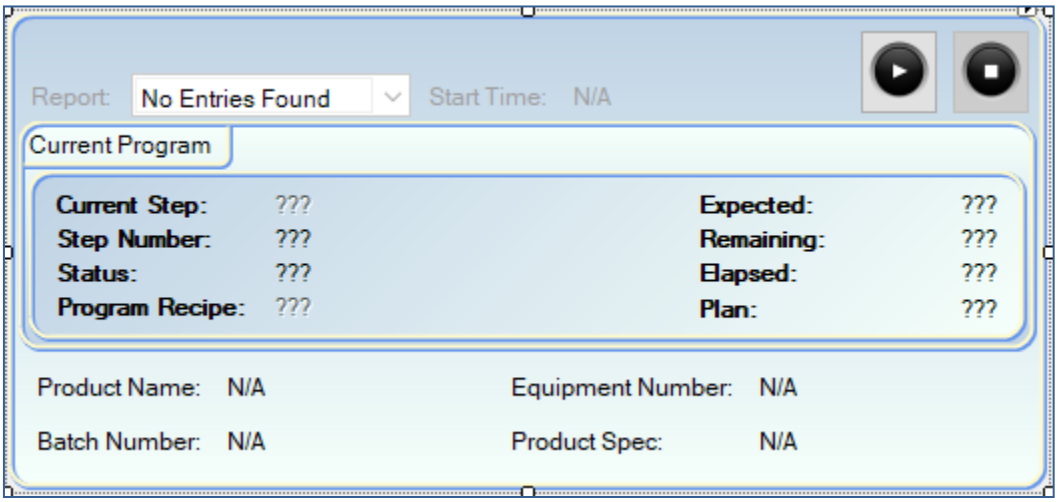
This is a button which enables starting or launching the Plan module.

There are only presentation configuration options for this control.

Plan Launcher Setup

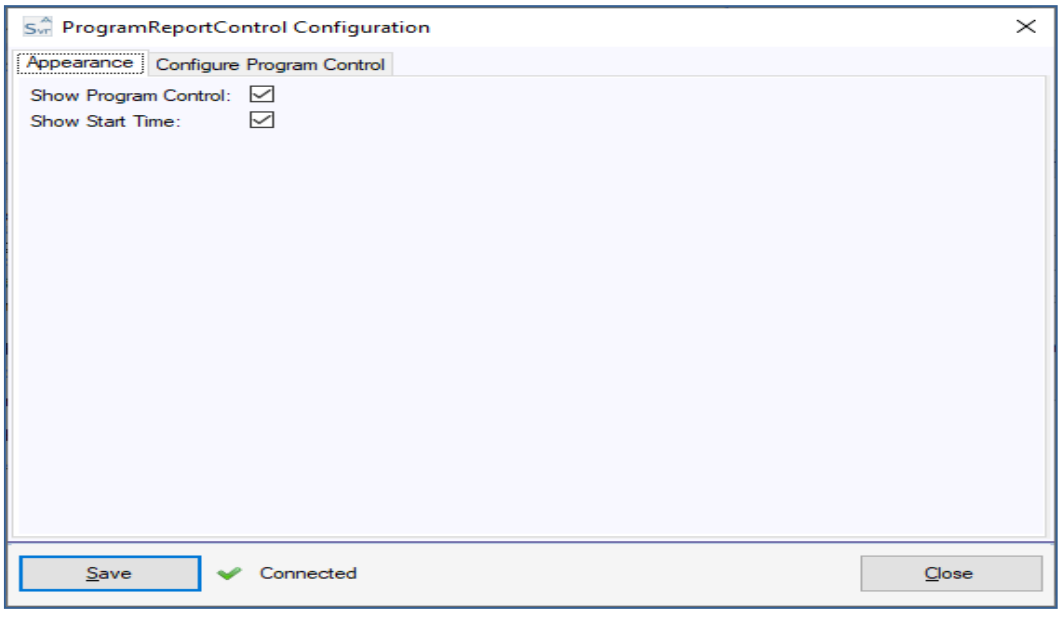
6.14 Program Report

This control allows a program with a defined report to be run. The operator can select the Report type prior to starting the program. The report will populate at the end of the program.



Program with Report Setup

The configuration allows for display of control of the program and the Start Time.

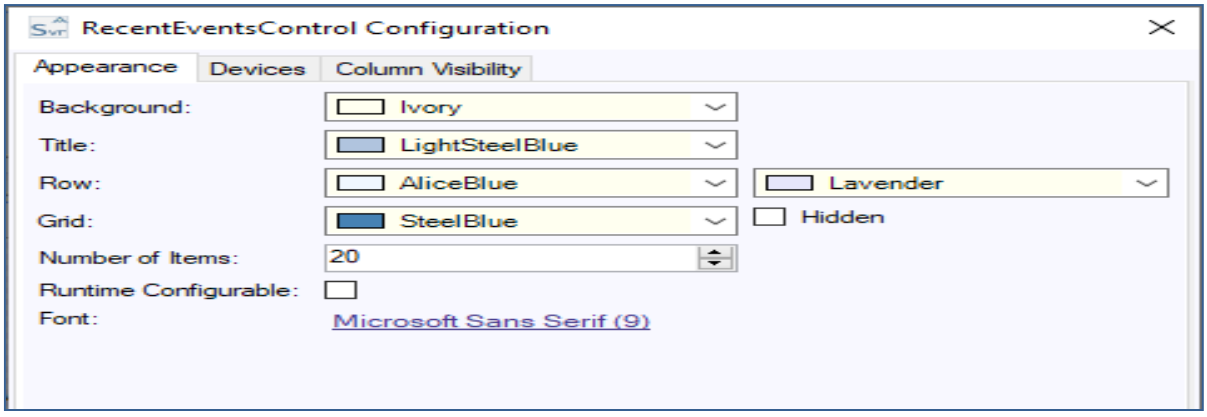


Program with Report Setup for Control

6.15 Recent Events

This control provides a rolling list of Events for the included objects. The objects are configured using the Project Explorer. The control is in the form of a list, with configuration sections for Appearance, Devices, and Visibility.

The Appearance section provides configuration of colours, and number of Rows and a selection for Runtime Configurable – to allow the items being displayed to be changeable in Runtime.

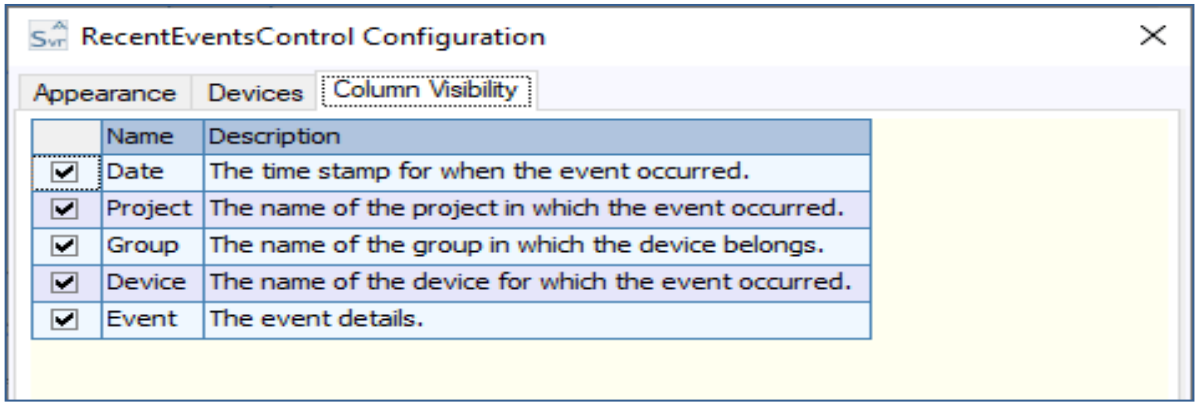


Recent Events control initial setup

The Devices sections provides selection of the devices to be displayed using Project Explorer.

The Column Visibility allows columns to be selected to be visible for

- Date and Time
- Project Name the name of the controller or Process Model
- Group the type of the object
- Device the name of the device object
- Event the status of the object at the time of the event



Recent Events control Column Visibility

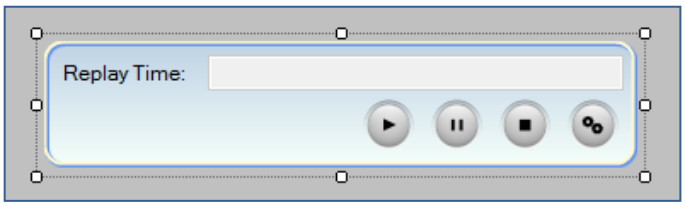
6.16 Recipe Launcher

This Button control launches the Accord Recipe Manager application. The recipes in Accord Server can then be edited, depending on security levels.

There are only presentation configuration options for this control.

6.17 Replay

The Replay Control allows a HMI instance, or workstation to display the state and status of all logged devices as they appeared in a previous time. The control can be used to select a time period in Runtime.

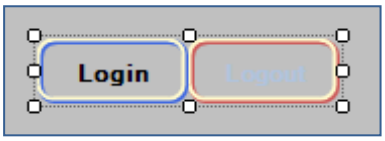


Replay Control in Panel

There are only presentation configuration options for this control.

6.18 Security

The Security Control is used to log into the HMI and service, to obtain access to functions.



Security Control in Panel

There are only presentation configuration options for this control.

The Smart Label control can be used to show the Username of the User who is logged in.

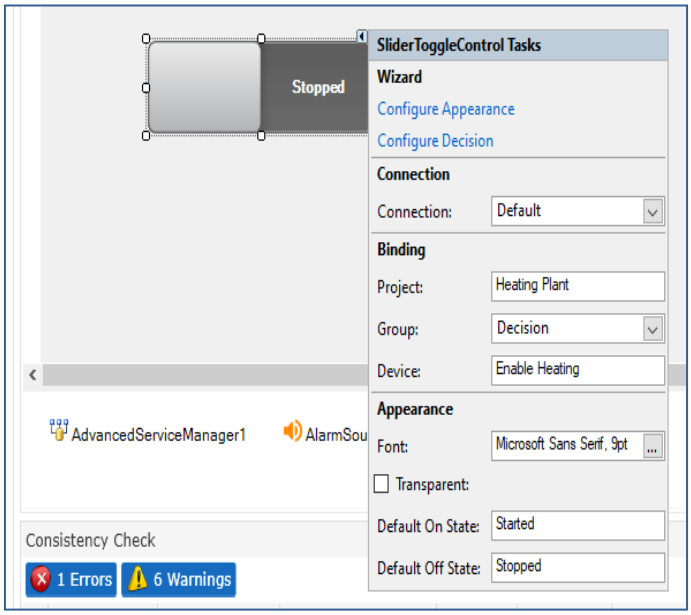
6.19 Slider Toggle

The Slider Toggle control can be used to indicate and/or change the state of an Accord Server Device with a Digital result with a more interactive graphical style than the standard Toggle Control.

