Item number	**FATEK FvDesigner Manual**	**Date**	2015/04/21	**Version**	1.1
				Total number of pages	431

FATEK FvDesigner Manual

FATEK

Bescuase the menual contents will change when software updates. If you want to download the newest version of manual, please go to http://www.fatek.com/tw/ .Support section.

List of Tables

List of Figures

FATEK FvDesigner Manual
Introduction to FATEK FvDesigner

Foreword

The FATEK FvDesigner is a software tool mainly used to design and develop FATEK FV HMI series product projects. The FvDesigner includes an easy to operate Windows interface which is similar to the frequently used Microsoft Office Ribbon interface; it is easy to learn and use. It supports rich figure objects to design various Windows interfaces and applications, and it also supports multiple types of database that allows the user to custom define, making it easier to organize, manage and share. It includes recipe functions, data log, alarm processing and user operation logs etc., making HMI function planning more complete.

System Requirements

Supported Operating Systems: Windows XP
Windows 7 (32&64 bits)
Windows 8 (32&64 bits)

System Installation

The installation instructions will appear once the installing package is executed; please follow and confirm the installation steps.

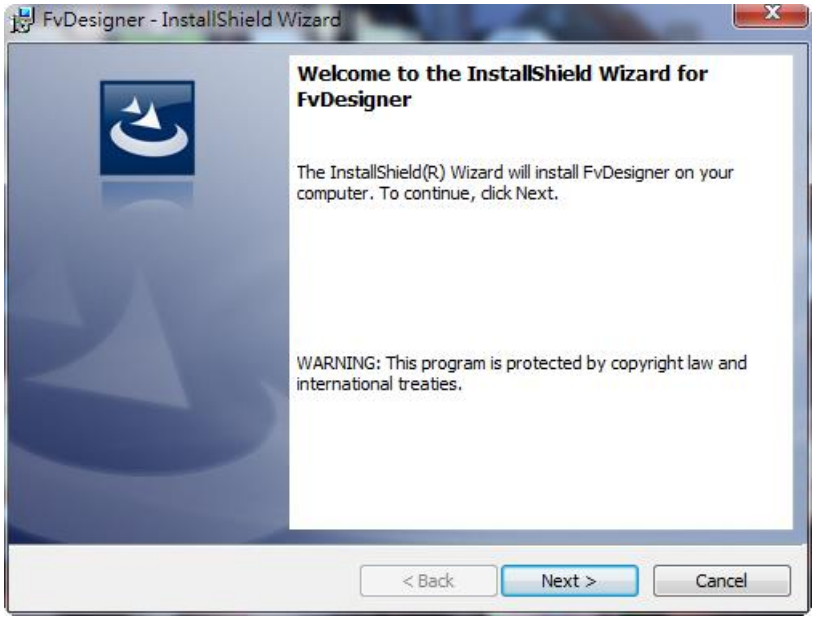


Figure 1 Installation Welcoming Screen

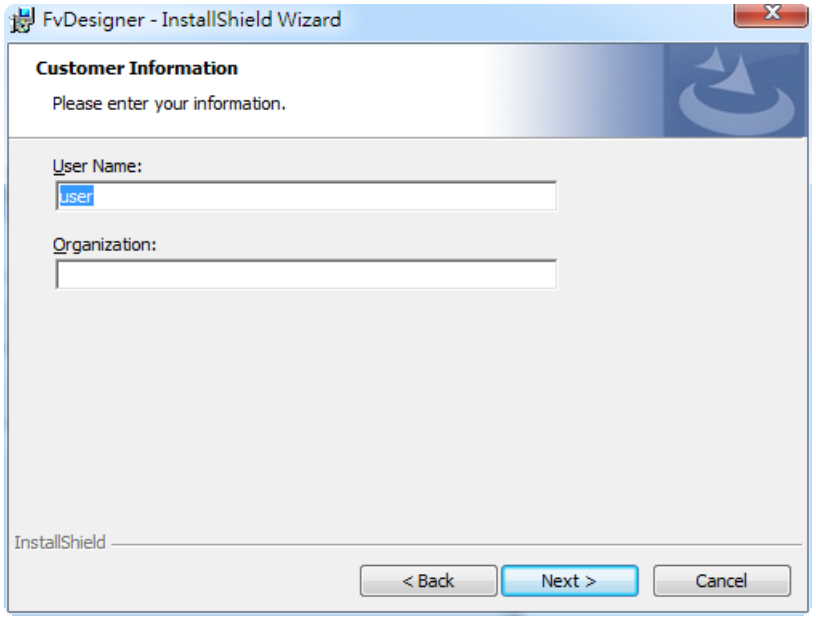


Figure 2 User Information

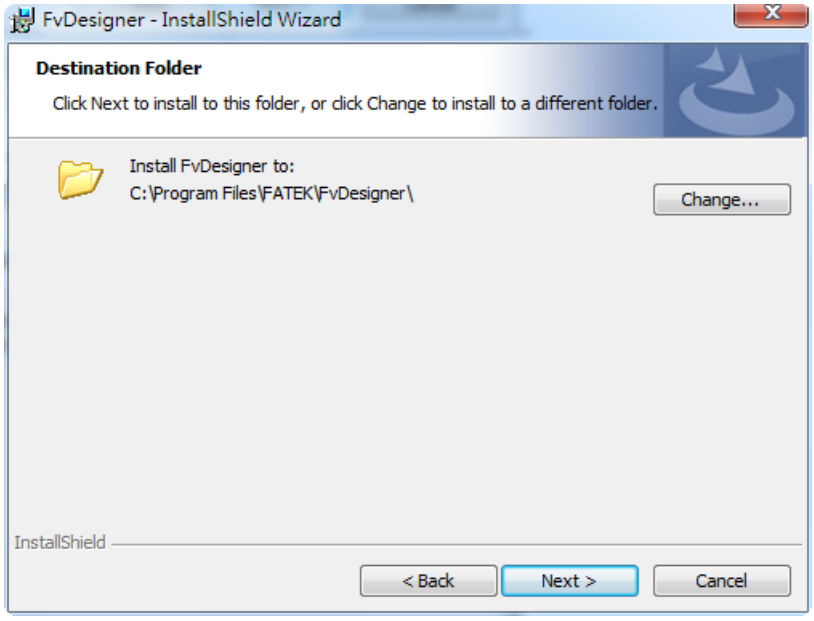


Figure 3 Select Software Installation Path

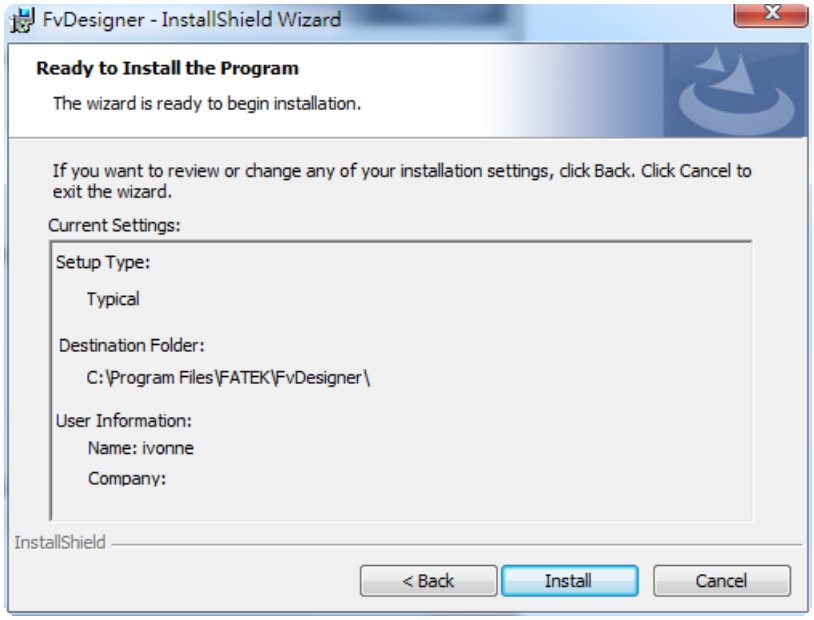


Figure 4 Confirmation Before Installation

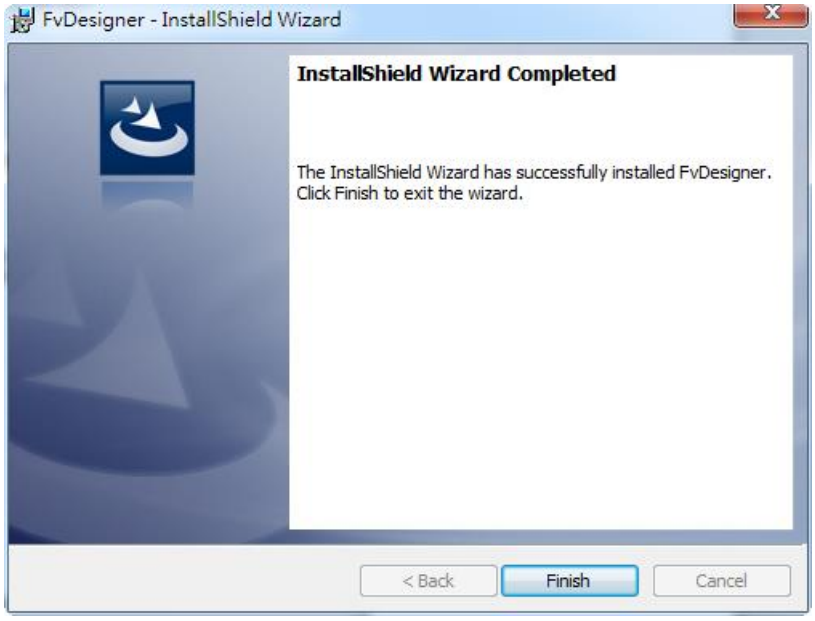


Figure 5 Installation Complete

Startup Screen

Every time FATEK FvDesigner is executed to edit and develop projects, it will first enter the startup screen. The functions provided are as follows:

Table 1 Startup Screen Functions

Function	Description
【Create New Project】	Uses a Project Wizard to guide the users to create a new project.
【Open Project】	Opens an existing project. A recently used project list will be displayed on the right of the startup screen; the user can select a project on the list and then click the Open button at the bottom of the list to open this project. If the existing project is protected with a password, the password must be entered before it can be opened.
【Exit】	Closes the FATEK FvDesigner.
	Switch to other language: English, Traditional Chinese and Simplified Chinese.

Figure 6 Startup Screen

When Create New Project is selected, initial configurations for the project can quickly be completed by following the preset steps of the Project Wizard.

Table 2 Create New Project Steps

Function	Description
【Choose HMI Model】	Choose the FATEK FV HMI model, resolution and the project to display. Images of actual product appearances will be displayed in the list below for the developer to choose from.
【Choose Controller】	Chose the controller to connect and the communication interface settings.
【Select Location】	Sets the project name and storage path.

First select the HMI product model to develop from the product image list below; the information field in the middle will display information on the hardware specifications and supported communication interface of the product.

Figure 7 Create New Project: Choose Product Type

Step two, select the PLC and equipment model and edit the communication interface and parameters. If the selected PLC device and communication interface uses serial transmission, the communications setting below will display related parameter settings for serial transmission. If the communication interface is Ethernet, network parameter settings interface including IP and port will be displayed; please refer to **Chapter 2.3–Link** for related parameter content settings.

Figure 8 Create New Project: Choose Controller

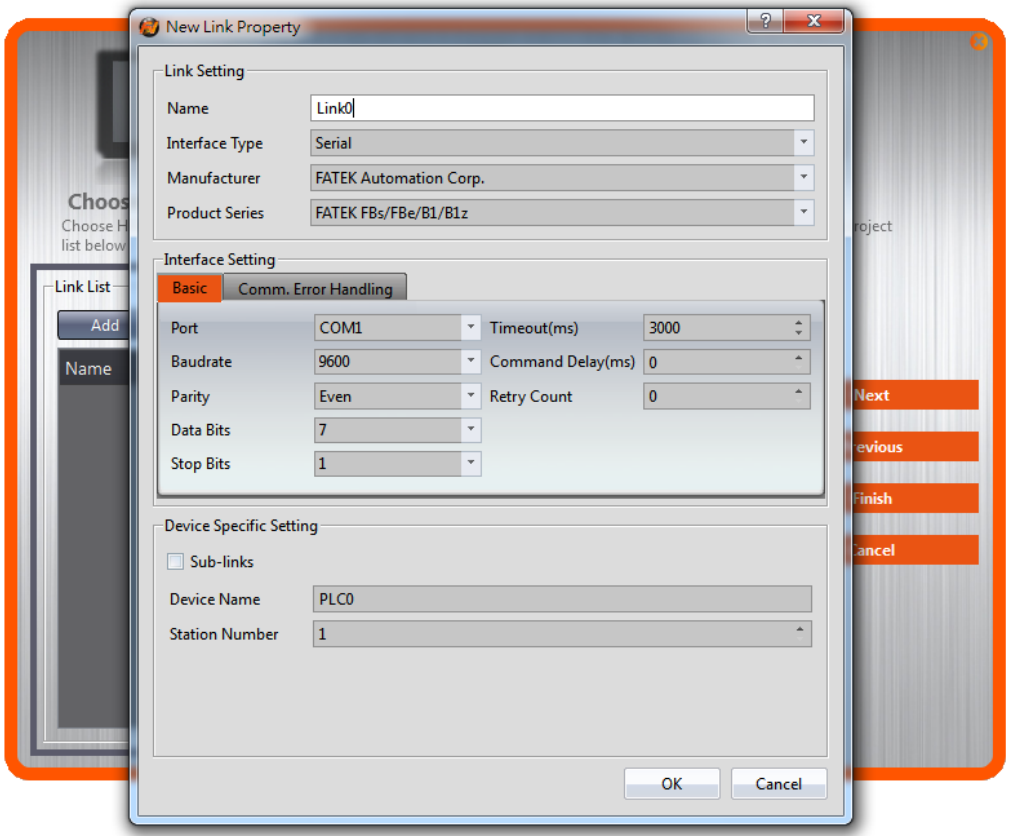


Figure 9 Create New Project: Controller Connection Configuration

Finally, select the project name and storage path and then press【Finish】to complete

the Create New Project steps and start developing.

Figure 10 Create New Project: Select Location

1. Window Configuration

The default Window Configuration of FATEK FvDesigner is as shown below:

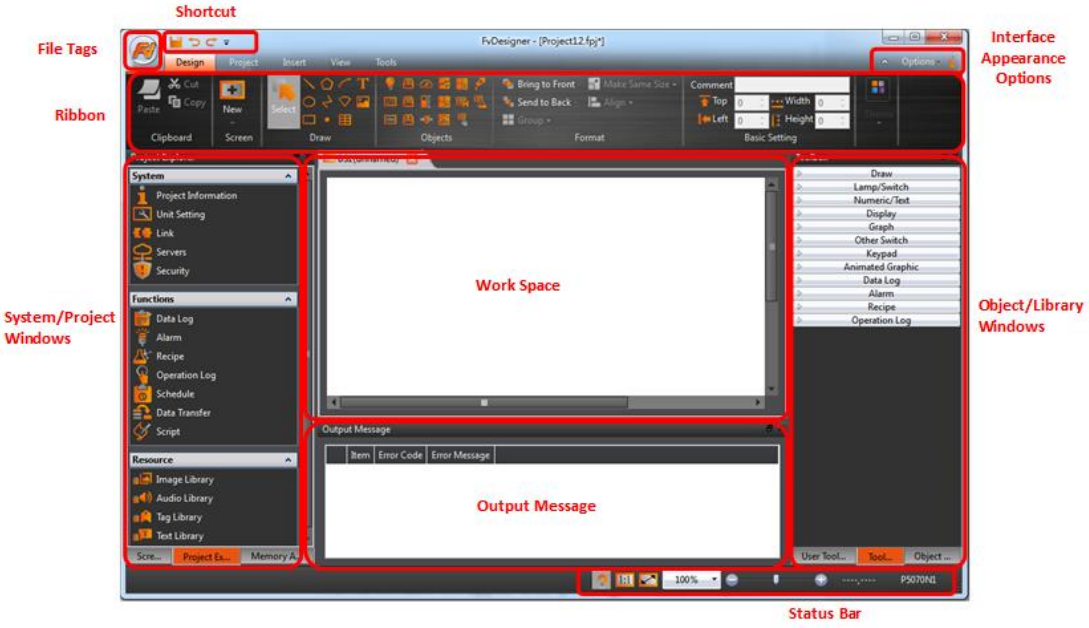


Figure 11 FATEK FvDesigner Window Configuration

1.1 File Tags

1.1.1File

The File Window will appear after pressing the  icon, as shown below.

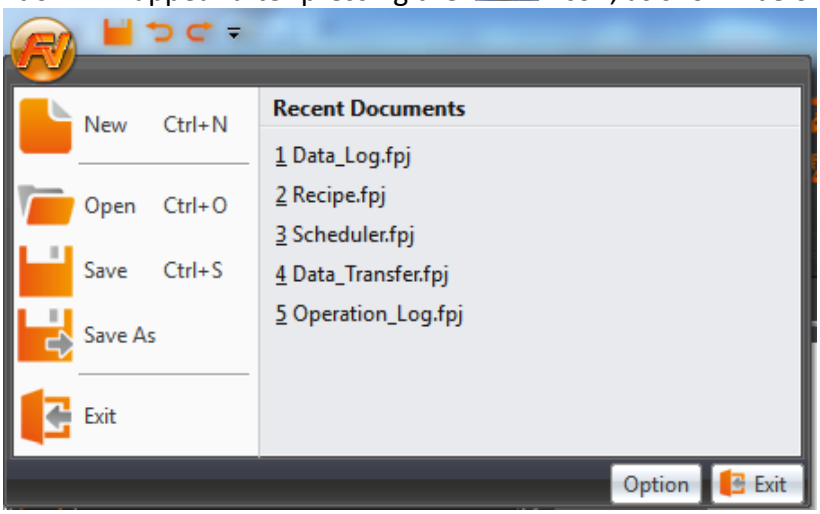


Figure 12 Toolbar–File

Table 3 File Options

Function	Description
【New(N)】	Close the current project and open the Project Wizard. A reminder window will appear to ask the developer whether to save the project if the current project was not yet saved.
【Open(O)】	Select the path and open a project. A reminder window will appear to ask the developer whether to save the project if the current project was not yet saved.

【Save(S)】	Save the currently editing project.
【Save as(A)】	Select the path and save the currently editing project as a new file.
【Recent Documents】	Open recently used project. These project names will be displayed on the right of the window; if the cursor is moved on top of a file name, the file path will be displayed.
【Option(I)】	Open【Option】, to set software environment related settings. **Function** / **Description** 【General】: Allows switching between different languages. 【Icon Color】: Allows switching icon between different colos.
【Exit(X)】	Close the current project and the program. A reminder window will appear to ask the developer whether to save the project if the current project was not yet saved.

1.2 Ribbon

The Ribbon is a user interface that uses panels and tab pages as the architecture; functions will be displayed with icons in the Window below according to different options selected. There are five pages in this section, which are Design, Project, Insert, Window and Tools respectively; their descriptions are as follows.

Figure 13 Ribbon Illustration

Table 4 Introduction to Ribbon User Interface Functions

Function	Description
【Design(D)】	Basic functions related to designing objects. **Block** / **Description** 【Clipboard】: Paste, Cut and Copy the selected object. 【Screen】: Three screen type options will be displayed when this button is pressed, which are: 1. Base Screen 2. Window Screen 3. Keypad Screen The screen type can be added once clicked. 【Basic Setting】: Allow quick setting of basic object information, including object comments, locations and sizes. 【Font】: Allow quick setting of text, including font, size, and color. 【Text: Allow quick setting of text alignment in the object.

<table>
<tr><td></td><td>
<table>
<tr><td>【Alignment】</td><td></td></tr>
<tr><td>【Theme】</td><td>Select appearance related settings. It can quickly and conveniently change the appearance and color of the selected object or group.</td></tr>
<tr><td>【Format】</td><td>Select the figure level, location, size, alignment and group relations between objects.</td></tr>
<tr><td>【Draw】</td><td>Select the draw object that needs to be placed on the work space.</td></tr>
<tr><td>【Object】</td><td>Select the object that needs to be placed on the work space.</td></tr>
</table>
</td></tr>
<tr><td>【Project(P)】</td><td>
Information and settings related to the project.
1.【Execute】: Functions related to project execution.
<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>【Compile】</td><td>Generate Running Package (*.cfrp).</td></tr>
<tr><td>【Decompile】</td><td>Decompile Running Package (*.cfrp).</td></tr>
</table>
2.【Transfer】: Functions related to project transfer.
<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>【Download】</td><td>Download running package to the HMI.</td></tr>
<tr><td>【Upload】</td><td>Upload running package from the HMI.</td></tr>
<tr><td>【File Transfer】</td><td>Transfer file.</td></tr>
</table>
3.【Run】: Executes the current project.
<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>【Simulation】</td><td>Open the simulation window; there are two modes to choose from: online simulation and offline simulation.</td></tr>
</table>
</td></tr>
<tr><td>【Insert(I)】</td><td>
Allows quick adding of a new window or function.
<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>【Screen】</td><td>Three screen type options will be displayed when this button is pressed, which are:
1. Base Screen
2. Window Screen
3. Keypad Screen
The screen type can be added once clicked.</td></tr>
<tr><td>【Device】</td><td>A【New Link Property】window will appear when this button is pressed; a new connection device can be added after editing related settings.</td></tr>
</table>
</td></tr>
</table>

	【Data Log】	A【Data Log Group Properties】window will appear when this button is pressed; a new data log group can be added after editing related settings.
	【Alarm】	An【Alarm Group Properties】window will appear when this button is pressed; a new alarm group can be added after editing related settings.
	【Recipe】	A【Recipe Group Properties】window will appear when this button is pressed; a new recipe group can be added after editing related settings.
	【Schedule】	A【Schedule Group Properties】window will appear when this button is pressed; a new schedule group can be added after editing related settings.
	【Data Transfer】	A【Data Transfer Group Properties】window will appear when this button is pressed; a new data transfer group can be added after editing related settings.
	【Script】	A【Script Editor】window will appear when this button is pressed; a new script function can be added after editing related settings.

【View(V)】

View all FvDesigner windows. Pressing this button can display/close this window.

1.【System/Project Windows】

Function	Description
【Screen List】	Display/Close Screen List.
【Project Explorer】	Display/Close Project Explorer.
【Memory Address】	Display/Close Memory Address.
【Output Message】	Displas/Close Output Message.

2.【Object/Library Windows】

Function	Description
【Object List】	Display/Close Object List.
【Toolbox】	Display/Close Toolbox.
【User Toolbox】	Display/Close User Toolbox.

3.【Window】

Function	Description
【Arrange Icons】	Arrange the icon format in the work space.

	【Cascade】	Use the cascade window format in the work space.
	【Switch Windows】	Switch between opened windows in the work space.
	【Close All】	Close all windows in the work space.
【Tools(T)】	Tools application program; please refer to the Application Tool chapter for details.	

Function	Description
【Pass Through】	Edit settings related to the pass through function.
【PLC Resource Review】	Allow checking of information on the various PLC drives supported by FvDesigner.
【Remote System Setting】	Allow setting the system setting on the remote HMI.

1.2.1 Design(D)

【Design(D)】mainly allows developers to conveniently use this interface to edit the object configurations of the screen windows in the work space; it provides general clipboard functions such as copying objects and applying object formats etc., and it allows adding of frequently used objects into the window from the object field. Theme can be used to quickly apply settings to the specific selected objects in the window and change their appearance properties; detailed descriptions are as follows:

Figure 14 Design

1.2.1.1 Clipboard

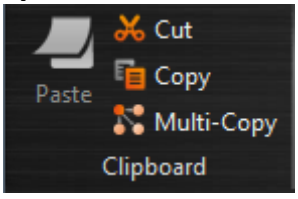


Figure 15 Design–Clipboard

Table 5 Design–Clipboard

Function	Description
【Cut】	Cut the object onto the clipboard.
【Paste】	Paste the cut or copied object.
【Copy】	Copy the object onto the clipboard.

【Multi-Copy】	Multi-Copy the object.

Multi-Copy function is available in the Design page of Ribbon(Figure 15) or in the pop-up menu which is showed after clicked the right button of the mouse(Figure 16).

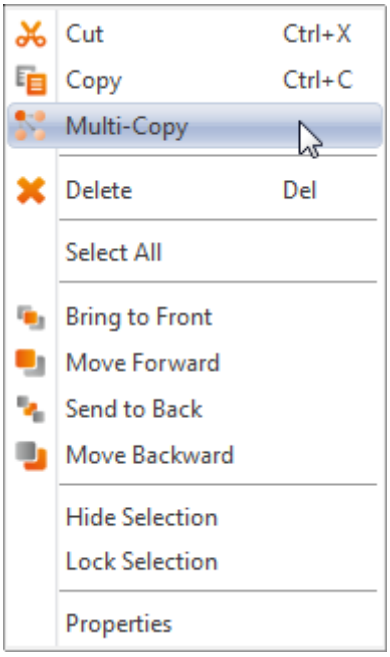


Figure 16 The pop-up menu which is after clicked the right button of the mouse

In the Multi-Copy window(Figure 17), you can set the amount of the copied object in the x and y direction, the sequence of adding the copied objects, whether to copy the comment of the object and register setting.

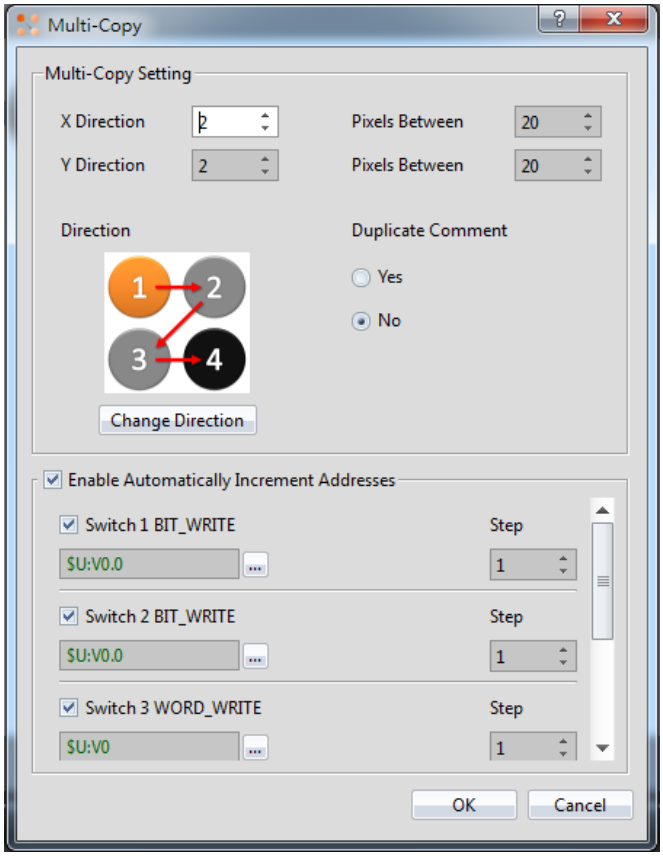


Figure 17 Multi-Copy window

1.2.1.2 Screen

A design screen can be quickly added here.

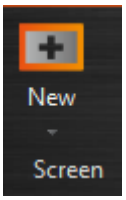


Figure 18 Design–Screen

Table 6 Design–Screen

Function	Description
【Base Screen】	General screen; its size is the same as the HMI resolution and cannot be changed.
【Window Screen】	This type of window screen is selected for both direct and indirect windows; the window screen size can be changed.
【Keypad Screen】	The required keypad screen can be customized here for use.

1.2.1.3 Basic Setting

Provide basic settings of object for users to quickly edit the comment, location and size of the object.

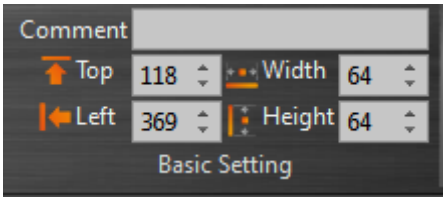


Figure 19 Design–Basic Setting

Table 7 Design–Basic Setting

Function	Description
【Comment】	The user can enter the comment and property of the object here.
【Top】 【Left】	The coordinates on the top-left corner of the object: Top: The y-coordinate for the top of the object. Left: The x-coordinate for the left-most point of the object.
【Width】 【Height】	The width and height of the object; uses pixel as units.

1.2.1.4 Font

Provide basic settings of text for users to quickly edit the font, size and color of the text.

Figure 20 Design-Font

1.2.1.5 Text Alignment

Provide basic settings of text alignment for users to quickly edit the position in the object.

Figure 21 Design-Text Alignment

1.2.1.6 Theme

Users can use this function to quickly apply settings to the specific selected objects in the window to change its appearance properties.

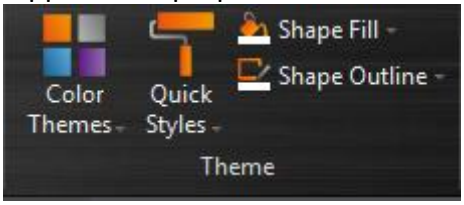
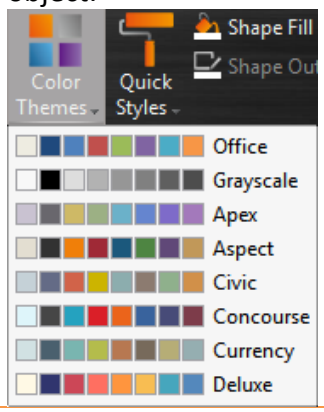
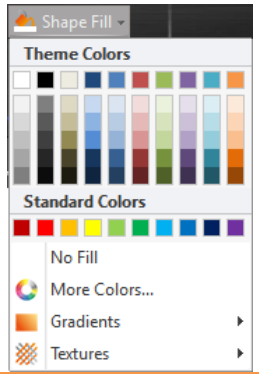


Figure 22 Design–Theme

Table 8 Design–Theme

Function	Description
【Color Themes】	Select the color theme you prefer and apply it on the object; allows designers to quickly change the color style of the object. 
【Quick Styles】	Select Quick Styles to apply the preset color configurations to each object; allows designers to quickly develop their own object color appearances. 
【Shape Fill/Shape Outline】	Adjust the appearance and color effects of the object. Note: Only the theme colors will change with the【Color Themes】; standard colors will not change with the【Color Themes】. 

1.2.1.7 Format

Provides object format function allowing users to select multiple objects and quickly organize the typesetting of the screen objects, including alignment, spacing and size adjustment functions etc.

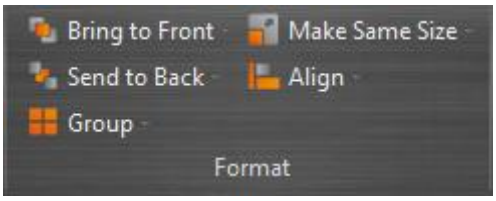


Figure 23 Design–Format

Table 9 Design–Format

Function	Description
【Bring to Front】	Two options will appear when this button is pressed: Bring to Front Move Forward
【Send to Back】	Two options will appear when this button is pressed: Send to Back Move Backward
【Make Same Size】	Three options will appear when this button is pressed: Make Same Size Make Same Width Make Same Height
【Align】	Eight options will appear when this button is pressed: Align Left Align Center Align Right Align Top Align Middle Align Bottom Distribute Horizontally Distribute Vertically
【Group】	Two options will appear when this button is pressed: Group Ungroup

1.2.1.8 Objects

Object provided by this software can be added from the object field; the more frequently used types are displayed here. After selecting the object to add, left-click the mouse directly on the window screen in the work space to add this object.
Use the Toolbox in the Object/Library Window section to the right to view all available object types; all object types are available there.

Figure 24 Design–Object

1.2.2 Project(P)

This field provides project related function settings, and it is divided into the following three parts:

【Execute】Compiles the project file into a running package, or decompiles the running package into a project file.

【Transfer】is a function related to file transfer; it can download the compiled running package onto the HMI for running or acquire the running package from the HMI and upload it onto the computer. User can also make USB update file to replace the running project on HMI.

【Run】opens the simulation function and runs and current project.

Figure 25 Project

1.2.2.1 Compile

Figure 26 Creating Running Package

The Compile function can be found in the【Project】function tab of the Ribbon task bar on top of the FvDesigner; click on【Compile】to start. The running package (*.cfrp - Compress FATEK Running Package) can be generated when the project file (*.fpj - FATEK Project) has successfully compiled; the running package can be downloaded to the FATEK HMI device through the Internet/USB/Serial cable. After compilation is complete, the output window will display information concerning the compile output and memory configuration situation etc. The project must be saved and compiled into a running package before simulation can be run or before the function can be downloaded.

Table 10 Compile Output Window Related Information

Information	Content
【Project】	The location of the compiled project file (*.fpj).
【Date】	Compilation date and time.
【Running Package】	The location to create the running package file (*.cfrp).
【Memory Usage】	Memory size used by objects.

	Memory size used by images. Memory size used by audios. Memory size used by the tag library. Memory size used by the text library. Memory size used by the scripts. Memory size used by the recipe files. Memory size used by fonts.
【Project Capacity】	Total size used by the running package. Space remaining for the running package.
【Compile Output】	Number of errors Number of warnings Compile Output: Success/Compile Failed.

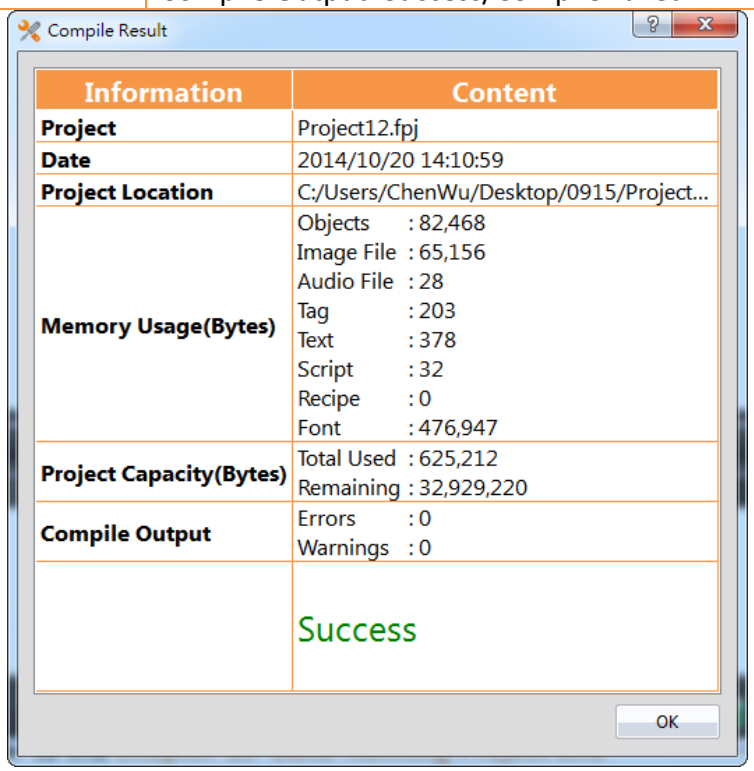


Figure 27 Compilation Result Dialog

1.2.2.2 Decompile

The decompile process can be used on the running package (.cfrp) uploaded by the HMI interface to extract the project and attached recipes and fonts. The decompile function can be found in the【Project】function tab of the Ribbon task bar on top of the FvDesigner; click on【Decompile】to start. Please refer to the **Chapter 15–Build Running Package and Simulation** for detailed functions.

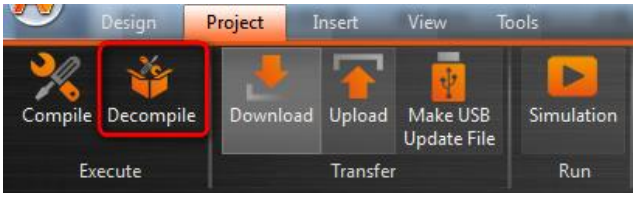


Figure 28 Decompile

1.2.2.3 Upload & Download

Data transfer can be performed for projects through USB or Internet connection. Click on the Download function and the FvDesigner will automatically save and compile the project directly; clicking the Upload function will upload the running package running on the HMI onto the computer. If users want to view the contents of the running package after upload is complete, the decompile function can be used to extract the running package.

The HMI network IP information must be set when using Internet transfer. The auto-search function can be used if you do not know the IP information; this software will search for the FATEK HMI device on the local network and display the device IP information found in the table. Select the target device IP to perform data transfer.

The transfer function is password protected; the upload or download password must be set before transferring and this password will be checked during connection. Communication will only be performed if the password is correct.

Please refer to the【**Upload**】and【**Download**】sections in Chapter15–Build Running Packages and Simulation for details.

1.2.2.4 Make USB Update File

This function can let users generate urfp file in the assigned path. Put this file in the “update” folder in the directory folder of USB and insert USB into the executing HMI. A dialog will pup up to ask the user if he or she wants to update the running project. If the user wants to update, there is a file list the user can choose from. Click the OK button to restart HMI and therefore replace the running project.

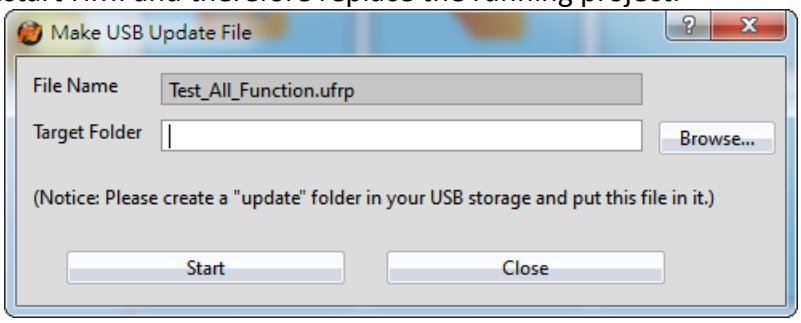


Figure 29 Make USB Update Project

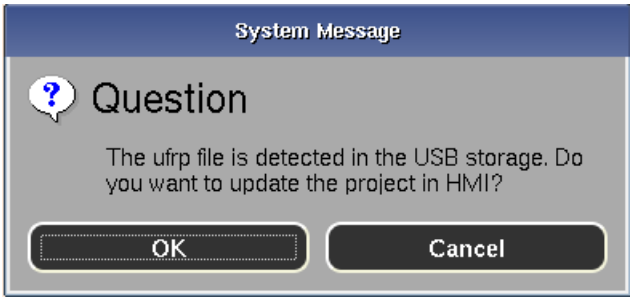


Figure 30 Project Update Question Dialog

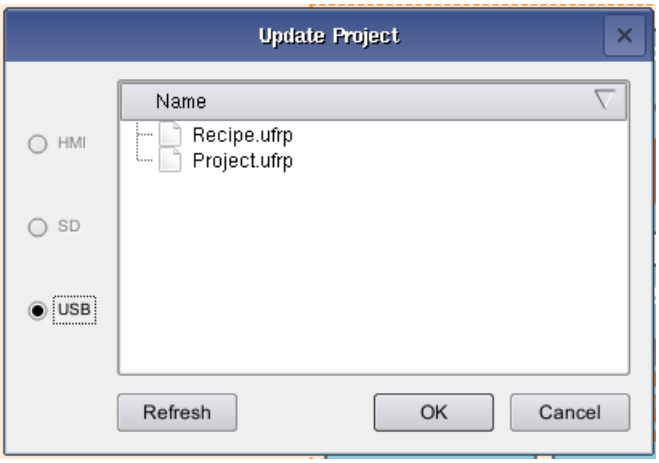


Figure 31 USB Update List

1.2.2.5 Simulation

The project must first be compiled to generate the running package file before running the simulation function, and the simulation is divided into Offline Simulation and Online Simulation; their descriptions are as follows:

Offline Simulation: Does not require connecting PLC and HMI equipment; the screens in the running package can be operated directly.