The following configuration options are available to the Slider Toggle control:

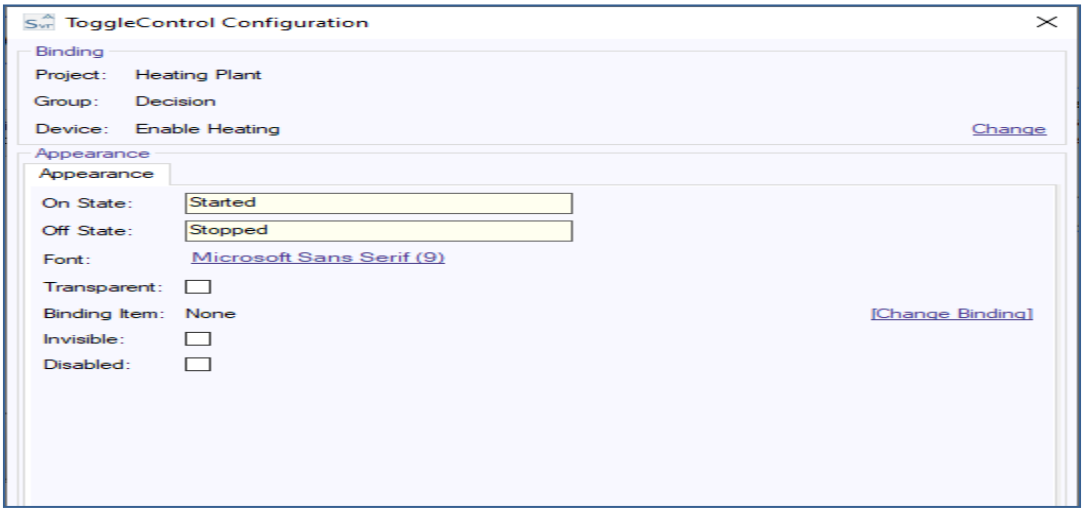
- **On State:** The text displayed by the control when the current state is 'On'.
- **Off State:** The text displayed by the control when the current state is 'Off'.
- **Font:** The font used by the control.
- **Transparent:** Once the background of the control is set to "Transparent," enabling this option will allow the controls within the square border of the control to be visible, otherwise the hosting window will be visible.

Configure Appearance: this brings up the configuration panel:
Configure Item: is to provide a link to the object in Controller, to allow change of settings.



Slider Toggle control Object Binding Setup

Configuration Panel:



Slider Toggle control Setup

Change: This Shows the Project Explorer for Binding to a Device.
Binding Item: This is the Device which binds selected controls together.

This function allows only 1 item of a group to be visible at a time. If the Binding Item is true then the other controls bound to the device are not visible.

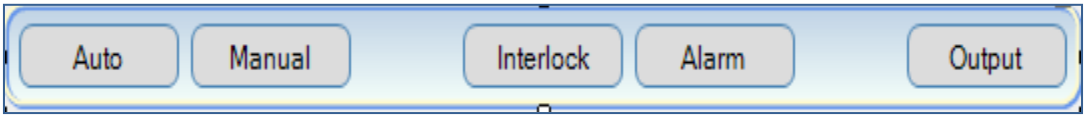
Click on Change Binding to select Device. To clear the selection, click on the selected device name and it will reset to None.

When invisible state is set for Binding item, all controls with the same Binding Item name will be invisible except the active control.

When disabled state is set for Binding Item, all controls with the same Binding item name will be Disabled except the active control.

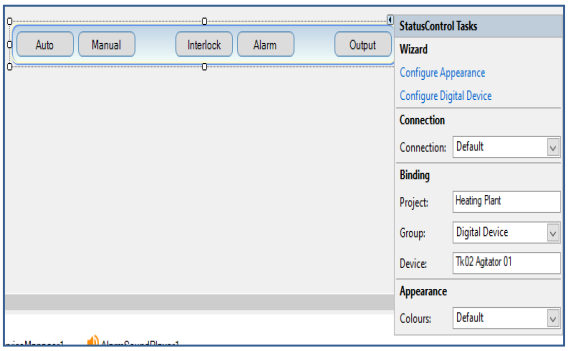
Bottom right of the form contains a help button, which contains information about different states of the Slider Toggle controls.

6.20 Status



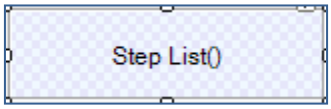
Device Status Display

The Status control shows the Status of a Digital Device.
The Device to be shown can be selected using the Project Explorer.



Device Status item selection

6.21 Step List

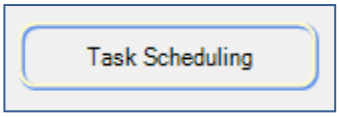


Step List placement

The Step List control shows a list of steps of the selected program and indicate the current active step. The Program for the Step List can be selected using the Project Explorer.

6.22 Task Scheduler

The Task Scheduler Control can be used to schedule commands to be sent to the controller on either a timed schedule or event triggered by the result of another Device.

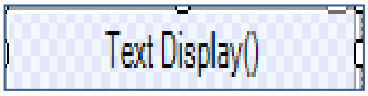


Task Scheduler Control placement

The only Design Time configuration option for the control is the connection.

6.23 Text Display

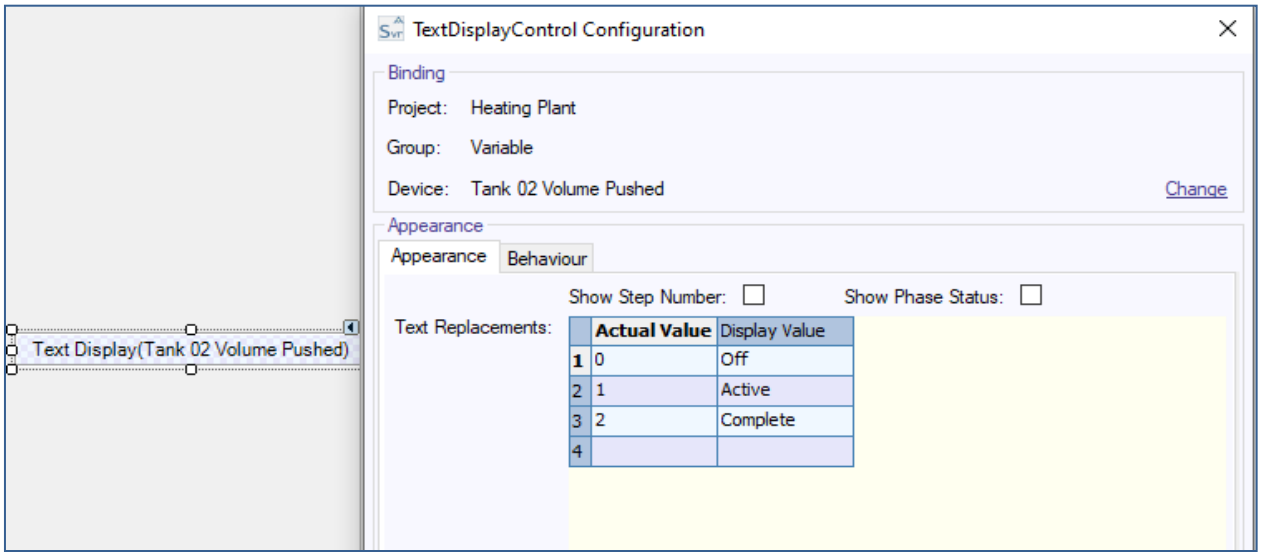
The Text Display control is used to show a pre-set text string instead of a value result from an Accord Server Device, and can be used to set the value by selecting the corresponding string.



Text Display Control placement

The following configuration options are available to the Text Display control:

- **Actual Value:** The value in the PLC being read from the Accord Server Device.
- **Display Value:** The string value which is to replace the Actual Value.



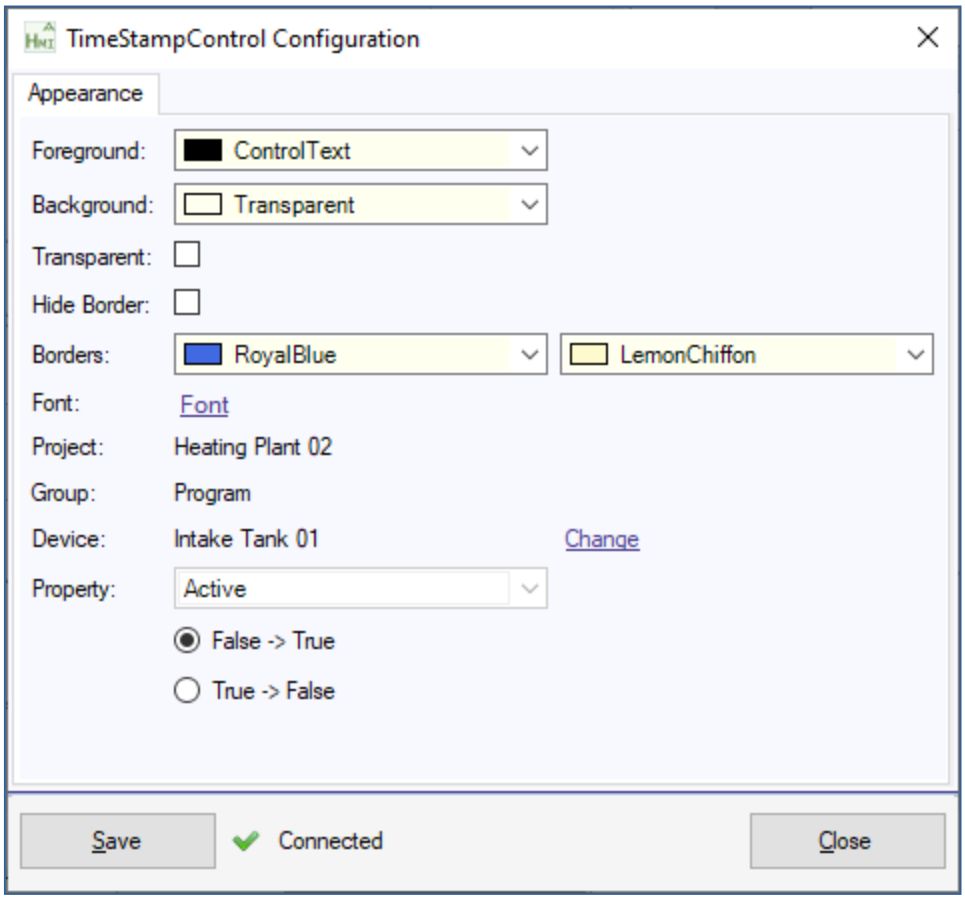
Text Display Control configuration

If the Device is a Program, then the name of the Current Step will be shown. The background of the control may be configured using 'Show Phase Status' and colours in **Behaviour** tab. The number of the step may also be displayed by ticking 'Show Step Number'.

Similarly, if the Device is a Unit, then the Product ID assigned to this Unit will be displayed. If there are no Products assigned to this Unit, then "None" will be displayed.

6.24 Time Stamp

The TimeStamp control displays the time that the configured event last occurred.
The Device and the Property may be selected.
Note: the selected Device must be enabled for logging (logging is enabled in Server).

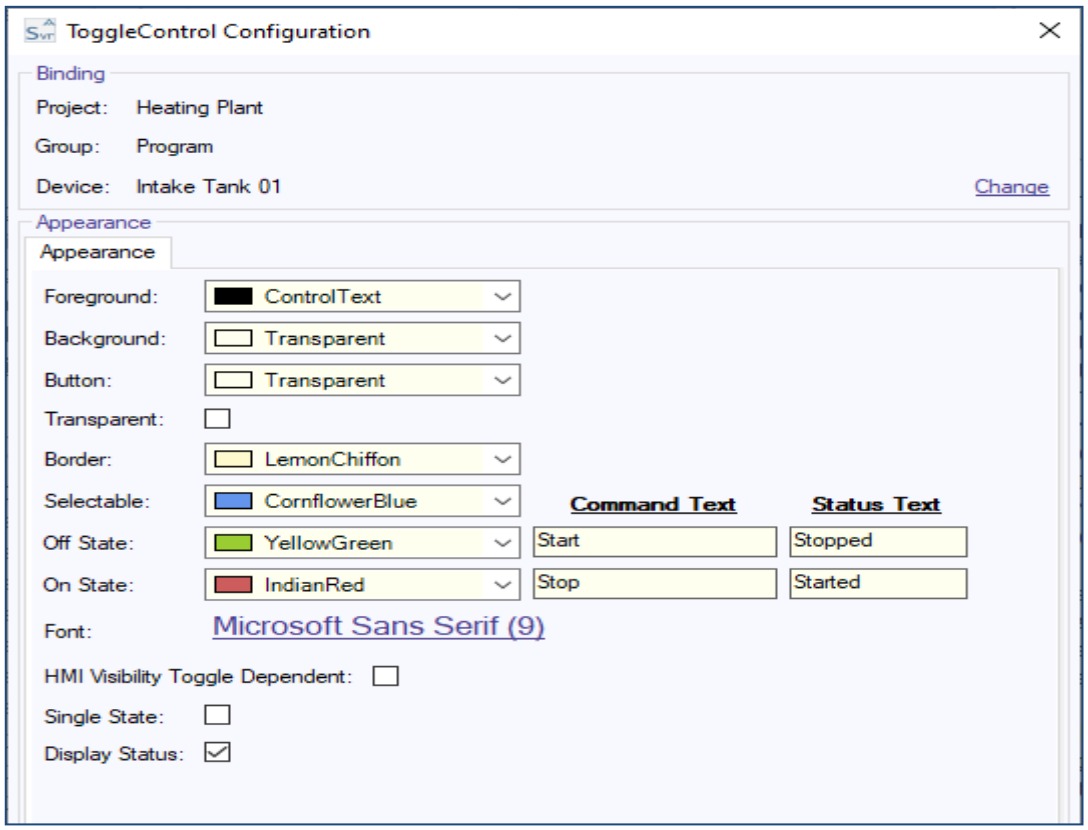


Time Stamp Control configuration

6.25 Toggle

The Toggle control can be used to indicate and/or change the state of a Device. The control can be configured to show one or two buttons and states, and to display a current status and can be configured for colours and visibility.

Toggle Control initial on screen showing 2 buttons

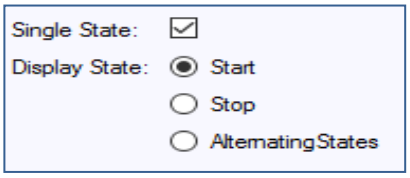


Toggle Control Initial Configuration – Single State not selected

Normally a Command Text, corresponding to a HMI command, will be displayed.

6.25.1 Single State:

This changes the control to One button / State. The control can be configured for Single use or for Alternating States.



Setup for Single State with Start button

If Alternating States is selected then the control will alternate between Command Texts.

6.25.2 Dual State

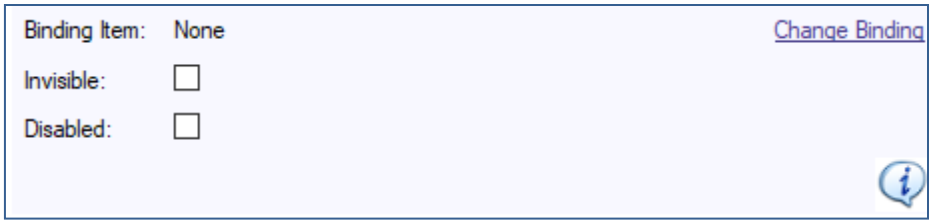
If Single State is not selected then Status Texts are made available as well as Command texts, to display of the current status of the linked device.

Example:
During Operation the text Started will be displayed when On and Stopped when Off. The buttons are Automatically highlighted and enabled.

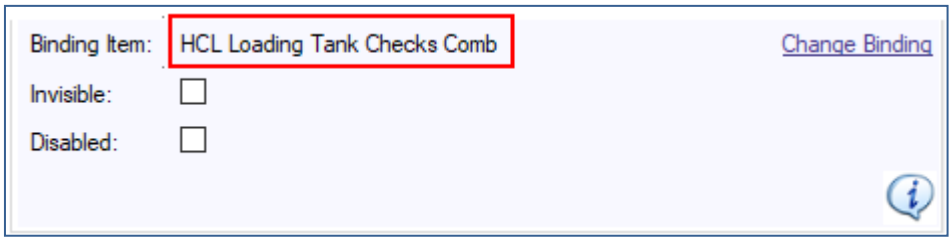
Runtime Display for two states with Status

6.25.3 Visibility Configuration

If Single state is set, Visibility binding configuration becomes available. Click on Change Binding to select device which will bind the controls together.



To clear the selected device, click on the selected device name and the name will reset to None. See highlighted arrea in the image below.



Binding configuration can work in two different ways; Invisible and Disabled.

Invisible selected: all controls with the same Binding Item name will be Invisible except the active control.

Disabled state: all controls with the same Binding item name will be Disabled except the active control.

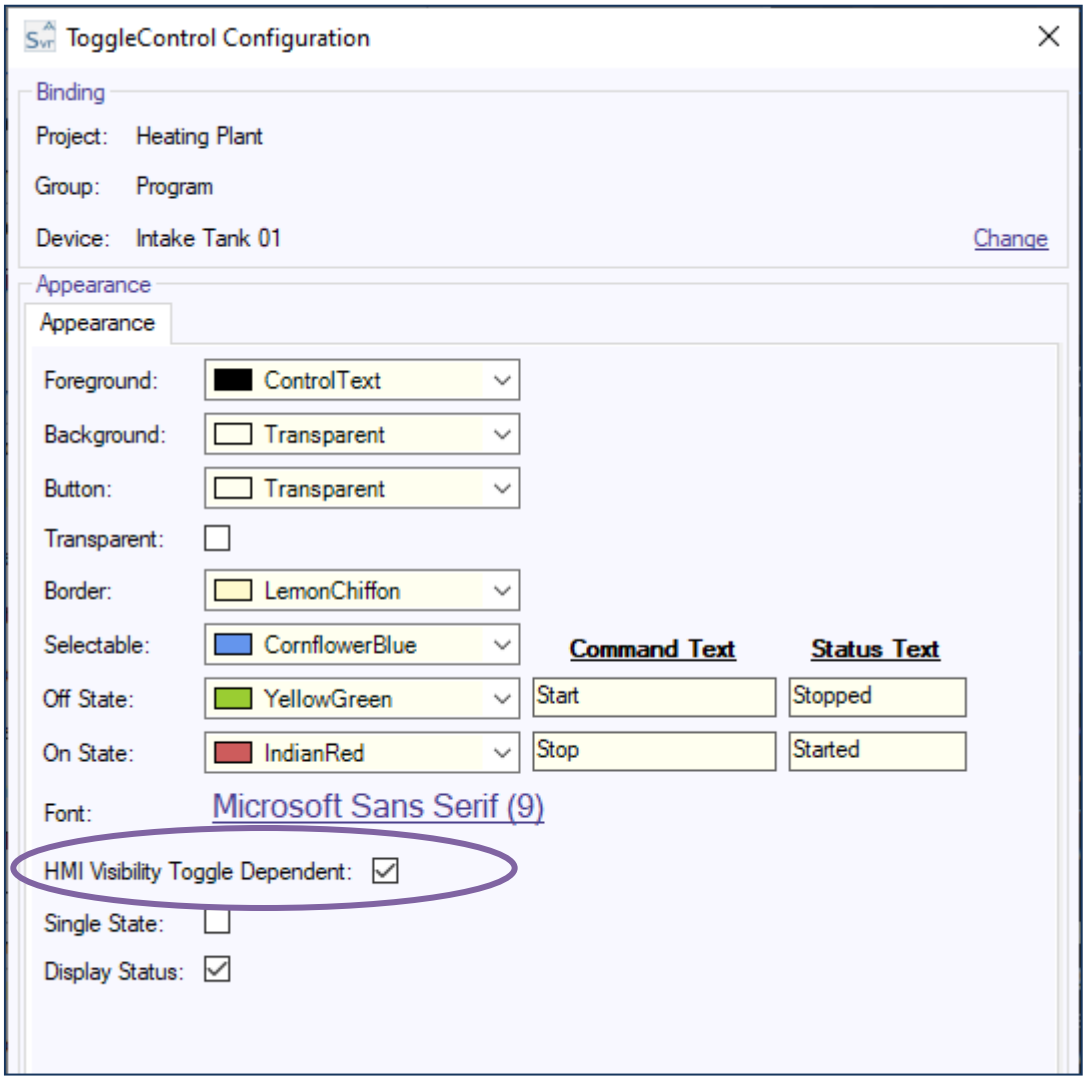
The “i” information button provides information about states of the toggle controls.