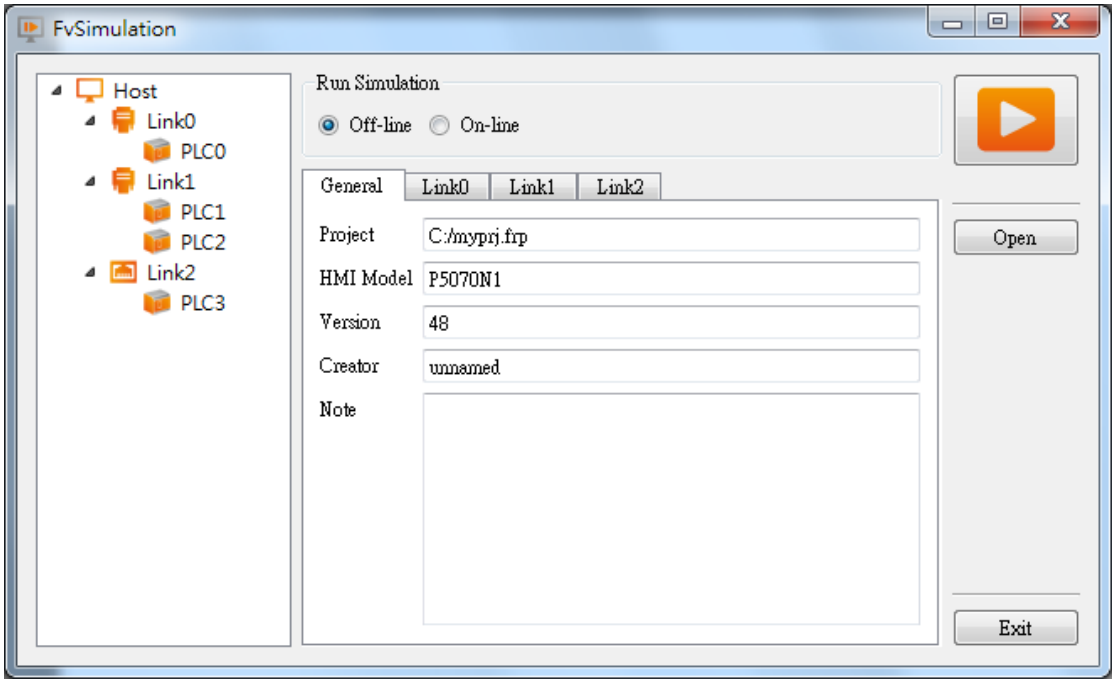


Figure 32 Offline Simulation

Online Simulation: PC and PLC connected; running package is executed on the PC to and communicates with the PLC.

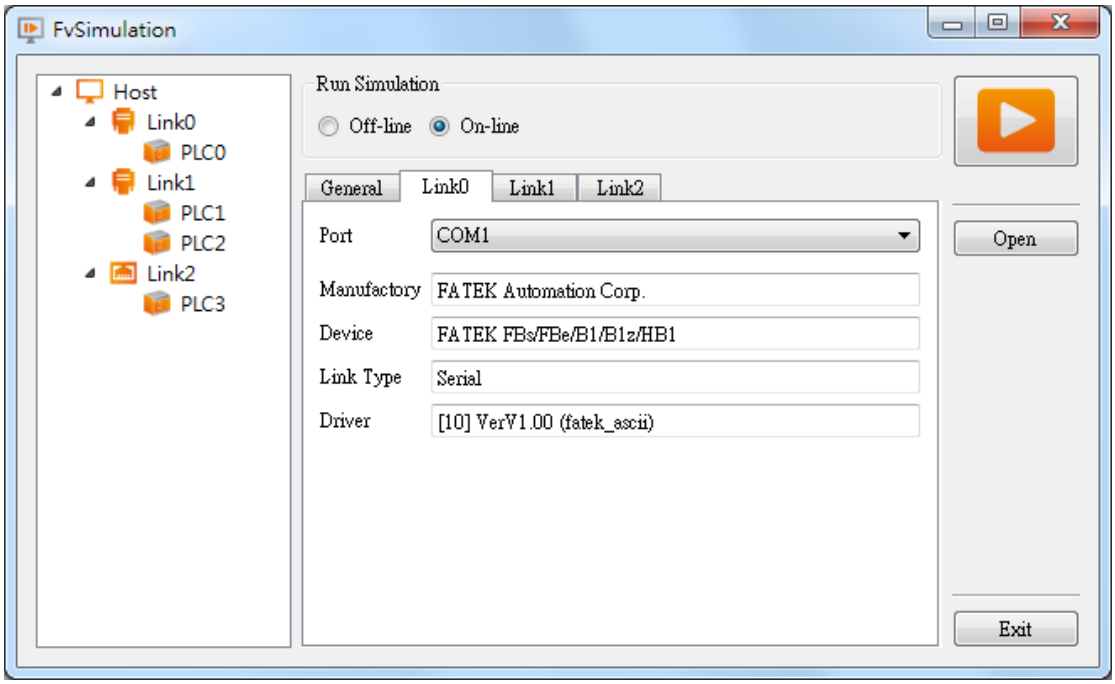


Figure 33 Online Simulation

Please refer to the simulation chapter in **Chapter15–Build Running Package and Simulation for details.**

1.2.3Insert(I)

This field allows users to quickly add screens or functions; they can be added by pressing this button, in which includes:

【Screen】

【Device】

【Data Log】

【Alarm】

【Recipe】

【Schedule】

【Data Transfer】

【Script】

Figure 34 Insert

1.2.4View(V)

Click on the working window to display and this window will be configured to the related preset position of the FvDesigner; the【System/Project Windows】will be placed on the left and the【Object/Library Windows】will be placed on the right.

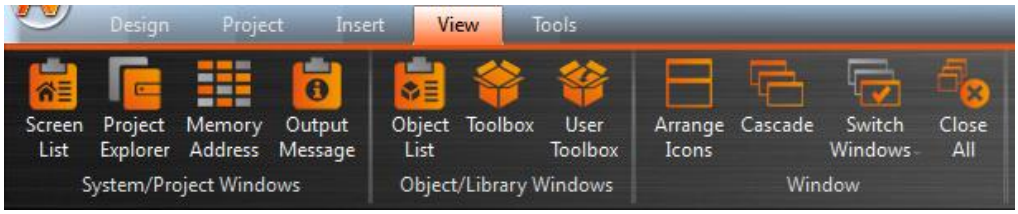


Figure 35 Window

Use the mouse to drag the working window and the FvDesigner will display the window configuration reminder; move the mouse to the configuration reminder and the working window will be placed at the position clicked. The FvDesigner has a【User Habit Log】function that will record the developer's window configuration position on the system so that the working window configuration will be configured to the same positions as the previous development environment every time the project is opened for development.

Figure 36 Configure Operating Window Position As You Like

1.2.5Tools(T)

The function field includes built-in Tools application programs, including【Pass Through】and【PLC Resource Review】;【Pass Through】allows users to communicate and connect to the PLC through the HMI, and the【PLC Resource Review】can help users to quickly find the supported PLC driver program version information and the internal single points of the PLC allowed for access and register information. Please refer to the explanations in the **Chapter16–Application Tool** and **Chapter17–PLC Resource Review** for detailed information.

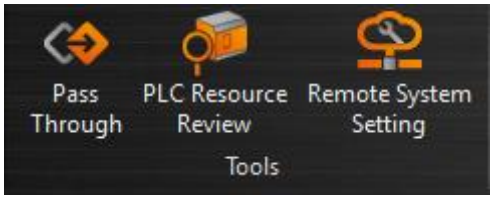


Figure 37 Tools

1.3 Shortcut

Allows users to set frequently used functions to be displayed here, making it easier for users to operate.

【New】

【Open】

【Save】

【Undo】

【Redo】

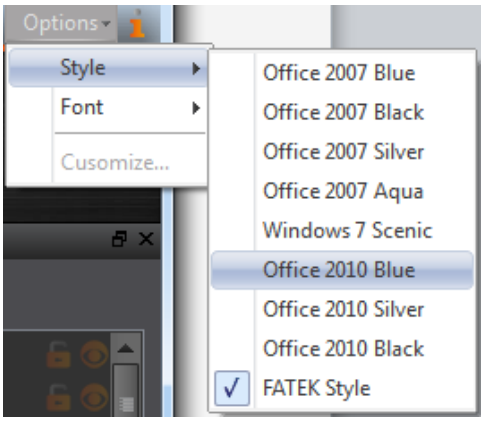
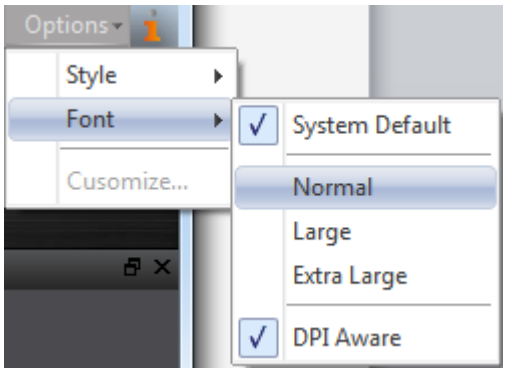
Figure 38 Shortcut

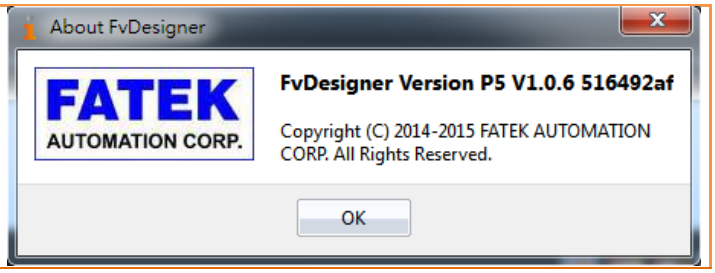
1.4 Interface Appearance Options

【Interface Appearance Options】provides customized interface appearance settings, allowing users to select whether to display the work space, color and text of the interface appearance and the program version information.

Figure 39 Interface Appearance Options

Table 11 Interface Appearance Options

Display Item	Description
 【Maximize/Minimize ribbon】	Pressing this button will minimize the work space and pressing it again will maximize the work space.
【Options】	Allows selecting the style and font of the interface. 【Style】Allows selecting the style of the interface.  【Font】Allows selecting the font size of the interface.  【Customize】Provides customized options.
 【About】	Displays software version, operating environment, user computer and other related information.

1.5 Status Bar

The【Status Bar】displays information on the work space window, the window resolution, HMI product specifications and type, and other information.

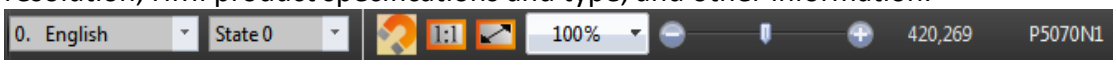
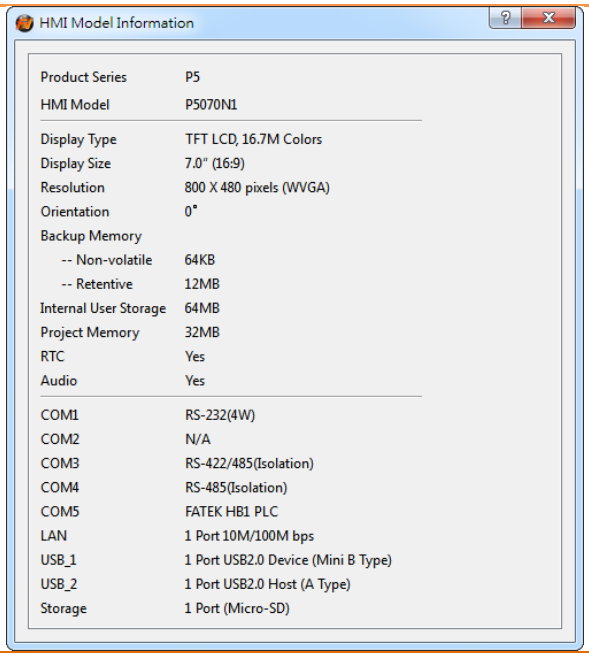


Figure 40 Status Bar

Table 12 Status bar

Display Item	Description
【Switch Languages】	Switch the current language of the project.
【Switch States】	Switch the current state of all objects.
【Snap Alignment】	While users are adjusting or moving objects, this function assist user to align nearby objects quickly.
【Actual Size】	Zoom the screen window ratio to 100%; this will only be displayed when the editing section of the screen is open.
【Fit Visible】	Zoom the screen window ratio to the same as the visible range; this will only be displayed when the editing section of the screen is open.
【Screen Display Ratio】	Zoom the screen window ratio between ranges 10%~550%; this will only be displayed when the editing section of the screen is open.
【Cursor Position】	Display the X and Y coordinates of the mouse in the editing section of the window; the point of origin is the top-left corner of the window. This will only be displayed when the editing section of the screen is open.
【HMI Model】	Information of the product model: Pressing this button will display the information of the current product model. Ex: P5070N1



1.6 System/Project Windows

Descriptions of the System/Project Windows are as follows:

1.6.1Screen List

The【Screen List】is used to manage the HMI screen tools created by the user. The HMI screen created can be quickly browsed here; pressing the left mouse button and selecting the screen will open the screen on the work space, and pressing the right mouse button will open the management menu to perform further settings. The following Figure is a screen of the Screen List:

Figure 41 Screen List Interface

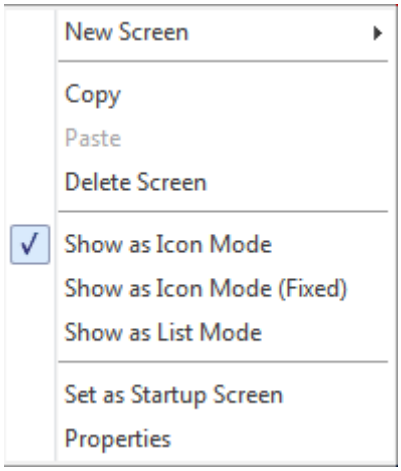
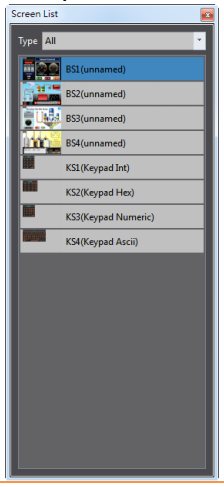
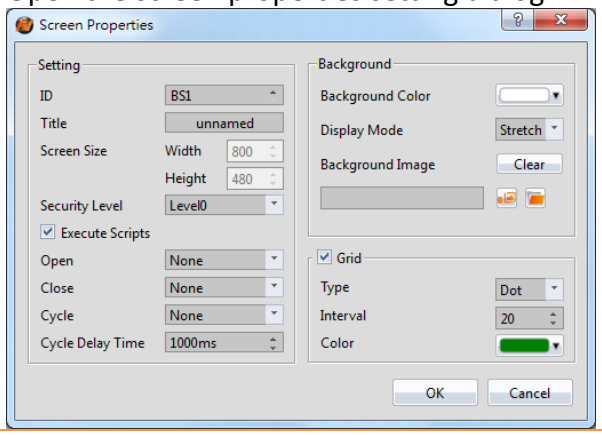


Figure 42 Management settings that shows when the right mouse button is clicked

Table 13 Screen List Management Settings

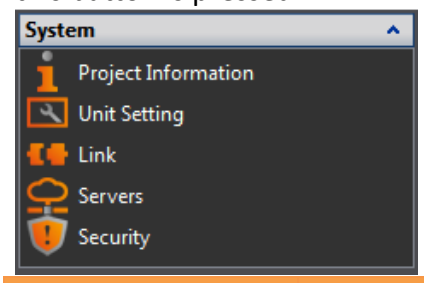
Function	Description
【New Screen】	Open the screen property setting dialog; press OK to add the new screen you want directly (Base Screen/Window Screen/Keypad Screen).
【Copy】	Copy the selected screen.
【Paste】	Paste the copied screen.
【Delete Screen】	Delete the selected screen.
【Show as Icon Mode】	The preview size will change according to the width of the window. 
【Show as Icon Mode (Fixed)】	The preview size will not change according to the window width; the icons line up side by side to fill up the window size as much as possible.

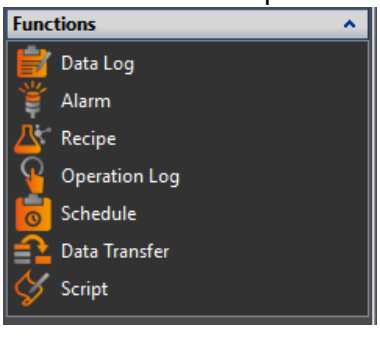
	
【Show as List Mode】	The preview will be displayed as a list. 
【Set as Startup Screen】	Set the selected screen as the startup screen. The background color of this screen will be different from other screens once it is set as the startup screen.
【Properties】	Open the screen properties setting dialog. 

1.6.2 Project Explorer

Project Explorer is the window to manage the entire project.

Table 14 Project Explorer Items

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>【System】</td><td>Please refer to Chapter 2–System for detailed contents.
Related setting windows will appear on the work space once this button is pressed.
 

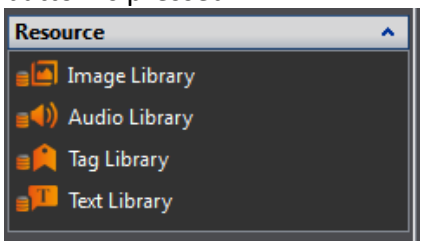
<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>【Project Information】</td><td>Allow users to browse information concerning the project and HMI, set the project password security and NV non-volatile memory configuration.</td></tr>
<tr><td>【Unit Setting】</td><td>The basic settings of the device can be set here.</td></tr>
<tr><td>【Link】</td><td>The configuration of the device/PLC connecting to the HMI can be set here.</td></tr>
<tr><td>【Servers】</td><td>The settings of various types of servers, FTP and VNC can be edited here.</td></tr>
<tr><td>【Security】</td><td>Security settings concerning the objects related to the project and user privileges can be set here.</td></tr>
</table></td></tr>
<tr><td>【Functions】</td><td>Related setting windows will be displayed on the work space when this button is pressed.
 

<table>
<tr><th>Function</th><th>Description</th></tr>
<tr><td>【Data Log】</td><td>Data log settings can be edited here; please refer to Chapter 6–【Data Log】 for detailed contents.</td></tr>
</table></td></tr>
</table>

	【Alarm】	Alarm settings can be edited here; please refer to **Chapter 7–【Alarm】** for detailed contents.
	【Recipe】	Recipe settings can be edited here; please refer to **Chapter 8–【Recipe】** for detailed contents.
	【Operation Log】	Operation log settings can be edited here; please refer to Chapter 9–【Operation Log】for detailed contents.
	【Schedule】	Scheduler settings can be edited here; please refer to **Chapter 10–【Schedule】**for detailed contents.
	【Data Transfer】	Data transfer settings can be edited here; please refer to **Chapter 11–【Data Transfer】** for detailed contents.
	【Script】	Script settings can be edited here; please refer to **Chapter 12–【Script】** for detailed contents.

【Resource】

Please refer to【Resource】for detailed contents. The setting window will be displayed on the work space when this button is pressed.



Function	Description
【Image Library】	Make the required images into【Image Library】files in advance so that they can easily be used when editing objects. Please refer to【Resource】for detailed contents.
【Audio Library】	Make the required audios into【Audio Library】files in advance so that they can easily be used when editing projects. Please refer to【Resource】for detailed contents.
【Tag Library】	Define the frequently used register addresses before designing a project

		to increase the system readability when designing. Please refer to 【Resource】for detailed contents.
	【Text Library】	If there is the need to switch the text displayed in real-time in order to achieve multi-language or other functions, edit the text to display required for different needs and make them into a table, and then use the【Control Address】to switch the currently displayed text group when the HMI interface is running. Please refer to【Resource】for detailed contents.

1.6.3 Memory Address

External devices, internal HMI devices or HMI system variables usually needs to be specified for the objects and functions of the HMI, and it is almost impossible for a user to remember which resources are used for which objects or functions when there are too many objects in a project; this is when【Memory Address】can be used to display which resources are used. This way the user will be able to effectively plan the settings of any object or function in a project.

As shown in the figure below, red represents the device registers that are occupied, green represents that registers that are not yet used; the user can arrange and set resources easier through this function. Left-click the mouse on an item in the list below to use and the corresponding screen or function list menu will open; double clicking the left mouse button on the item will open the setting dialog of that item directly.

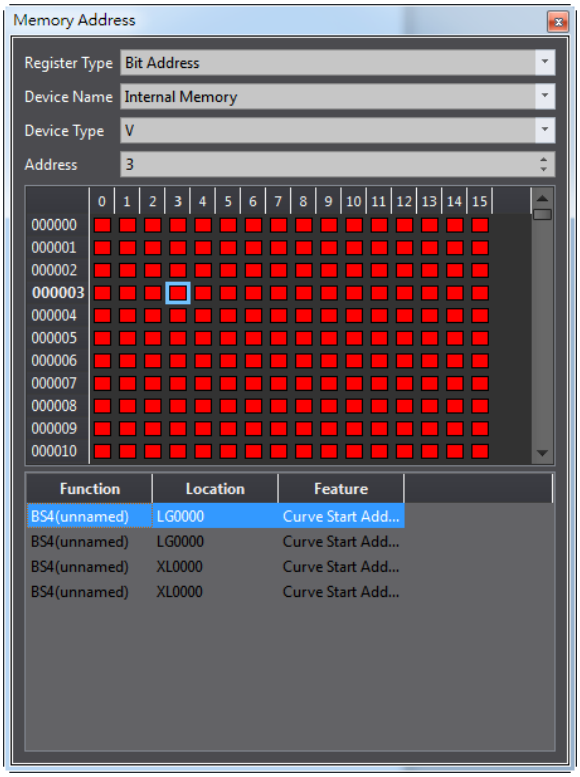


Figure 43 Memory Address Operation Interface

1.6.4 Output Message

When compiling, the output window will display the action status so that the developer can know about the warning, error and other information after compilation is executed. Clicking the various information with the mouse will open the related setting dialog directly for the user to debug.

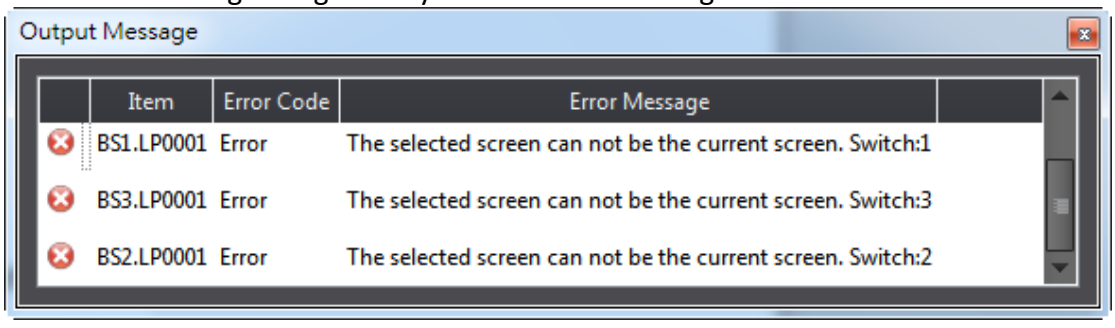


Figure 44 Output window

1.7 Object/Library Windows

1.7.1 Object List

This window lists all objects included on the screen; click the option in the window and the object in the【Work Space】will be highlighted (surrounded by a red frame), double clicking the mouse can display the editing window of the object directly.

There is a lock icon to the right of the【Object List】that can lock the function of the

object; when it is clicked into a locked icon, the position and properties of the object cannot be changed. The eye icon displays the function of the object; when the icon is clicked into a closed eye, the object will not be displayed in the【Work Space】.

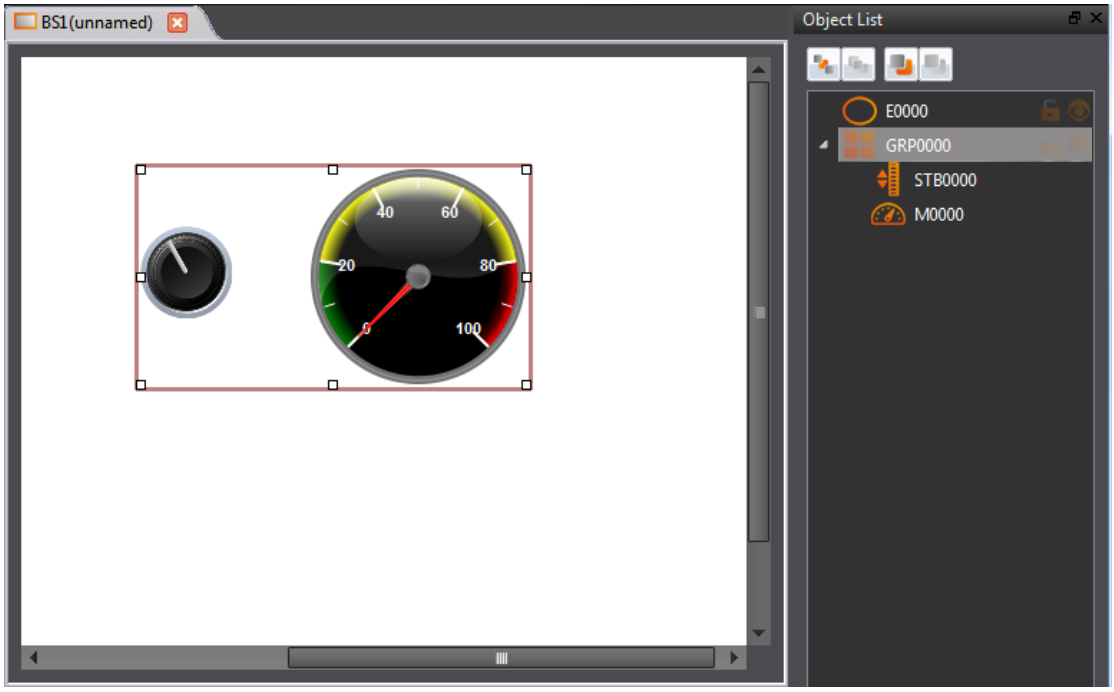


Figure 45 Object List

Table 15 Object List Functions

Function	Description
【Send to Back】	Send the selected object to the bottom
【Bring to Front】	Bring the selected object to the top.
【Move Backward】	Move the selected object down a level.
【Move Forward】	Move the selected object up a level.
【Object ID】	ID number of the object. Ex: LD_0001, LD is the model code, 0001 is the code number.
【Unlock/Lock】	【Unlock】: Allow editing of the object properties or moving of the object. 【Lock】: Cannot allow editing of the object properties or moving of the object.
【Visible/Invisible】	【Visible】: Display object. 【Invisible】: Hide object.

1.7.2Toolbox

The FvDesigner provides a basic【Toolbox】; the developer can expand various types of objects provided directly from the toolbox according to the different categories. Select an object and drag it over to the【Work Space】with the mouse to complete deploying the object.

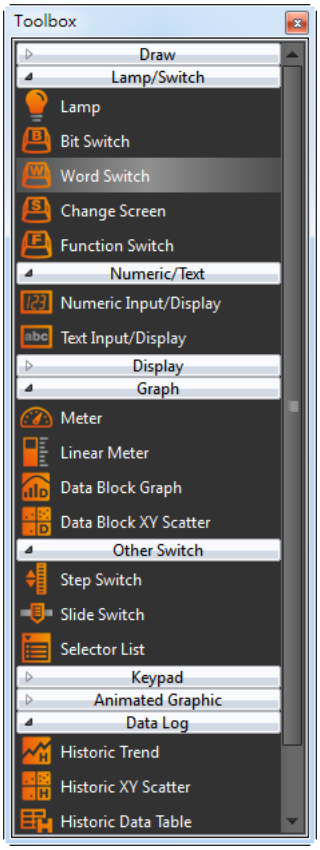


Figure 46 Toolbox Illustration

1.7.3 User Toolbox

Although the【Toolbox】provided by this software is able to meet the needs of most users, however, the objects provided in the【Toolbox】are all preset values and cannot allow users to use objects they changed on their own. This is why this software also provides the【User Toolbox】function; not only does it allow users to access objects that they have modified, it also provides【Import】and【Export】functions so that the objects in the【User Toolbox】can be quickly transferred between different computers, accelerating the development speed for the user.

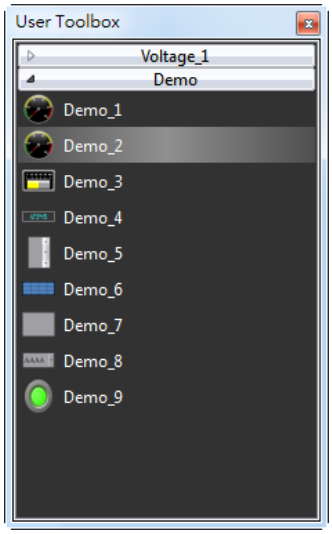


Figure 47 User Toolbox Illustration

Please refer to the **Chapter 14–【User Toolbox】** for detailed explanations on 【User Toolbox】

1.8 Work Space

【Work Space】displays in two forms: the【Screen Edit Window】and【Function Settings Window】.

1.8.1Screen Edit Window

Opening a window or adding a screen from the Screen List will display the Screen Edit Window in the work space. The【Status Bar】can be used to adjust the window display ratio and when an object is clicked,【Basic Setting】and【Status Bar】will display the position, size and other object alignment information of the object. Use the functions on the design page to edit the objects in this window.【Toolbox】or objects in the【User Toolbox】can be added to the Screen Edit Window directly using drag-and-drop with the mouse.

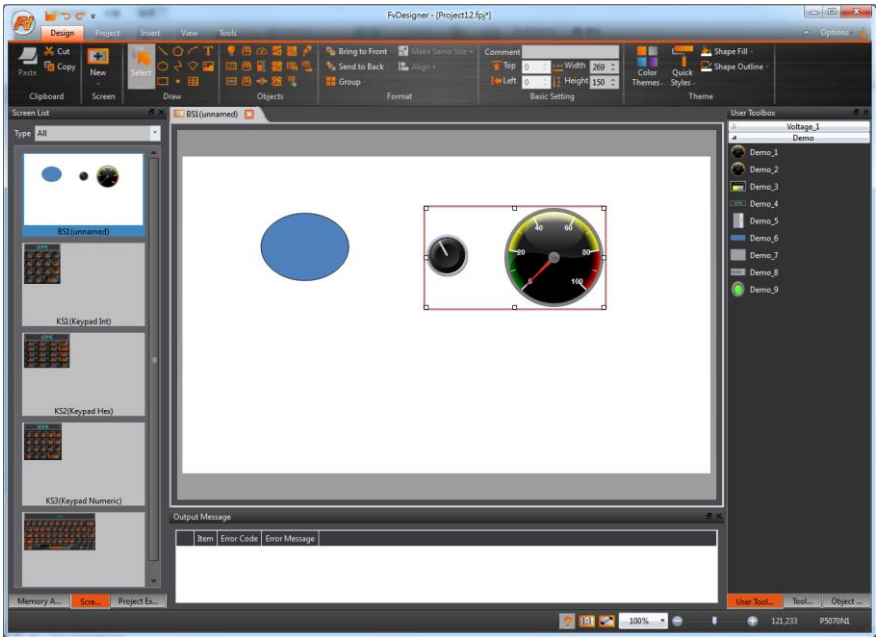


Figure 48 Work Space–Screen Edit

1.8.2 Function Settings Window

When a function setting to the left of the Project Explorer is clicked, for example when the operation log function option is clicked, the【Work Space】will display the operation log setting window as shown in the figure below. To close this window after setting is complete, click on the “x” (close) on top of the screen.

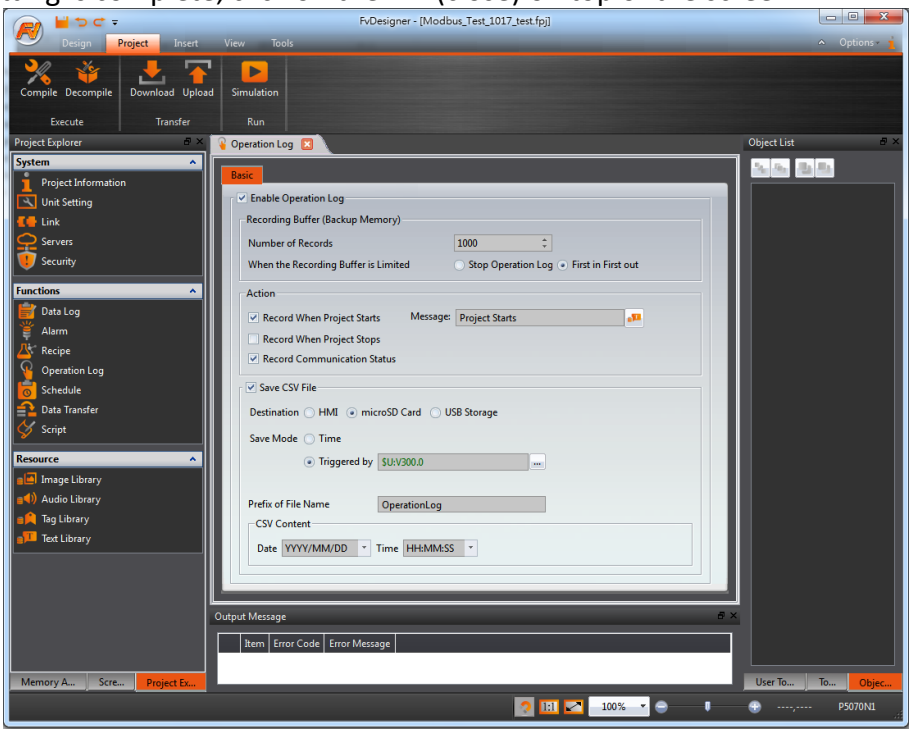


Figure 49 Work Space–Function Settings

2. System

Click on the setting option in【System】and the related setting window will be displayed at the work space of the window.

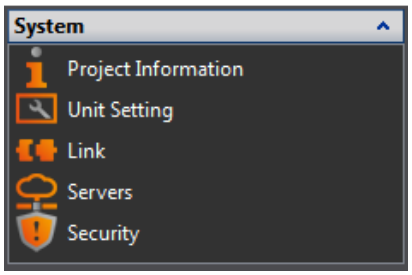


Figure 50 System

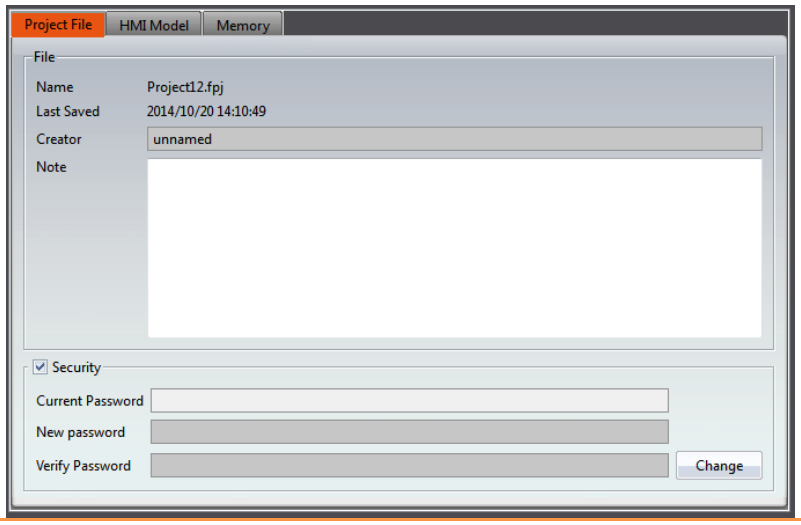
2.1 Project Information

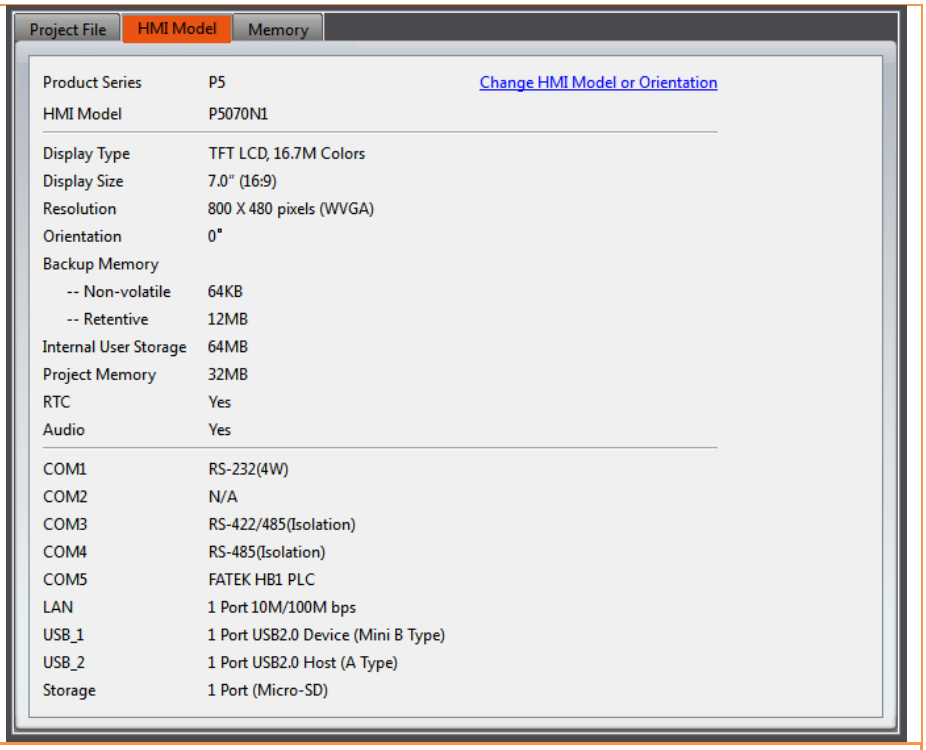
This information includes the model and specifications of the product used in the project, the IO inter-faces included on the device and project configuration information, etc. as shown below.

Table 16 Project Information

Item	Description
【Project File】	Information on the project files including the name of the project creator and the last saved time. The password protection function can also be enabled.

Item	Description
【Name】	The name of this project.
【Last Saved】	The last time the project was saved.
【Creator】	The creator of this project.
【Note】	Notes on the project.

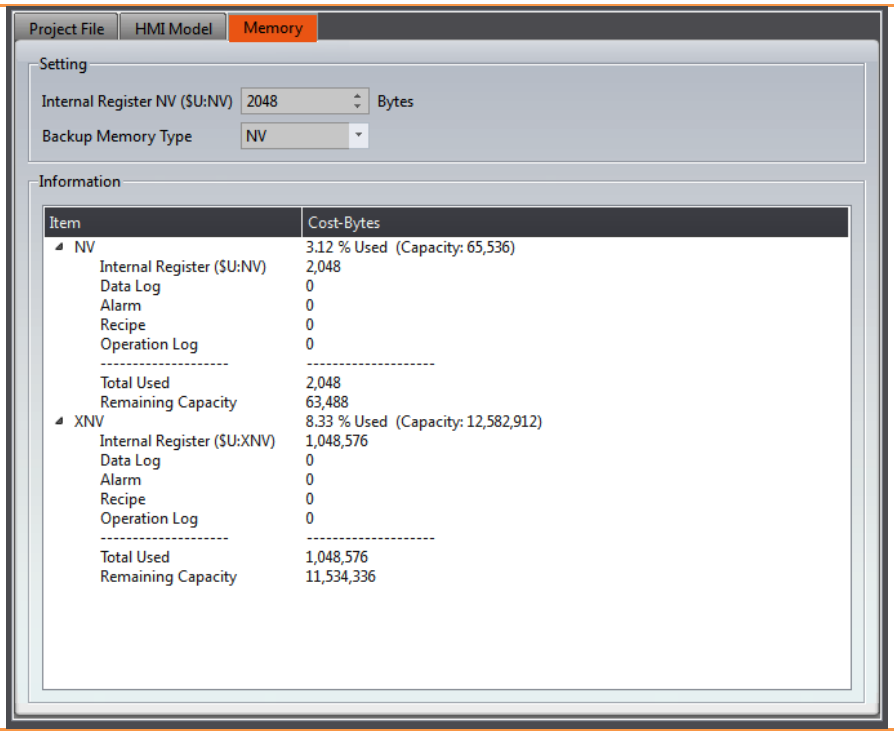
	【Security】	Select whether to enable the password protection function for the project. The password must be entered every time this project is opened or when downloading this project to the HMI if a password is set. 【Current Password】: Enter the previously set password. 【New Password】: Enter the new password. 【Verify Password】: Enter the new password again. 【Change】:Change password.
		
【HMI Unit】	Detailed information on the HMI can be seen here, including the series, name, screen information and information on the HMI unit.	



【Memory】

Information on the memory configuration. The size of the【Internal register NV】required in the project can be planned here; it can also set the non-volatile backup section to NV or XNV.