6.25.4 Digital Control – Visibility

There are 2 types of visibility that are configurable for the device

6.25.4.1 HMI Visibility Toggle Dependent

HMI Visibility Toggle Dependant means that the visibility for the Toggle Control is linked to the HMI Visibility Toggle. This Toggle switches between On and Off and the devices that are linked to it then alternate as Visible or Invisible.

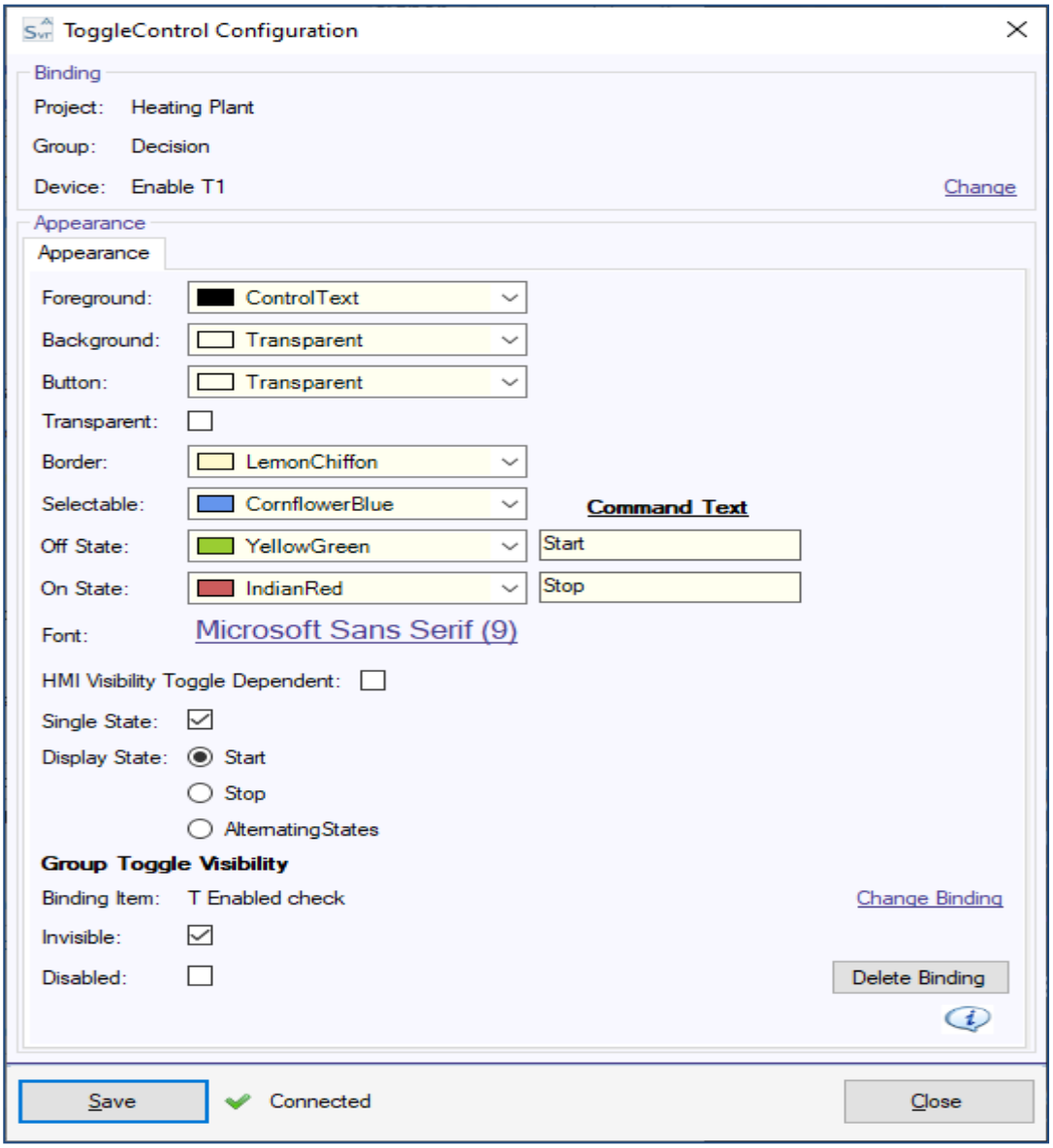


HMI Visibility Toggle selected for a Toggle Control

6.25.4.2 Group Toggle Visibility

This is used to link the Visibility or Enabling of a Toggle control dependent on the state of a linked item. The Toggle must be a Single State item and the Binding for the Group must be a Combination, or Comparison, or Decision.

This is usually used for an exclusive selection, for example if only one route of many routes can be chosen for a program and the Routes are grouped into a combination in the controller.



Group Toggle Visibility setup

In the example the Decision will be Invisible if the Binding item is True, except if this Toggle has been used to make the Binding item combination true.

6.26 Value

The Value control is used to display a numerical value result from an Accord Server Device.

Value Control initial placement on Screen

The required device is selected using the Project Explorer.

Common configuration options are available to the Value control.

6.27 Value Table

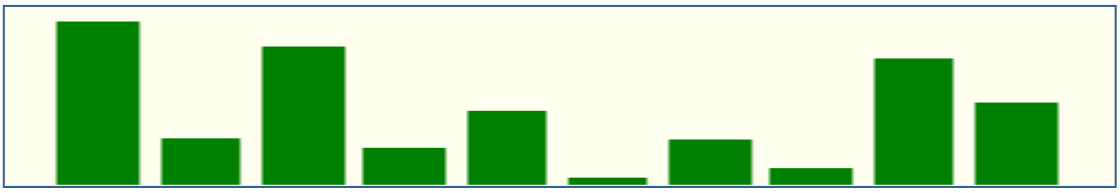
The Value Table allows a table of values or states to be displayed.

There is no Design time configuration for this, the table is configured in Runtime.

7 KPI Monitoring Controls

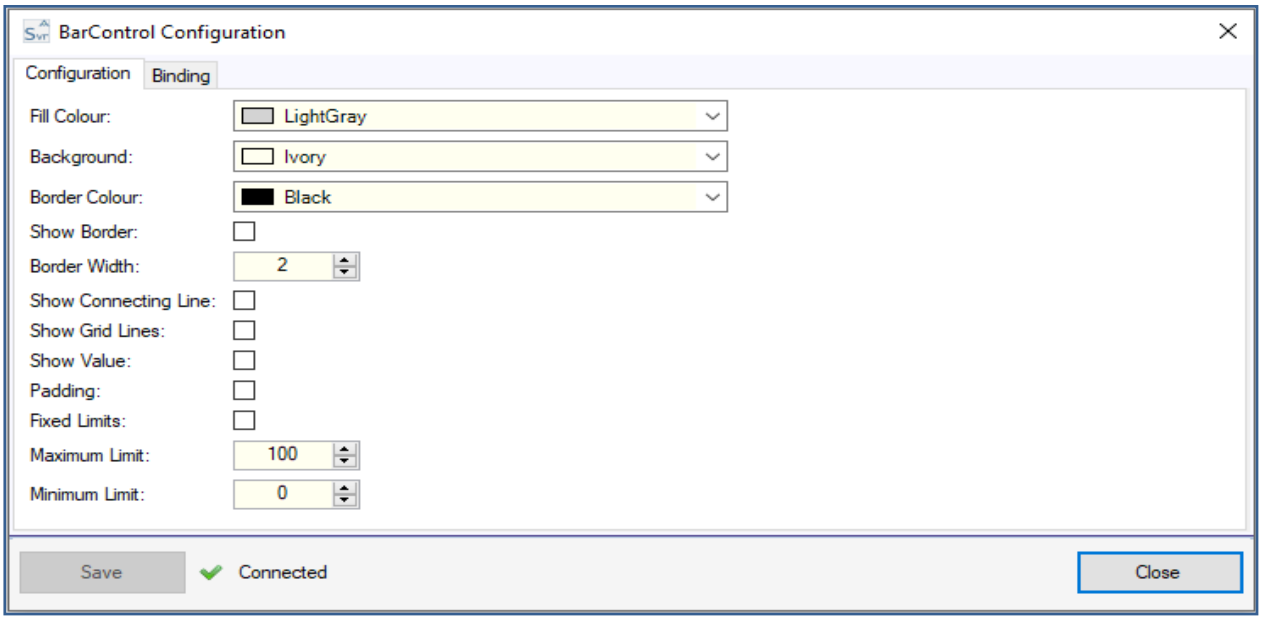
7.1 Bar Control

The Bar Control is used to monitor value(s) of a single or multiple devices.



Bar Control Initial Placement on Screen

The following configuration options are available to the Bar Control:



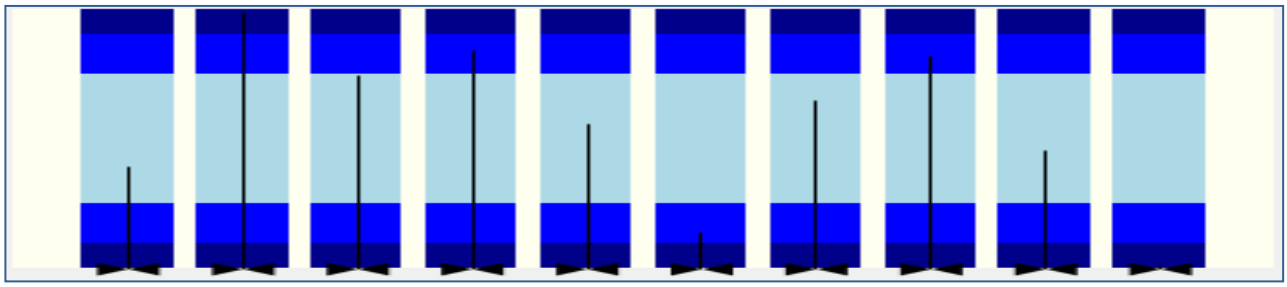
Bar Control Configuration

- **Fill Colour:** Sets the colour of the "fill" area above the bar.
- **Background Colour:** Sets the background colour of the control.
- **Show Connecting Line:** Displays a line connecting the values across all devices.
- **Show Grid Lines:** Displays grid lines in the background of the control.
- **Show Value:** Displays the current value as a label on the bar.
- **Fixed Limits:** When this is enabled, the range of the bar area will be from the value entered in **Minimum Limit** to the value entered in **Maximum Limit**. When disabled, the range will change dynamically based on the highest and lowest current values.

Bindings for the properties of devices may be configured in the "Binding" tab.

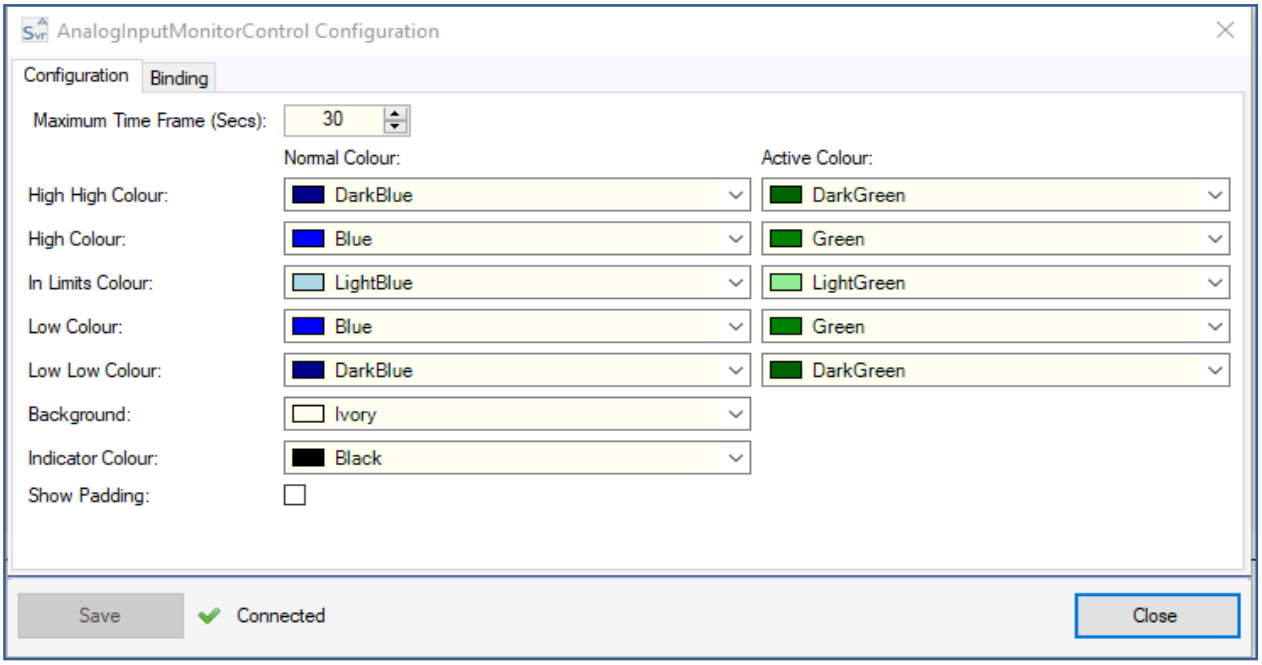
7.2 Multiple Analog Monitor

The Analog Input Monitor Control is used to monitor value(s) of a single or multiple Analog Inputs with colour change display in relation to their Low Low, Low, High and High High levels.



Analog Input Monitor initial Placement on Screen

The following configuration options are available for the Analog Input Monitor Control:



Analog Input Monitor Configuration

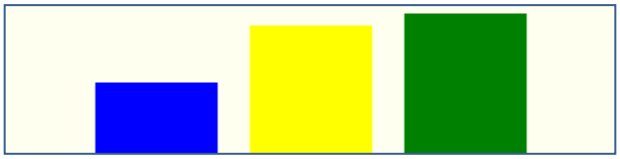
- **Maximum Time Frame:** Sets the time duration for the "recent value tracking" vertical line. This line will cover a range from the minimum to maximum value reached during the configured timeframe, with indicators for both the current and oldest values.
- **Normal Colour:** Sets the inactive colour for the High High, High, 'In Limits', Low and Low Low sections of the bars. This is the colour displayed when the value is not currently within the specified range.

- **Active Colour:** Sets the active colour for the High High, High, 'In Limits', Low and Low Low sections of the bars. This is the colour displayed when the value is currently within the specified range.
- **Background:** Sets the background colour of the control.
- **Indicator Colour:** Sets the colour of the value indicator within the bars.

Devices may be added and removed to/from the control via the "Binding" tab.

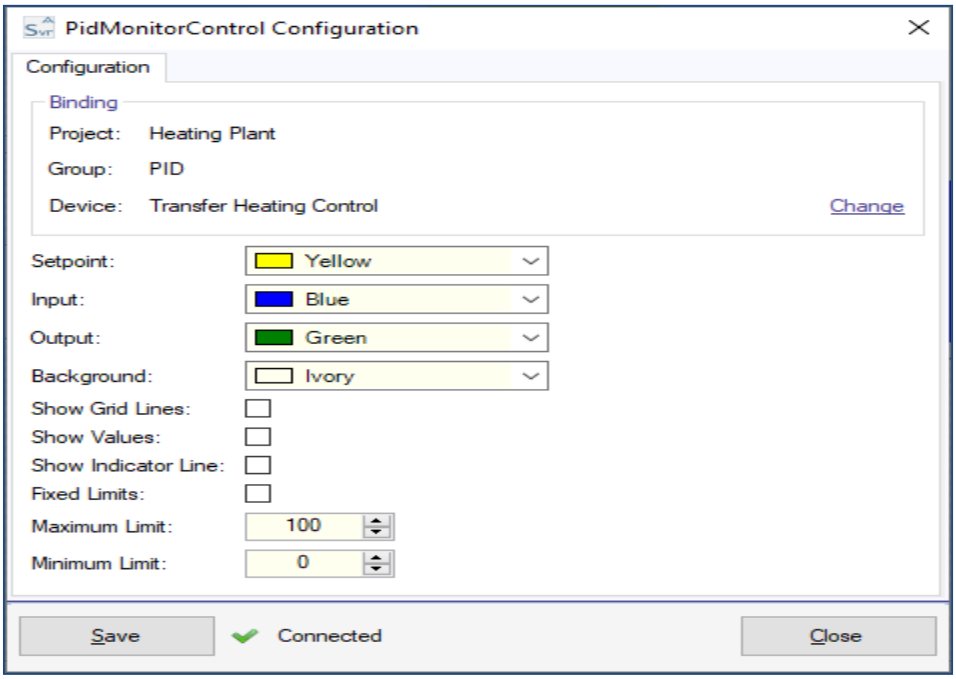
7.3 PID Monitor

The PID Monitor Control is used to monitor the Setpoint, Input and Output values of a single PID Loop.



PID Monitor initial Placement on Screen

The following configuration options are available to the PID Monitor Control:



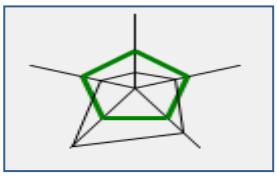
PID Monitor Configuration

- **Setpoint:** Sets the colour for the bar indicating the current setpoint value.
- **Input:** Sets the colour for the bar indicating the current input value.
- **Output:** Sets the colour for the bar indicating the current output value.
- **Background:** Sets the background colour for the controls.
- **Show Grid Lines:** Displays grid lines in the background of the control.
- **Fixed Limits:** When this is enabled, the range of the bar area will be from the value entered in **Minimum Limit** to the value entered in **Maximum Limit**. When disabled, the range will change dynamically based on the highest and lowest current values.

The binding for the control may be configured by clicking the “Change” button. The desired PID loop is selected using the Project Explorer.

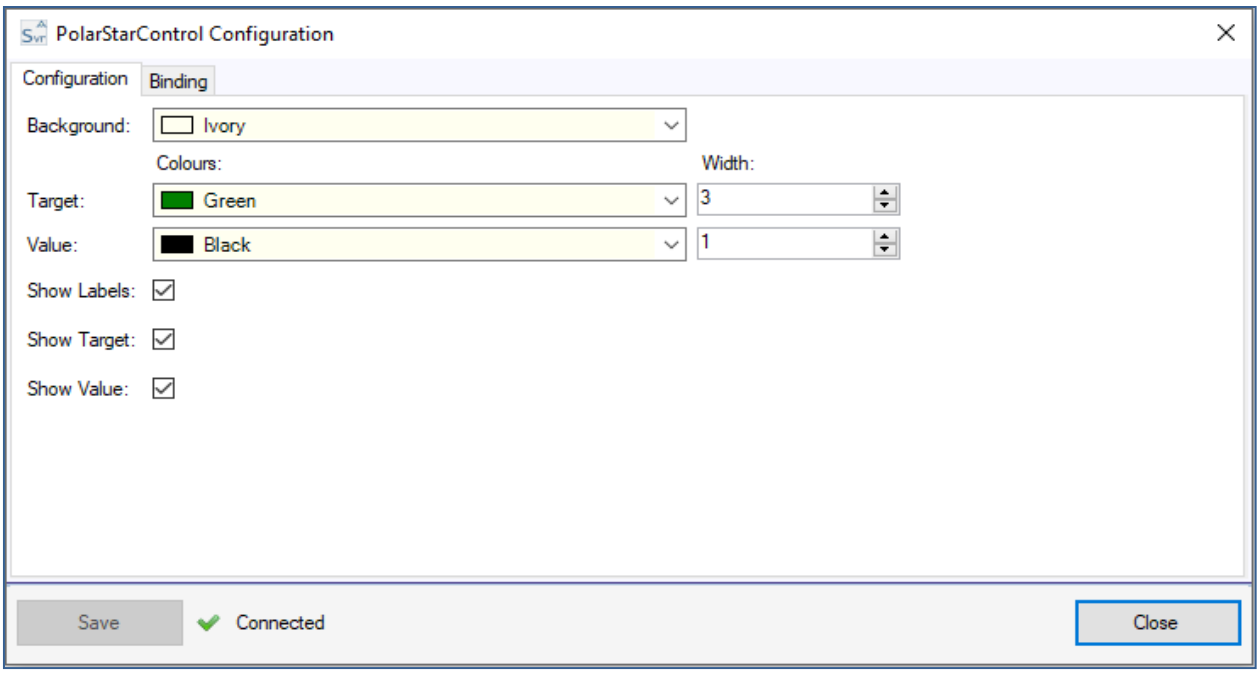
7.4 Polar Star

The Polar Star Control is used to display relative values for a number of devices.