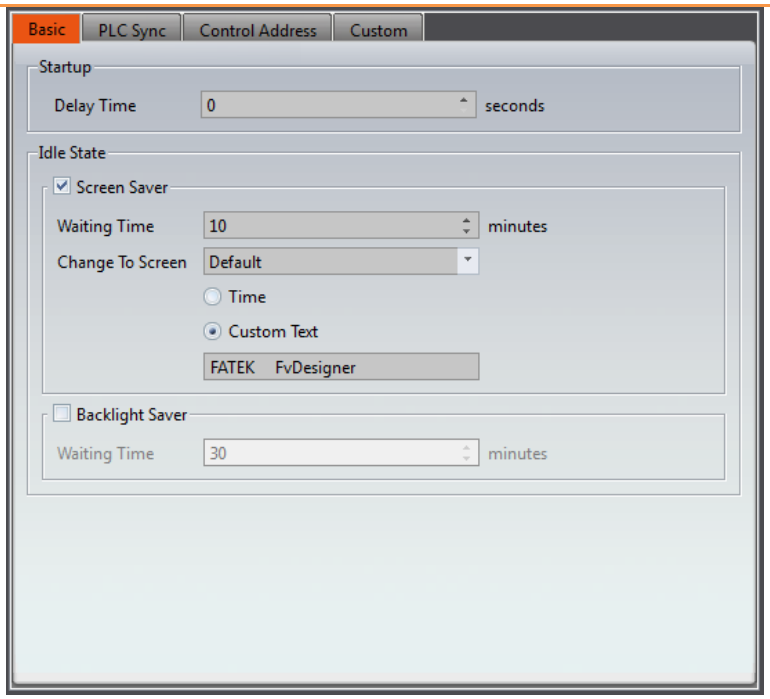
Note:
NV and XNV have different uses.
Data saved on the NV will still be saved even if there was an abnormal power interruption.
In order to prolong the usage life of the Flash memory, the data on the XNV will be automatically saved to a file by the system every minute; if the system register【SS_FORCE_BACKUP_XNV】is used, when this register is triggered as 1, the XNV will also save the file and automatically clears to 0 once the save is complete.

2.2 Unit Setting

Table 17 Unit Setting

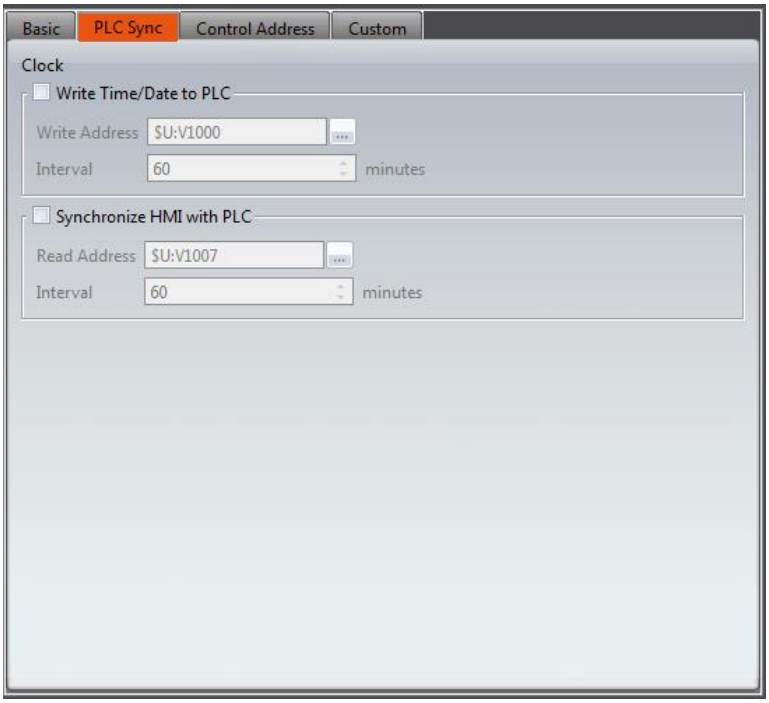
Item	Description
【Basic】	The basic setting includes the Startup and Idle State. The Delay Time can be set for Startup and Screen Saver, and the Backlight Saver can be set for the Idle State. The Screen Saver can automatically switch to the pre-set window or turn on the Backlight Saver when the system has been idle for a certain amount of time in order to save power.



The Screen Saver can switch to base screen or default Screen Saver screen including【Time】and 【Custom Text】mode. User does not have any effert to design the Screen Saver screen.

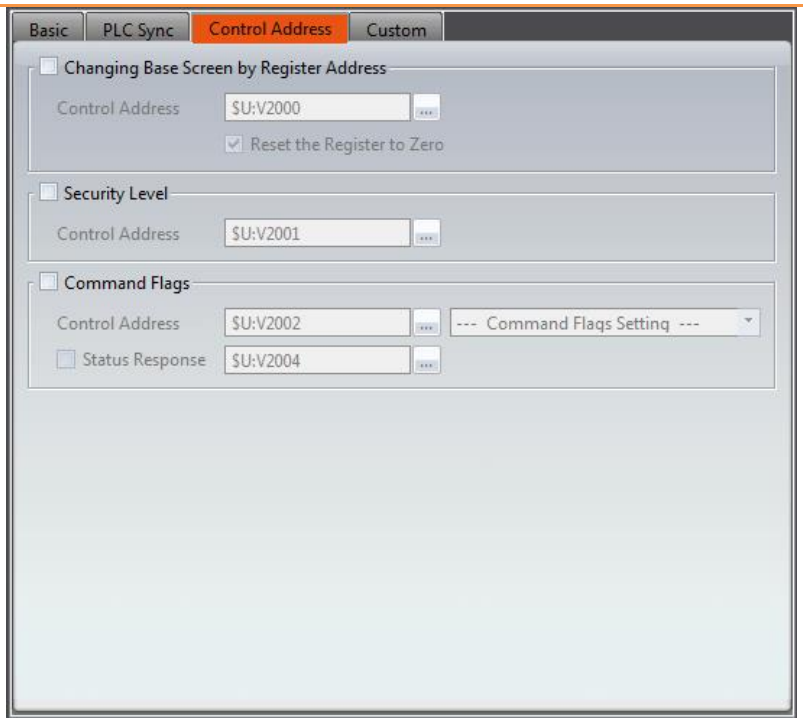
【Time】mode

【Custom Text】mode

<table>
<tr>
<td>【PLC Sync】</td>
<td>HMI has build-in RTC clock. It can be synchronized with PLC RTC by【PLC Sync】【Clock】setting.
 

【Write Time/Date to PLC】
Write RTC clock data of HMI to the Write Address of PLC.
【Synchronize HMI with PLC】
Read RTC clock data from the Read Address of PLC, and write the data to

Write Address and Read Address data format:
<table>
<tr><td>WORD 0</td><td>Second</td><td>0~59</td></tr>
<tr><td>WORD 1</td><td>Minute</td><td>0~59</td></tr>
<tr><td>WORD 2</td><td>Hour</td><td>0~23</td></tr>
<tr><td>WORD 3</td><td>Day</td><td>1~31</td></tr>
<tr><td>WORD 4</td><td>Month</td><td>1~12</td></tr>
<tr><td>WORD 5</td><td>Year</td><td>0~99</td></tr>
<tr><td>WORD 6</td><td>Day of Week</td><td>0~6</td></tr>
</table>
Note:
Day of Week value 0, 1-6 (Sunday, Monday~Saturday)</td>
</tr>
<tr>
<td>【Control Address】</td>
<td>【Control Address】
The following control addresses are read from PLC periodly, and set or trigger specific internal functions.</td>
</tr>
</table>



【Changing Base Screen by Register Address】

HMI changes the current screen to target screen, according to the value of register address. The value is ID of the target screen. The value can be reset to 0 after changing screen.

【Security Level】

The security level can be modified by the value of register address.

【Command Flags】

Command Flags control address format:

WORD 0	Command Flags triggered bits
WORD 1	Command Flags parameter

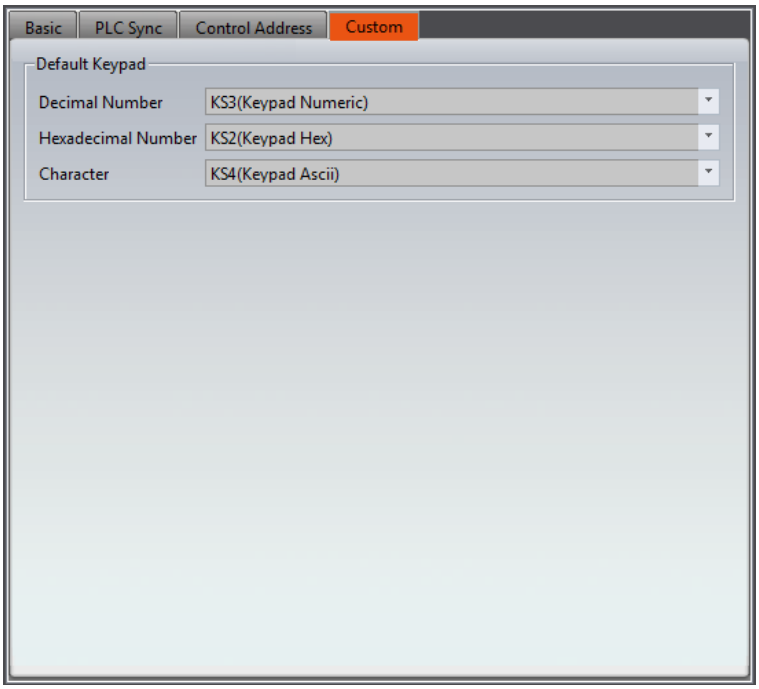
To enable the functions, user have to config control address and click target items in【--- Command Flags Setting ---】。However, the value (WORD 0) is set to【Status Response】after process if it is enabled.

When each triggered bits value (WORD 0) is changed from 0 to 1, HMI will process the specific function. HMI only handles with one command process every scanning time.

Command Flags includes functions as follows:

Sound Buzzer (WORD 0 Bit0)

WORD 1 = 0 Short Beep
WORD 1 = 1 Long Beep
WORD 1 = 2 Short-Short Beep
WORD 1 = 3 Long-Short Beep

	Backlight On (WORD 0 Bit1) WORD 1 Reserved **Backlight Off (WORD 0 Bit2)** WORD 1 Reserved
【Custom】	The developer can custom configure the operating inter-face as the pre-set keypad so that this pre-set keypad will pop up when operating the text input or numeric input objects. Available settings include Decimal Number, Hexadecimal Number and Character. 

2.3 Link

FATEK HMI can connect to the following types of devices. Click on connect device and the connection setting window will be displayed in the work space window as shown in the figure below:

Table 18 Device Connection Type

Device	Description
Device/PLC	Connecting to the various brands of Device/PLC Driver.

2.3.1 Device/PLC Connection Setting

Setting the communication device Device/PLC: The connection overview will list the information of all the devices connected to the HMI; use the Add/Edit/Delete functions to configure the connection device.

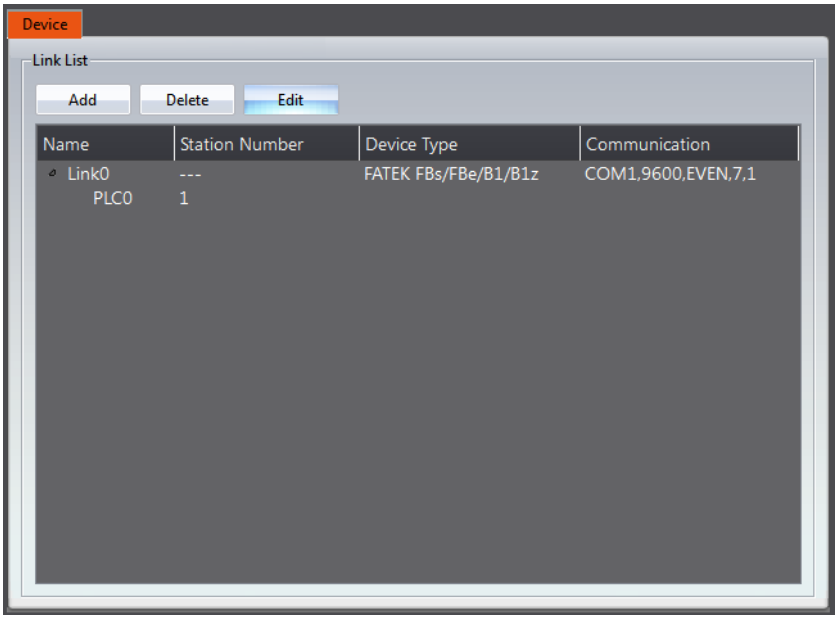


Figure 51 Device Connection Setting–Device/PLC

Double click on a device in the list to open the device property setting window directly for editing. The interface of sub-link is as shown below.

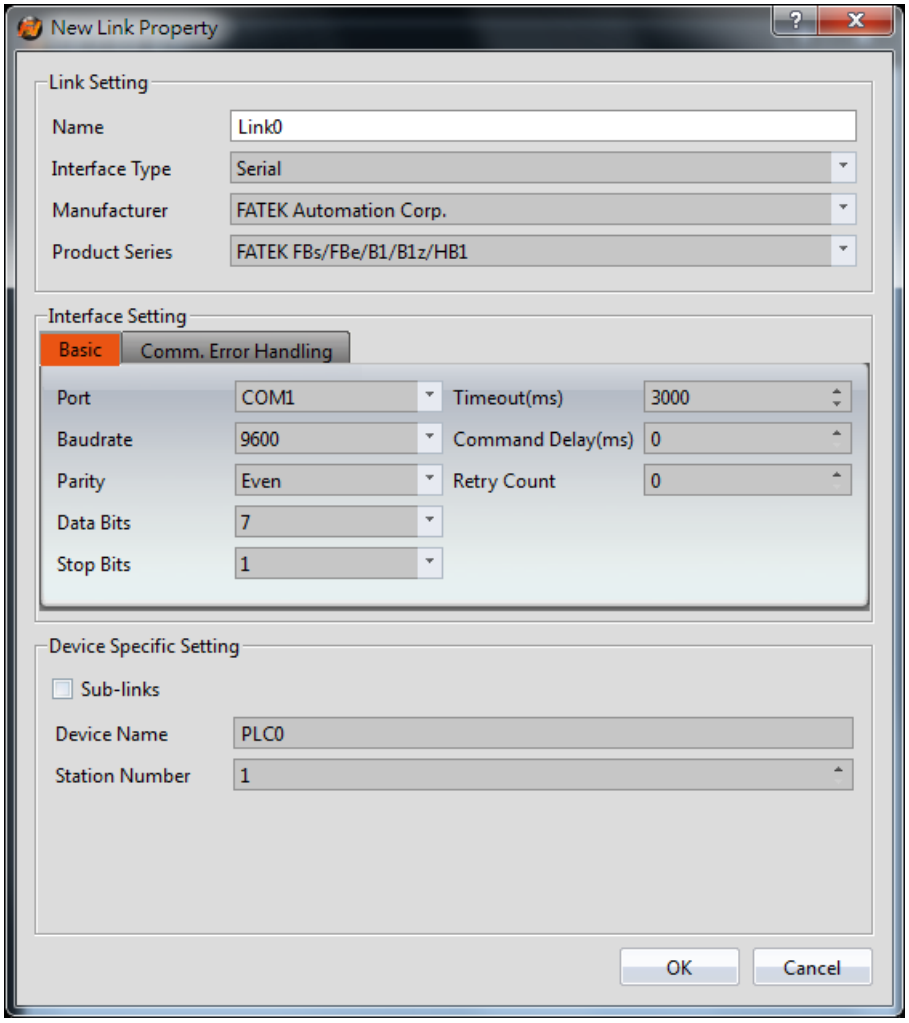


Figure 52 Link Properties

Table 19 Link Property Settings

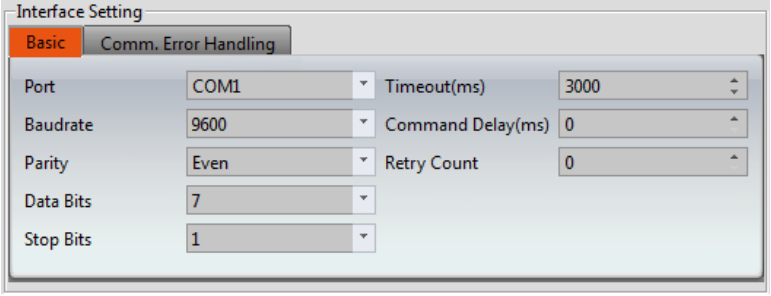
Item	Description
【Link Setting】	Allow setting the basic settings for connection.

Item	Description
【Name】	The name of this connection.
【Interface Type】	Transfer method; available selections include Serial or Ethernet.
【Manufacturer】	The manufacturer of the connecting device.
【Series】	The product name of the connecting equipment.

【Interface Setting】

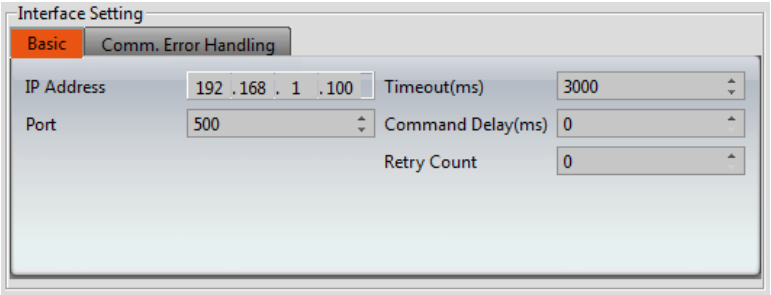
Allow setting of the communication interface; the interface will change according to the【Interface Type】in【Link Setting】.

When the【Interface Type】is【Serial】



Item	Description
【Port】	Select the port to connect.
【Baudrate】	Select the baud rate.
【Parity】	Select the verification method.
【Data Bits】	Select the length of the data.
【Stop Bits】	Select the length of the stop bit.
【Timeout Time】	Set the waiting time before ending the connection and generating an error when there is an abnormal communication.
【Command Delay】	The delay sending and receiving time for controller signals.
【Retry Count】	The number of times the HMI will automatically re-send the confirmation signal when there is an abnormal communication.

When【Interface Type】is【Ethernet】

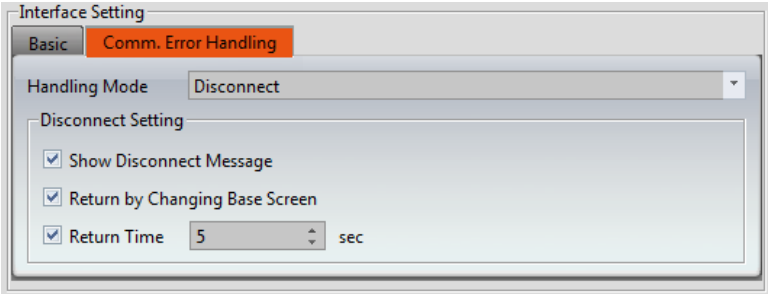


Item	Description

【IP Address】	Select the IP address of the port.
【Port】	Select the port terminal.
【Timeout Time】	Set the waiting time before ending the connection and generating an error when there is an abnormal communication.
【Command Delay】	The delay sending and receiving time for controller signals.
【Retry Count】	The number of times the HMI will automatically re-send the confirmation signal when there is an abnormal communication.

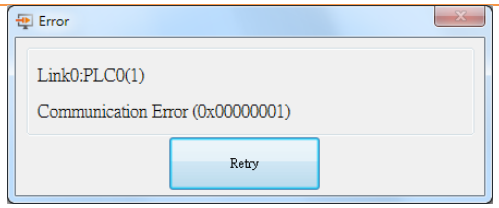
【Comm. Error Handling】

Select an action to be handle with communication error.



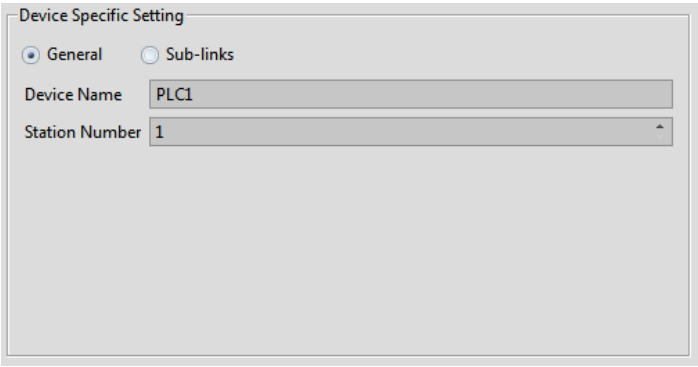
There are four handling modes as follows:

- **Process Sequentially**
  Process each communication data sequentially. If the data can not be query this scanning time, system will requrey it again next time.
  The communication error window shows when communicate failed. User can close the window then operate continuely.
- **Continue**
  The communication error window shows when communicate failed. User can **not** close the window and stop to operate current screen. Until the communication restores, the window closes automatically.
- **Stop**
  The communication error window shows when communicate failed. User can **not** close the window and stop to operate current screen. **Retry** switch is abailable to retry the reestablishment of communication. Until the communication restores, the window closes automatically.

<table>
<tr>
<td></td>
<td>


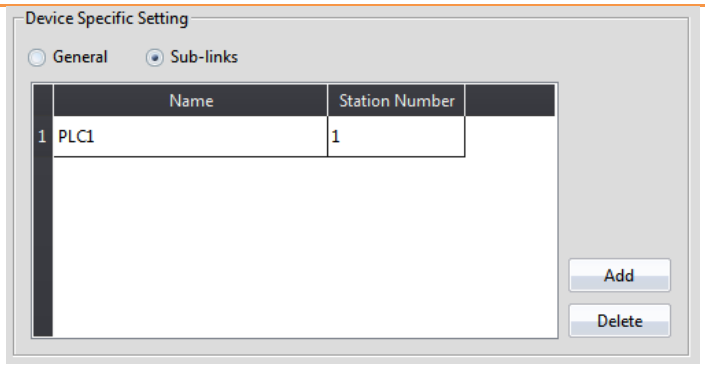
Disconnect
When communication error occurs, the links stop communicating. It resets condition to re-start to communicate according to Dissconnect Setting.
【Disconnect Setting】
Show Disconnect Message:
The communication error window shows when communicate failed. User can close the window then operate continuely.
Return by Changing Base Screen:
The disconnected link re-starts to communicate after changing base screen.
Return Time:
The disconnected link re-starts to communicate when return time is timeout.

</td>
</tr>
<tr>
<td>【Device Specific Setting】</td>
<td>
Configuration setting of the equipment.

Select【General】, 1-to-1 connection


<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>【Device Name】</td><td>Set the name of the equipment.</td></tr>
<tr><td>【Station Number】</td><td>Set the station number of the equipment.</td></tr>
</table>

Select【Sub-links】, supports 1-to-N connections.
</td>
</tr>
</table>



2.3.2PLC Address Setting (Input Address)

The address of the registers can be set at the address setting field in the setting window of each object. Users can enter the register address directly using the keypad or select the address from the【Input Address】setting dialog by pressing the button on the right.

When typing string in the PLC address seeting field, it shows hint list to quickly select specific device or tag. When mouse moves into the setting filed with **Tag** string, the mapping address shows on the tip.

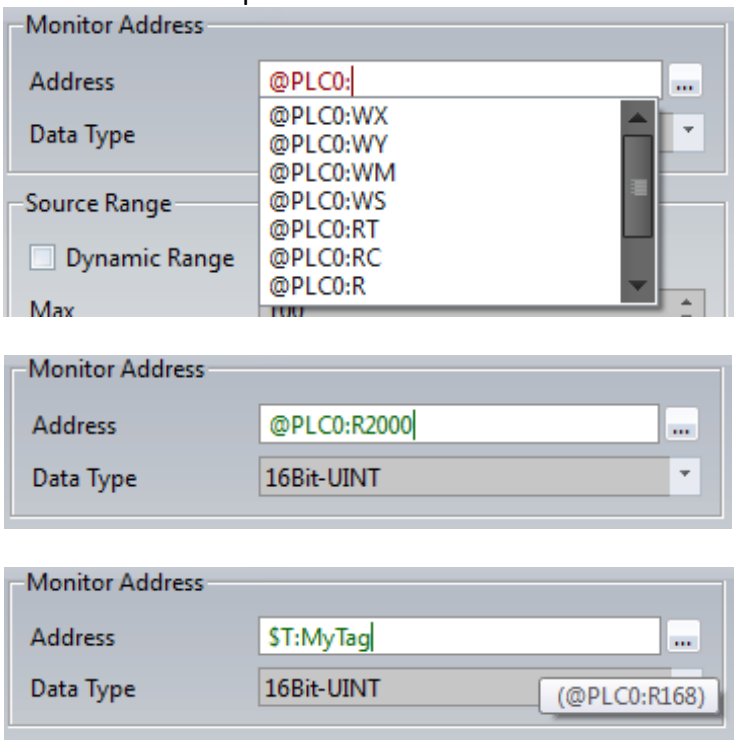


Figure 53 PLC address setting field

The【Input Address】setting dialog is as shown below; the three source modes available for selection include Device, System and Tag.

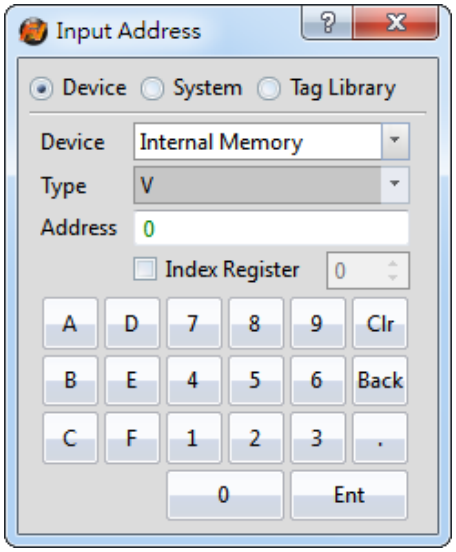
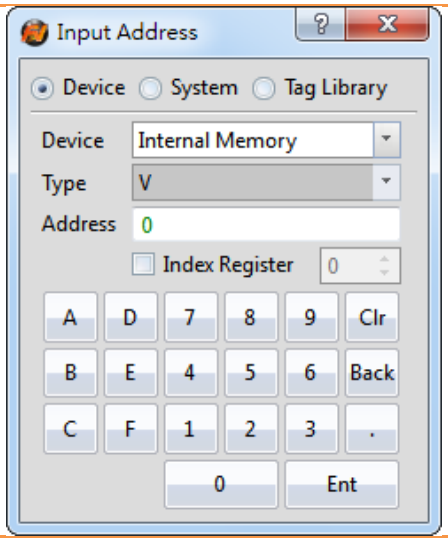
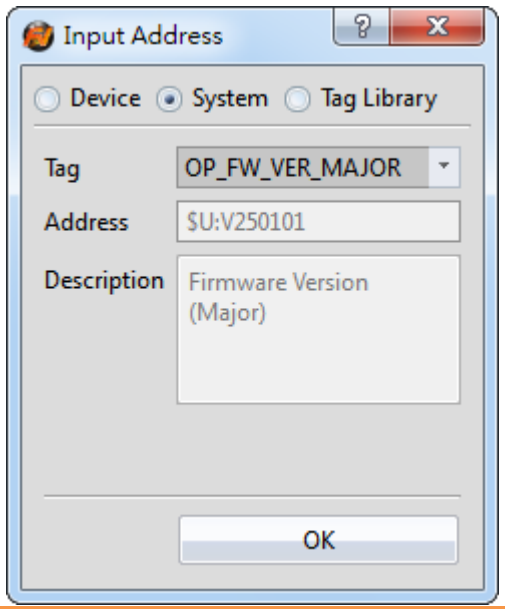


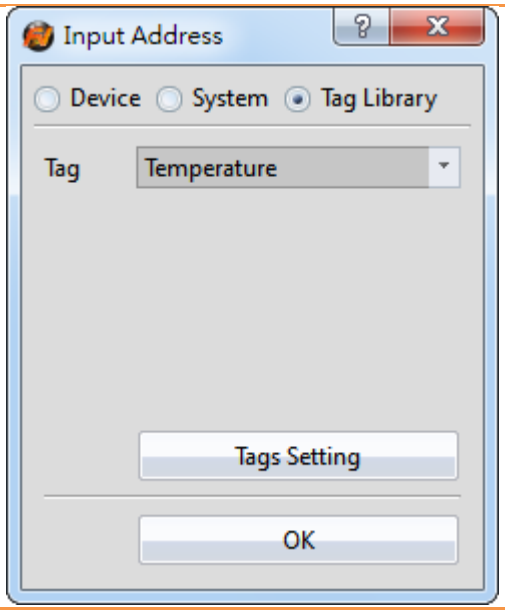
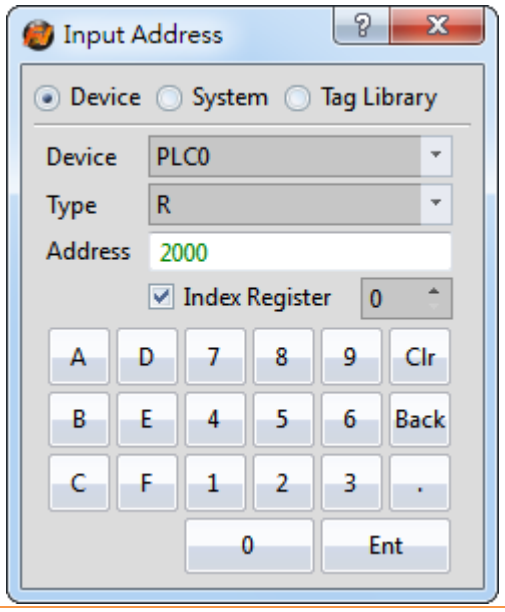
Figure 54 PLC Input Address Setting Dialog

Table 20 Access Address Settings

Item	Description
【Device】	Register address inside the HMI/PCL device. After selecting the connection, the address will display the register pattern for the designer to choose from and fill in the address of the pattern. There is a foolproof function that will guide the developer to enter the correct address when entering the address. Fill them in sequentially and the legal addresses will be displayed in green; an illegal address will be displayed in red.

Item	Description
【Device】	Device where the register is located.
【Type】	Device type of the register.
【Address】	Register address.
【Index Register】	Index register setting. Selecting this option means using the index register. The numbers behind is the index register address.

<table>
<tr><td></td><td> 
</td></tr>
<tr><td>【System】</td><td>Special register address inside the HMI. The address type displays information on the register function and the corresponding register address of the function.
<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>【System Tag】</td><td>The system’s default register tag.</td></tr>
<tr><td>【Address】</td><td>The corresponding register address of the system tag.</td></tr>
<tr><td>【Description】</td><td>Describe the function of the system tag.</td></tr>
</table>

</td></tr>
<tr><td>【Tag】</td><td>Use the tags defined in the custom tag library.</td></tr>
</table>

	
Use Index Address	The index register is an index addressing register. The user can change the read and write addresses of the online objects on the HMI while the screen program is running without changing the contents of the object address once there is an index register. This software provides a total of 128 sets of index registers with 64 sets of 16-bit index registers and 64 sets of 32-bit registers. As shown in the example below, if the address content of the $I0 index register is 10, then this address is marked as R2010 of PLC0. 

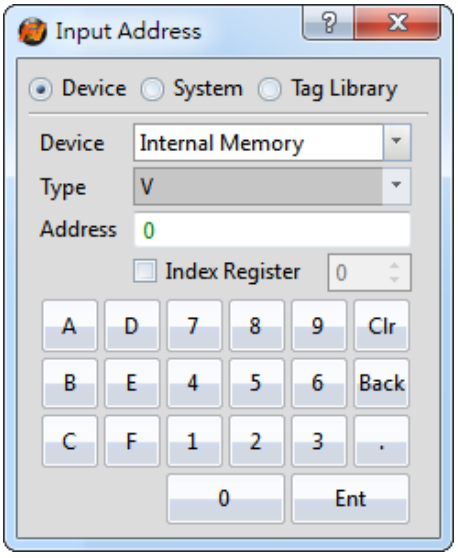


Figure 55 Address Setting Window

3. Objects

FvDesigner provides dozens of practical objects for the users to choose from; the list of all available objects is listed below. Click on the hyperlink to view detailed descriptions of this object.

There are two ways to place an object onto the work space:

1. Left-click the mouse on an object in the object section of the design page in the function section and then left-click the mouse on the work space.
2. Use the mouse to drag-and-drop an object in the toolbox onto the work space.

Every object added to the work space will appear in the object list and every object has its own unique ID. There are two ways to view and change the properties of an object:

1. Double-click on the object and the setting page of the object will appear.
2. Single-click on an object and then click on the right mouse button to display the object menu, and then select Properties.

The Monitor Address can be set for many objects, this means that the data source of this object is from the register address of the device (HMI, PLC). Details can be viewed at the【Memory Address】section of the screen in order for the user to have a better understanding of the usage status of the registers.

The properties (such as color etc.) of all Draw Object can be set from the Ribbon workspace on the software interface, as shown in the figure below.

Hint: Ribbon only has some common settings. Detailed settings for each object must be set through another method

Figure 56 Ribbon workspace for Style

The following is the list of objects provided by the FvDesigner; click on the hyperlink of the object's name to view the detailed descriptions of the object.

Table 21 Image Objects and Basic Object Library Categories

Function	Description
【Draw】	Basic Draw components.

Function	Description
【Dot】	Draw a dot
【Line】	Draw a line
【Polyline】	Draw a polyline
【Rectangular】	Draw a rectangle
【Polygon】	Draw a polygon
【Ellipse】	Draw an ellipse
【Arc】	Draw an arc
【Pie】	Draw a pie
【Table】	Draw a table
【Text】	Text input block
【Image】	Insert image block

<table>
<tr><td>【Lamp/Switch】</td><td>Basic Lamp/Switch.

<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Lamp】</td><td>Use the changes in the lamp icon to display the address value.</td></tr><tr><td>【Bit Switch】</td><td>Allow users to press the switch to change the bit status.</td></tr><tr><td>【Word Switch】</td><td>Allow users to press the switch to change the work value.</td></tr><tr><td>【Change Screen】</td><td>Allow users to press the switch to change the currently displayed screen.</td></tr><tr><td>【Function Switch】</td><td>Allow users to press the switch to execute specific functions.</td></tr></table></td></tr>
<tr><td>【Numeric/Text】</td><td>Numeric/Text Display/Input.

<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Numeric Input/Display】</td><td>Display/Change the value saved on the address.</td></tr><tr><td>【Text Input/Display】</td><td>Display/Change the text saved on the address.</td></tr></table></td></tr>
<tr><td>【Display】</td><td>Display Date/Time, Window Screen Display

<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Date/Time Display】</td><td>Display the current date and time according to the format set by the user.</td></tr><tr><td>【Window Screen Display】</td><td>Display the window screens created in the project.</td></tr></table></td></tr>
</table>

<table>
<tr><td>【Graph】</td><td>Graph<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Meter】</td><td>Use a pointer to represent data</td></tr><tr><td>【Linear Meter】</td><td>Use the bar length/width changes to represent data</td></tr><tr><td>【Data Block Graph】</td><td>Capture continuous data and draws it into a curve.</td></tr><tr><td>【Data Block XY Scatter】</td><td>Capture continuous data and draws it into a data block XY scatter.</td></tr></table></td></tr>
<tr><td>【Other Switch】</td><td>Other Switches.<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Step Switch】</td><td>Write the values corresponding to the status set by the user sequentially into the address.</td></tr><tr><td>【Slide Switch】</td><td>Allow users to write the value into the address by dragging the slide.</td></tr><tr><td>【Selector List】</td><td>Display the switch with a pull-down menu allowing the user to select the switch needed.</td></tr></table></td></tr>
<tr><td>【Keypad】</td><td>Keypad related objects.<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Input Display】</td><td>Used to display the currently entered value or text on the keypad screen.</td></tr><tr><td>【Key】</td><td>Used to provide the functions required for entering values or text, etc. on the keypad screen.</td></tr><tr><td>【Show Limit Value】</td><td>Used to display the currently allowed maximum or minimum input value on the keypad screen.</td></tr></table></td></tr>
<tr><td>【Animated Graphic】</td><td>Animated Graphic.<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Animated Graphic】</td><td>Used when a dynamic display of changes in status, address and size is required.</td></tr></table></td></tr>
</table>

<table>
<tr><td>【Data Log】</td><td>Data Log-related objects.<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Historic Trend】</td><td>Draw the data and corresponding time acquired by the【Data Log】into a curve.</td></tr><tr><td>【Historic XY Scatter】</td><td>Draw the data acquired by the【Data Log】into a historic XY scatter.</td></tr><tr><td>【Historic Data Table】</td><td>Display the data acquired by the【Data Log】with a table.</td></tr></table></td></tr>
<tr><td>【Alarm】</td><td>Alarm-related objects.<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Alarm Display】</td><td>Use a table to display alarm-related contents including messages and levels, and when the alarm occurred, was acknowledged and the recovery time, etc.</td></tr><tr><td>【Alarm Scrolling Text】</td><td>Use a scrolling text to display alarm-related contents including messages and levels, and when the alarm occurred, was acknowledged and recovery time, etc.</td></tr></table></td></tr>
<tr><td>【Recipe】</td><td>Recipe-related objects.<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Recipe Selector】</td><td>Used to select the recipe.</td></tr><tr><td>【Recipe Table】</td><td>Used to view or edit the recipe.</td></tr></table></td></tr>
<tr><td>【Operation Logger】</td><td>Operation Logger-related objects.<table><tr><th>Function</th><th>Description</th></tr><tr><td>【Operation Viewer】</td><td>View the Operation Logger.</td></tr></table></td></tr>
</table>

3.1 Introduction to Draw Object

Draw Object provides diverse drawing objects, as shown below:

Table 22 Draw Object objects

Item	Description
【Dot】	Draw a dot
【Line】	Draw a line
【Polyline】	Draw a polyline
【Rectangular】	Draw a rectangle
【Polygon】	Draw a polygon
【Ellipse】	Draw an ellipse
【Arc】	Draw an arc
【Pie】	Draw a pie
【Table】	Insert a table
【Text】	Insert text
【Image】	Insert an image

The drawing objects described above can all be found in Toolbox on the right side of the Ribbon workspace on the software interface, as shown in the figure below:

Figure 57 Draw Object in the Ribbon workspace

Figure 58 Draw Object toolbox

The properties (such as color etc.) of all Draw Object can be set through two mechanisms:

1. Set from the Ribbon workspace on the software interface, as shown in

the figure below.

Hint: Ribbon only has some common settings. Detailed settings for each object must be set through another method

Figure 59 Ribbon workspace for Style

2. Double-click the left mouse button or click the right mouse button on the object and select【Properties】to display and the object's property page and perform settings.

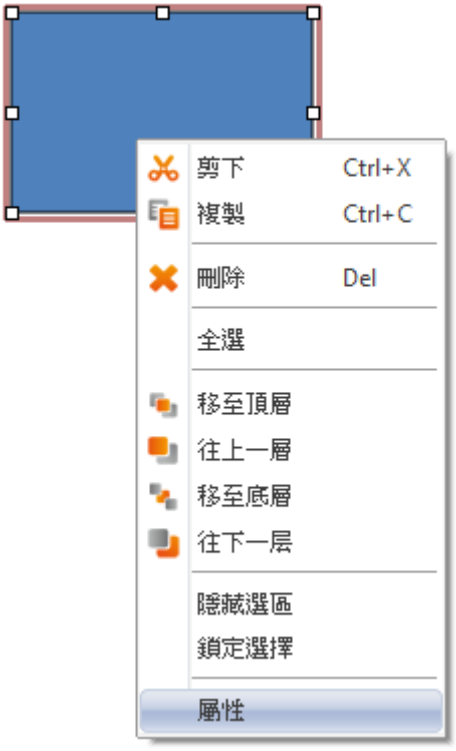


Figure 60 Click the right mouse button for setting functions

3.2 Draw Object Properties Setting Dialog Box

3.2.1【Dot】

The setting page is a shown in the figure below:

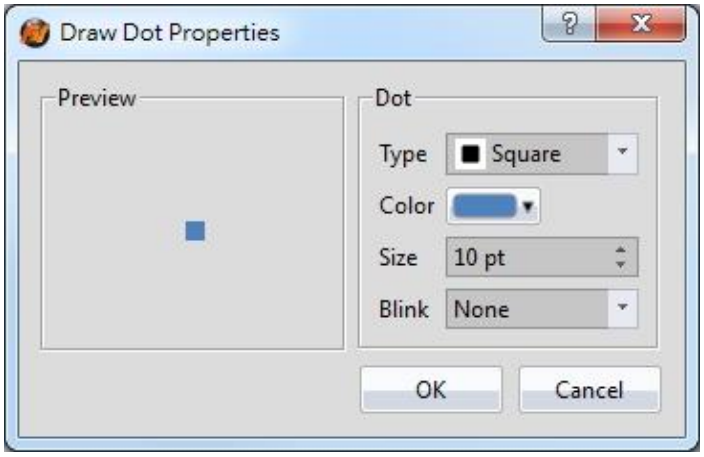


Figure 61 Setting page for【Dot】

Table 23 Property settings for【Dot】

Property	Description
【Preview】	Preview the appearance of the object.
【Dot】	【Type】 Set the type of dot. 【Color】 Set the color of the dot. 【Size】 Set the size of the dot. 【Blink】 Set the blinking of the dot; four blinking speeds are available for selection: None, Fast, Medium and Slow.

3.2.2【Line】

The setting page is as shown in the figure below:

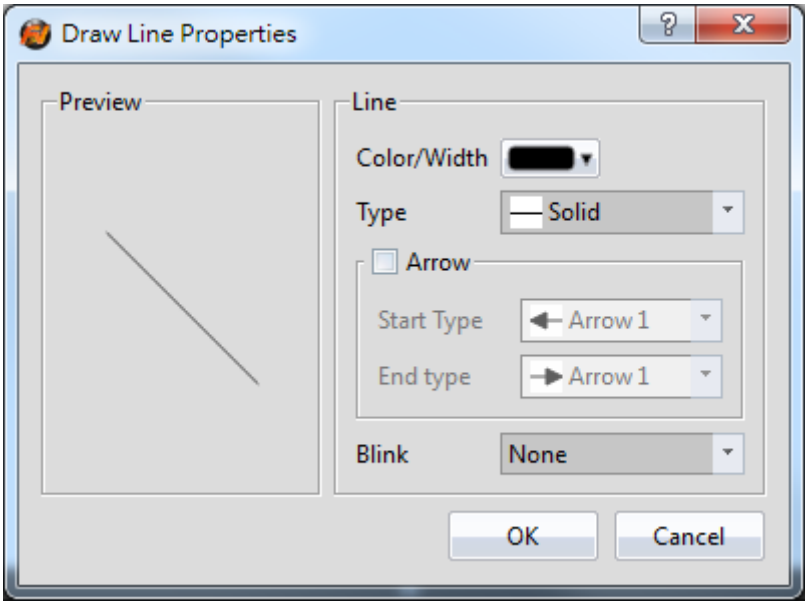


Figure 62 Settings page for【Line】

Table 24 Property settings for【Line】

Property	Description
【Preview】	Preview the appearance of the object.
【Line】	【Color/Width】 Set the color and the width of the line. 【Type】 Set the type of line. 【Arrow】 Set whether to have arrows on the ends of the line. 【Start Type) Set the arrow type at the start of the line. 【End Type) Set the arrow type at the end of the line. 【Blink) Set the blinking of the line; four blinking speeds are available for selection: None, Fast, Medium and Slow.

Tip:

1. User can create a line that the angle is a multiple of 45 degrees (including horizontal and vertical line) easily, by pressing "Shift" keypad.

2. If user modifies the line’s terminal and presses "Shift" keypad at the same time, the line angle can be fixed.
3. Generally (without pressing any keypad), the angle can be changed as a multiple of 5 degrees.
4. If user modifies the line’s terminal and presses "Alt" keypad at the same time, the line angle can be changed randomly.

3.2.3【Polyline】

The setting page is a shown in the figure below:

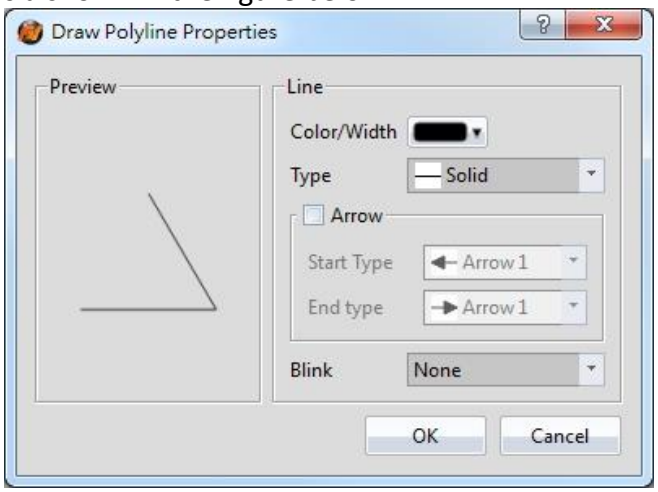


Figure 63 Settings page for【Polyline】

Table 25 Property settings for【Polyline】

Property	Description
【Preview】	Preview the appearance of the object.
【Line】	【Color/Width】 Set the color and the width of the line. 【Type】 Set the type of line. 【Arrow】 Set whether to have arrows on the ends of the line. 【Start Type) Set the arrow type at the start of the line. 【End Type) Set the arrow type at the end of the line.

	【Blink) Set the blinking of the line; four blinking speeds are available for selection: None, Fast, Medium and Slow.

Users can randomly modify the corresponding dot positions for 【Polyline】, or even add or delete a dot.

1. To modify the relative position of a dot
   When the user double-clicks on an object, a dragging block will be displayed for the dots of this object; this is when you can change the position of the dots, as shown in the figure below:

Figure 64 Illustration diagram when users double-click on a【Polyline】

2. Adding a dot

When the user double-clicks on an object, a dragging block will be displayed for the dots of this object; move the mouse anywhere on the line and the cursor will change to . At this time, press and hold the left mouse button and move the mouse to insert a dot anywhere you want.

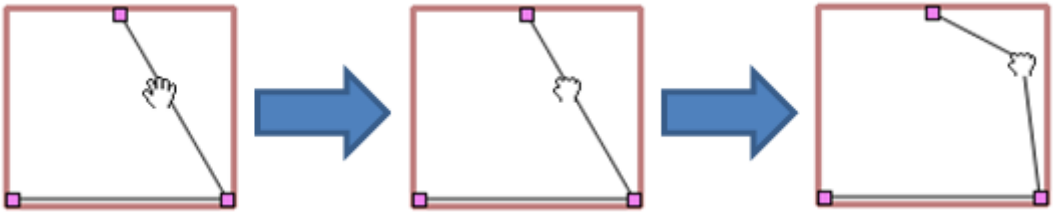


Figure 65 Illustration diagram of adding a dot on a【Polyline】

3. Deleting a dot

When the user double-clicks on an object, a dragging block will be displayed for the dots of this object; move the mouse onto any block on the line and the cursor will change to . At this time, press and hold the right mouse button to display the option to delete the dot.

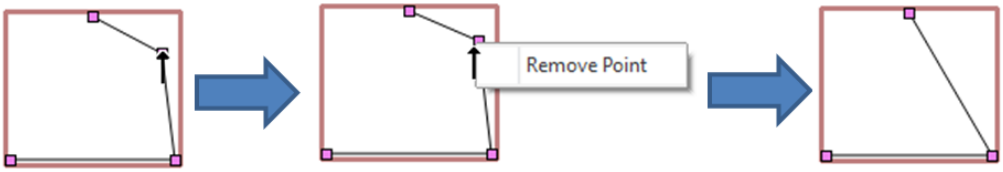


Figure 66 Illustration diagram of deleting a dot on a【Polyline】

3.2.4【Rectangle】

The setting page is shown in the figure below:

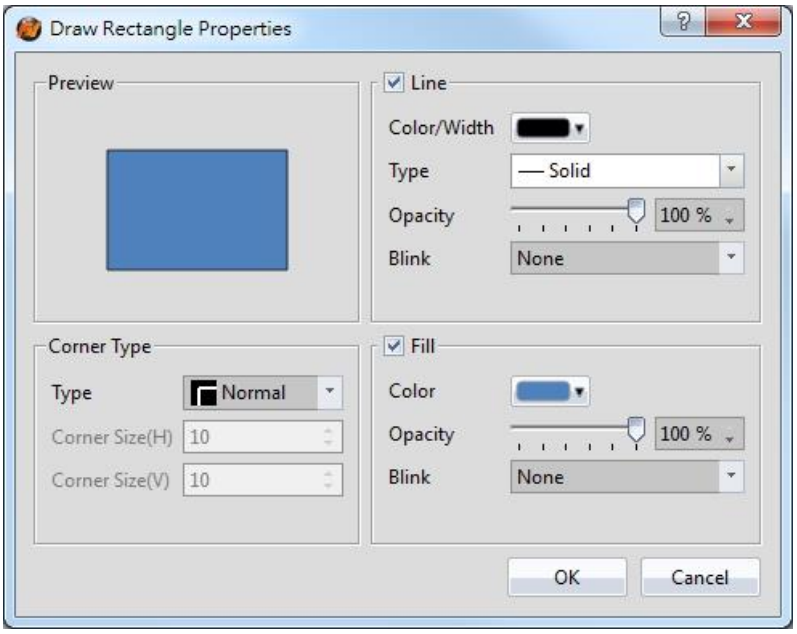


Figure 67 Setting page for【Rectangular】

Table 26 Property settings for【Rectangular】

Property	Description
【Preview】	Preview the appearance of the object.
【Line】	【Color/Width】 Set the color and the width of the line. 【Type】 Set the type of line. 【Opacity】 Set the opacity of the line. 【Blink】 Set the blinking of the line; three blinking speeds are available for selection: Fast, Medium and Slow.
【Fill】	【Color】 Set the color or material type of the fill. 【Opacity】 Set the opacity of the fill.

	【Blink】 Set the blinking of the fill; four blinking speeds are available for selection: None, Fast, Medium and Slow.
【Corner Type】	【Type】 Set the corner type. 【Corner Size(H)】 Set the horizontal size of the corner. 【Corner Size(V)】 Set the vertical size of the corner.

3.2.5【Polygon】

【Polygon】is the same as【Polyline】. Users can randomly modify the corresponding dot positions or even add and delete dots. The operating method is identical to 【Polyline】.

The setting page is shown in the figure below:

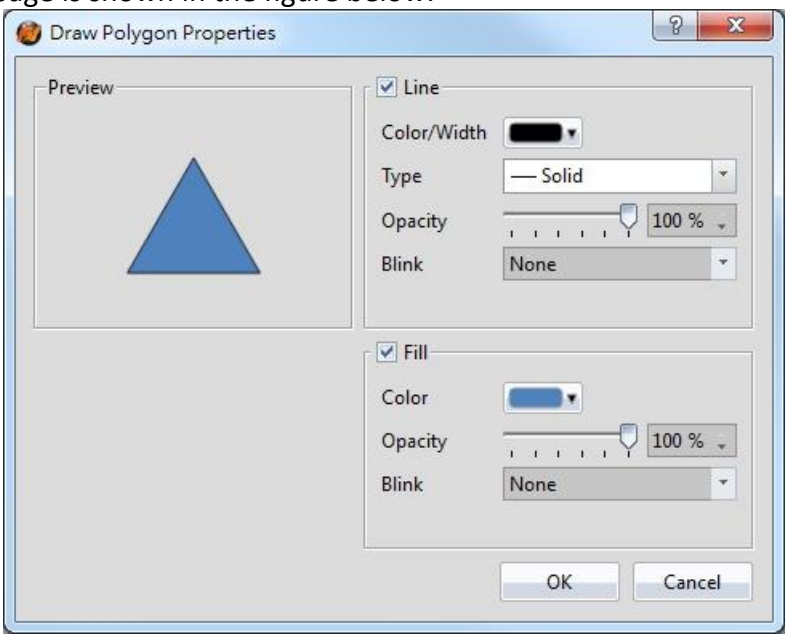


Figure 68 Setting page for【Polygon】

Table 27 Property settings for【Polygon】

Property	Description
【Preview】	Preview the appearance of the object.
【Line】	【Color/Width】 Set the color and the width of the line.

	【Type】 Set the type of line. 【Opacity】 Set the opacity of the line. 【Blink】 Set the blinking of the line; four blinking speeds are available for selection: None, Fast, Medium and Slow.
【Fill】	【Color】 Set the color or material type of the fill. 【Opacity】 Set the opacity of the fill. 【Blink】 Set the blinking of the fill; four blinking speeds are available for selection: None, Fast, Medium and Slow.

3.2.6【Ellipse】

The setting page is shown in the figure below:

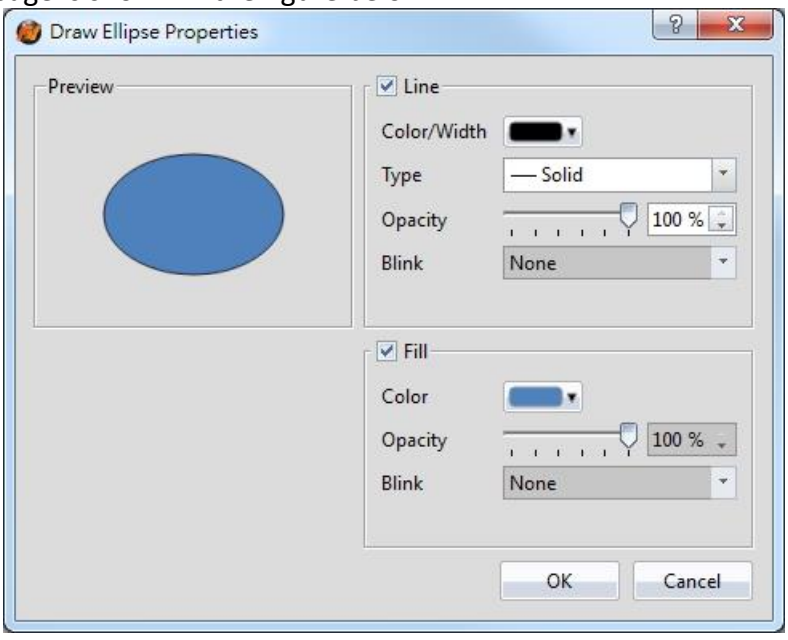


Figure 69 Setting page for【Ellipse】

Table 28 Property settings for【Ellipse】

Property	Description

【Preview】	Preview the appearance of the object.
【Line】	【Color/Width】 Set the color and the width of the line. 【Type】 Set the type of line. 【Opacity】 Set the opacity of the line. 【Blink】 Set the blinking of the line; four blinking speeds are available for selection: None, Fast, Medium and Slow.
【Fill】	【Color】 Set the color or material type of the fill. 【Opacity】 Set the opacity of the fill. 【Blink】 Set the blinking of the fill; four blinking speeds are available for selection: None, Fast, Medium and Slow.

3.2.7【Arc】

The setting page is shown in the figure below:

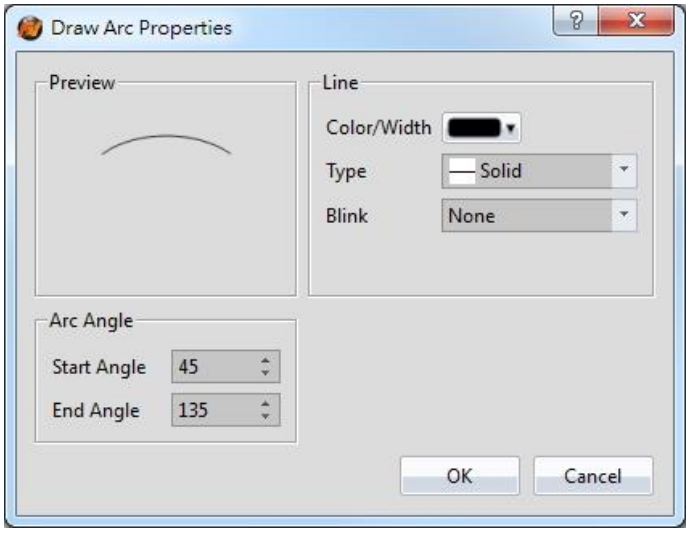


Figure 70 Setting page for【Arc】

Table 29 Property settings for【Arc】

Property	Description
【Preview】	Preview the appearance of the object.
【Line】	【Color/Width】 Set the color and the width of the line. 【Type】 Set the type of line. 【Blink】 Set the blinking of the line; four blinking speeds are available for selection: None, Fast, Medium and Slow.
【Arc Angle】	【Start Angle】 Set the starting angle of the arc. 【End Angle】 Set the ending angle of the arc.

Users can change the angle of the【Arc】directly:

When the user clicks on the object, dragging blocks will appear on the two ends of this object. At this time, users can change the angle of the arc.

3.2.8【Pie】

The setting page is shown in the figure below:

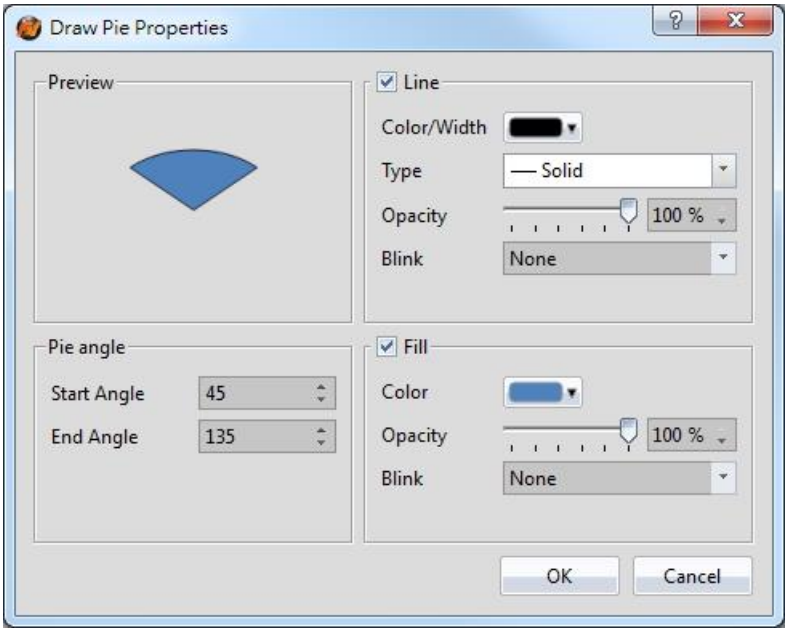


Figure 71 Setting page for【Pie】

Table 30 Property settings for【Pie】

Property	Description
【Preview】	Preview the appearance of the object.
【Line】	【Color/Width】 Set the color of the line. 【Type】 Set the type of line. 【Blink】 Set the blinking of the line; four blinking speeds are available for selection: None, Fast, Medium and Slow.
【Fill】	【Color】 Set the color or material type of the fill. 【Opacity】 Set the opacity of the fill. 【Opacity】 Set the opacity of the line. 【Blink】 Set the blinking of the fill; four blinking speeds are available for selection: None, Fast, Medium and Slow.

【Pie Angle】	【Start Angle】 Set the starting angle of the pie. 【End Angle】 Set the ending angle of the pie.

Users can change the angle of the【Pie】directly:

When the user clicks on the object, dragging blocks will appear on the two ends of this object. At this time, users can change the angle of the arc.

3.2.9【Table】

The setting page is shown in the figure below:

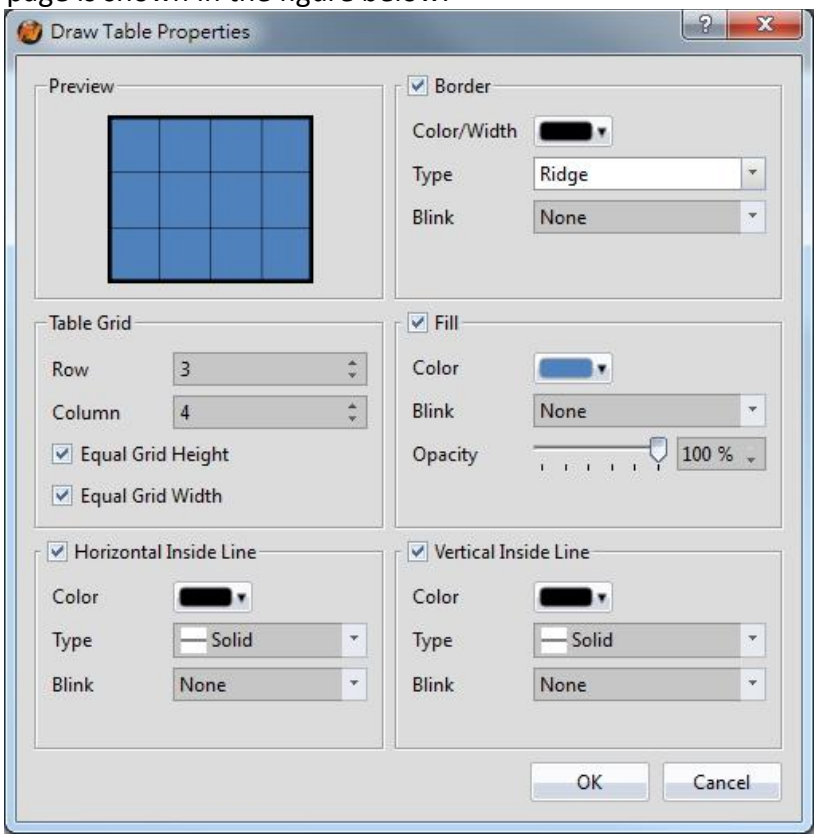


Figure 72 Setting page for【Table】

Table 31 Property settings for【Table】

Property	Description
【Preview】	Preview the appearance of the object.
【Border】	【Color/Width】 Set the color of the border. 【Type】

	Set the border type. 【Blink】 Set the blinking of the border; four blinking speeds are available for selection: None, Fast, Medium and Slow.
【Table Grid】	【Row】 Set the number of rows for the table. 【Column】 Set the number of columns for the table. 【Equal Grid Height】 Set the grid of the table to have the same height. 【Equal Grid Width】 Set the grid of the table to have the same width. Note: When【Equal Grid Height】and【Equal Grid Width】are not selected, users can drag the border of the grids to change the size of the grids.
【Fill】	【Color】 Set the color or material type of the fill. 【Blink】 Set the blinking of the fill; four blinking speeds are available for selection: None, Fast, Medium and Slow. 【Opacity】 Set the opacity of the fill.
【Horizontal Inside Line】	Check whether to display the horizontal grid lines. 【Color】 Set the color of the grid lines. 【Type】 Set the type of grid line. 【Blink】 Set the blinking of the fill; four blinking speeds are available for selection: None, Fast, Medium and Slow.
【Vertical	Check whether to display the vertical grid lines. 【Color】

Inside Line】	Set the color of the grid lines. 【Type】 Set the type of grid line. 【Blink】 Set the blinking of the fill; four blinking speeds are available for selection: None, Fast, Medium and Slow.

3.2.10 【Text】

The setting page is shown in the figure below:

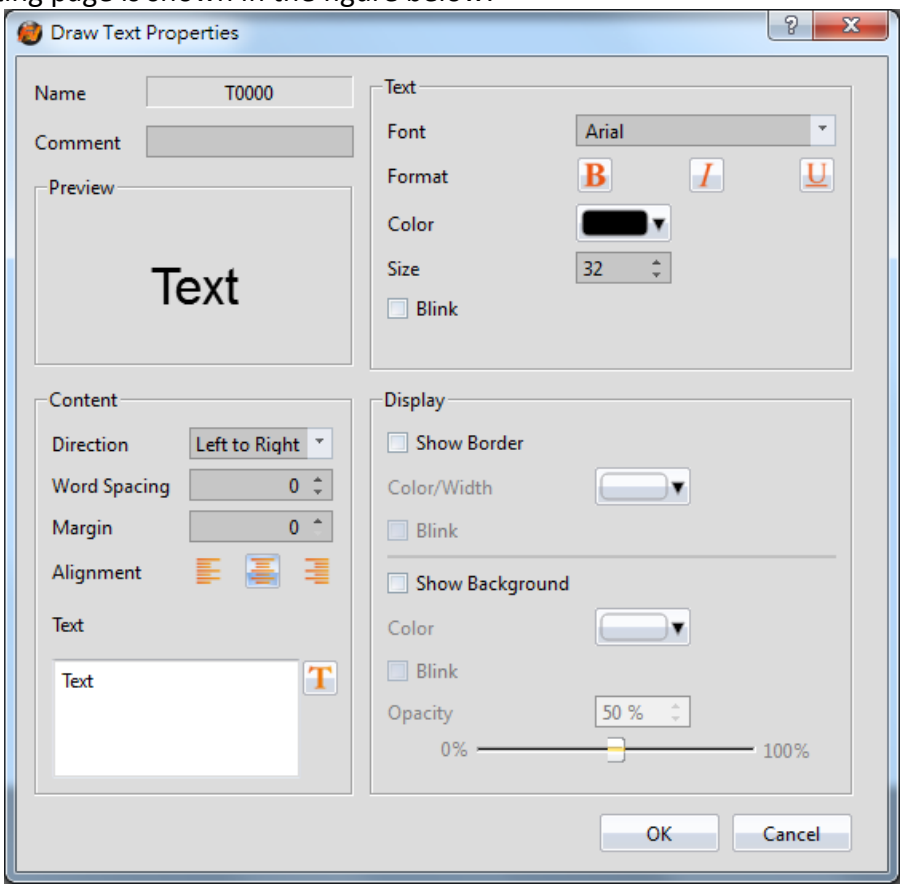


Figure 73 Setting page for【Text】

Table 32 Property settings for【Text】

Property	Description
【Preview】	Preview the appearance of the object.
【Content】	【Direction】 Set the direction of the text. 【Word Spacing】

	Set the spacing between words. 【Margin】 Set the margin of the texts. 【Alignment】 Set the alignment of the texts. 【Text】 Set the text display.
【Text】	【Font】 Set the font of the texts. 【Format】 Set the format of the texts. 【Color】 Set the color of the texts. 【Size】 Set the size of the texts. 【Blink】 Check to set whether to turn on the blinking function for the texts.
【Display】	Divided into two parts: top and bottom; borders and backgrounds can be set individually. Border: 【Show Border】 Check to set whether to display the border. When it is checked, the color, width and blinking function of the border can be set at the bottom. 【Color/Thickness】 Set the displayed color and thickness of the border. 【Blink】 Set whether to turn on the blinking function of the border. Background: 【Show Background】 Check to set whether to display the background. When it is

	checked, the color, width and blinking function of the background can be set at the bottom. 【Color】 Set the background color of the object. 【Blink】 Set whether to turn on the blinking function for the background of the object. 【Opacity】 Set the background opacity of the object. The larger the value, the less transparent the background.

3.2.11 【Image】

The setting page is shown in the figure below:

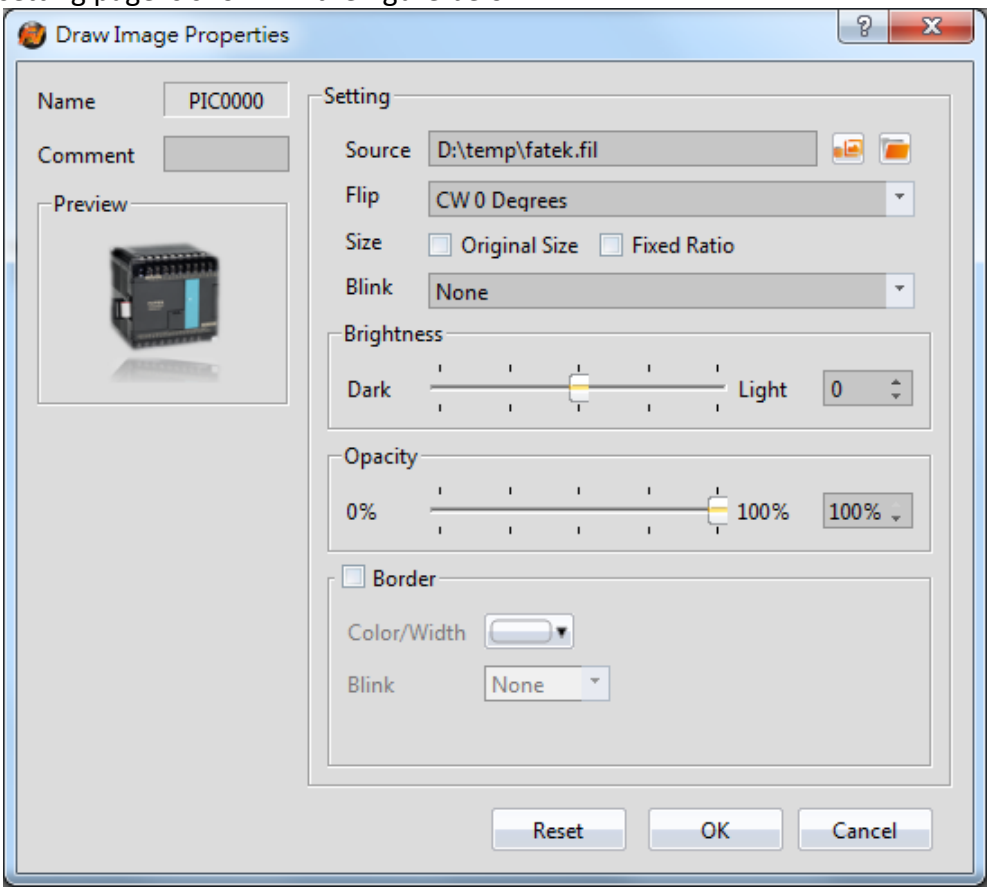


Figure 74 Setting page for【Image】

Table 33 Property settings for【Image】

Property	Description

【Preview】	Preview the appearance of the object.
【Setting】	【Source】 Display the source location of the image. 【Flip】 Set the flipping angle of the image. 【Size】 Set the zoom size restrictions of the image object. When 【Original】 is selected, the size of the image object is fixed at its original size. When 【Fixed Ratio】 is selected, the image object can be zoomed according to its original ratio. The image object can be stretched freely when neither is selected. 【Blink】 Set the blinking of the image object. Four blinking speeds are available for selection: None, Fast, Medium and Slow.
【Brightness】	Set the displayed brightness of the image object. The greater the value the brighter the object will be displayed.
【Opacity】	Set the displayed opacity of the image object. The greater the value the less transparent the object will be displayed.
【Border】	Set the border of the image object. The display appearance of the border can be set once this option is selected. 【Color/Thickness】 Set the displayed color and thickness of the border. 【Blink】 Set the blinking of the border. Four blinking speeds are available for selection: None, Fast, Medium and Slow.

3.3 Base Object Property Setting Dialog

3.3.1 【Lamp】

When the numeric value of the address that you want to view has changed, the 【Lamp】 object can be used to map the changes of each numeric value of the register to a specific icon (such as bright or dim lamp) in order to allow more intuitive understanding of the current numeric value of the register by using changes in icons.

3.3.1.1 【Setting】

The 【Lamp】【Setting】 page is as shown in the figure below, the meanings of each

setting item are listed below:

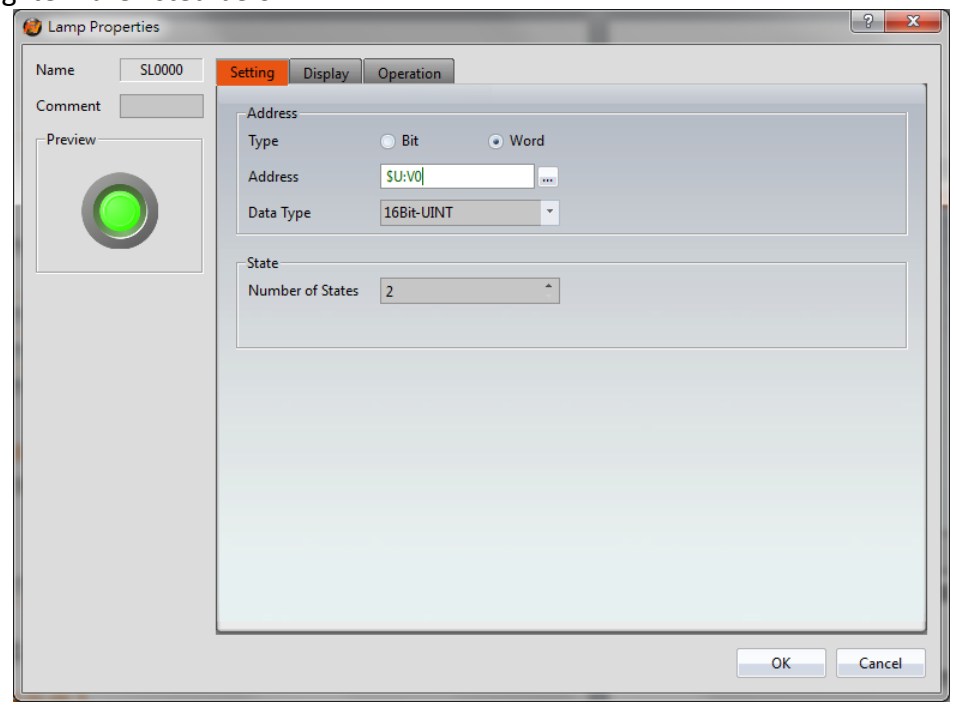


Figure 75 【Setting】Screen of【Lamp】

Table 34 【Setting】Properties of【Lamp】

Property	Description
【Preview】	Preview the appearance of this object.
【Address】	【Type】 Set whether the monitored address of the lamp is a Bit or Word. The default setting is Bit. 【Address】 Set the address of the lamp to monitor. 【Data Type】 Set the data type of the lamp; this setting item will appear when the type is set as Word.
【State】	【Number of States】 Set the number of states of the lamp. When the Lamp Type is Bit, the number of states is fixed as 2. If the Type is Word, it can be set between 2~256.

3.3.1.2 【Display】

The【Lamp】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

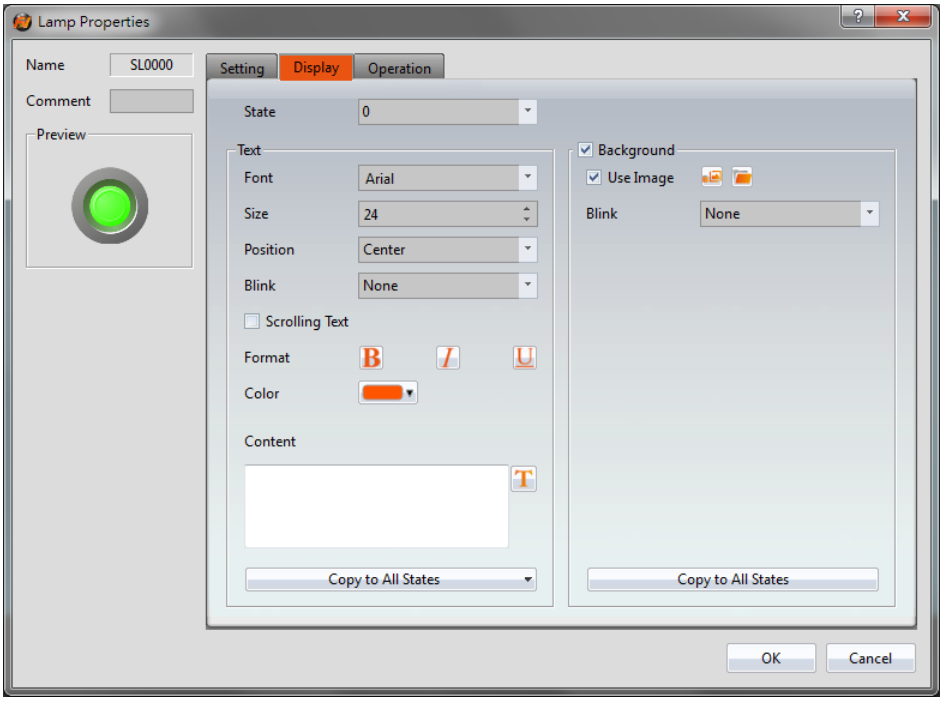


Figure 76 【Display】Setting Screen of【Lamp】

Table 35 【Display】Setting Properties of【Lamp】

Property	Description
【State】	Select the state needed to be edited.
【Text】	【Font】 Set the font of the text displayed for the currently editing state. 【Size】 Set the size of the text displayed for the currently editing state. 【Position】 Set the position of the text displayed for the currently editing state. 【Blink】 Set the blinking function for the text of the currently editing state. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】 Set the scrolling text function for the text of the currently editing state. There are four scrolling speeds available to

	choose from slow to fast. 【Format】 Set the format of the text displayed for the currently editing state, including Bold, Italics and Underline. 【Color】 Set the color of the text displayed for the currently editing state. 【Content】 Set the text displayed for the currently editing state. It can be inputted directly or acquired from the【Text Library】. 【Copy to All States】 Apply the settings of the text for the currently editing state to all states.
【Background】	【Use Image】 Set whether to use an image for the displayed background of the currently editing state. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of the currently editing state. This setting item will appear if 【Use Image】 was not selected. 【Blink】 Set the blinking function for the displayed background of the currently editing state. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Copy to All States】 Apply the settings of the background for the currently editing state to all states.

3.3.1.3 【Operation】

The【Lamp】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

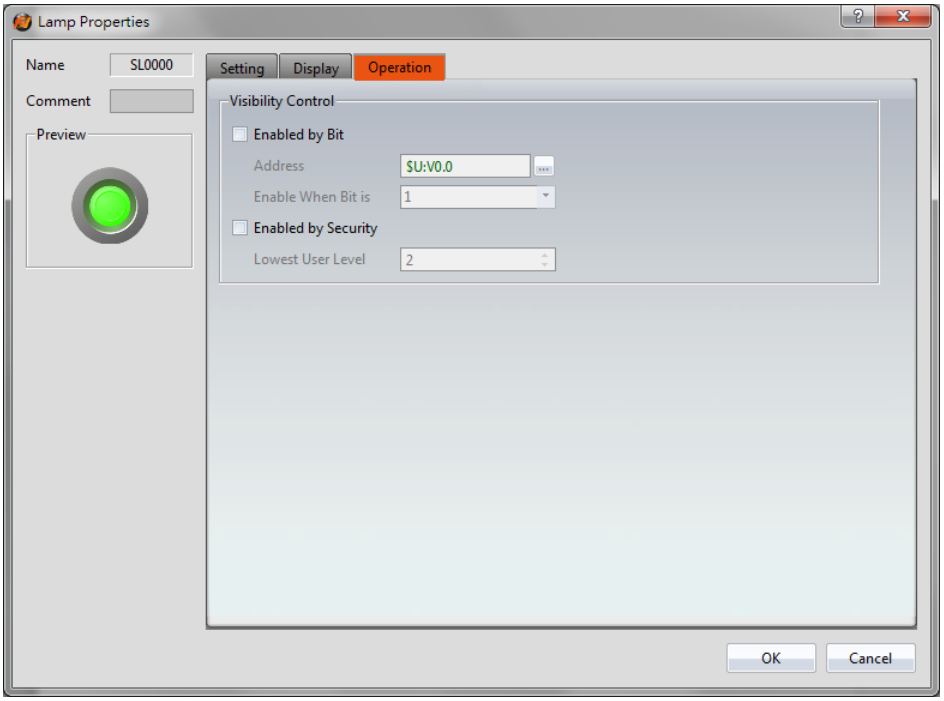


Figure 77 【Operation】Setting Screen of【Lamp】

Table 36 【Operation】Setting Properties of【Lamp】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.

3.3.2Switch

Switch allows users to perform specific operation behaviors by pressing objects, including【Bit Switch】,【Word Switch】,【Change Screen】and【Function Switch】.