Polar Star initial Placement on Screen

The following configuration options are available for the Polar Star Control:



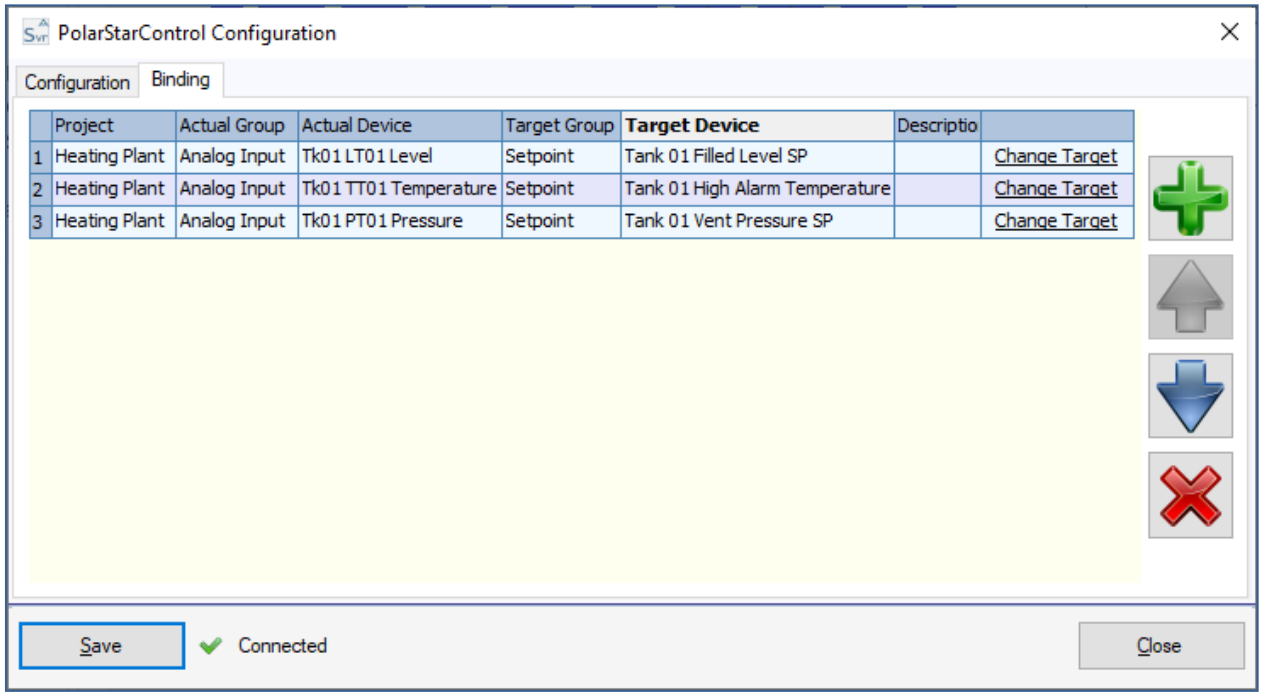
Polar Star Configuration

- **Background:** Sets the background colour for the control.
- **Colour:** Sets the colour of the indicator line for both the Target and Value indicator lines.
- **Width:** Sets the width of the indicator line for both the Target and Value indicator lines.
- **Show Labels:** When checked, this will display the description on each point on the star.
- **Show Target:** When checked, this will display labels showing the current targets.
- **Show Value:** When checked, this will display labels showing the current values.

Devices may be added and removed to/from the control via the “Binding” tab.

- Free text may be added in the **‘Description’** to be displayed on the control.
- Click **‘Change Target’** to add/change the target setpoint that the actual value is referenced to.

The required items are selected using the Project Explorer.

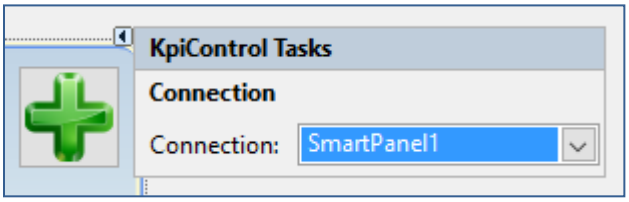


Polar Star Device Selection

7.5 Query

The Query Control can be used to device values and statistical values from the system. It can be configured statistics gathered from recorded historical data.

The only Design Time configuration option for the control is the connection which will be used by the control during Runtime. By default this is the panel the control is hosted on, which is in turn the connection set in the Service Manager within the Design Application. Any Advanced Service Manager Control hosted in the current panel may also be chosen here.

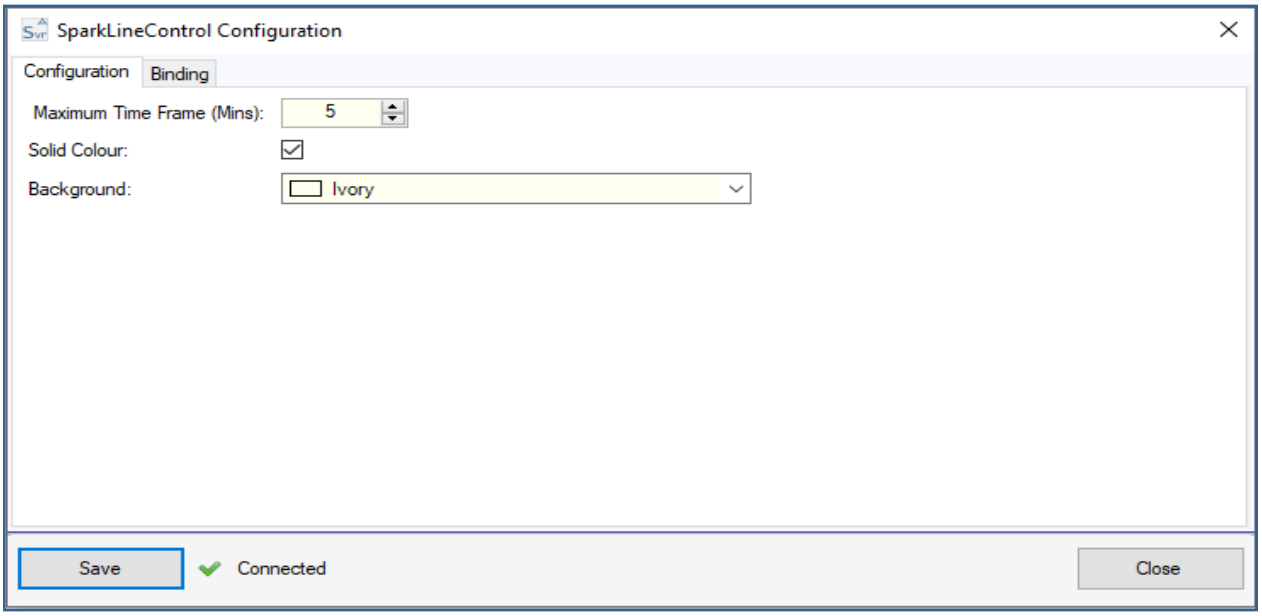


7.6 Spark Line

The Spark Line Control can be used to display a small basic live trend of a value.

Spark Line initial Placement

The following configuration options are available to the Spark Line Control:



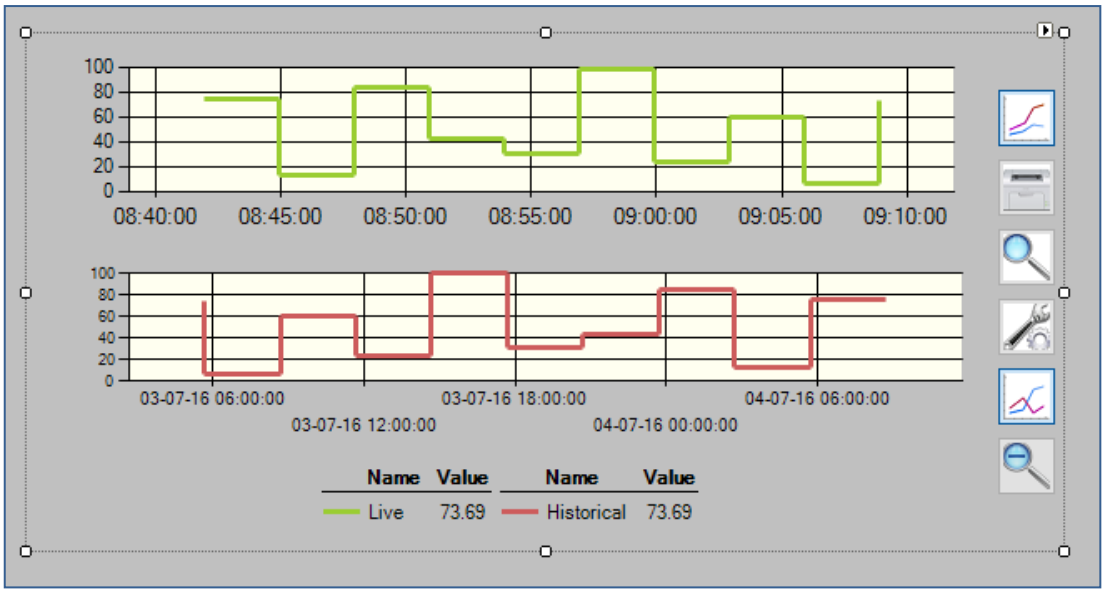
Spark Line Configuration

- **Maximum Time Frame:** Sets the maximum timeframe which the graph will display.
- **Solid Colour:** If checked, the area underneath the spark line will be filled..
- **Background:** Sets the background colour of the control.

Binding the property of a device may be configured in the “Binding” tab.
The required item for the binding is selected using the Project Explorer

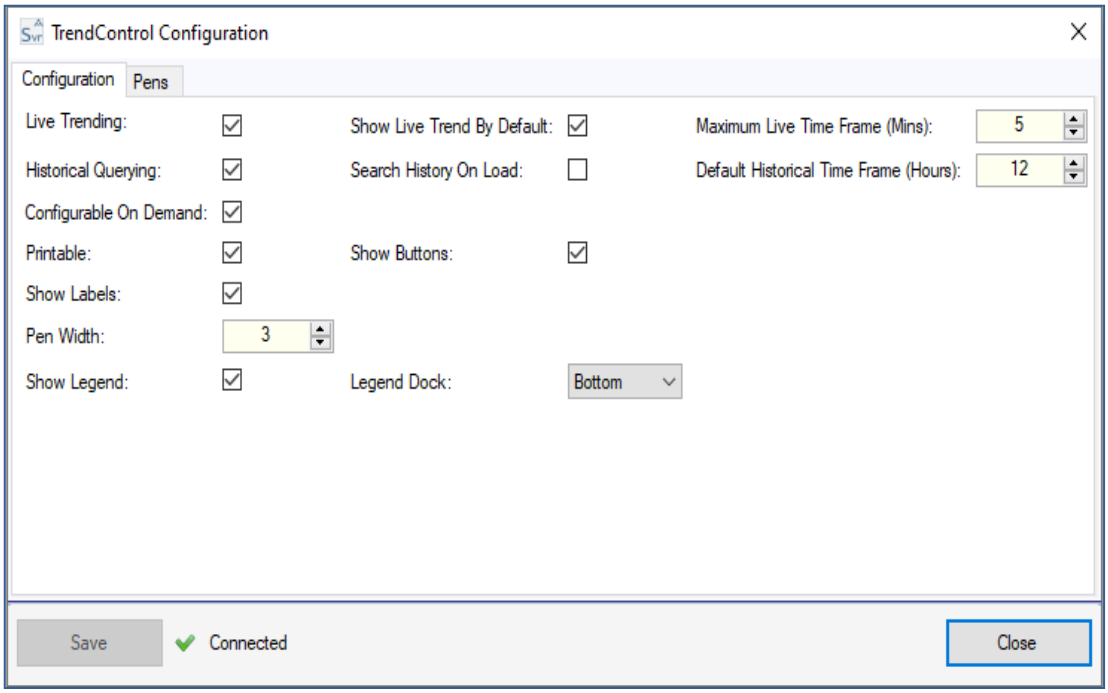
7.7 Trend

The Trend control can be used to display live or historical trend a value or values.