3.3.2.1 【Bit Switch】

The【Bit Switch】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

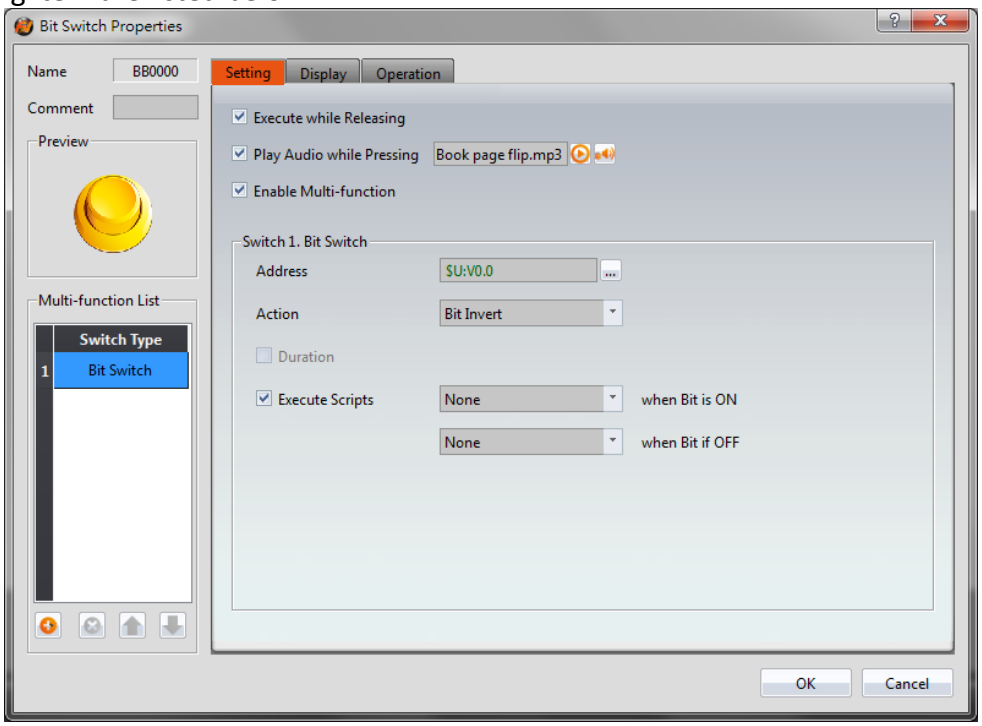


Figure 78 【Setting】Screen of【Bit Switch】

Table 37 【Setting】Properties of【Bit Switch】

Property	Description
【Preview】	Preview the appearance of this object.
【Execute while Releasing】	Select whether to execute the action set for the Bit Switch while releasing. The action will be executing immediately when the switch is pressed if this option is not selected.
【Play Audio while Pressing】	Select whether to play audio when the switch is pressed; an【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected.
【Enable Multi-function】	Select whether to enable the Multi-function

	Switch. A【Multi-function Switch List】will appear on the left when selected.
【Multi-function Switch List】	This list will appear when【Enable Multi-function】 is selected. The【Multi-function Switch List】is used to display the list of functions that will be executed when the switch is pressed. A maximum of 16 sets of operations can be set, and the system will execute the set operations in order when the switch is pressed. 【Add】 Add the number of switches in【Multi-function Switch List】. The type of switch to add can be selected. 【Delete】 Delete the switch currently selected in the【Multi-function Switch List】. 【Up】 Move the order of the switch currently selected in the【Multi-function Switch List】up. 【Down】 Move the order of the switch currently selected in the【Multi-function Switch List】down. Note: ➢ The order of the object itself is fixed as first and it cannot be moved up or down. ➢ The【Multi-function Switch List】of an object can only include one【Change Screen】 Or 【Function Switch】, and its order must be last.
【Address】	Set the operating address of the Bit Switch.
【Action】	Set the operation of the Bit Switch. Setting items that will appear below varies according to the different operation selected.

【Duration】	The duration of the operation when the Bit Switch is pressed. The duration time can be set on the right when this option is selected. For example, if the operation is set as【Set Bit】, and the duration is set as 1 second, when the Bit Switch is pressed the【Address】will change to 1 and then automatically change to 0 after 1 second.
【Execute Scripts】	Set whether to execute scripts when the Bit Switch is pressed. The ID of the script to execute can be set on the right when this option is selected. If the【Action】is set as【Bit Momentary】,【Bit Invert】or【Periodic Switch】, individual scripts can be set to execute when the【Address】is 1 and 0.
【Set Bit】	The【Address】will change to 1 when the Bit Switch is pressed.
【Reset Bit】	The【Address】will change to 0 when the Bit Switch is pressed.
【Bit Momentary】	The【Address】will change to 1 when the Bit Switch is pressed, and the【Address】will change to 0 when the Bit Switch is released.
【Bit Invert】	The current state of the【Address】will change from 1 to 0 or 0 to 1 according to its current state.
【Comparison】	If the numeric value of the【Reference Address】read by【Data Type】satisfies the【Condition】and【Constant】set when the Bit Switch is pressed, the【Address】will change to 1.
【Periodic Switch】	The state of the【Address】will change periodically according to the【Time Interval】and【Number of Times】set for the【Address】when the Bit Switch is pressed.

3.3.2.2 【Word Switch】

The【Word Switch】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

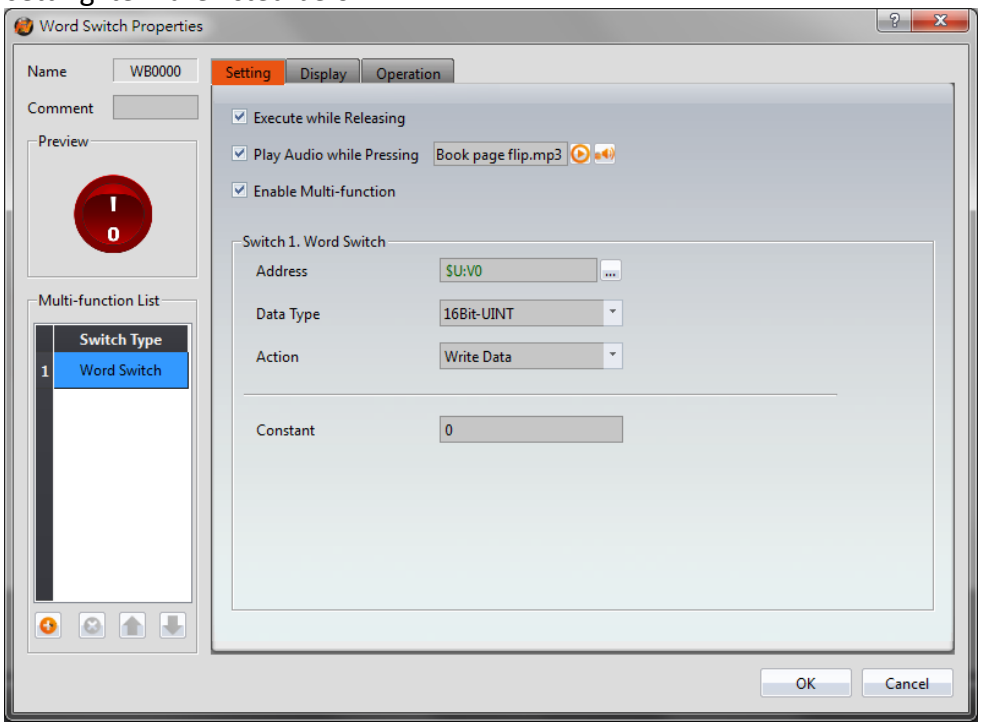


Figure 79 【Setting】Screen of【Word Switch】

Table 38 【Setting】Properties of【Word Switch】

Property	Description
【Preview】	Previews the appearance of this object.
【Execute while Releasing】	Select whether to execute the action set for the Word Switch while releasing. The action will be executing immediately when the switch is pressed if this option is not selected.
【Play Audio while Pressing】	Select whether to play audio when the switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected.
【Enable Multi-function】	Select whether to enable the Multi-function Switch. A【Multi-function Switch List】will appear on the left when selected.
【Multi-function Switch List】	This list will appear when【Enable Multi-function】is selected. The【Multi-function

	Switch List】is used to display the list of functions that will be executed when the switch is pressed. A maximum of 16 sets of operations can be set, and the system will execute the set operations in order when the switch is pressed. 【Add】 Add the number of switches in【Multi-function Switch List】. The type of switch to add can be selected. 【Delete】 Delete the switch currently selected in the【Multi-function Switch List】. 【Up】 Move the order of the switch currently selected in the【Multi-function Switch List】up. 【Down】 Move the order of the switch currently selected in the【Multi-function Switch List】down. Note: ➢ The order of the object itself is fixed as first and it cannot be moved up or down. ➢ The【Multi-function Switch List】of an object can only include one【Change Screen】 Or 【Function Switch】, and its order must be last.
【Address】	Set the operating address of the Word Switch.
【Data Type】	Set the data type of the Word Switch.
【Action】	Set the operation of the Word Switch. Setting items that will appear below vary according to the different operation selected.
【Write Data】	The numeric value of the【Address】will be set to the 【Constant】 according to the【Data Type】set when the Word Switch is pressed.
【Add Data】	The【Address】will add the【Constant】to the

	current numeric value according to the【Data Type】set every time the Word Switch is pressed. The maximum numeric value for the Word Switch to add can be controlled with【Max】. 【Continuously Add】 The Word Switch will continually execute the【Add Data】action when the Word Switch is continually pressed and not released if this setting is selected. 【Cyclically Add】 While the current numeric value is greater than or equal to the【Max】, the value will be set to【Min】if the Word Switch is pressed.
【Subtract Data】	The【Address】will subtract the【Constant】from the current numeric value according to the【Data Type】set every time the Word Switch is pressed. The minimum numeric value for the Word Switch to subtract can be controlled with【Min】. 【Continuously Subtract】 The Word Switch will continually execute the【Subtract Data】action when the Word Switch is continually pressed and not released if this setting is selected. 【Cyclically Subtract】 While the current numeric value is less than or equal to the【Min】, the value will be set to【Max】if the Word Switch is pressed.

3.3.2.3 【Change Screen】

The【Change Screen】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

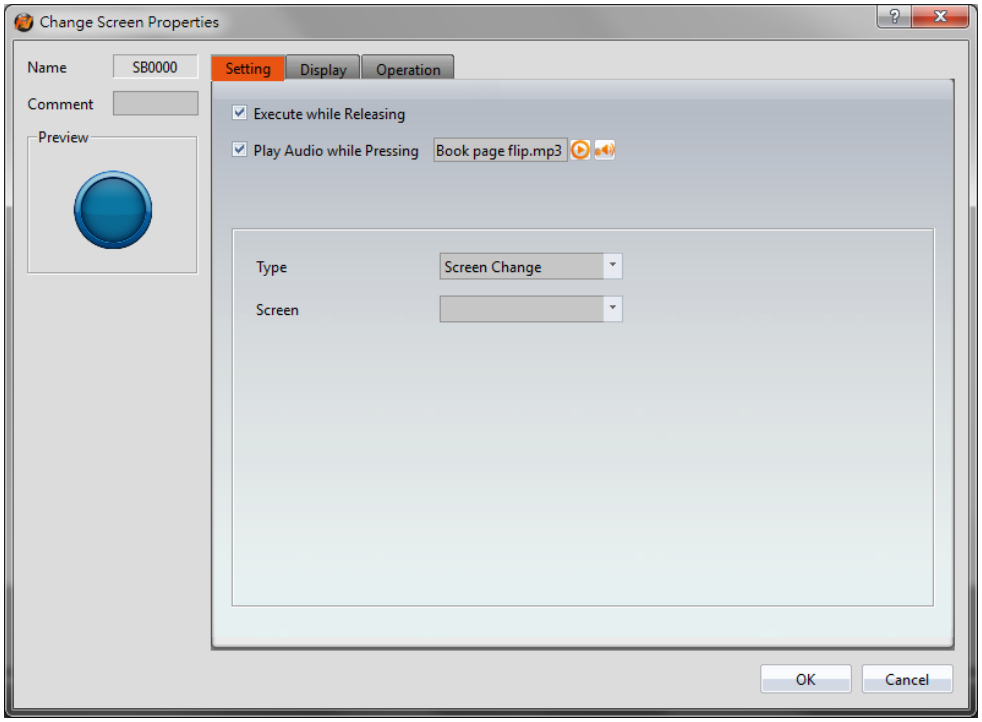


Figure 80 【Setting】Screen of【Change Screen】

Table 39 【Setting】Properties of【Change Screen】

Property	Description
【Preview】	Previews the appearance of this object.
【Execute while Releasing】	Select whether to execute the action set for Change Screen while releasing; the action will be executing immediately when the switch is pressed if this option is not selected.
【Play Audio while Pressing】	Select whether to play audio when the switch is pressed; an【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the 【Audio Selector】 can be pressed to play the audio selected.
【Type】	Set the operation type of Change Screen; setting items that will appear below varies according to the different operation selected.
【Screen Change】	The displayed screen of the human machine interface will change to the screen set in 【Screen】 when Change Screen is pressed.
【Previous Change】	The displayed screen of the human machine interface will change to the previous screen displayed when Change Screen is pressed.

3.3.2.4 【Function Switch】

The【Function Switch】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

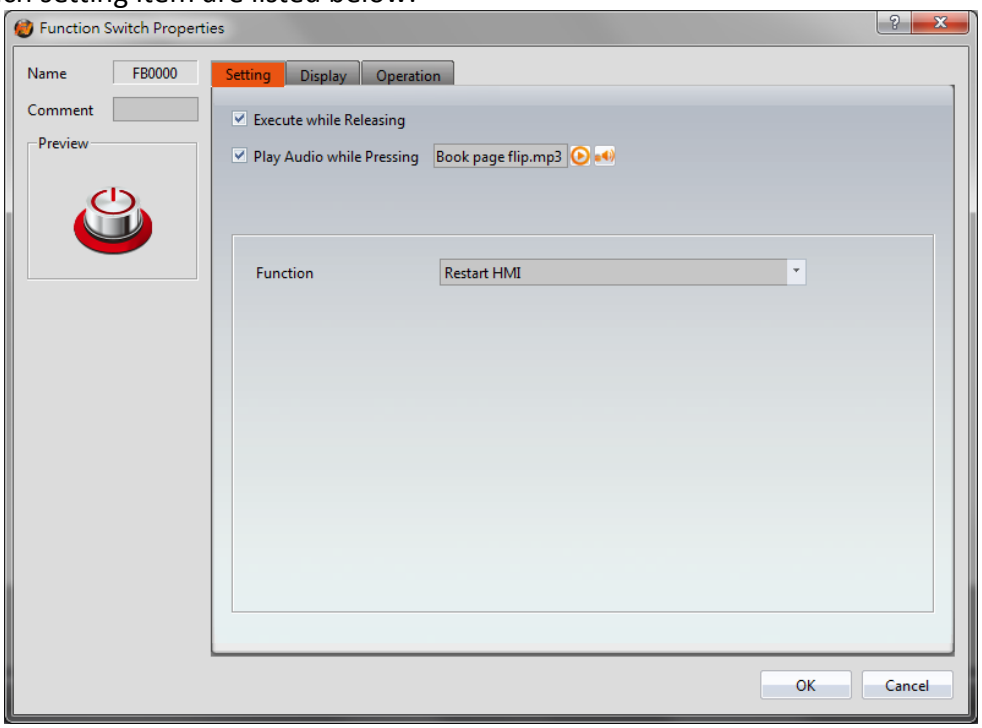


Figure 81 【Setting】Screen of【Function Switch】

Table 40 【Setting】Properties of【Function Switch】

Property	Description
【Preview】	Previews the appearance of this object.
【Execute while Releasing】	Select whether to execute the action set for the Function Switch while releasing. The action will be executing immediately when the switch is pressed if this option is not selected.
【Play Audio while Pressing】	Select whether to play audio when the switch is pressed; an【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the 【Audio Selector】 can be pressed to play the audio selected.
【Function】	Set the operation function of the Function Switch. Setting items that will appear below varies according to the different functions selected.
【Restart HMI】	The human machine interface will restart when

	the Function Switch is pressed.
【Increase Brightness】	The brightness of the human machine interface display will increase when the Function Switch is pressed.
【Decrease Brightness】	The brightness of the human machine interface display will decrease when the Function Switch is pressed.
【Turn Backlight OFF】	The brightness of the human machine interface display will decrease to the lowest brightness level when the Function Switch is pressed.
【Log in】	The system will display the log in window for the operator to log in when Function Switch is pressed.
【Log Out】	The operator will be logged out when Function Switch is pressed.
【Import User Accounts】	Update the username and user passwords, or passwords only ,it depends on the setting in 【Security】. 【Overwrite】 If【Overwrite】is selected, the usernames and user passwords currently saved on the human machine interface will be overwritten. If it is not selected, the new username and user password will be added to the human machine interface.

【Recipe: Import Recipe Group from File】	Import the file contents of the recipe group; user will be able to see complete contents of the recipe group if recipe tables are available. Users will also be able to see the changes in the numeric value of the displayed components if the register addresses of the displayed components are the same as the current recipe address set in the recipe. A drop-down list will appear below when this function is used for the user to decide which recipe group will be used. 【Recipe Group】 The recipe group ID and recipe group name can be seen here if the user adds new recipe groups with the recipe setting function. Note: the index of this recipe group will become 0 when this function is used, so the current recipe collection will have an index value of 0.
【Recipe: Export Recipe Group back to File】	Export the contents of the recipe group into a recipe group file. The user can choose to export a new file or overwrite the original recipe group file. A drop-down list will appear below when this function is used for the user to decide which recipe group will be used. 【Recipe Group】 The recipe group ID and recipe group name can be seen here if the user adds new recipe groups with the recipe setting function.
【Recipe: Write Current Recipe to Target Address】	A drop-down list will appear below when this function is used for the user to decide which recipe group will be used. The contents of the parameter in the HMI current recipe will be written to the register of the target address according to the setting of this recipe group. 【Recipe Group】 The recipe group ID and recipe group name can be seen here if the user adds new recipe groups with the recipe setting function.
【Recipe: Read From Target Address to Current Recipe】	A drop-down list will appear below when this function is used for the user to decide which recipe group will be used. The register contents

	of the target address will be read and the value will be written to the current recipe of the HMI according to the setting of this recipe group. 【Recipe Group】 The recipe group ID and recipe group name can be seen here if the user adds new recipe groups with the recipe setting function.
【Execute Scripts】	The system will execute the selected【Script】when Function Switch is pressed.
【Transfer File from HMI to USB Storage】	Transfer the files from HMI internal strorage to USB storage.
【Transfer File from HMI to microSD Card】	Transfer the files from HMI internal strorage to microSD card.

3.3.2.5 【Display】

The【Switch】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

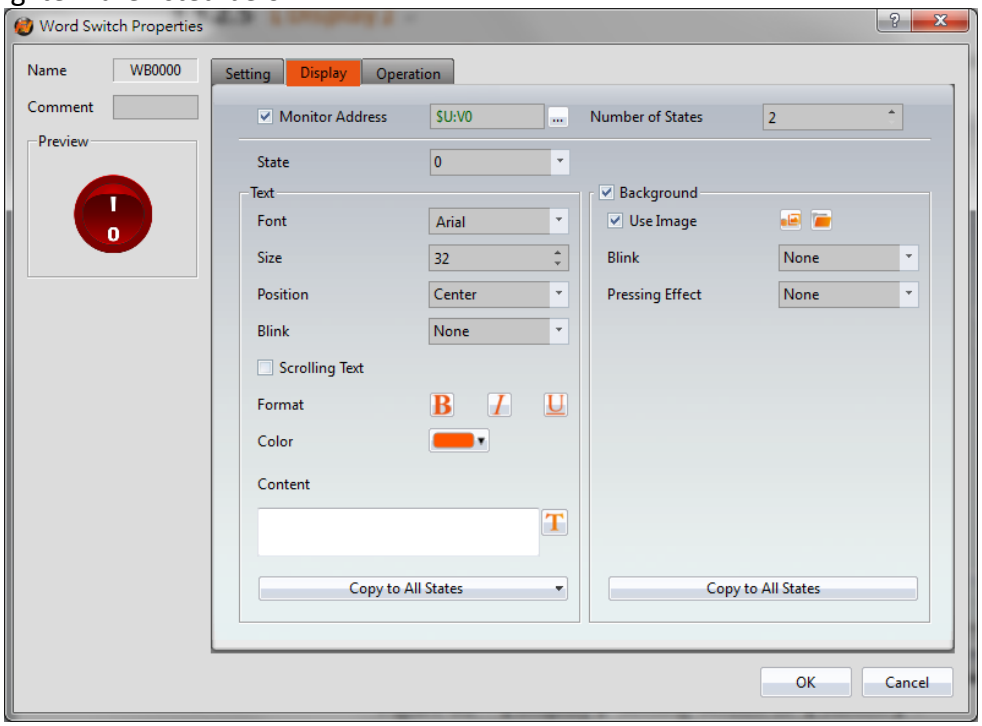


Figure 82 【Display】Setting Screen of【Switch】

Table 41 【Display】Setting Properties of【Switch】

Property	Description
【Monitor Address】	Set whether the switch will change its own state according

	to the changes in numeric value of the monitor address set. A monitor address setting item will appear for users to perform setting after this option is selected.
【Number of States】	Set the number of states for the switch to display.
【State】	Select the state needed to be edited.
【Text】	【Font】 Set the font of the text displayed for the currently editing state. 【Size】 Set the size of the text displayed for the currently editing state. 【Position】 Set the position of the text displayed for the currently editing state. 【Blink】 Set the blinking function for the text of the currently editing state. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】 Set the scrolling text function for the text of the currently editing state; There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for the currently editing state, including Bold, Italics and Underline. 【Color】 Set the color of the text displayed for the currently editing state. 【Content】 Set the displayed text of the currently editing state; it can be inputted directly or acquired from the【Text Library】. 【Copy to All States】 Apply the settings of the text for the currently editing state to all states.

【Background】	【Use Image】 Set whether to use an image for the displayed background of the currently editing state. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of the currently editing state. This setting item will appear if【Use Image】was not selected. 【Blink】 Set the blinking function for the background of the currently editing state. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Pressing Effect】 Set the pressing effect of the currently editing state. There are two effects available for selection:【None】and【Highlight】. 【Copy to All States】 Apply the settings of the background for the currently editing state to all states.

3.3.2.6 【Operation】

The【Switch】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

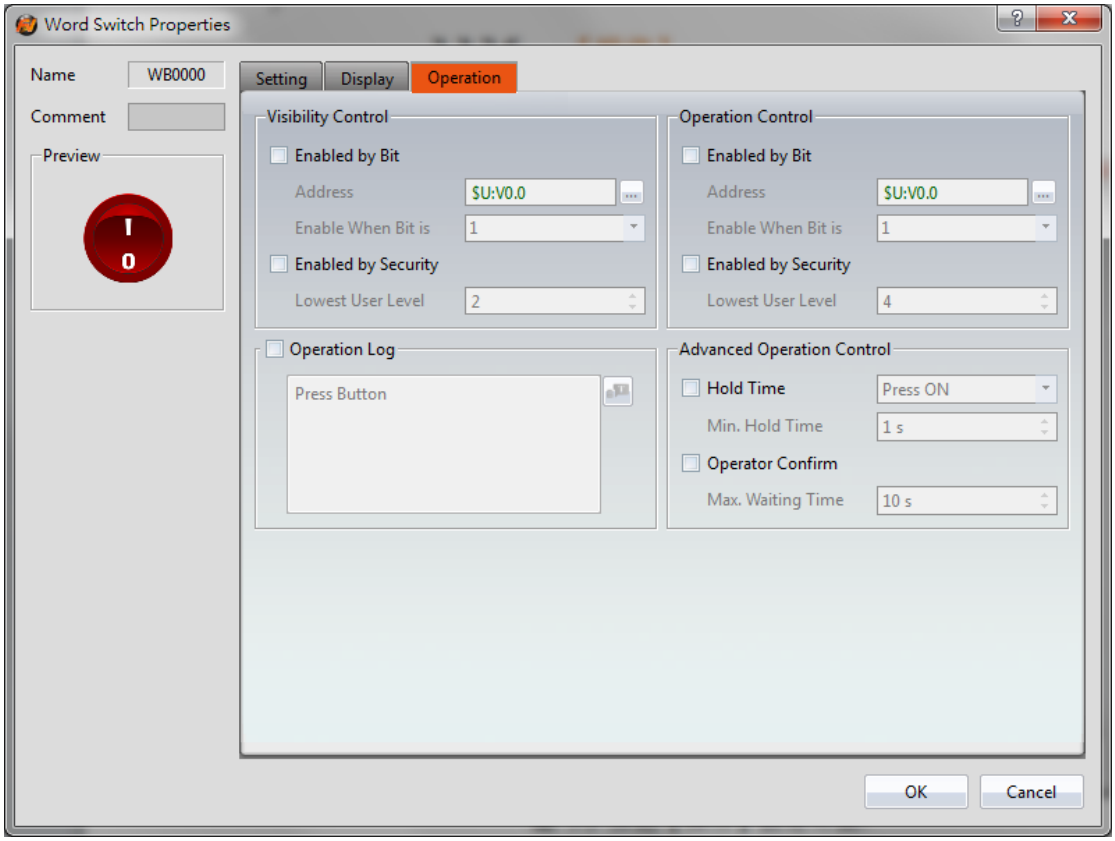


Figure 83 【Operation】Setting Screen of【Switch】

Table 42 【Operation】Setting Properties of【Switch】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the

	object.
【Operation Control】	Operation control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control operation by a specific Bit. 【Address】 Set the address of the operation control Bit. 【Enable When Bit is】 Set whether to operate the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the【Text Library】.
【Advanced Operation Control】	【Hold Time】 Select whether the operation is controlled by hold time; hold time can be divided into two types: ➢ 【Press On】: Press directly and confirm whether to execute this operation according to the【Min Hold Time】. ➢ 【Double Press】: Use two quick presses to confirm whether to execute this operation. 【Operation Confirm】 Select whether to display the confirm window after the operation is executed. 【Max Waiting Time】 When the confirm window is displayed, the system will close the confirm window and cancel this operation if the user did not respond within this time.

3.3.3【Numeric Input/Display】

【Numeric Input/Display】can display the numeric value saved in specific addresses; the【Numeric Input/Display】can also be clicked to enter specific numeric values to the register address if the【Allow Input】setting is enabled.

3.3.3.1 【Setting】

The【Numeric Input/Display】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

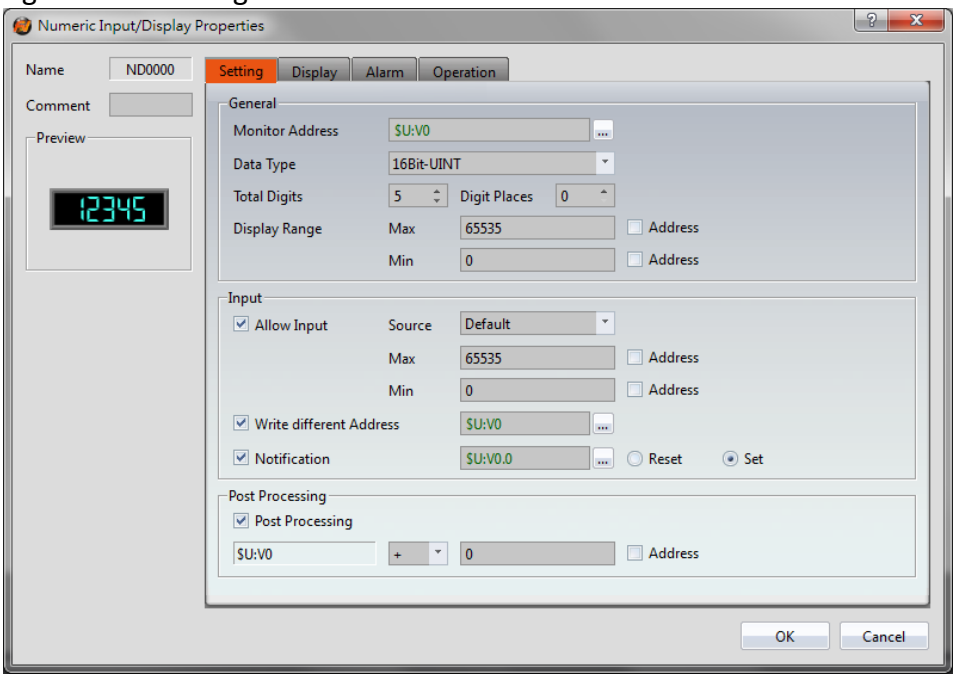


Figure 84 【Setting】Screen of【Numeric Input/Display】

Table 43 【Setting】Properties of【Numeric Input/Display】

Property	Description
【Preview】	Preview the appearance of this object.
【General】	【Monitor Address】 Set the monitor address of Numeric Input/Display. 【Data Type】 Set the data type of Numeric Input/Display. 【Total Digits】 Set the total number of digits of Numeric Input/Display. 【Digit Places】

	Set the decimal place of the Numeric Input/Display. 【Display Range】 Set the【Max】and【Min】display of the Numeric Input/Display. The【Address】on the rear can be used to set the source address for reading the maximum value or minimum value by【Data Type】.
【Input】	【Allow Input】 Set whether to allow the input function for the Numeric Input/Display object. Related input setting items will appear if this option is selected. 【Source】 Select the【Keypad Screen】to pop-up when the Numeric Input/Display is touched. 【Max】 Set the maximum allowed input value for Numeric Input/Display. The【Address】on the rear can be used to set the source address for reading the maximum value by【Data Type】. 【Min】 Set the minimum allowed input value for Numeric Input/Display. The【Address】on the rear can be used to set the source address for reading the minimum value by【Data Type】. 【Write different Address】 Set whether to allow writing the different address for the Numeric Input/Display object. Related setting items will appear if this option is selected, allowing setting of target address for writing value, so that the source address for reading value and the target address for writing value can be different. 【Notification】 Set whether to allow the notification function for the Numeric Input/Display object. Related setting items will appear if this

	option is selected, allowing setting of bit and value for notification.
【Post Processing】	【Post Processing】 Set whether to allow post-processing functions for the Numeric Input/Display object. Related post processing setting items will appear if this option is selected, allowing setting of processing methods (add, subtract, multiply and divide) and constants. The【Address】on the rear can be used to set the source address for processing constant.

3.3.3.2 【Display】

The【Numeric Input/Display】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

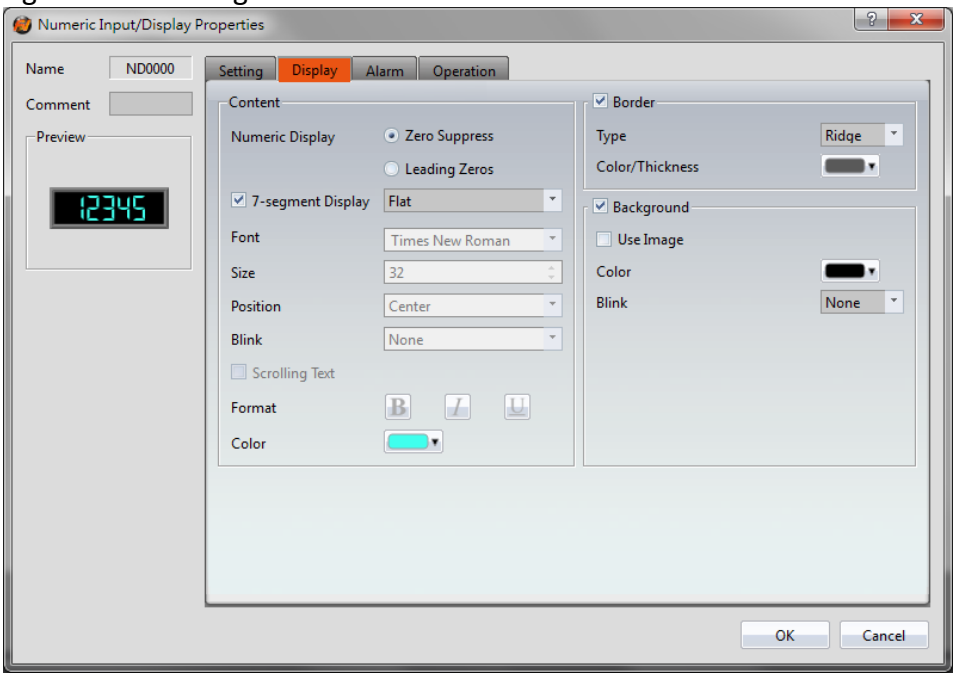


Figure 85 【Display】Setting Screen of【Numeric Input/Display】

Table 44 【Display】Setting Properties of【Numeric Input/Display】

Property	Description
【Content】	【Numeric Display】 Set the display method for the numeric value of Numeric Input/Display. Selecting【Zero Suppress】will not display the 0 in front and selecting【Leading Zeroes】will display the 0 in front. 【7-segment Display】

	Set whether to allow the 7-segment display function for the Numeric Input/Display object. If this option is selected, related setting items for setting of style of the 7-segment display will appear. 【Font】 Set the font for the displayed text of Numeric Input/Display. 【Size】 Set the size for the displayed text of Numeric Input/Display. 【Position】 Set the position for the displayed text of Numeric Input/Display. 【Blink】 Set the blinking function for the text of Numeric Input/Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】 Set the scrolling text function for the text of Numeric Input/Display. There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for Numeric Input/Display, including Bold, Italics and Underline. 【Color】 Set the color for the displayed text of Numeric Input/Display.
【Border】	【Color/Thickness】 Set the color and thickness for the displayed border of Numeric Input/Display. 【Blink】 Set the blinking function for the border of Numeric Input/Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.
【Background】	【Use Image】 Set whether to use an image for the displayed background of the Numeric Input/Display. When this option is checked, an

	【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of Numeric Input/Display. This setting item will appear if 【Use Image】 was not selected. 【Blink】 Set the blinking function for the displayed background of Numeric Input/Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.

3.3.3.3 【Alarm】

The【Numeric Input/Display】【Alarm】page is as shown in the figure below, the meanings of each setting item are listed below:

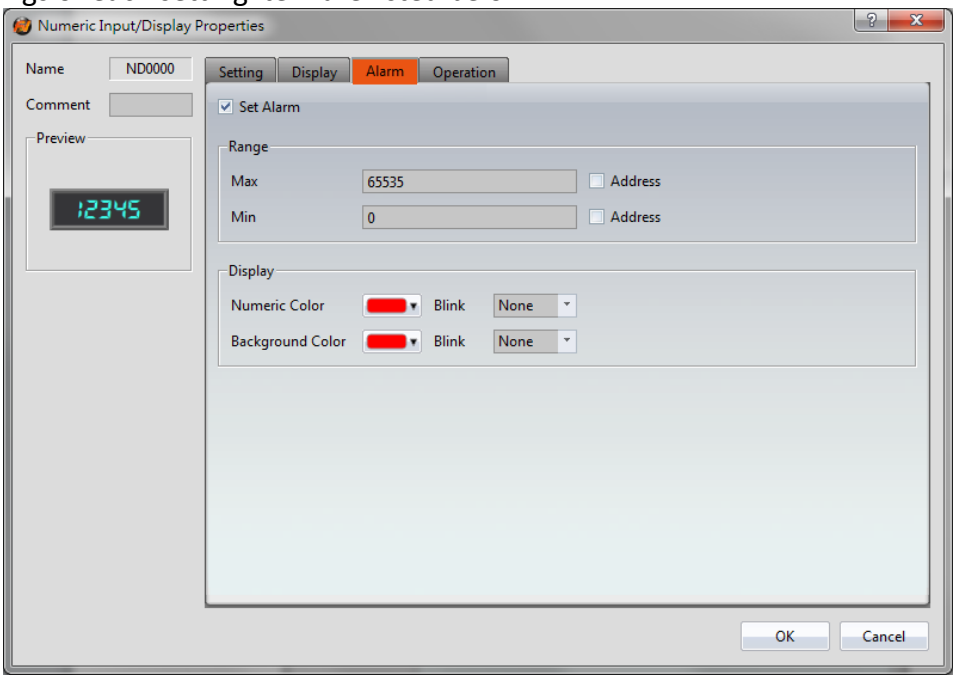


Figure 86 【Alarm】Setting Screen of【Numeric Input/Display】

Table 45 【Alarm】Setting Properties of【Numeric Input/Display】

Property	Description
【Set Alarm】	Set whether to enable the alarm function of Numeric Input/Display. Alarm related setting items will appear below when this option is selected.
【Range】	Set the range of the alarm; the alarm condition is fulfilled when the numeric value displayed by Numeric Input/Display exceeds the maximum or minimum value.

	【Max】 Set the maximum alarm value for Numeric Input/Display; the 【Address】below can be used to set the source address for reading the maximum value by the【Data Type】 set in the 【Setting】page. 【Min】 Set the minimum alarm value for Numeric Input/Display; the 【Address】on the rear can be used to set the source address for reading the minimum value by the【Data Type】 set in the 【Setting】page.
【Display】	Set the displayed appearance of Numeric Input/Display when the alarm conditions are fulfilled. 【Numeric Color】 Set the color of the displayed text for Numeric Input/Display when the alarm conditions are fulfilled. The【Blink】on the rear can be used to set the blinking function of the text when the alarm condition are fulfilled and there are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Background Color】 Set the color of the displayed background for Numeric Input/Display when the alarm conditions are fulfilled. The 【Blink】on the rear can be used to set the blinking function of the background when the alarm condition are fulfilled and there are four blinking speeds available to choose from: None, Slow, Medium and Fast.

3.3.3.4 【Operation】

The【Numeric Input/Display】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

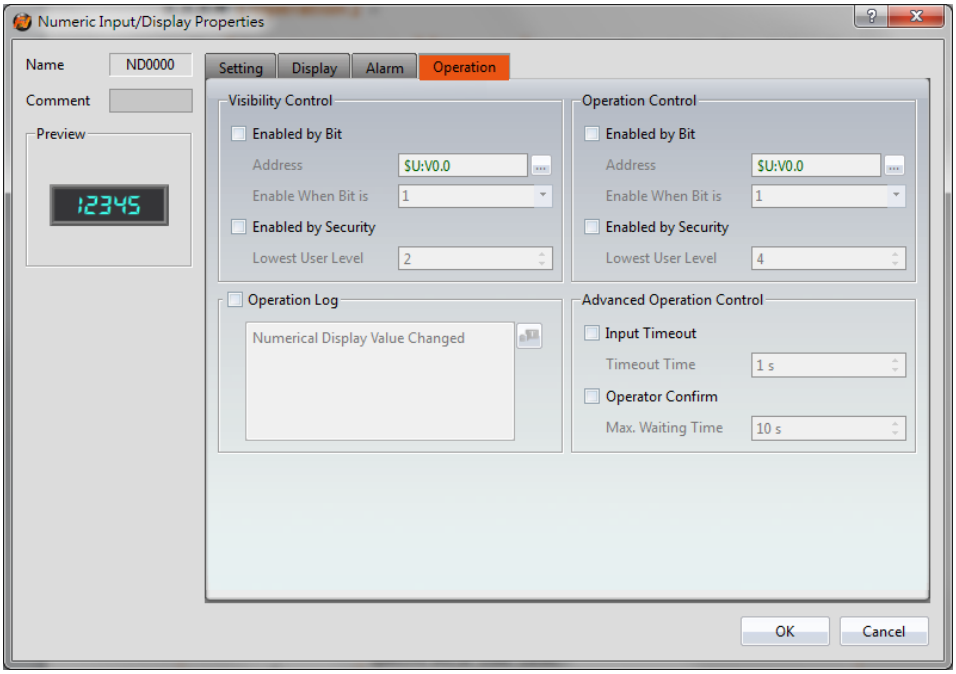


Figure 87 【Operation】Setting Screen of【Numeric Input/Display】

Table 46 【Operation】Setting Properties of【Numeric Input/Display】

Property	Description
【Visibility Control】	Visibility control of the object; it can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Sets the minimum level of the user logged in to display the object.
【Operation Control】	Operation control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】

	Select whether to control operation by a specific Bit. 【Address】 Set the address of the operation control Bit. 【Enable When Bit is】 Set whether to operate the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the【Text Library】.
【Advanced Operation Control】	【Input Timeout】 Select whether the【Keypad Screen】is controlled by time. 【Timeout Time】 If the user did not operate any object on the【Keypad Screen】within this time, the system will close the【Keypad Screen】and cancel this operation. 【Operation Confirm】 Select whether to display the confirm window after the operation is executed. 【Max Waiting Time】 The system will close the confirm window and cancel this operation if the user did not respond within this time.

3.3.4【Text Input/Display】

【Text Input/Display】can display the text saved in specific addresses. The【Text Input/Display】can also be clicked to enter specific text to the register addre if the【Allow Input】setting is enabled.

3.3.4.1 【Setting】

The【Text Input/Display】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

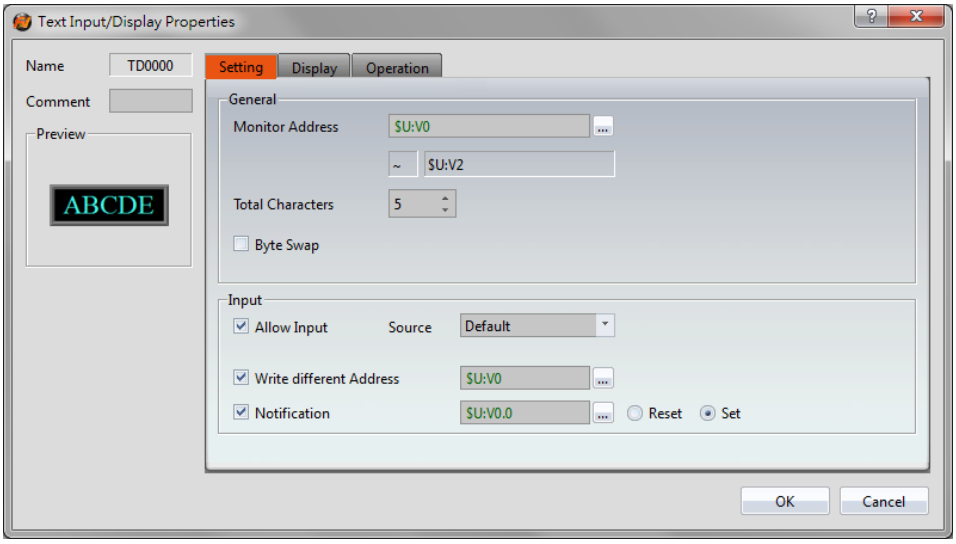


Figure 88 【Setting】Screen of【Text Input/Display】

Table 47 【Setting】Properties of【Text Input/Display】

Property	Description
【Preview】	Preview the appearance of this object.
【General】	【Monitor Address】 Set the monitor address of Text Input/Display; when this setting is changed, the final address below will change according to the inputted【Monitor Address】and【Total Characters】. 【Total Characters】 Set the total number of characters for Text Input/Display; when this setting is changed, the final address above will change according to the inputted【Monitor Address】and【Total Characters】. 【Byte Swap】 Select whether to enable high and low byte swapping function.
【Input】	【Allow Input】 Set whether to allow the input function for the Text Input/Display object; related input setting items will appear if

	this option is selected. 【Source】 Set the code number of the【Keypad Screen】to pop-up when the Text Input/Display is touched. 【Write different Address】 Set whether to allow writing the different address for the Text Input/Display object. Related setting items will appear if this option is selected, allowing setting of target address for writing text, so that the source address for reading text and the target address for writing text can be different. 【Notification】 Set whether to allow the notification function for the Text Input/Display object. Related setting items will appear if this option is selected, allowing setting of bit and value for notification.

3.3.4.2 【Display】

The【Text Input/Display】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

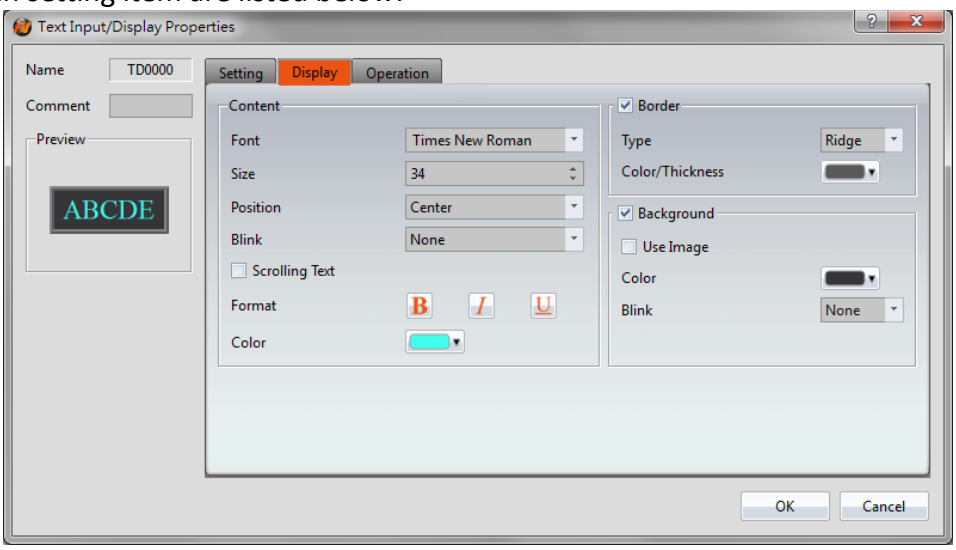


Figure 89 【Display】Setting Screen of【Text Input/Display】

Table 48 【Display】Setting Properties of【Text Input/Display】

Property	Description
【Content】	【Font】 Set the font for the displayed text of Text Input/Display.

	【Size】 Set the size for the displayed text of Text Input/Display. 【Position】 Set the position for the displayed text of Text Input/Display. 【Blink】 Set the blinking function for the text of Text Input/Display. There are four blinking speeds available to choose from:None, Slow, Medium and Fast. 【Scrolling Text】 Set the scrolling text function for the text of Text Input/Display. There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for Text Input/Display, including Bold, Italics and Underline. 【Color】 Set the color for the displayed text of Text Input/Display.
【Border】	【Color/Thickness】 Set the color and thickness for the displayed border of Text Input/Display. 【Blink】 Set the blinking function for the border of Text Input/Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.
【Background】	【Use Image】 Set whether to use an image for the displayed background of Text Input/Display. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of Text Input/Display. This setting item will appear if 【Use Image】 was not selected.

	【Blink】 Set the blinking function for the displayed background of Text Input/Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.

3.3.4.3 【Operation】

The【Text Input/Display】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

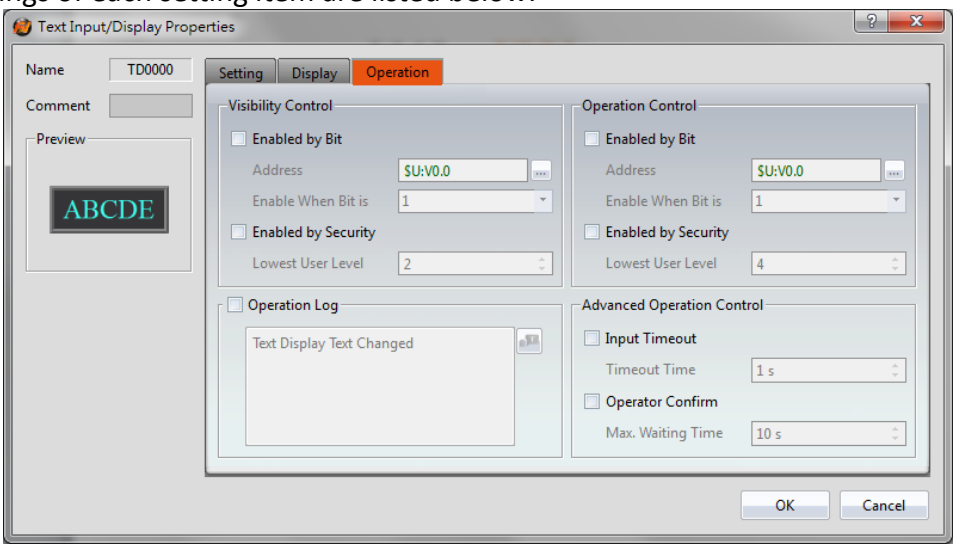


Figure 90 【Operation】Setting Screen of【Text Input/Display】

Table 49 【Operation】Setting Properties of【Text Input/Display】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in.

	【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Control】	Operation control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control operation by a specific Bit. 【Address】 Set the address of the operation control Bit. 【Enable When Bit is】 Set whether to operate the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the Text Library.
【Advanced Operation Control】	【Input Timeout】 Select whether the【Keypad Screen】is controlled by time. 【Timeout Time】 If the user did not operate any object on the【Keypad Screen】within this time, the system will close the【Keypad Screen】and cancel this operation. 【Operation Confirm】 Select whether to display the confirm window after the operation is executed. 【Max Waiting Time】 The system will close the confirm window and cancel this operation if the user did not respond within this time.

3.3.5【Date/Time Display】

【Date/Time Display】can display the current date and time according to the format set by the user.

3.3.5.1 【Setting】

The【Date/Time Display】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

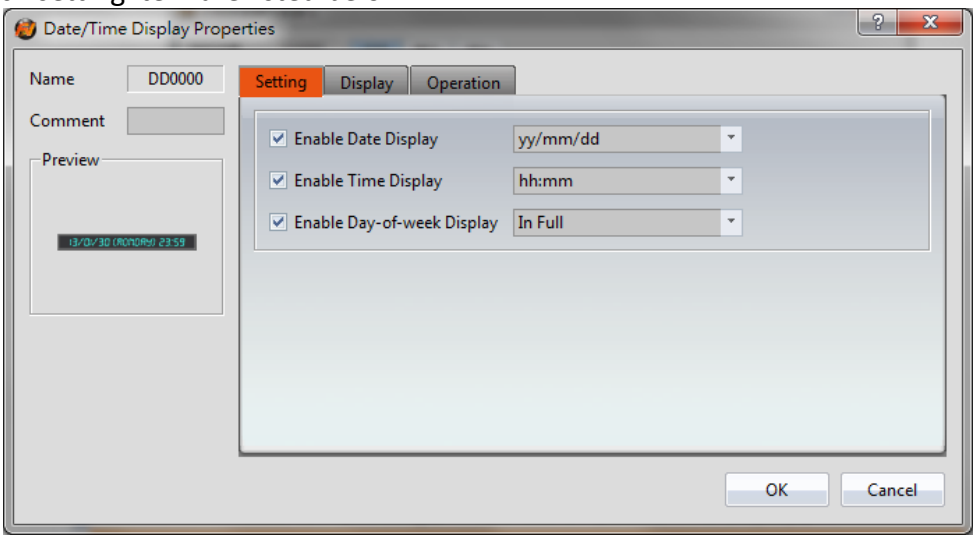


Figure 91 【Setting】Screen of【Date/Time Display】

Table 50 【Setting】Properties of【Date/Time Display】

Property	Description
【Preview】	Previews the appearance of this object.
【Enable Date Display】	Set whether to enable date display; a date format selector will appear on the rear for the user to select the display format of the date if this option is selected.
【Enable Time Display】	Set whether to enable time display. A time format selector will appear on the rear for the user to select the display format of the time if this option is selected.
【Enable Day-of-week Display】	Set whether to enable day-of-week display; a day-of-week format selector will appear on the rear for the user to select the display format of the day-of-week if this option is selected.

3.3.5.2 【Display】

【Date/Time Display】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

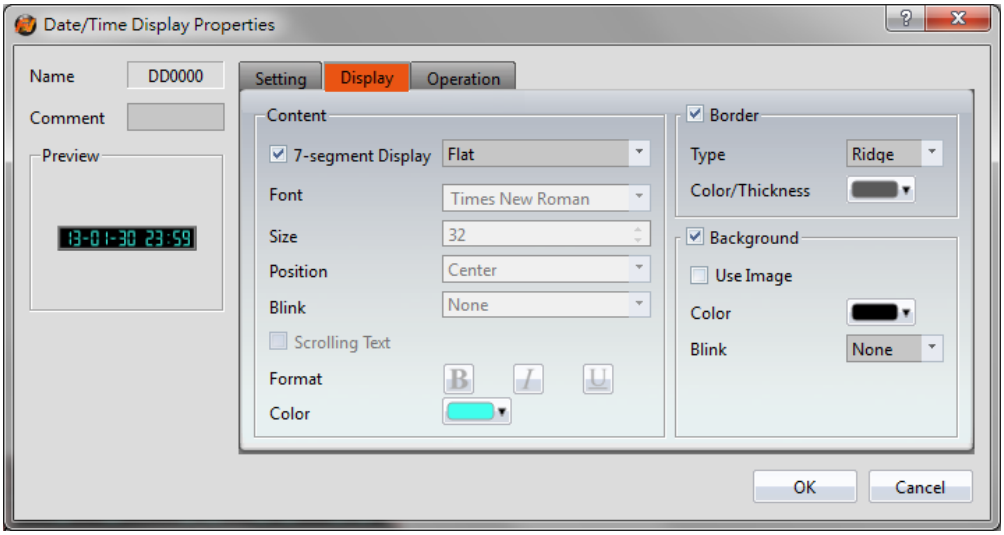


Figure 92 【Display】Setting Screen of【Date/Time Display】

Table 51 【Display】Setting Properties of【Date/Time Display】

Property	Description
【Content】	【7-segment Display】 Set whether to allow the 7-segment display function for the Date/Time Display object. If this option is selected, related setting items for setting of style of the 7-segment display will appear. Note: while this option is selected, because it can only show part of text(0/O, 1, 2, 3, 4, 5/S, 6, 7, 8, 9/g, A, B, C, D, E,F, h, H, L, o, P, r, u, U, Y), the【Enable Day-of-week Display】function will be disabled. 【Font】 Set the font for the displayed text of Date/Time Display. 【Size】 Set the size for the displayed text of Date/Time Display. 【Position】 Set the position for the displayed text of Date/Time Display. 【Blink】 Set the blinking function for the text of Date/Time Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】

	Set the scrolling text function for the text of the Date/Time Display. There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for the Date/Time Display, including Bold, Italics and Underline. 【Color】 Set the color for the displayed text of Date/Time Display.
【Border】	【Color/Thickness】 Set the color and thickness for the displayed border of Date/Time Display. 【Blink】 Set the blinking function for the border of Date/Time Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.
【Background】	【Use Image】 Set whether to use an image for the displayed background of the Date/Time Display. When this option is checked, an 【Image Selector】 will appear asking the user to select an image either from the 【Image Library】 or from a file. 【Color】 Set the displayed background color of the Date/Time Display. This setting item will appear if 【Use Image】 was not selected. 【Blink】 Set the blinking function for the displayed background of the Date/Time Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.

3.3.5.3 【Operation】

The【Date/Time Display】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

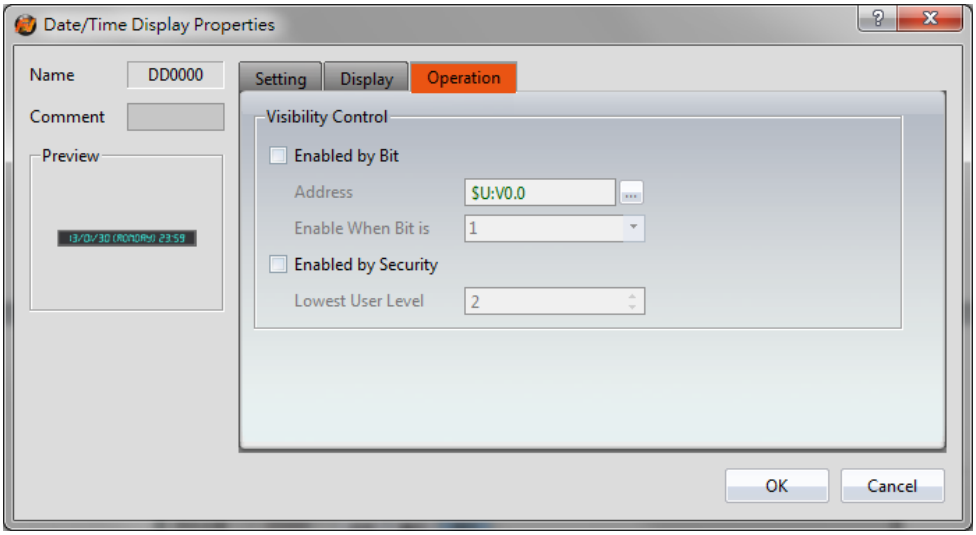


Figure 93 【Operation】Setting Screen of【Date/Time Display】

Table 52 【Operation】Setting Properties of【Date/Time Display】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.

3.3.6【Window Screen Display】

【Window Screen Display】can display the【Window Screen】created in the project, and supports using the numeric value of specific addresses to control the【Window Screen】displayed by the Window Screen Display.

3.3.6.1 【Setting】

The【Window Screen Display】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

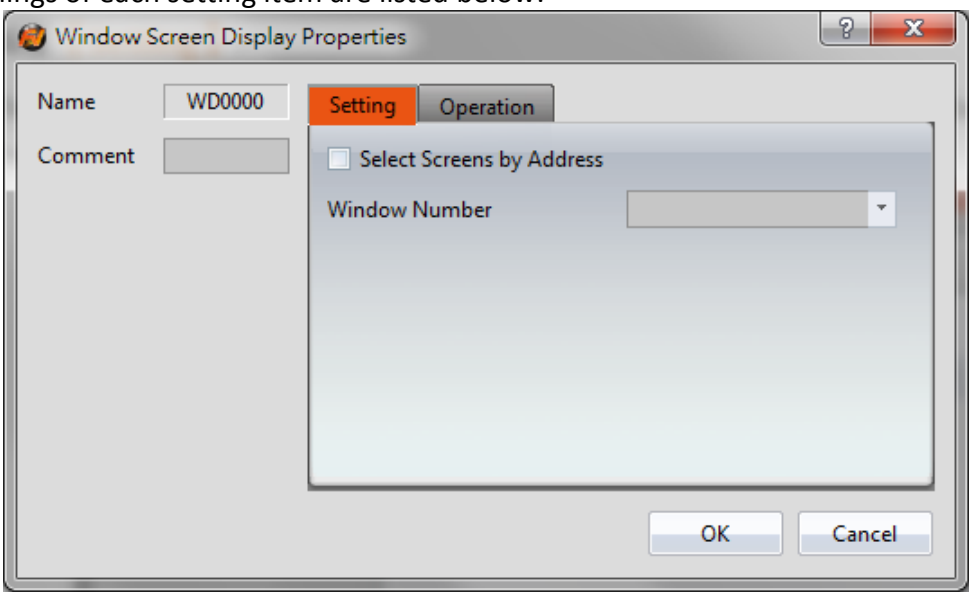


Figure 94 【Setting】Screen of【Window Screen Display】

Table 53 【Setting】Properties of【Window Screen Display】

Property	Description
【Select Screens by Address】	Set whether to select screen by address. The【Window Screen】displayed by Window Screen Display will be determined by the numeric value saved in【Window Selection Address】if this setting is selected. If this setting is not selected, the Window Screen Display will have a fixed display of the【Window Screen】selected by【Window Number】.
【Window Number】	Set the【Window Screen】displayed by the Window Screen Display. This setting will appear if【Select Screens by Address】is not selected.
【Window Selection Address】	Set the【Window Selection Address】of the Window Screen Display; when the HMI is operating, the Window Screen Display will read the【Window Selection Address】according to the

	【Data Type】Set, and display the【Window Screen】with the number that matches the numeric value read. This setting will appear if【Select Screens by Address】is selected.
【Data Type】	Set the Data Type used to read the【Window Selection Address】.

3.3.6.2 【Operation】

The【Window Screen Display】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

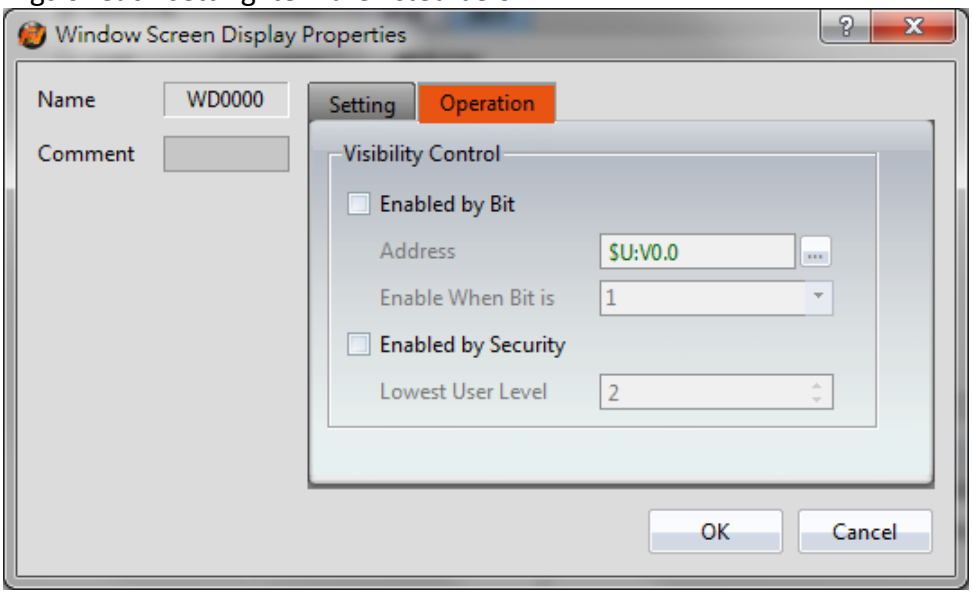


Figure 95 【Operation】Setting Screen of【Window Screen Display】

Table 54 【Operation】Setting Properties of【Window Screen Display】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】

	Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.

3.3.7【Meter】

【Meter】can read the value of specific registers and display this valueby a pointer indicator.
Introduction to the property setting dialog are as follows:

3.3.7.1 【General】

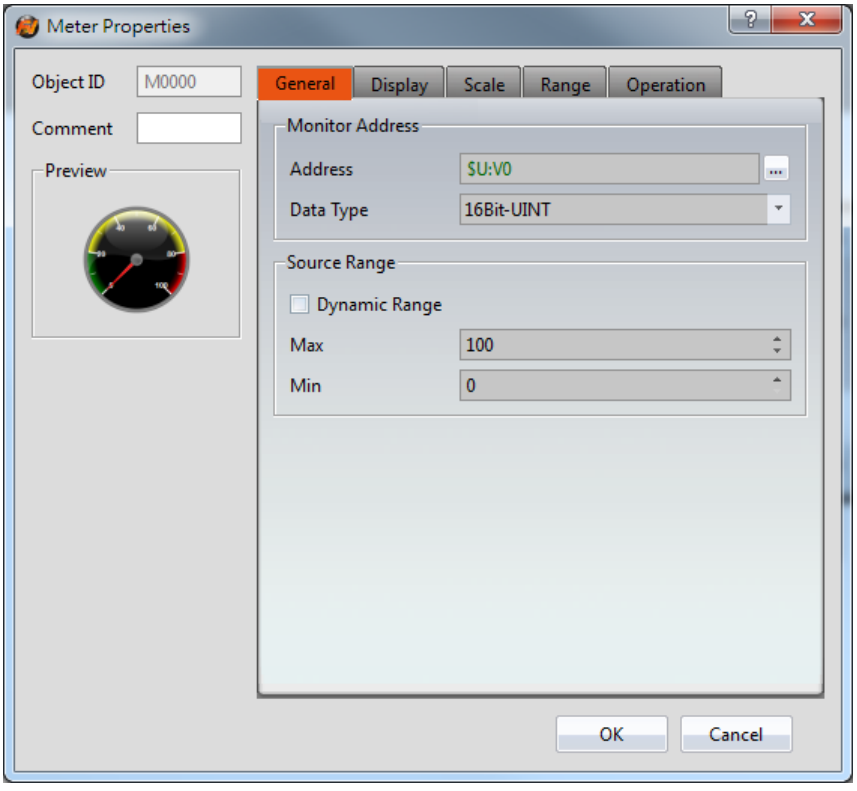


Figure 96 【General】Setting Screen of【Meter】

Table 55 【General】Setting Properties of【Meter】

Property	Description

【Preview】	Preview the appearance of this object.
【Monitor Address】	【Address】 Set the address to monitor. 【Data Type】 Set the data format of the monitor address.
【Source Range】	【Dynamic Range】 Select whether to allow the maximum and minimum value of the display range to change according to the contents of the specified address. 【Max】 Set the maximum value of the display range. When【Dynamic Range】is selected, the address for maximum display range will be set. 【Min】 Set the minimum value of the display range. When【Dynamic Range】is selected, the address for minimum display range will be set. Note: When【Dynamic Range】is selected, the content value of the maximum address must be greater than the content value of the minimum address in order for the display range to be changed validly.

3.3.7.2 【Display】

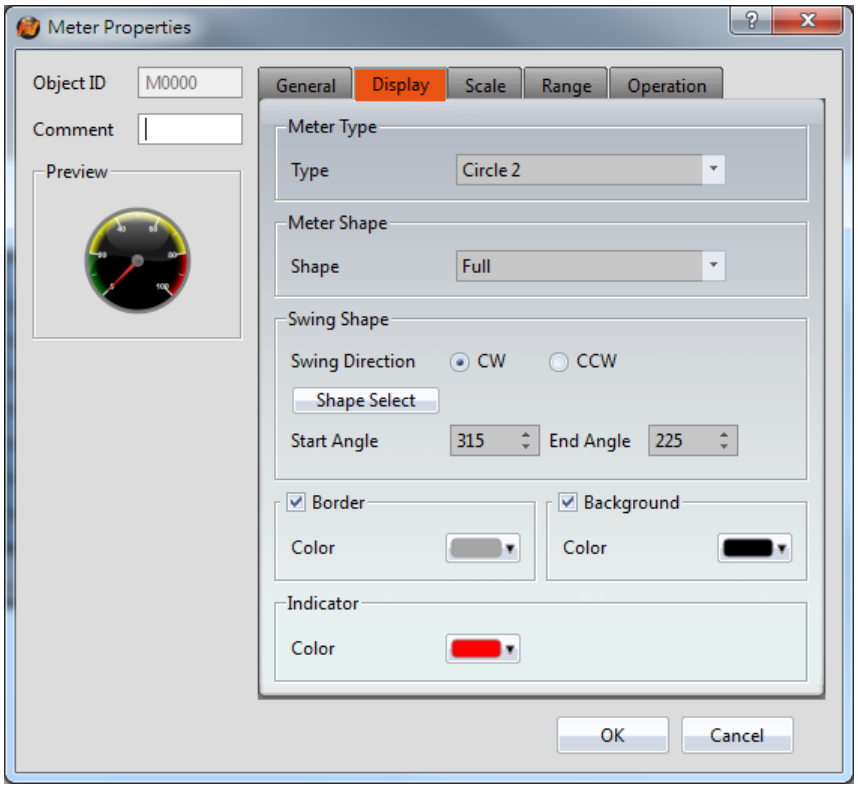
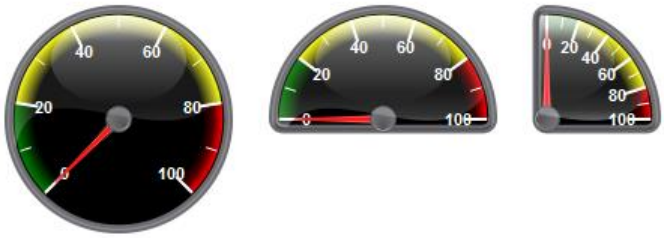


Figure 97 【Display】Setting Screen of【Meter】

Table 56 【Display】Setting Properties of【Meter】

Property	Description
【Meter Type】	【Type】 Set the meter type., There are the following two types: 
【Meter Shape】	【Shape】 Set the meter shape. There are Circular/Semicircular/Quadrant available for selection. 
【Swing Shape】	Set the swinging angle of the meter indicator.

	【Shape Select】 Users can click this button to set common pointer swinging angles quickly. 【Swing Direction】 Set the swinging direction; there are two options:【CC】 (Clockwise) and【CCW】(Counter-Clockwise). 【Custom Shape】 If the [Shape Select] described above do not meet user's requirement, this option can be selected to customize the swinging angle.
【Border】	【Color】 Set the color of the border.
【Background】	【Color】 Set the background color and filling of the meter.

3.3.7.3 【Scale】

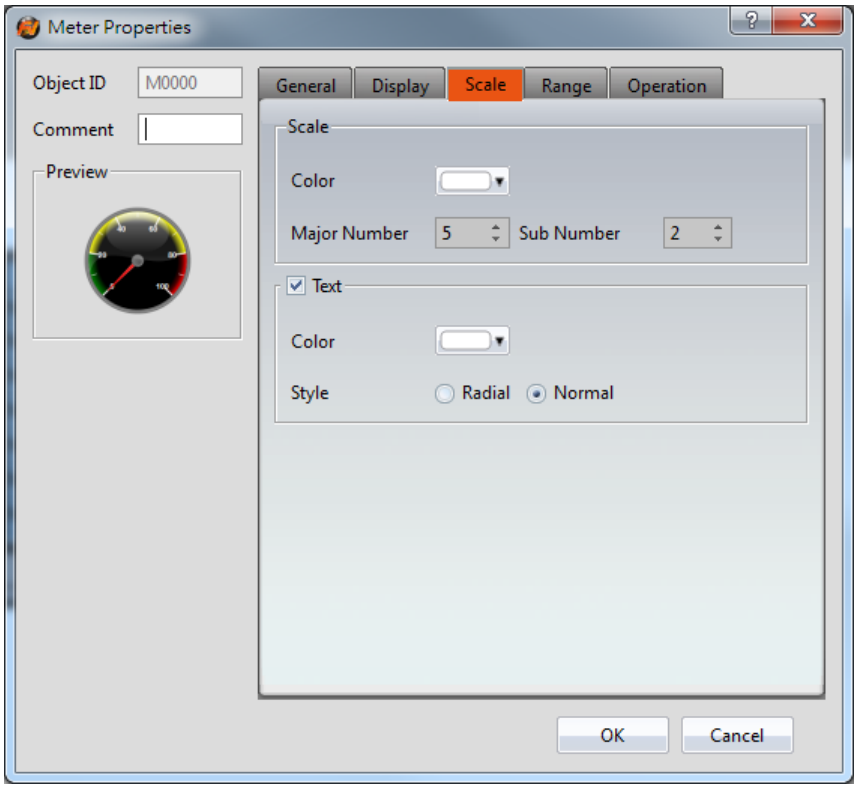


Figure 98 【Scale】Setting Screen of【Meter】

Table 57 【Scale】Setting Properties of【Meter】

Property	Description
【Scale Frame】	【Color】 Set the color of the scale. 【Major Number】 Set the number of main scales. 【Sub Number】 Set the number of sub scales.
【Text】	【Color】 Set the color of the text. 【Style】 Set the distribution of the text.

3.3.7.4 【Range】

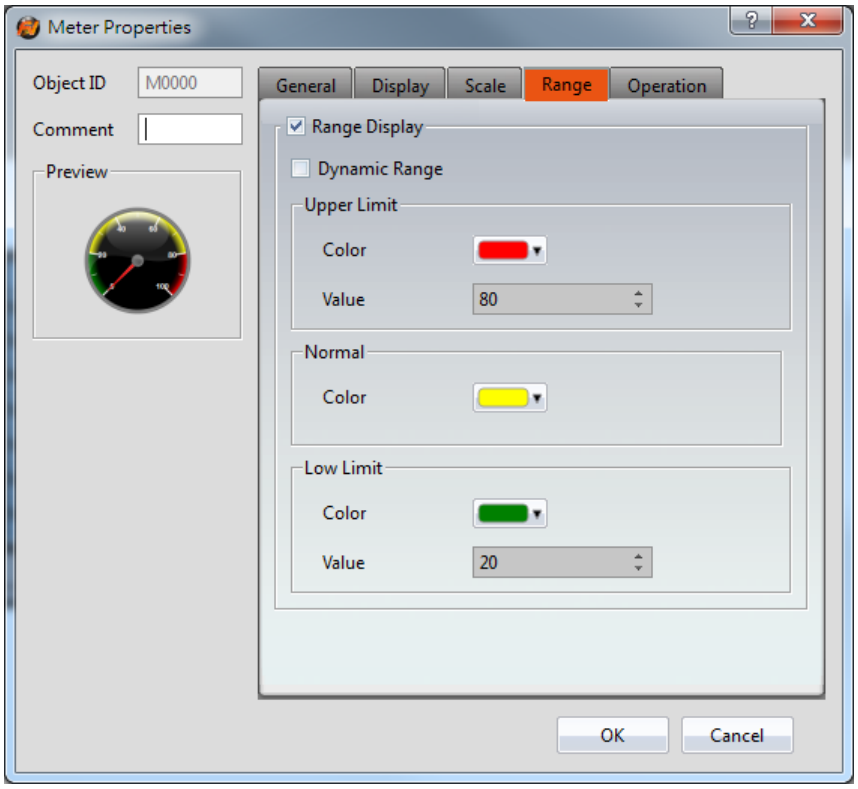


Figure 99 【Range】Setting Screen of【Meter】

Table 58 【Range】Setting Properties of【Meter】

Property	Description
【Scale Frame】	Select whether to display range marks on the meter. 【Dynamic Range】 Select whether to allow the maximum and minimum value of the display range to change according to the contents of the specified address. Note: When【Dynamic Range】is selected, the content value of the maximum address must be greater than the content value of the minimum address in order for the range marks to be changed validly.
【Upper Limit】	【Color】 Set the color of the upper limit range. 【Value】 Set the value of the upper limit. When【Dynamic Range】is selected, the address of the upper limit value will be set.
【Normal】	【Color】 Set the color of the normal range.
【Lower Limit】	【Color】

	Set the color of the lower limit range. 【Value】 Set the value of the lower limit. When【Dynamic Range】is selected, the address of the lower limit value will be set.

3.3.7.5 【Operation】

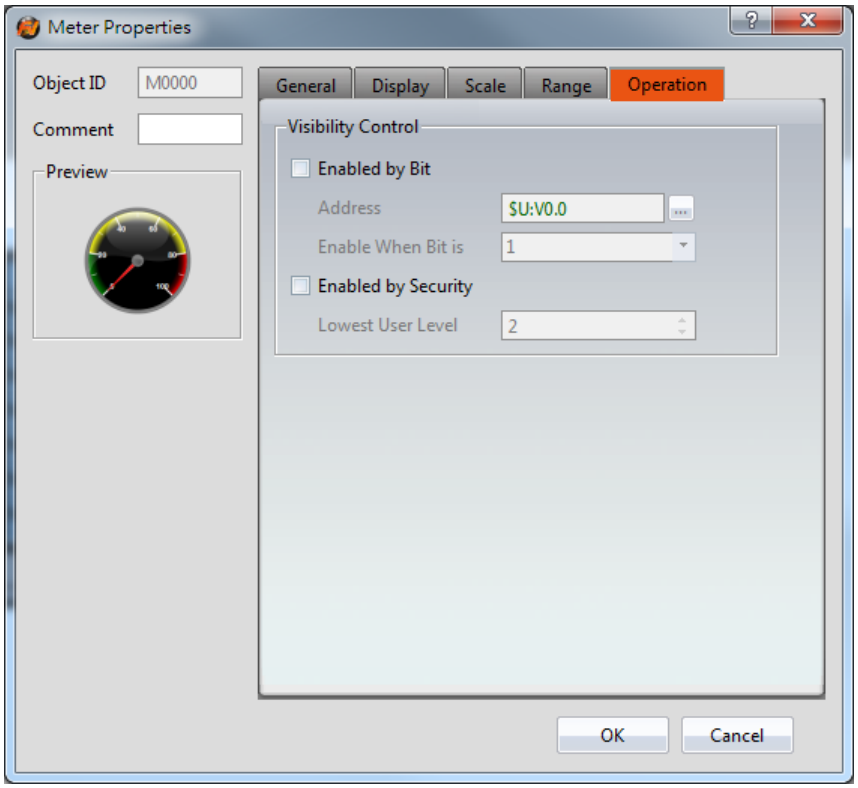


Figure 100 【Operation】Setting Screen of【Meter】

Table 59 【Operation】Setting Properties of【Meter】

Property	Description
【Visibility Control】	Visibility control of the object can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0.

	【Enabled by Security】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.

3.3.8【Linear Meter】

【Linear Meter】can read the value of specific registers and display the value read using changes in the length or width of a column.
Introduction to the property setting dialog is as follows:

3.3.8.1 【General】

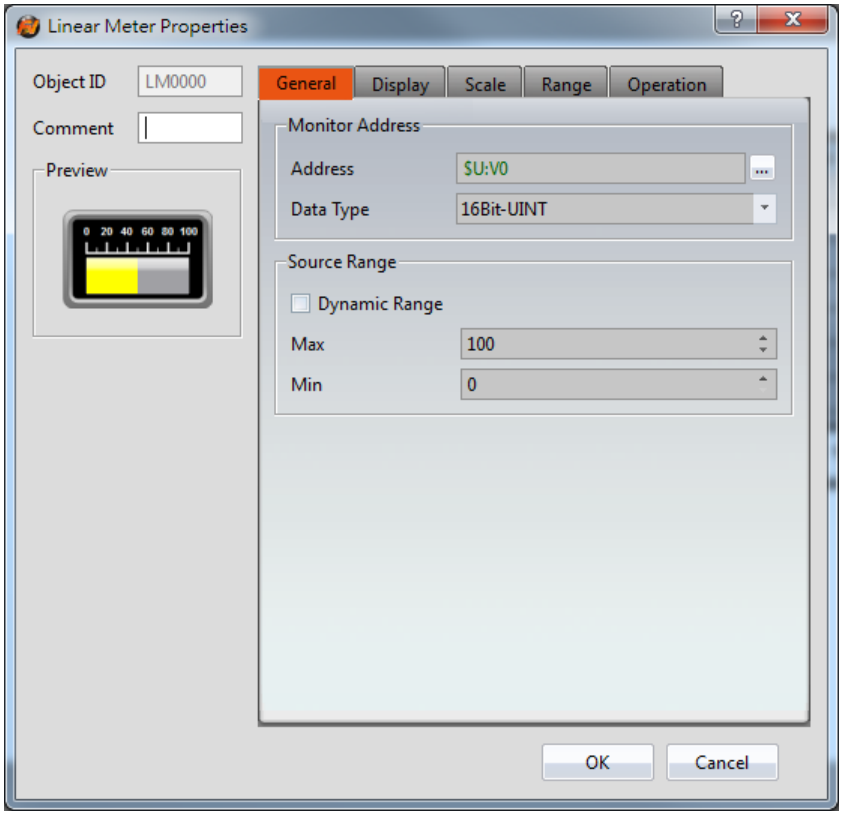


Figure 101 【General】Setting Screen of【Linear Meter】

Table 60 【General】Setting Properties of【Linear Meter】

Property	Description
【Preview】	Preview the appearance of this object.

【Monitor Address】	【Address】 Set the address to monitor. 【Data Type】 Set the data format of the monitor address.
【Source Range】	【Dynamic Range】 Select whether to allow the maximum and minimum value of the display range to change according to the contents of the specified address. 【Max】 Set the maximum value of the display range. When【Dynamic Range】is selected, the address for maximum display range will be set. 【Min】 Set the minimum value of the display range. When【Dynamic Range】 is selected, the address for minimum display range will be set. Note: When【Dynamic Range】is selected, the content value of the maximum address must be greater than the content value of the minimum address in order for the display range to be changed validly.

3.3.8.2 【Display】

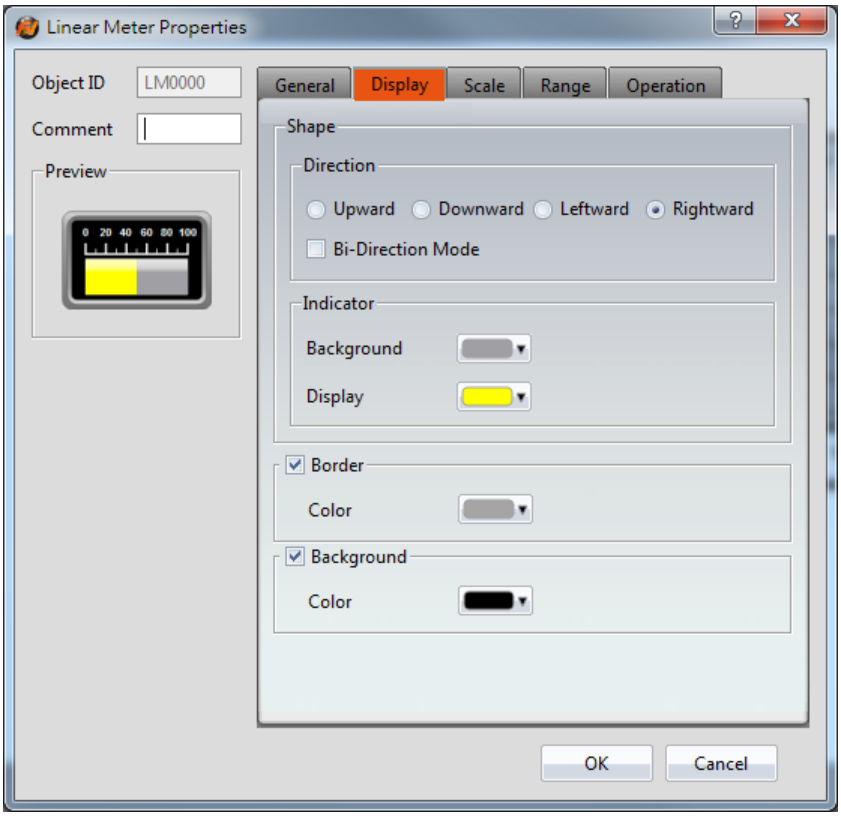


Figure 102 【Display】Setting Screen of【Linear Meter】

Table 61 【Display】Setting Properties of【Linear Meter】

Property	Description
【Direction】	Set the direction of the Linear Meter; there are【Upward】, 【Downward】,【Leftward】and【Rightward】available to choose from. 【Bi-Direction Mode】 Select whether to make up and down length changes or left and right width changes for the Linear Meter according to the reference point -【Middle Value】.  【Middle Value】 Sets the reference point of【Bi-Direction Mode】.
【Indicator】	【Background】 Set the background color of the indicator. 【Display】 Set the display color of the indicator.

【Border】	【Color】 Set the color of the border.
【Background】	【Color】 Set the color and filling of the background.