Trend Control placement on screen

The following configuration options are available for the Trend control:



Trend Control configuration

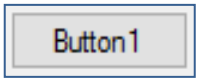
- **Live Trending:** Enables the control to record data from the selected Devices.
- **Historical Querying:** Enables the control to access historical data for the selected Devices.
- **Configurable On Demand:** Enables configuration of the control during Runtime.
- **Printable:** Enables the "Print" button during Runtime.
- **Show Labels:** Enables the labels on the graph to be visible during Runtime.
- **Pen Width:** The width of the pens used to draw the graph during Runtime.
- **Show Legend:** Enables the legend of the graph to be visible during Runtime.
- **Show Live Trend By Default:** Enables the Live trend to be visible when the HMI screen is first shown.
- **Search History On Load:** Enables the Historical trend to be queried and visible when the HMI screen is first shown.
- **Hide Buttons:** Hides all configuration buttons during Runtime.
- **Legend Dock:** The position of the Legend relative to the trend graph.
- **Maximum Live Time Frame:** The period of time data will be kept on the Live trend.
- **Default Historical Time Frame:** The time frame queried by the Historical trend when the HMI screen is first shown.

Binding for Pens for the property / properties of devices is configured in the "Pens" tab.
The required devices for the pens are selected using the Project Explorer

8 Form Controls

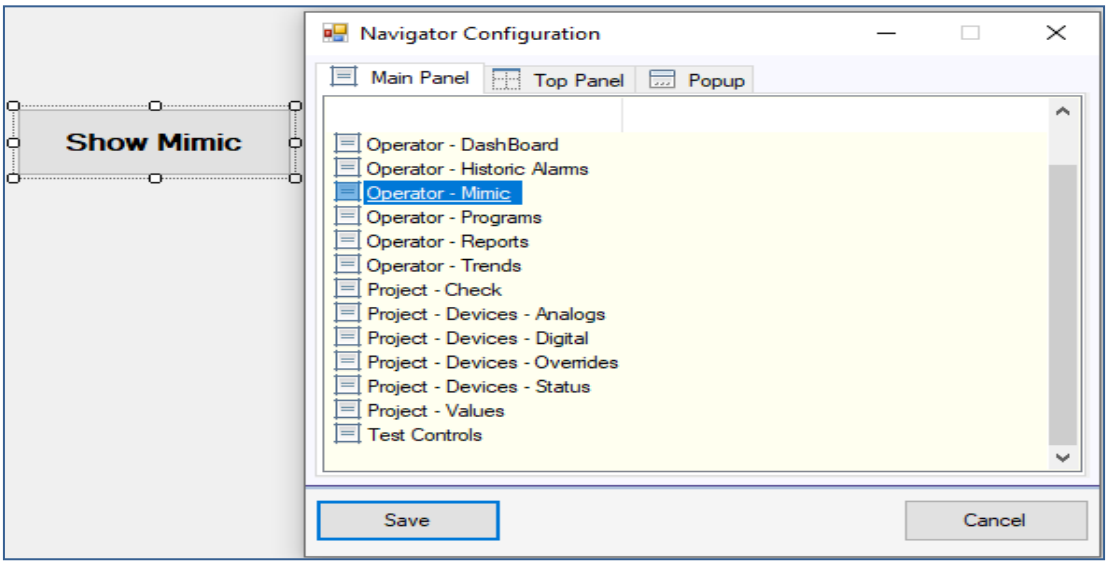
8.1 Button

The Button control can be configured to navigate to other windows of the HMI application.



Button Control placement on screen

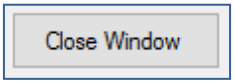
The navigation is set up by selecting **'Configure Navigator'** in the Right-click menu and the target panel is selected.



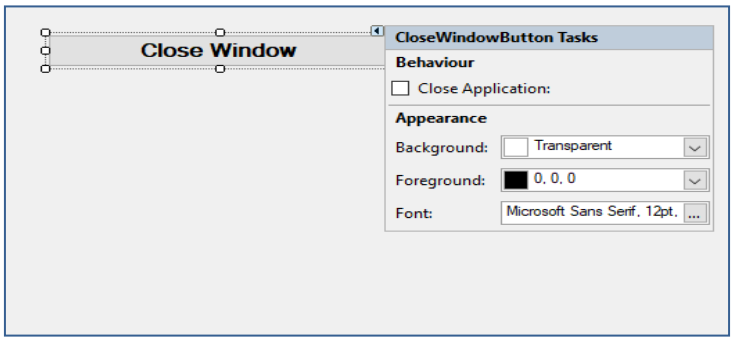
Button Control Navigation selection

8.2 Close Window Button

The Close Window control is used to close a Popup or the HMI Application in Runtime.



Close Window Button Control placement on screen



Close Window Button Control Setup

HMI Runtime may be ended by selecting **Close Application**.

8.3 Label

This is a text which is always present on the Screen.

8.4 Device Label

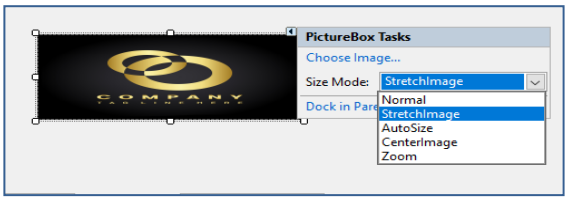
This is a label type which has visibility controlled by the Device Label Visibility control. The visibility is toggled each time the Device Label Visibility is pressed.

8.5 HMI Visibility Toggle

HMI Visibility Toggle button placement on screen

This button is used to toggle visibility for Devices which have HMI Visibility Toggle Dependent selected. The Button may be configured for Appearance.

8.6 Picture Box

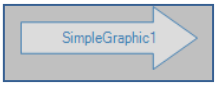


Picture Box placement on screen

This control allows a static image to be loaded into a screen panel. There are options for image display as Normal, Stretch, AutoSize, Centre Image and Zoom. The Stretch option allows the Image to fit to the selected size box.

8.7 Simple Graphic

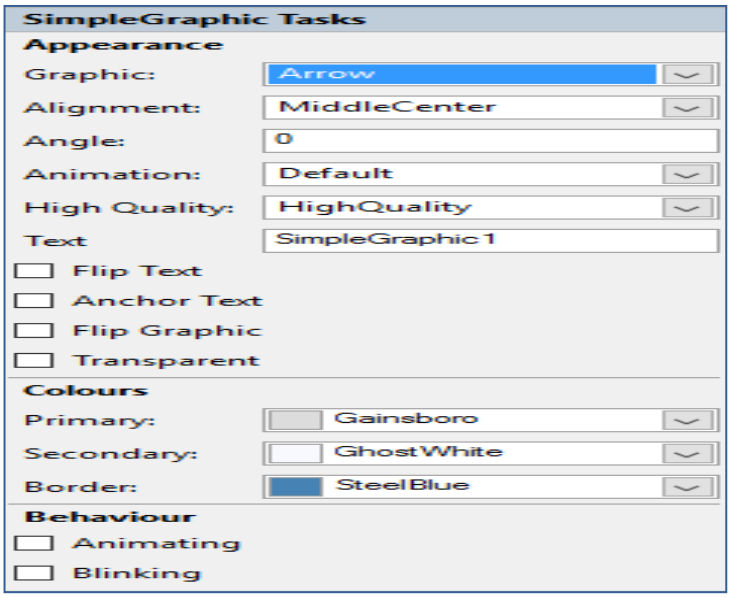
The Simple Graphic control is used for display purposes only, with no functionality.



Simple Graphic placement on screen

The following additional configuration options are available to the Simple Graphic control:

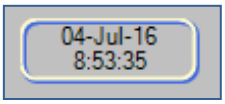
- **Animating:** Enables the animation of certain graphic types.
- **Blinking:** Causes the graphic to blink during Runtime.



Simple Graphic Configuration

8.8 Smart Label

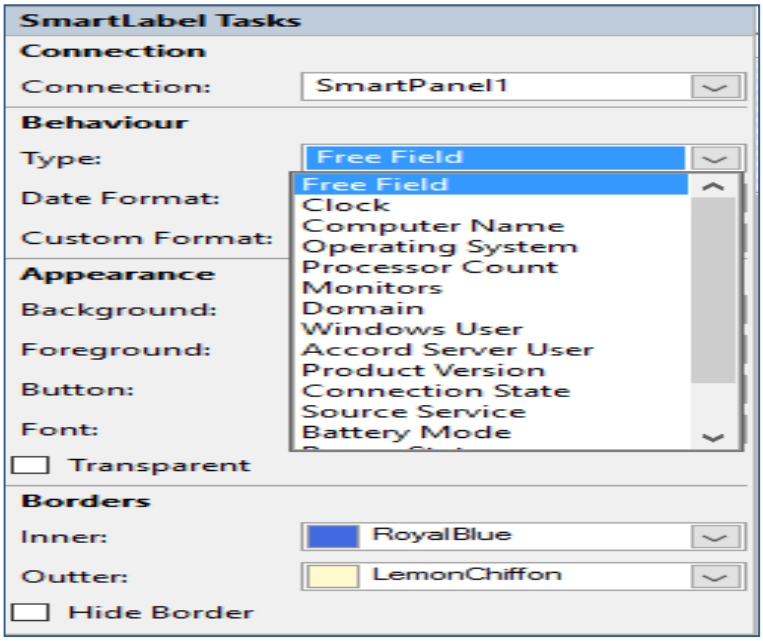
The Smart Label control can be used to add a variety of useful information to a HMI panel.