3.3.8.3 【Scale】

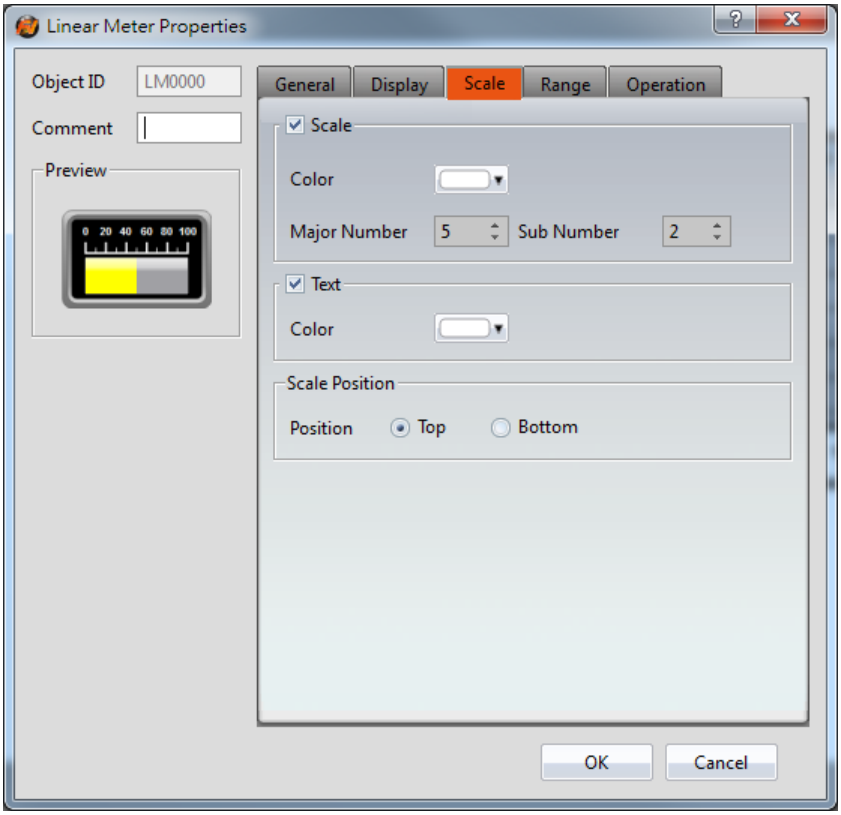


Figure 103 【Scale】Setting Screen of【Linear Meter】

Table 62 【Scale】Setting Screen of【Linear Meter】

Property	Description
【Scale Frame】	【Color】 Set the color of the scale. 【Major Number】 Set the number of main scales. 【Sub Number】 Set the number of sub scales.
【Text】	【Color】 Set the color of the text.

【Scale Position】	When the user set the direction of the Linear Meter to 【Upward】or【Downward】,【Left】or【Right】can be selected for the scale position. On the other hand, when the direction of the Linear Meter is 【Leftward】or【Rightward】,【Top】or【Bottom】can be selected for the scale position.

3.3.8.4 【Range】

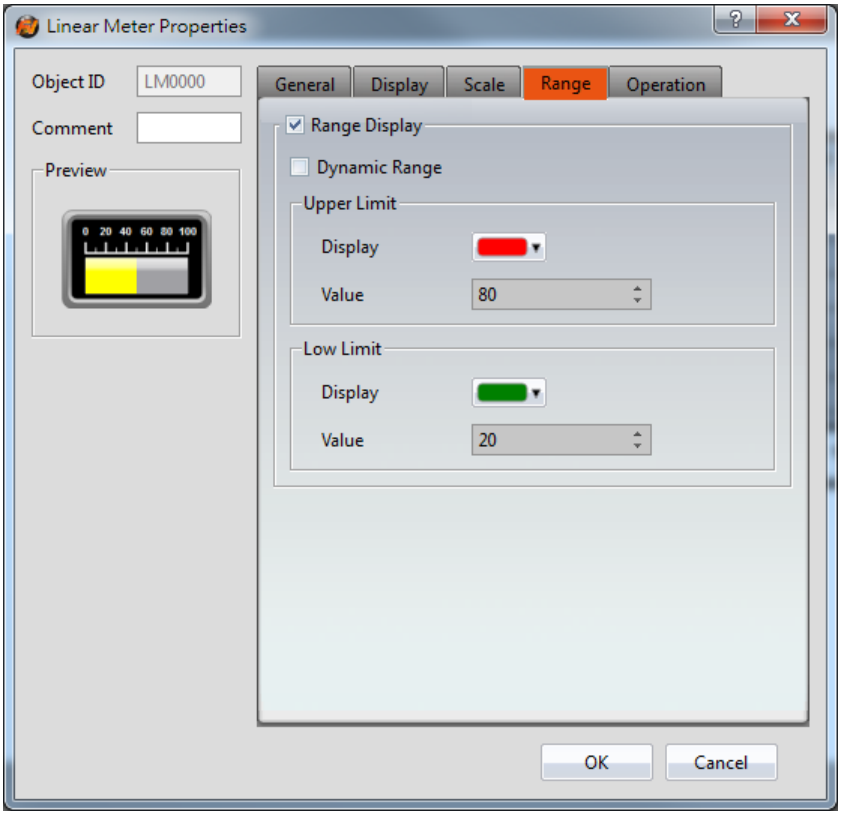


Figure 104 【Range】Setting Screen of【Linear Meter】

Table 63 【Range】Setting Properties of【Linear Meter】

Property	Description

【Range Display】	Select whether the color for the indicator of the Linear Meter will be changedaccording to the contents of the monitored address. 【Dynamic Range】 Select whether to allow the maximum and minimum value of the display range to change according to the contents of the specified address. Note: When【Dynamic Range】is selected, the content value of the upper limit address must be greater than the content value of the lower limit address in order for the color of the indicator to change accordingly.
【Upper Limit】	【Display】 Set the color of the upper limit range. 【Value】 Set the value of the upper limit. When【Dynamic Range】is selected, the address of the upper limit value will be set.
【Lower Limit】	【Display】 Set the color of the lower limit range. 【Value】 Set the value of the lower limit. When【Dynamic Range】is selected, the address of the lower limit value will be set.

3.3.8.5 【Operation】

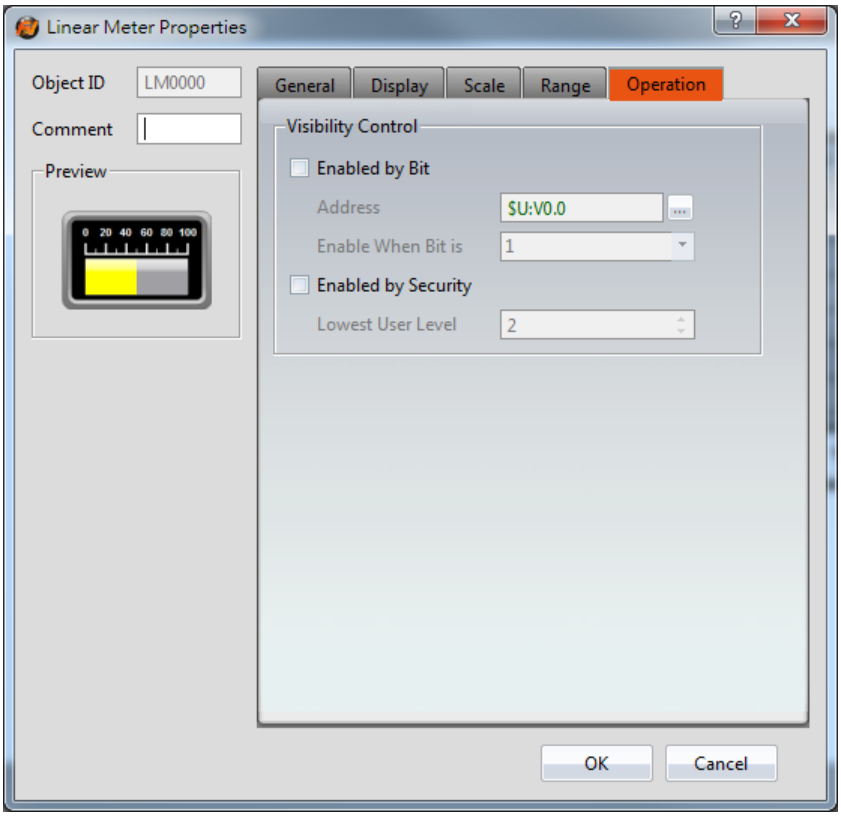


Figure 105 【Operation】Setting Screen of【Linear Meter】

Table 64 【Operation】Setting Properties of【Linear Meter】

Property	Description
【Preview】	Preview the appearance of this object.
【Visibility Control】	Visibility control of the object can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the

	object.

3.3.9【Data Block Graph】

【Data Block Graph】is an object used to display curves, in which the x value of the curve uses continuous data numbers of a specified address as the source, and the y value is derived from the contents of the continuous data. Its main functions are as follows:

- Read the continuous data of a specified address directly.
- Pauses or starts updating the reading of the continuous data of a specified address through the【Sub Switch】, and clearing the displayed data. It can also temporarily preserve the old curve (persistence) for comparison purposes.

Introduction to the【Data Block Graph】property settings dialog box are as follows:

3.3.9.1 【General】

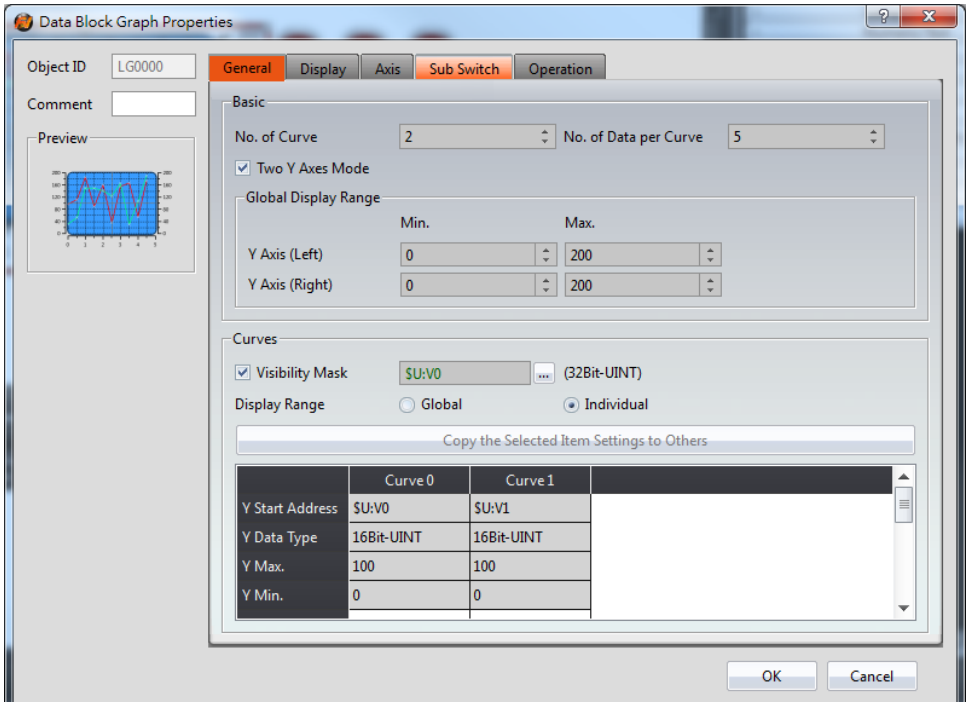


Figure 106 【General】Setting Screen on【Data Block Graph】

Table 65 【General】Setting Properties of【Data Block Graph】

Property	Description
【Preview】	Preview the appearance of this object.
【Basic】	【No. of Curve】 Set the number of curves.

	【No. of Data per Curve】 Set the number of data per curve, which is the number of dots per curve. 【Two Y Axes Mode】 Select whether to display the two y axes lines.
【Global Display Range】	Represents the range that can be displayed. 【Min】 Set the minimum Global Range value for the Y-axis. 【Max】 Set the maximum Global Range value for the Y-axis. Note: The【Global Display Range】represents the range that can be displayed. If【Max】is 100 and【Min】is 0, data exceeding this range will not be able to be displayed.
【Curves】	【Visibility Mask】 Select whether to use visibility mask to control the visibility of the each curve. While selecting, use should assign the 32bit UINT register as the mask, in which the 0 bit control the display of the curve 0, and so on. 【Display Range】 Used to set the display mode for the display range of the curve. It is usually one of the two following types: ➢ 【Global】 The display ranges of all the curves are identical to the【Global Display Range】. ➢ 【Individual】 The display range of all the curves can be different from the【Global Display Range】. Explanation: When to set【Display Range】as【Individual】-When the value ranges of the number of curves are different, for example when the value range of curve a is 0~10, and curve b is 0~1000, it can be discovered that the degree of changes for curve a will be difficult to observe if the two curves are placed in the same figure. This is when【Display Range】can be set as【Individual】and the display range of each curve can be defined; the system will automatically zoom the value of the curves according to the value in【Global Display Range】. Take this case for example, if the value in【Global Display Range】is 0~100, when the value of curve a is 5, the system will zoom it to 50; and when the value of curve b is 500, the system will also zoom it into 50, and so on.

The statements of curve properties in the table are as below:

【Y Start Address】

Set the starting address for the source of the Y value of the curve.

【Y Data Type】

Set the data type for the Y value of the curve.

Explanation: The range of the curve reading address is determined by the【No. of Data per Curve】, 【Start Address) and 【Data Type】; users can determine the range by looking at the following example.

- Example 1:

【No. of Data per Curve】= 3; Y-axis【Start Address】=$U:V0; Y-axis【Data Type】=16Bit-UINT

Dot	X value	Y value
0	0	$U:V0
1	1	$U:V1
2	2	$U:V2

- Example 2:

【No. of Data per Curve】= 3; Y-axis【Start Address】=$U:V0; Y Y-axis【Data Type】=32Bit-UINT

Dot	X value	Y value
0	0	$U:V0~$U:V1
1	1	$U:V2~$U:V3
2	2	$U:V4~$U:V5

【Y Max】

Set the maximum Individual Display Range value for the Y value of the curve, , if【Display Range】is【Individual】

【Y Min】

Set the minimum Individual Display Range value for the Y-axis, if【Display Range】is【Individual】.

【Y Axis】

If【Two Y Axes Mode】is selected, the setting is used to decide the curve's reference y-axis.

【Line】

Select whether to display the curve line.

	【Line Color】 Set the line color of the curve. 【Line Type】 Set the line type of curve. 【Symbol】 Select whether to display the curve symbols. 【Symbol Color】 Set the color of the symbols. 【Symbol Type】 Set the symbol type.

3.3.9.2 【Display】

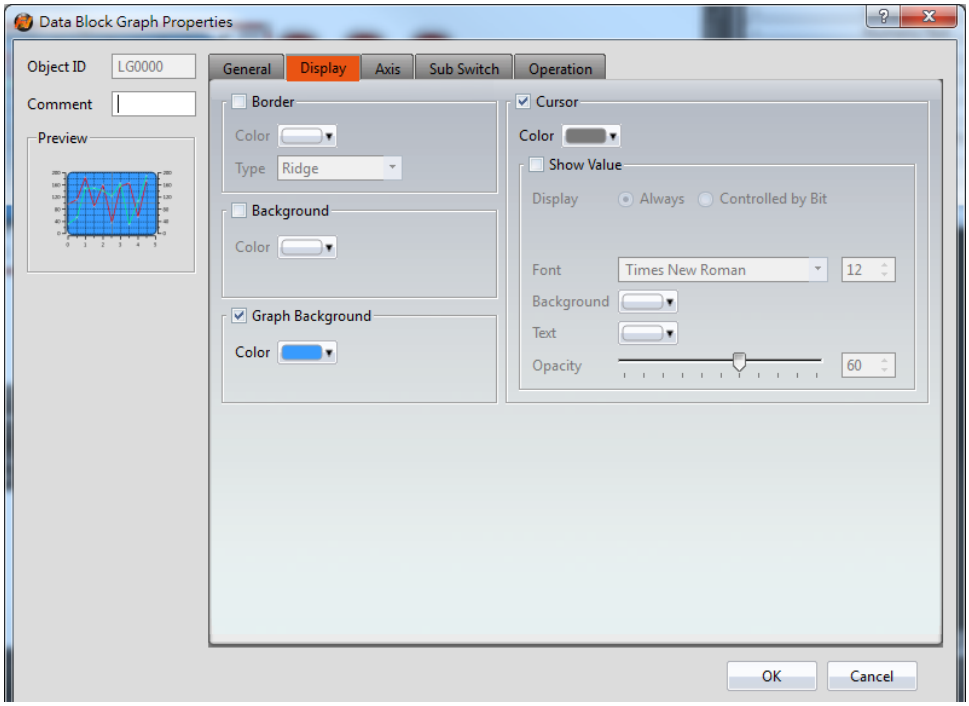


Figure 107 【Display】Setting Screen of【Data Block Graph】

Table 66 【Display】Setting Properties of【Data Block Graph】

Property	Description
【Border】	Select whether to display the border. 【Color】

	Set the color of the border. 【Type】 Set the border type.
【Background】	Select whether to display the background. 【Color】 Set the color of the background.
【Graph Background】	Select whether to display the graph background. 【Color】 Set the color of the graph background.
【Cursor】	Select whether to display the cursor. 【Color】 Set the color of the cursor.
【Cursor】【Show Value】	Select whether to display the cursor value. 【Display】 Set the way of cursor value visibility. If 【Always】 is set, the cursor value is always shown. If 【Controlled by Bit】 is selected, the visibility of cursor value depends on a certain bit. 【Font】 Set the font type and size of cursor value. 【Background】 Set the background color of the cursor value. 【Text】 Set the text color of the cursor value. 【Opacity】 Set the background opacity of the cursor value.

3.3.9.3 【Axis】

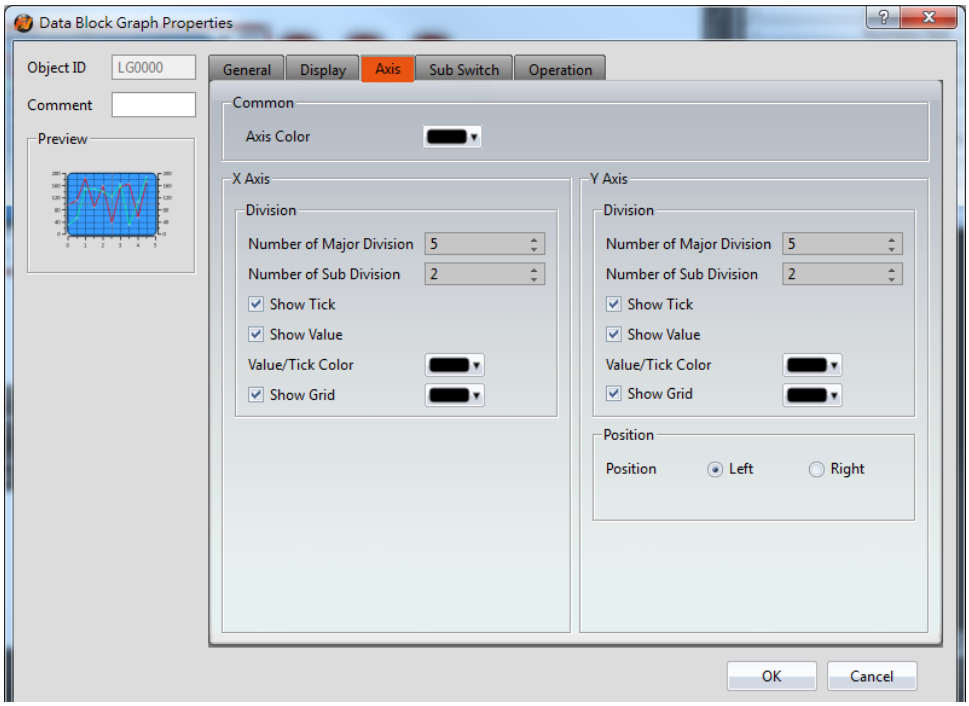


Figure 108 【Axis】Setting Screen of【Data Block Graph】

Table 67 【Axis】Setting Properties of【Data Block Graph】

Property	Description
【Common】	【Axis Color】 Set the color of the axis.
【X-axis】【Division】	【Number of Major Division】 Set the number of major divisions for the X-axis. 【Number of Sub Division】 Set the number of sub divisions for the X-axis. 【Show Tick】 Select whether to display the tick. 【Show Value】 Select whether to display the value on the X-axis. 【Value/Tick Color】 Set the colors of the value and tick. 【Show Grid】 Select whether to display vertical grids, and sets the color of the grids.

【Y-axis】【Division】	【Number of Major Division】 Set the number of major divisions for the Y-axis. 【Number of Sub Division】 Set the number of sub divisions for the Y-axis. 【Show Tick】 Select whether to display the tick on the Y-axis. 【Show Value】 Select whether to display the value on the Y-axis. 【Value/Tick Color】 Set the colors of the value and tick. 【Show Grid】 Select whether to display horizontal grids, and sets the color of the grids.
【Y-axis】【Position】	【Position】 Set the Y-axis position.

3.3.9.4 【Sub Switch】

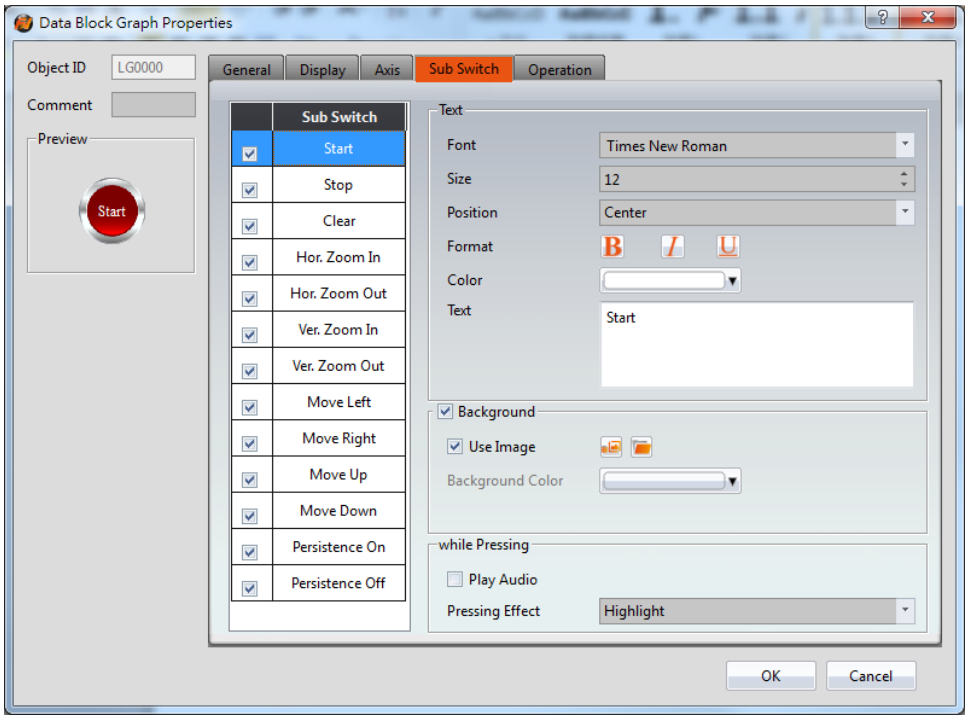


Figure 109 【Sub Switch】Setting Screen of【Data Block Graph】

Table 68 【Sub Switch】Setting Properties of【Data Block Graph】

Property	Description
【Sub Switch List】	【Sub Switch List】that can be selected for【Data Block Graph】. Sub switches can be enabled after selecting them. Setting options for the appearance of the selected sub switches will also appear on the right. When different sub switches are selected from the list, the setting contents of the appearance setting items to the right will be updated according to the sub switches selected. In which the (Sub Switches) are divided into: ➢ 【Start】—Start updating curve. ➢ 【Stop】—Stop updating curve. ➢ 【Clear】—Clear curve. ➢ 【Hor. Zoom In】—Horizontal zoom in. ➢ 【Hor. Zoom Out】—Horizontal zoom out. ➢ 【Ver. Zoom In】—Vertical zoom in. ➢ 【Ver. Zoom Out】—Vertical zoom out. ➢ 【Move Left】—Move Left. ➢ 【Move Right】—Move Right.

	➢ 【Move Up】—Move Up. ➢ 【Move Down】—Move Down. ➢ 【Persistence On】-Preserve old curves ON; can be used for comparing curves. The color of old curves will be darker than the original ones. ➢ 【Persistence Off】-Preserve old curves OFF; also clears all old curves.
【Text】	【Font】 Set the displayed text font of the sub switch currently selected. 【Size】 Set the displayed text size of the sub switch currently selected. 【Position】 Set the displayed text position of the sub switch currently selected. 【Format】 Set the displayed text format of the sub switch currently selected, including Bold, Italics and Underline. 【Color】 Set the displayed text color of the sub switch currently selected. 【Text】 Set the displayed text of the sub switch currently selected.
【Background】	Set the background of the sub switch currently selected. Check it to activate background settings, and the displayed background of the sub switch currently selected can be edited below. If this option is not checked, the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the sub switch currently selected. When this option is checked, an image selection setting item will appear asking the user to select an image either from the【Image Library】or from a file.

	【Background Color】 Set the displayed background color of the sub switch currently selected. This setting item will appear if 【Use Image】was not selected.
【while Pressing】	【Play Audio】 Select whether to play audio when the sub switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected. 【Pressing Effect】 Set the pressing effect of the sub switch currently selected. There are two effects available for selection:【None】and【Highlight】.

3.3.9.5 【Operation】

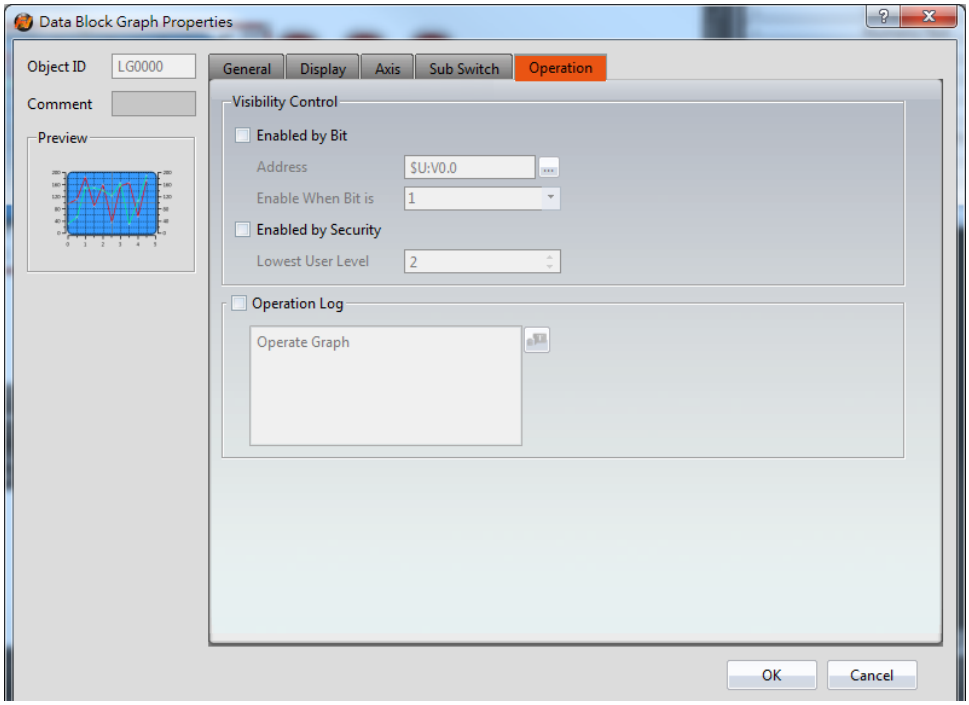


Figure 110 【Operation】Setting Screen of【Data Block Graph】

Table 69 【Operation】Setting Properties of【Data Block Graph】

Property	Description

【Visibility Control】	Visibility control of the object; it can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the【Text Library】.

3.3.10 【Data Block XY Scatter】

【Data Block XY Scatter】 is an object used to display the curve, in which the sources of both X/Y values are the continuous data contents of a specified address. Its main functions are as follows:

- Read the continuous data of a specified address directly.
- Pauses or starts updating the reading of the continuous data of a specified address through the【Sub Switch】and clearing the displayed data. It can also temporarily preserve the old curve for comparison purposes.

Introduction to the property setting dialog box are as follows:

3.3.10.1 【General】

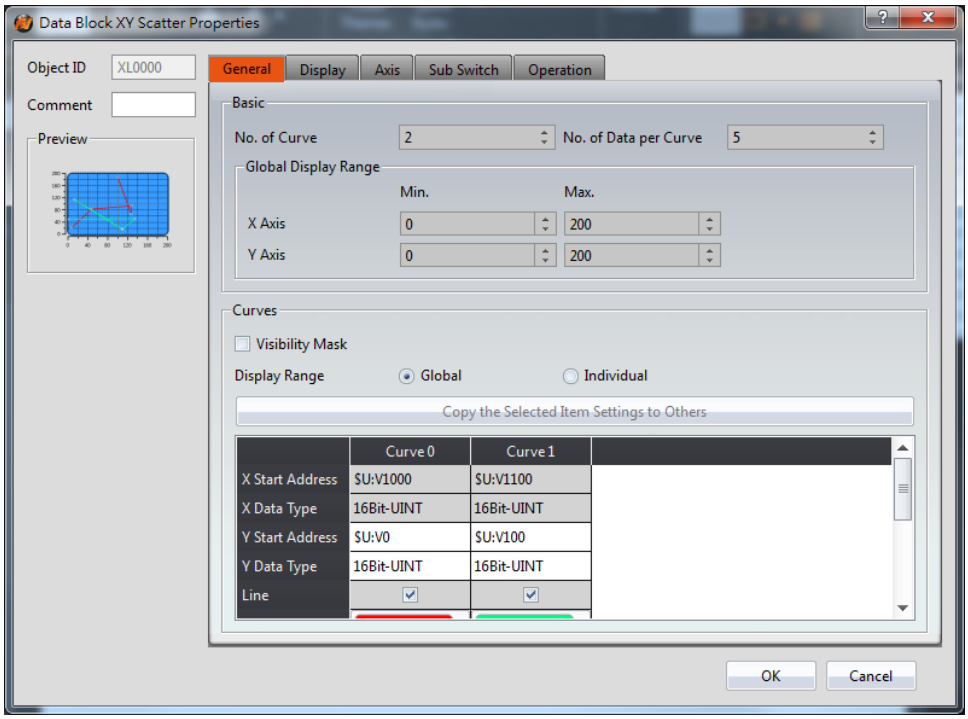


Figure 111 【General】 Setting Screen of 【Data Block XY Scatter】

Table 70 【General】 Setting Properties of 【Data Block XY Scatter】

Property	Description
【Preview】	Preview the appearance of this object.
【Basic】	【No. of Curve】 Set the number of curves. 【No. of Data per Curve】 Set the number of data per curve, which is the number of dots per curve.
【Global Display Range】	Set the range that can be displayed. 【Max】 Set the maximum Global Range value for the X-axis/Y-axis. 【Min】 Set the minimum Global Range value for the X-axis/Y-axis. Note: The 【Global Display Range】 represents the range that can be displayed. If 【Max】 is 100 and 【Min】 is 0, data exceeding this range will not be able to be displayed.
【Curves】	【Visibility Mask】 Select whether to use visibility mask to control the visibility of the each curve. While selecting, use should assign the

32bit UINT register as the mask, in which the 0 bit control the display of the curve 0, and so on.

【Display Range】

Set the display mode for the display range of the curve. It is usually one of the two following types:

- 【Global】

  The display ranges of all the curves are identical to the【Global Display Range】.

- 【Individual】

The display range of all the curves can be different from the【Global Display Range】.

Explanation: When to set【Display Range】as【Individual】-When the value ranges of several curves are different, for example when the X and Y value range of curve a is 0~10, and the X and Y value range of curve b is 0~1000, it can be discovered that the degree of changes for curve a will be difficult to observe if the two curves are placed in the same figure. This is when【Display Range】can be set as【Individual】and the display range of each curve can be defined. The system will automatically zoom the value of the curves according to the value in【Global Display Range】. Take this case for example: if the X-axis【Global Display Range】value is 0~100 and the Y-axis【Global Display Range】value is 0-50, when the value of curve a is (5, 5), the system will zoom it to (50, 25). When the value of curve b is (500, 100), the system will also zoom it into (50, 5) and so on.

The statements of curve properties in the table are as below:

【X/Y Start Address】

Set the starting address for the source of the X/Y value of the curve.

【X/Y Data Type】

Set the data type for the X/Y value of the curve.

Explanation: The range of the curve reading address is determined by the【No. of Data per Curve】,【Start Address】and【Data Type】. Users can calculate the range by looking at the following example.

- Example 1:

【No. of Data per Curve】= 3; X-axis【Start Address】= $U:V0; X-axis【Data Type】= 16Bit-UINT; Y-axis【Start Address】= $U:V10; Y-axis【Data Type】= 16Bit-UINT

Dot	X value	Y value
0	$U:V0	$U:V10
1	$U:V1	$U:V11
2	$U:V2	$U:V12

- Example 2:

【No. of Data per Curve】= 3; X-axis 【Start Address】= $U:V0; X-axis 【Data Type】= 16Bit-UINT; Y-axis 【Start Address】= $U:V10; Y-axis【Data Type】= 32Bit-UINT

Dot	X value	Y value
0	$U:V0	$U:V10~$U:V11
1	$U:V1	$U:V12~$U:V13
2	$U:V2	$U:V14~$U:V15

【X/Y Max】

Set the maximum Individual Display Range value for the X/Y-axis, if【Display Range】is【Individual】.

【X/Y Min】

Set the minimum Individual Display Range value for the X/Y-axis, if【Display Range】is【Individual】.

【Line】

Select whether to display the curve line.

【Line Color】

Set the line color of the curve.

【Line Type】

Set the line type of curve.

【Symbol】

Select whether to display the curve symbols.

【Symbol Color】

Set the color of the symbols.

【Symbol Type】

Set the symbol type.

3.3.10.2【Display】

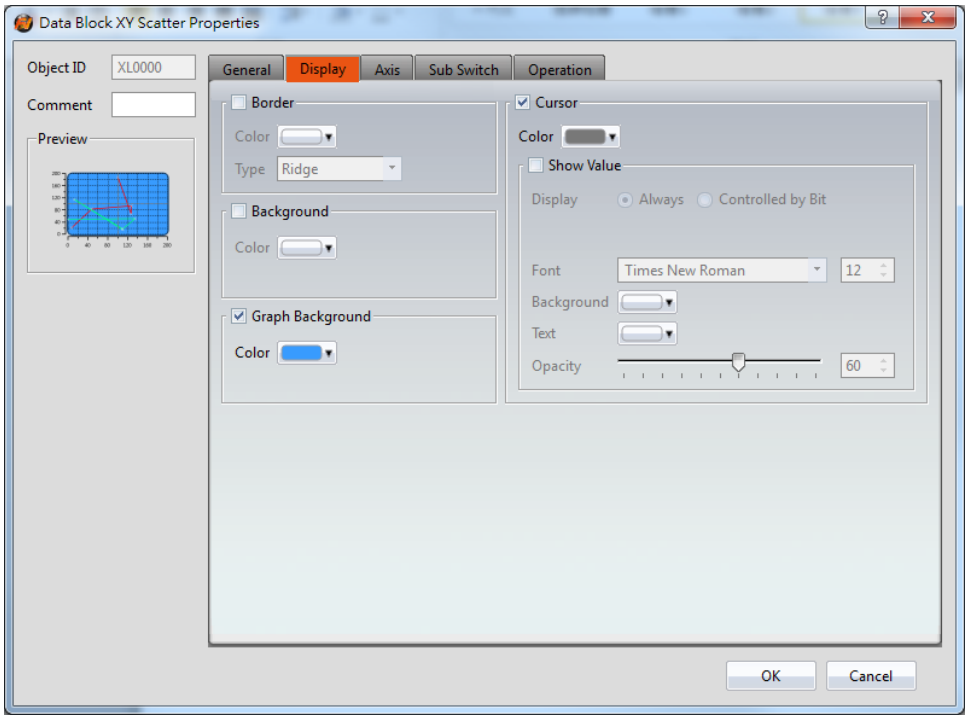


Figure 112 【Display】Setting Screen of【Data Block XY Scatter】

Table 71 【Display】Setting Properties of【Data Block XY Scatter】

Property	Description
【Border】	Select whether to display the border. 【Color】 Set the color of the border. 【Type】 Set the border type.
【Background】	Select whether to display the background. 【Color】 Set the color of the background.
【Graph Background】	Select whether to display the graph background. 【Color】 Set the color of the graph background.
【Cursor】	Select whether to display the cursor. 【Color】 Set the color of the cursor.
【Cursor】【Show Value】	Select whether to display the cursor value. 【Display】 Set the way of cursor value visibility. If【Always】is set, the cursor value is always shown. If【Controlled by Bit】is selected, the visibility of cursor value depends on a certain

	bit. 【Font】 Set the font type and size of cursor value. 【Background】 Set the background color of the cursor value. 【Text】 Set the text color of the cursor value. 【Opacity】 Set the background opacity of the cursor value.

3.3.10.3【Axis】

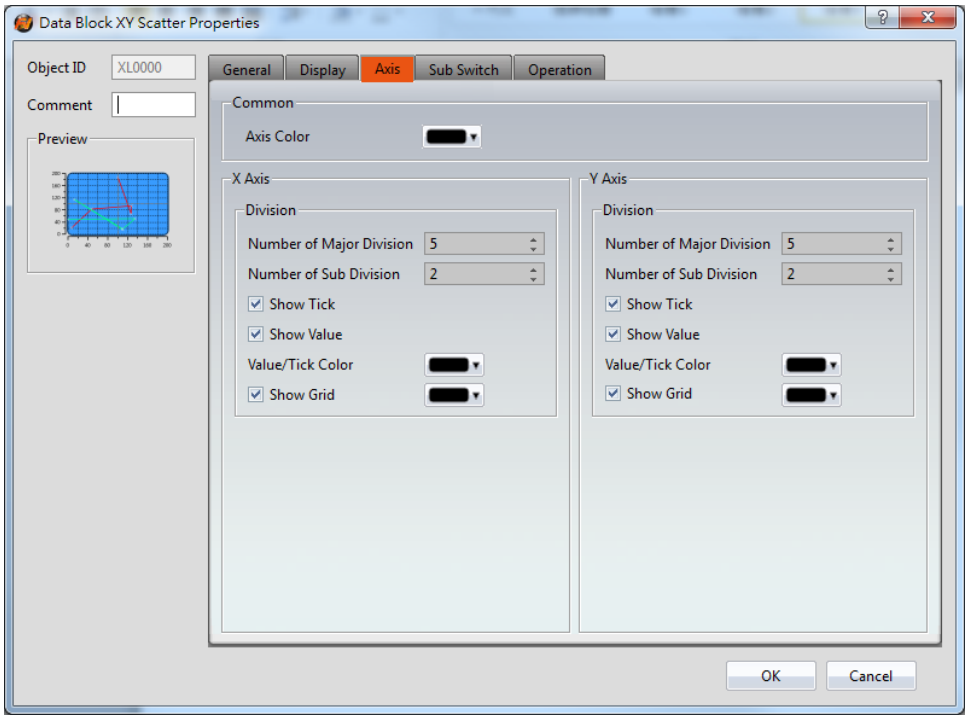


Figure 113 【Axis】Setting Screen of【Data Block XY Scatter】

Table 72 【Axis】Setting Properties of【Data Block XY Scatter】

Property	Description
【Common】	【Axis Color】 Set the color of the axis.
【X-axis】【Division】	【Number of Major Division】 Set the number of major divisions for the X-axis.

	【Number of Sub Division】 Set the number of sub divisions for the X-axis. 【Show Tick】 Select whether to display the tick. 【Show Value】 Select whether to display the value on the X-axis. 【Value/Tick Color】 Set the colors of the value and tick. 【Show Grid】 Select whether to display vertical grids, and set the color of the grids.
【Y-axis】【Division】	【Number of Major Division】 Set the number of major divisions for the Y-axis. 【Number of Sub Division】 Set the number of sub divisions for the Y-axis. 【Show Tick】 Select whether to display the tick on the Y-axis. 【Show Value】 Select whether to display the value on the Y-axis. 【Value/Tick Color】 Set the colors of the value and tick. 【Show Grid】 Select whether to display horizontal grids, and set the color of the grids.