Smart Label placement on screen

The following configuration options are available to the Smart Label control:

- **Connection:** The Accord Server Connection used by the control when an applicable type is selected.
- **Background:** The background colour used by the control.
- **Foreground:** The foreground colour used by the control.
- **Button:** The button colour used by the control.
- **Font:** The type, style and size of the font used by the control.
- **Borders:** The colour of the inner/outer border used by the control.
- **Hide Border:** Toggle whether or not the border is hidden.
- **Transparent:** Once the background of the control is set to "Transparent," enabling this option will allow the controls within the square border of the control to be visible, otherwise the hosting window will be visible. This is disabled by default and will have no effect in design time for performance reasons.



Smart Label configuration

- **Type:** The type of information shown by the control:
  - Clock: The current system time of the computer.
  - Computer Name: The current system name of the computer.
  - Operating System: The current operating system of the computer.
  - Processor Count: The number of processor cores of the computer.
  - Monitors: The number of monitors connected to the computer.
  - Domain: Domain for the computer running the HMI application.
  - Windows User: The User logged into the operating system on the computer.
  - Accord Server User: User logged into the Accord Server on the HMI application.
  - Product Version: Version of the HMI application.
  - Connection State: Current state of the connection to the Accord Server service.
  - Battery Mode: The status of the PC battery.
  - Power Status: The status of the PC power module.
  - Available Resources: A percentage representation of available resources, using the Accord Server resource algorithm.
  - System Up Time: The time that the PC has been running for.
  - Application Up Time: The time the HMI application has been connected to the Accord Server.

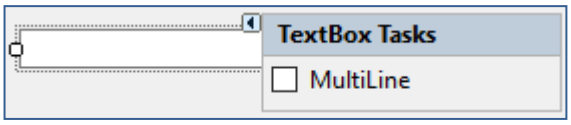
- **Date Format:** The display format for date/time information, when applicable.
- **Custom Format:** Customised format for date/time information.

8.9 Text Box

The Text Box control is used to display static text in the HMI application.

Text Box placement on screen

Selecting the Text Box will make an arrow appear, giving the option to enable or disable the display of multiple lines within the Text Box.

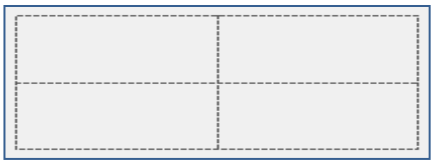


Text Box Multiline Configuration

9 Container Controls

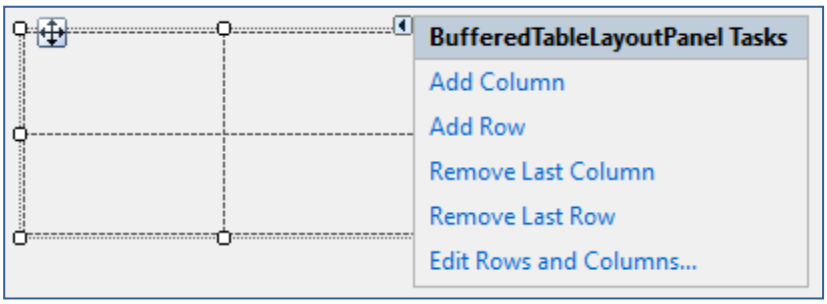
9.1 Buffered Table Layout Panel

The Buffered Table Layout Panel can be used to correctly align multiple controls within a section of the HMI application.

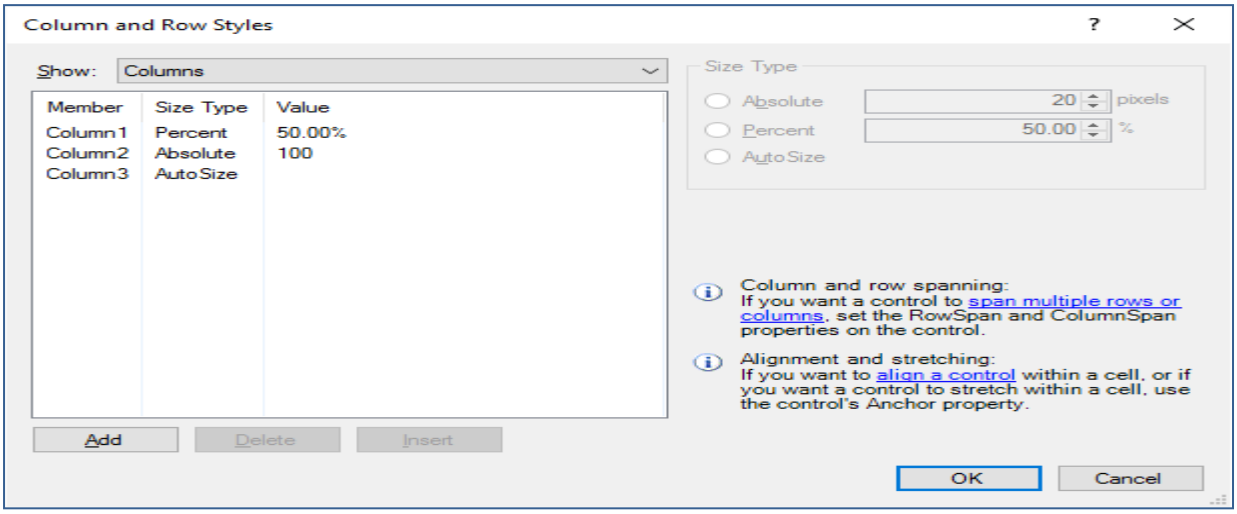


Buffered Table placement on screen

Selecting the Buffered Table Layout Panel will make an anchor appear for moving the control, and an arrow which will show options for adding or removal of rows and columns.



Clicking **'Edit Rows and Columns'** displays the **'Column and Row Styles'** window.



Buffered Table Layout configuration

Use the drop-down list at the top to alternate between editing **Rows** and **Columns**.

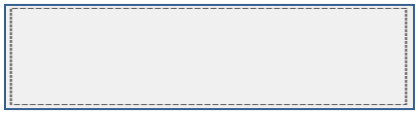
- The **Add** button will add a new row/column to the end of the list.
- The **Delete** button will delete the row/column currently selected in the list.
- The **Insert** button will add a new row/column in the currently selected location in the list.

Once a row/column is selected, its size type and value can be configured:

- **Absolute** size sets the size of the row/column to the configured value in pixels.
- **AutoSize** causes the row/column to automatically size to fit the control(s) within it.
- All rows with **Percent** selected will size themselves to use the configured percentage of the remaining space in the panel not taken up by **Absolute** and **AutoSize** rows/columns.

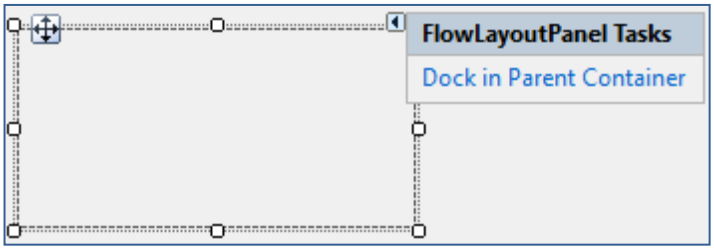
9.2 Flow Layout Panel

The Flow Layout Panel can automatically align multiple controls.



Flow Layout Panel on screen

Selecting the Flow Layout Panel will make an anchor appear for moving the control, and an arrow which will allow the panel to be docked in the parent container.



Flow Layout Panel configuration

When a control is added to the Flow Layout Panel, it will be aligned according to the configured direction. By default, this is **Left-to-right**, but may be changed in the **Properties** panel to the right of the **Design** window.

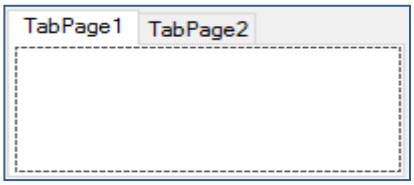
9.3 Round Panel

The Round Panel can be used to contain multiple related controls which can them be moved as a group, or to act as a border for a single control.

Simply drag the control(s) into the panel to add them.

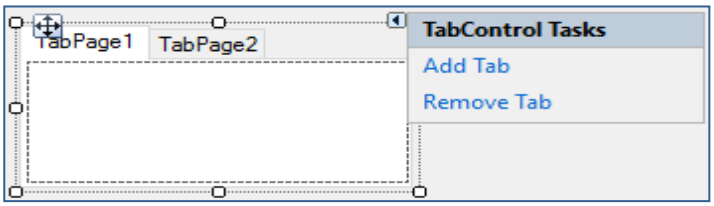
9.4 Tab Control

The Tab Control can be used to hold multiple pages of control configurations which can be accessed by selecting the appropriate tab.



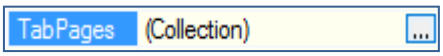
Tab Control on screen

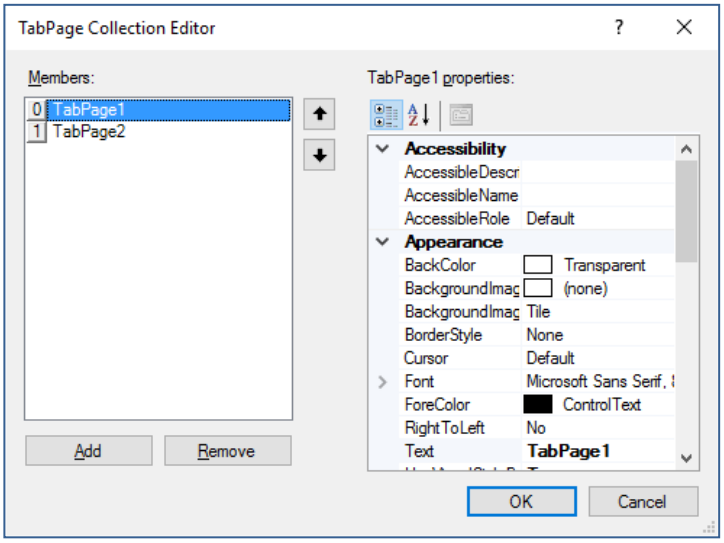
Selecting the Tab Control enables a list of options for addition or removal of tabs.



Tab Control configuration

clicking on the **'[…]'** icon in the **TabPages** in the **Properties** panel to the right of the **Design** window displays the **TabPage Collection Editor** for more detailed configuration**.**





Tab Control collection editor