3.3.10.4 【Sub Switch】

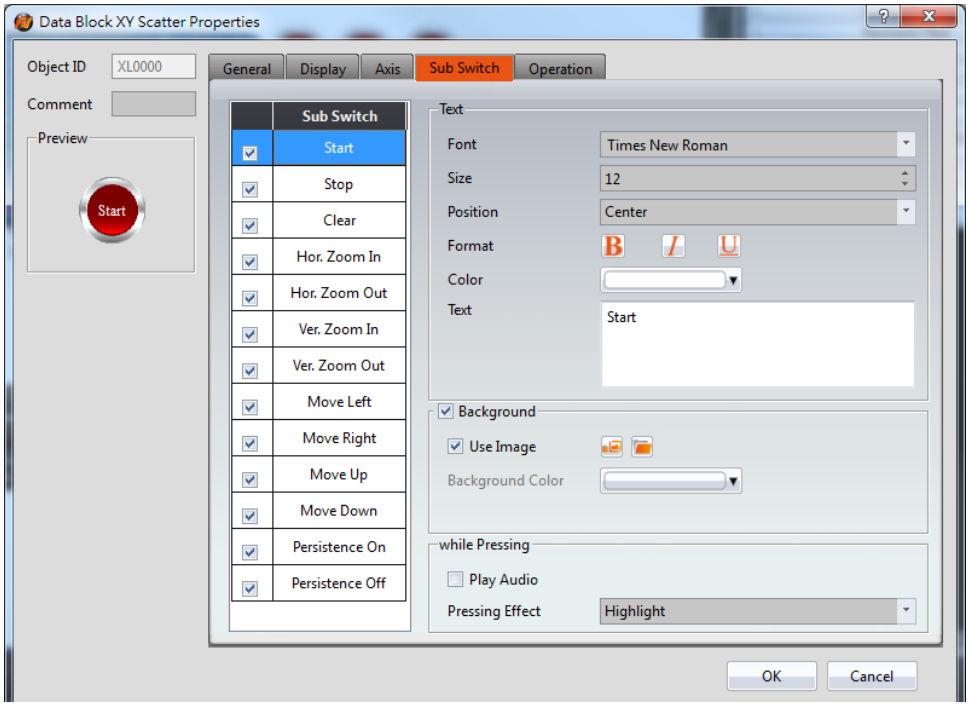


Figure 114 【Sub Switch】Setting Screen of【Data Block XY Scatter】

Table 73 【Sub Switch】Setting Properties of【Data Block XY Scatter】

Property	Description
【Sub Switch List】	【Sub Switch List】that can be selected for【Data Block XY Scatter】. Sub switches can be enabled after selecting them. Setting options for the appearance of the selected sub switches will also appear on the right. When different sub switches are selected from the list, the setting contents of the appearance setting items to the right will be updated according to the sub switches selected. In which the【Sub Switches】are divided into: ➢ 【Start】—Start updating curve. ➢ 【Stop】—Stop updating curve. ➢ 【Clear】—Clear curve. ➢ 【Hor. Zoom In】—Horizontal zoom in. ➢ 【Hor. Zoom Out】—Horizontal zoom out. ➢ 【Ver. Zoom In】—Vertical zoom in. ➢ 【Ver. Zoom Out】—Vertical zoom out. ➢ 【Move Left】—Move Left.

	➢ 【Move Right】—Move Right. ➢ 【Move Up】—Move Up. ➢ 【Persistence On】-Preserve old curves ON; can be used for comparing curves. The color of old curves will be darker than the original ones. ➢ 【Persistence Off】-Preserve old curves OFF; also clears all old curves.
【Text】	【Font】 Set the displayed text font of the sub switch currently selected. 【Size】 Set the displayed text size of the sub switch currently selected. 【Position】 Set the displayed text position of the sub switch currently selected. 【Format】 Set the displayed text format of the sub switch currently selected, including Bold, Italics and Underline. 【Color】 Set the displayed text color of the sub switch currently selected. 【Text】 Set the displayed text of the sub switch currently selected.
【Background】	Set the background of the sub switch currently selected. Check it to activate background settings, and the displayed background of the sub switch currently selected can be edited below. If this option is not checked, the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the sub switch currently selected. When this option is checked, an image selection setting item will appear asking the user to select an image either from the【Image Library】or from a file.

	【Background Color】 Set the displayed background color of the sub switch currently selected. This setting item will appear if 【Use Image】was not selected.
【while Pressing】	【Play Audio】 Select whether to play audio when the sub switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected. 【Pressing Effect】 Set the pressing effect of the sub switch currently selected. There are two effects available for selection:【None】and【Highlight】.

3.3.10.5【Operation】

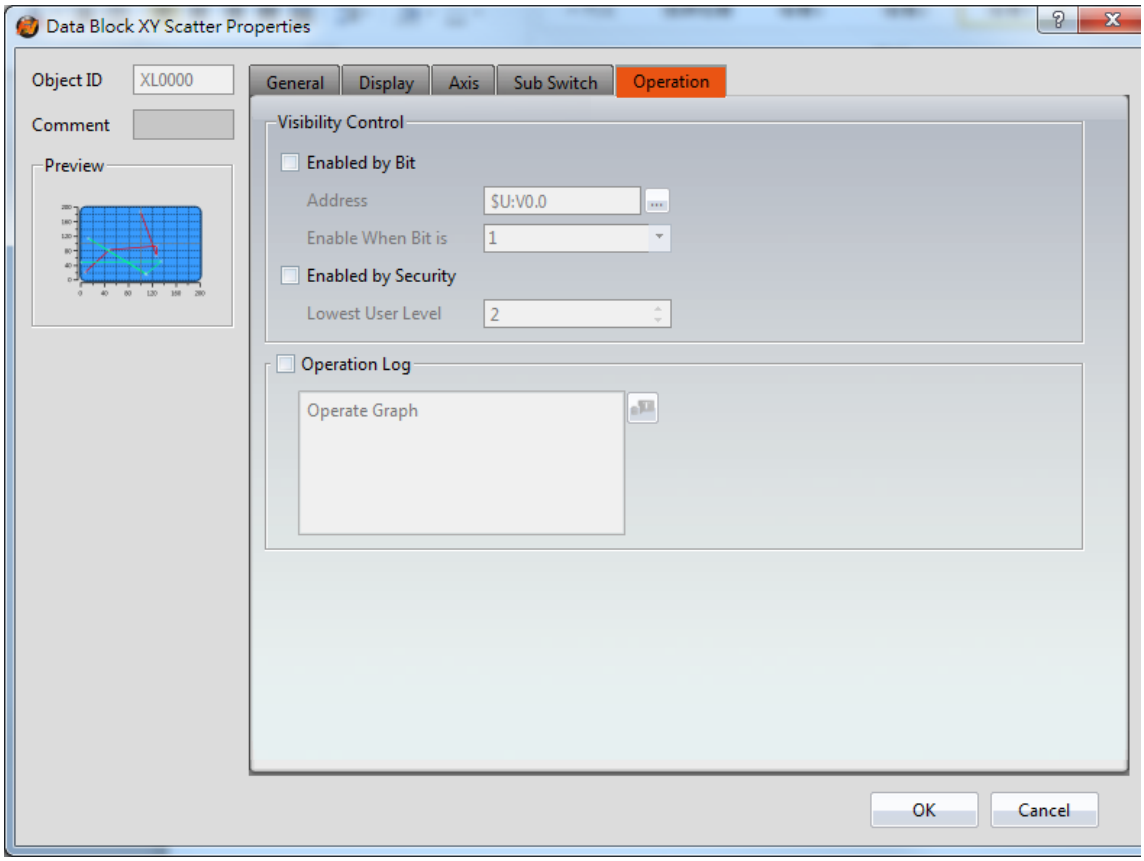


Figure 115 【Operation】Setting Screen of【Data Block XY Scatter】

Table 74 【Operation】Setting Properties of【Data Block XY Scatter】

Property	Description
【Visibility Control】	Visibility control of the object; it can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the

	object.
【Operation Logger】	Select whether to enable the 【Operation Logger】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the【Text Library】.

3.3.11 【Step Switch】

【Step Switch】can write the numeric value corresponding to the set state into specific registers in order to change its state by pressing the Step Switch. The numeric value written into the register will also change accordingly.

3.3.11.1 【Setting】

The【Step Switch】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

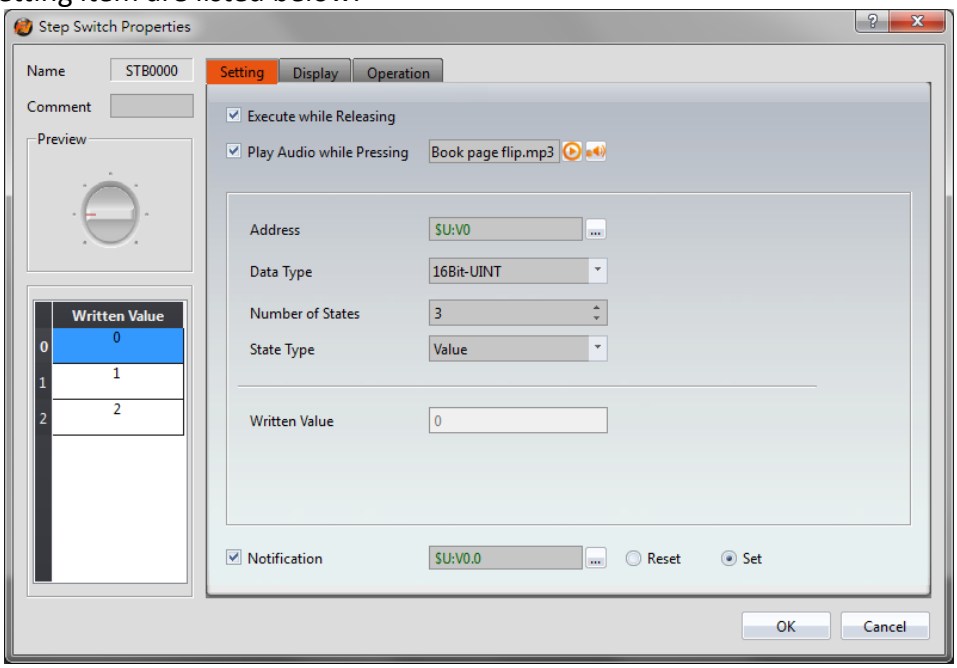


Figure 116 【Setting】Screen of【Step Switch】

Table 75 【Setting】Properties of【Step Switch】

Property	Description
【Preview】	Preview the appearance of this object.
【Execute while Releasing】	Select whether to execute the action set for the Step Switch while releasing. The action will be executing immediately when the Step Switch is pressed if this option is not selected.
【Play Audio while Pressing】	Select whether to play audio when the Step Switch is pressed. An【Audio Selector】will

	appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected.
【Address】	Set the operating address of the Step Switch.
【Data Type】	Set the Data Type of the Step Switch.
【Number of States】	Set the number of states of the Step Switch; the maximum number of states is 256.
【State Type】	Set the State Type of the Step Switch. The【Written Value】cannot be edited and numeric values identical to each state number will be automatically filled out if【Value】is selected. For example, the【Written Value】will be 0 of the state is 0. Users can switch between states from the list on the left and customize the numeric value corresponding to each state from【Written Value】if【Custom】is selected.
【Written Value】	Sets the numeric value to write for each state when the Step Switch is pressed.
【Notification】	Set whether to allow the notification function for the Step Switch. Related setting items will appear if this option is selected, allowing setting of bit and value for notification.

3.3.11.2【Display】

The【Step Switch】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

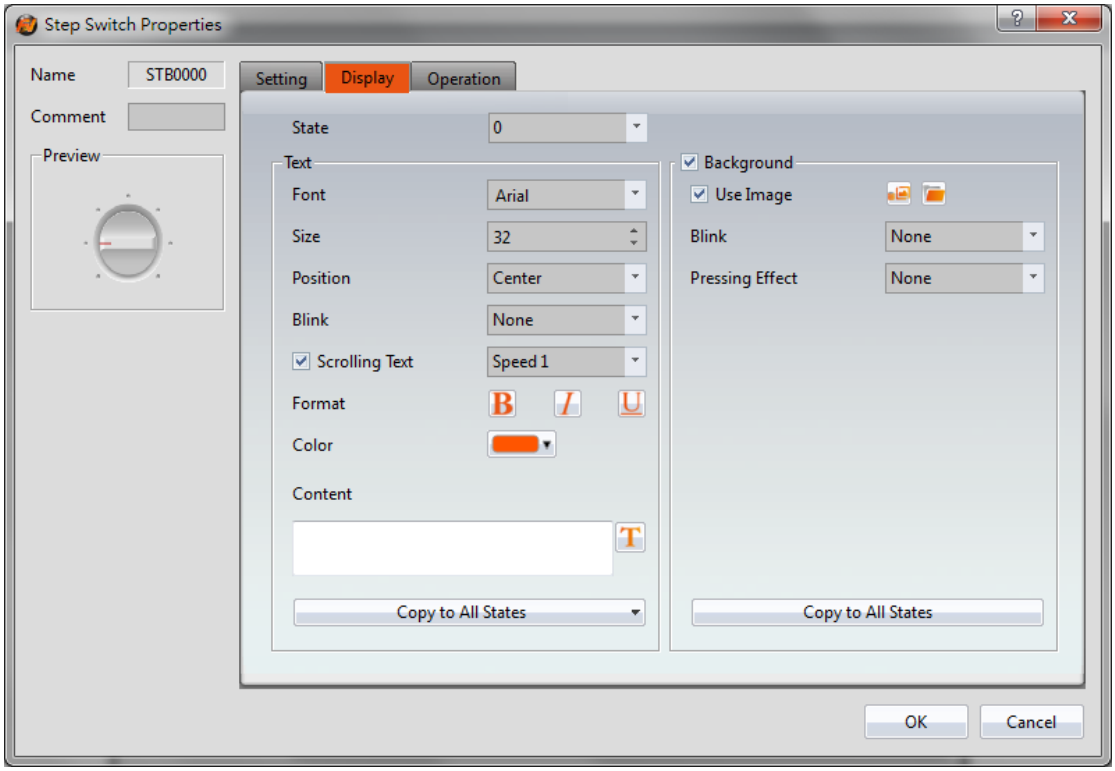


Figure 117 【Display】Setting Screen of【Step Switch】

Table 76 【Display】Setting Properties of【Step Switch】

Property	Description
【State】	Switch to the state currently editing.
【Text】	【Font】 Set the font of the text displayed for the currently editing state. 【Size】 Set the size of the text displayed for the currently editing state. 【Position】 Set the position of the text displayed for the currently editing state. 【Blink】 Set the blinking function for the text of the currently editing state. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】

	Set the scrolling text function for the text of the currently editing state. There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for the currently editing state, including Bold, Italics and Underline. 【Color】 Set the color of the text displayed for the currently editing state. 【Content】 Set the displayed text of the currently editing state. It can be inputted directly or acquired from the【Text Library】. 【Copy to All States】 Apply the settings of the text for the currently editing state to all states.
【Background】	【Use Image】 Set whether to use an image for the displayed background of the currently editing state. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of the currently editing state. This setting item will appear if 【Use Image】 was not selected. 【Blink】 Set the blinking function for the displayed background of the currently editing state. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Pressing Effect】 Set the pressing effect of the currently editing state. There are two effects available for selection: None and Highlight. 【Copy to All States】 Apply the settings of the background for the currently editing state to all states.

3.3.11.3 【Operation】

The【Step Switch】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

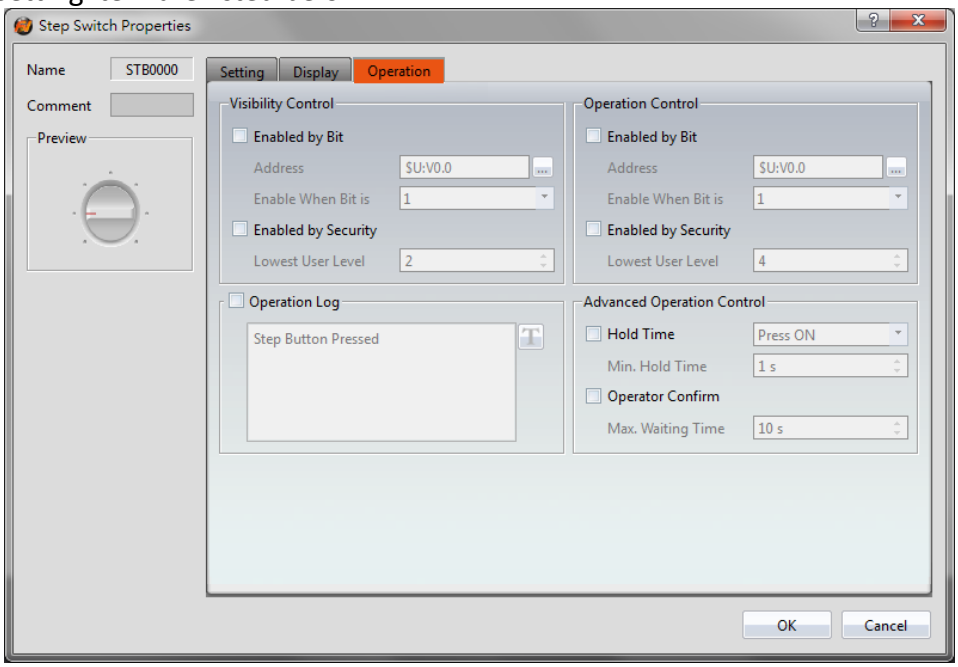


Figure 118 【Operation】Setting Screen of【Step Switch】

Table 77 【Operation】Setting Properties of【Step Switch】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】

	Set the minimum level of the user logged in to display the object.
【Operation Control】	Operation control of the object; it can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control operation by a specific Bit. 【Address】 Set the address of the operation control Bit. 【Enable When Bit is】 Set whether to operate the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the Text Library.
【Advanced Operation Control】	【Hold Time】 Select whether the operation is controlled by hold time. Hold time can be divided into two types: ➢ 【Press On】: Press directly and confirm whether to execute this operation according to the【Min Hold Time】. ➢ 【Double Press】: Use two quick presses to confirm whether to execute this operation. 【Operation Confirm】 Select whether to display the confirm window after the operation is executed. 【Max Waiting Time】 When the confirm window is displayed, the system will close the confirm window and cancel this operation if the user does

	not respond within this time.

3.3.12 【Slide Switch】

【Slide Switch】allows users to write the numeric value corresponding to the final position of the slider into the set register by dragging.

3.3.12.1 【Setting】

The【Slide Switch】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

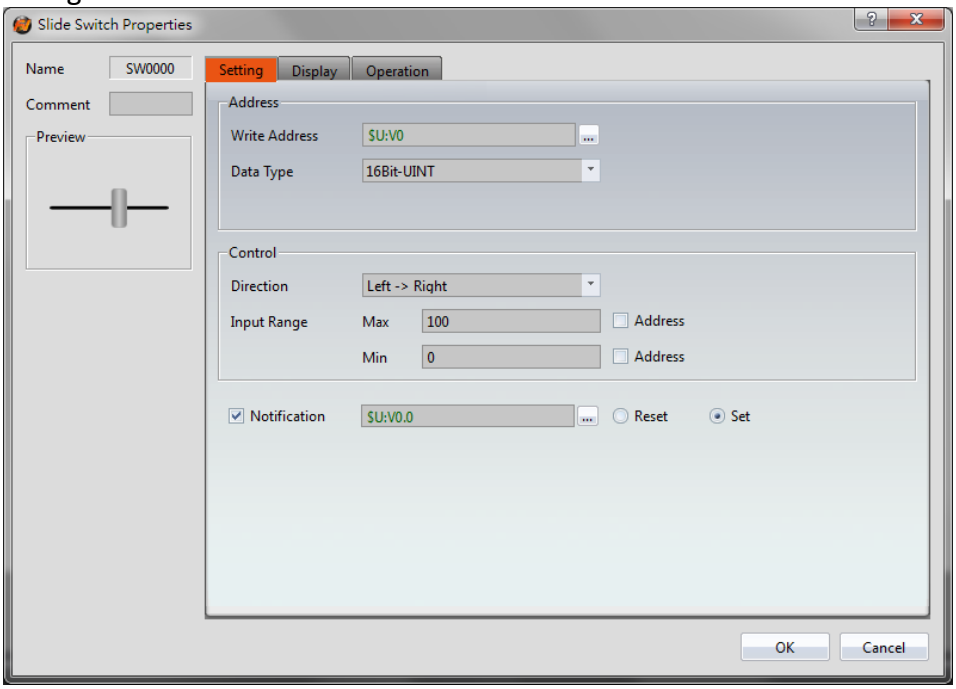


Figure 119 【Setting】Screen of【Slide Switch】

Table 78 【Setting】Properties of【Slide Switch】

Property	Description
【Preview】	Preview the appearance of this object.
【Address】	【Write Address】 Set the register address to write the numeric value when the user operates the Slide Switch. 【Data Type】 Set the Data Type of the Slide Switch.
【Control】	【Direction】 Set the moving direction of the Slide Switch.

	【Input Range】 Set the【Max】and【Min】numeric value for the Slide Switch to write. The【Address】below can be used to set the source address for reading the maximum value or minimum value by【Data Type】.
【Notification】	Set whether to allow the notification function for the Slide Switch. Related setting items will appear if this option is selected, allowing setting of bit and value for notification.

3.3.12.2 【Display】

The【Slide Switch】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

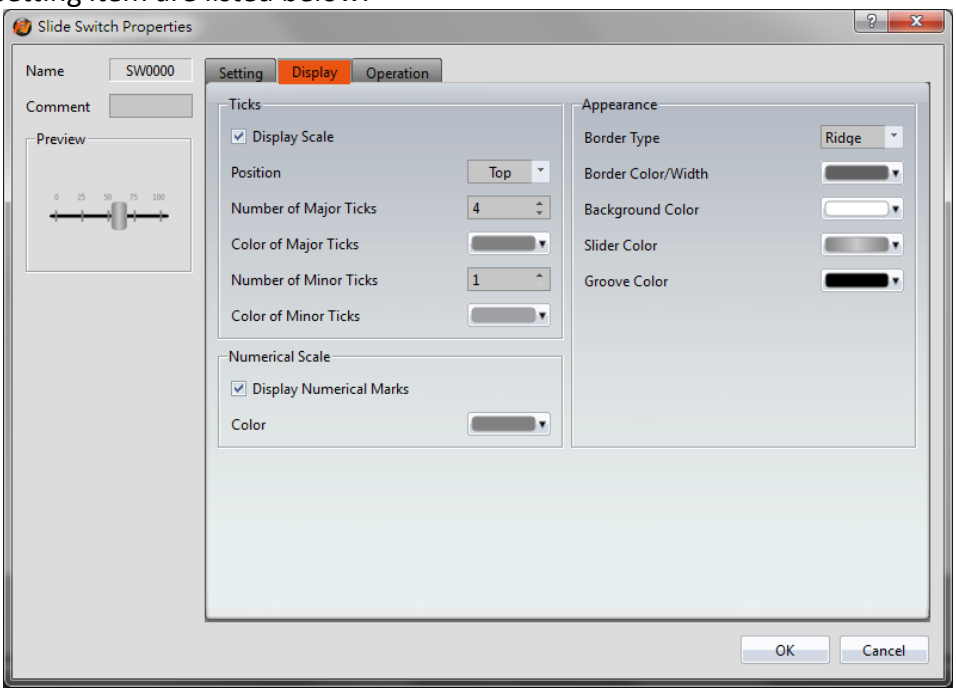


Figure 120 【Display】Setting Screen of【Slide Switch】

Table 79 【Display】Setting Properties of【Slide Switch】

Property	Description
【Ticks】	【Display Scale】 Set whether to display the scale of the Slide Switch. 【Position】 Set the position to display the scale for the Slide Switch.

	【Number of Major Ticks】 Set the number of major ticks for the Slide Switch. 【Color of Major Ticks】 Set the displayed color of the major tick for the Slide Switch. 【Number of Minor Ticks】 Set the number of minor ticks for the Slide Switch. 【Color of Minor Ticks】 Set the displayed color of the minor tick for the Slide Switch.
【Numerical Scale】	To display the【Numerical Scale】, the【Display Scale】function must first be enabled. Settings related to【Numerical Scale】can only be edited after【Display Scale】is selected. 【Display Numerical Marks】 Set whether to display the numerical marks for the Slide Switch. 【Color】 Set the displayed color for the numerical marks of the Slide Switch.
【Appearance】	【Border Type】 Set the displayed border type of the Slide Switch. 【Border Color/Width】 Set the border color and border thickness of the Slide Switch. 【Background Color】 Set the background color of the Slide Switch. 【Slider Color】 Set the slider color of the Slide Switch. 【Groove Color】 Set the groove color of the Slide Switch.

3.3.12.3 【Operation】

The【Slide Switch】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

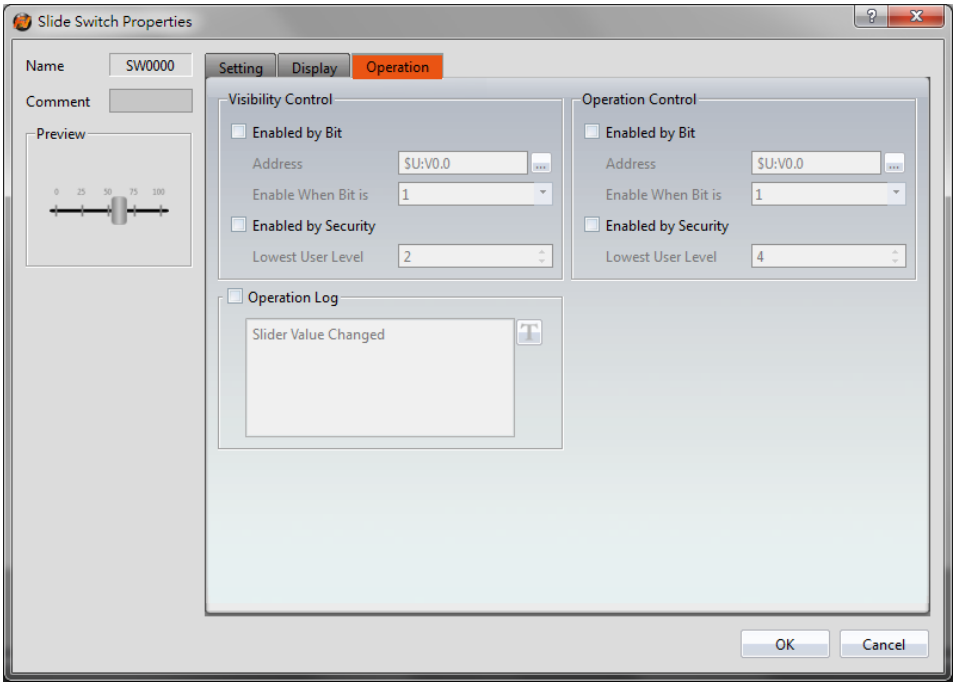


Figure 121 【Operation】Setting Screen of【Slide Switch】

Table 80 【Operation】Setting Properties of【Slide Switch】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Control】	Operation control of the object. It can be controlled by a specific Bit or User Level.

	【Enable by Bit】 Select whether to control operation by a specific Bit. 【Address】 Set the address of the operation control Bit. 【Enable When Bit is】 Set whether to operate the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the Text Library.

3.3.13 【Selector List】

【Selector List】allows users to display multiple switches using a pull-down menu so that related switches can be organized into the same list, making it convenient for the operators to select the switches they need.

3.3.13.1 【Setting】

The【Selector List】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

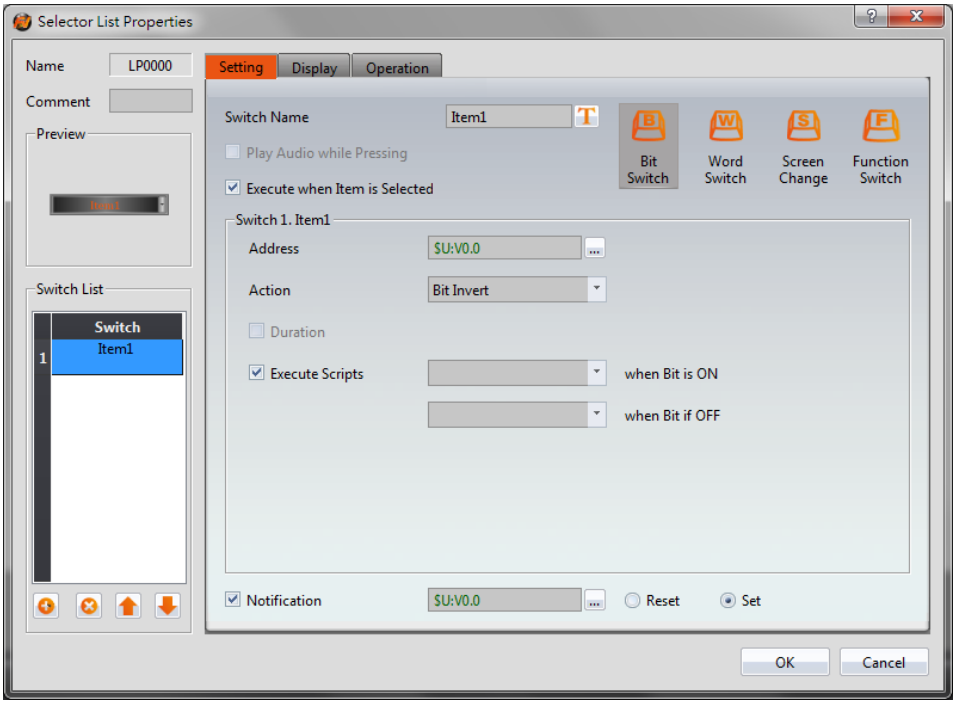


Figure 122 【Setting】Screen of【Selector List】

Table 81 【Setting】Properties of【Selector List】

Property	Description
【Preview】	Preview the appearance of this object.
【Switch Name】	Set the name of the switch currently selected. Users can change the currently selected switch from the【Switch List】.
【Execute when Item is Selected】	Select whether to enable the【Execute when Item is Selected】function. When it is enabled, the function of a switch will be executed immediately when the user selected a switch from the Selector List object. If it is not enabled, the function of the selected switch will only be executed after the user pressed the【Execute】button.
【Bit Switch】	Change the currently editing switch type to【Bit Switch】.
【Word Switch】	Change the currently editing switch type to【Word Switch】.
【Change Screen】	Change the currently editing switch type to【Change Screen】.
【Function Switch】	Change the currently editing switch type to【Function Switch】.

【Notification】	Set whether to allow the notification function. Related setting items will appear if this option is selected, allowing setting of bit and value for notification.
【Switch List】	Display the switch list currently included in the Selector List item object. 【Add】 Increase the number of switches in the 【Switch List】; the type of switch to add can be selected. 【Delete】 Delete the switch currently selected in the 【Switch List】. 【Up】 Move the order of the switch currently selected in the 【Switch List】 up. 【Down】 Move the order of the switch currently selected in the 【Switch List】 down.

3.3.13.2 【Display】

The 【Selector List】【Display】 page is as shown in the figure below, the meanings of each setting item are listed below:

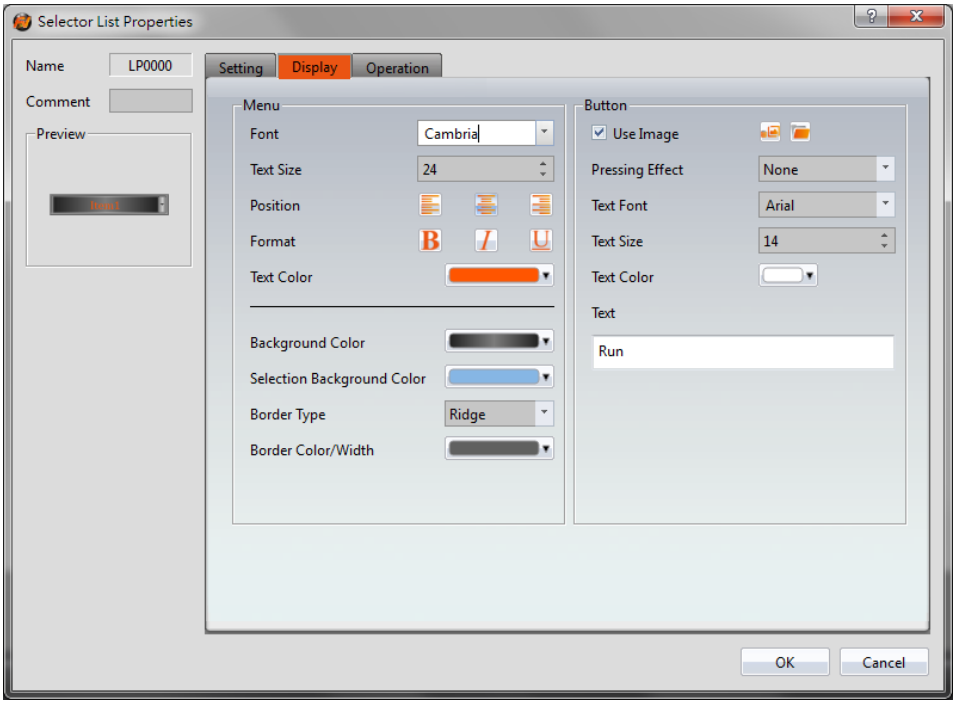


Figure 123 【Display】Setting Screen of【Selector List】

Table 82 【Display】Setting Properties of【Selector List】

Property	Description
【Menu】	【Font】 Set the font of the text displayed for the Selector List. 【Size】 Set the size of the text displayed for the Selector List. 【Position】 Set the position of the text displayed for the Selector List. 【Format】 Set the format of the text displayed for the Selector List, including Bold, Italics and Underline. 【Color】 Set the color of the text displayed for the Selector List. 【Background Color】 Set the displayed background color of the Selector List. 【Selection Background Color】 Set the displayed background color of the selected item in

	Selector List. 【Border Type】 Set the displayed border type of the Selector List. 【Border Color/Width】 Set the displayed border color and border thickness of the Selector List.
【Button】	【Use Image】 Set whether to use an image for the displayed background of the【Execute】button. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of the【Execute】button. This setting item will appear if 【Use Image】 was not selected. 【Pressing Effect】 Set the pressing effect of the【Execute】button. There are three effects available for selection: None, Sunken and Highlight. 【Text Font】 Set the displayed text font of the【Execute】button. 【Text Size】 Set the displayed text size of the【Execute】button. 【Text Color】 Set the displayed text color of the【Execute】button. 【Text】 Set the text displayed for the【Execute】button. It can be inputted directly or acquired from the【Text Library】.

3.3.13.3【Operation】

The【Selector List】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

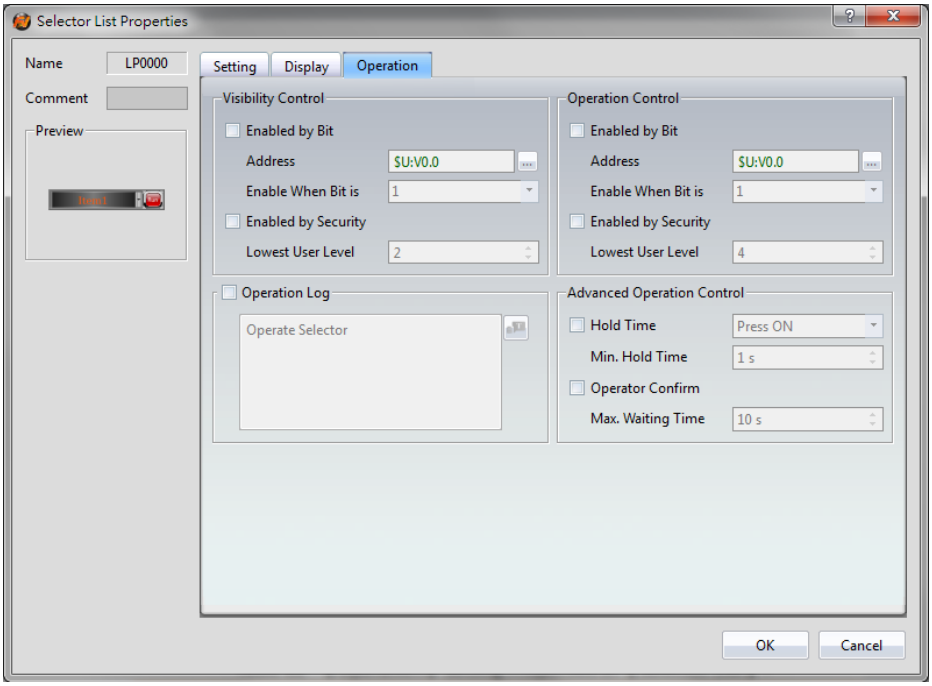


Figure 124 【Operation】Setting Screen of【Selector List】

Table 83 【Operation】Setting Properties of【Selector List】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the

	object.
【Operation Control】	Operation control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control operation by a specific Bit. 【Address】 Set the address of the operation control Bit. 【Enable When Bit is】 Set whether to operate the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the【Text Library】.

3.3.14 【Input Display】

【Input Display】is used on the【Keypad Screen】; it can display the numeric value or text currently entered with the keypad.

The【Input Display】property settings dialog is as shown in the figure below, the meanings of each setting option are listed below:

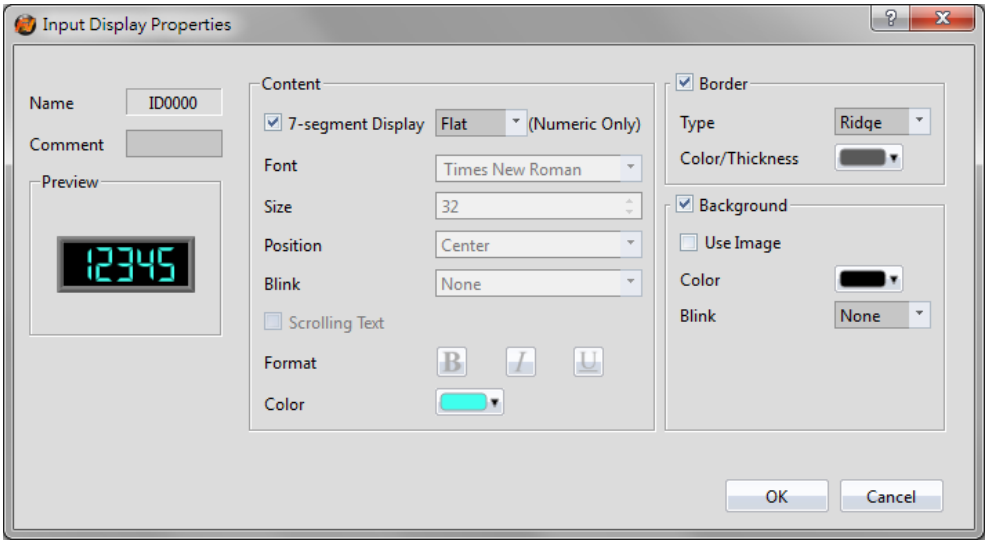


Figure 125 Setting Dialog of【Input Display】

Table 84 Setting Properties of【Input Display】

Property	Description
【Preview】	Preview the appearance of this object.
【Content】	【7-segment Display】 Set whether to allow the 7-segment display function for the Input Display object. If this option is selected, related setting items for setting of style of the 7-segment display will appear. Note: while this option is selected, it can only show part of text (0/O, 1, 2, 3, 4, 5/S, 6, 7, 8, 9/g, A, B, C, D, E, F, h, H, L, o, P, r, u, U, Y). 【Font】 Set the font for the displayed text of Input Display. 【Size】 Set the size for the displayed text of Input Display. 【Position】 Set the position for the displayed text of Input/Display. 【Blink】 Set the blinking function for the text of Input/Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】 Set the scrolling text function for the text of Input/Display.

	There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for Input/Display, including Bold, Italics and Underline. 【Color】 Set the color for the displayed text of Input/Display.
【Border】	【Color/Thickness】 Set the color and thickness for the displayed border of Input/Display. 【Blink】 Set the blinking function for the border of Input/Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.
【Background】	【Use Image】 Set whether to use an image for the displayed background of Input/Display. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of Input/Display. This setting item will appear if 【Use Image】 was not selected. 【Blink】 Set the blinking function for the displayed background of Input/Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.

3.3.15 【Key】

Key is used on【Keypad Screen】. It can provide the functions for the keypad needed for inputting numeric value or text. The 9 functions include【Text】,【ENT】,【CLR】,【BS】,【DEL】,【LEFT】,【RIGHT】,【Caps Lock】and【CANCEL】.

3.3.15.1 【Setting】

The【Key】【Setting】page is as shown in the figure below, the meanings of each setting

item are listed below:

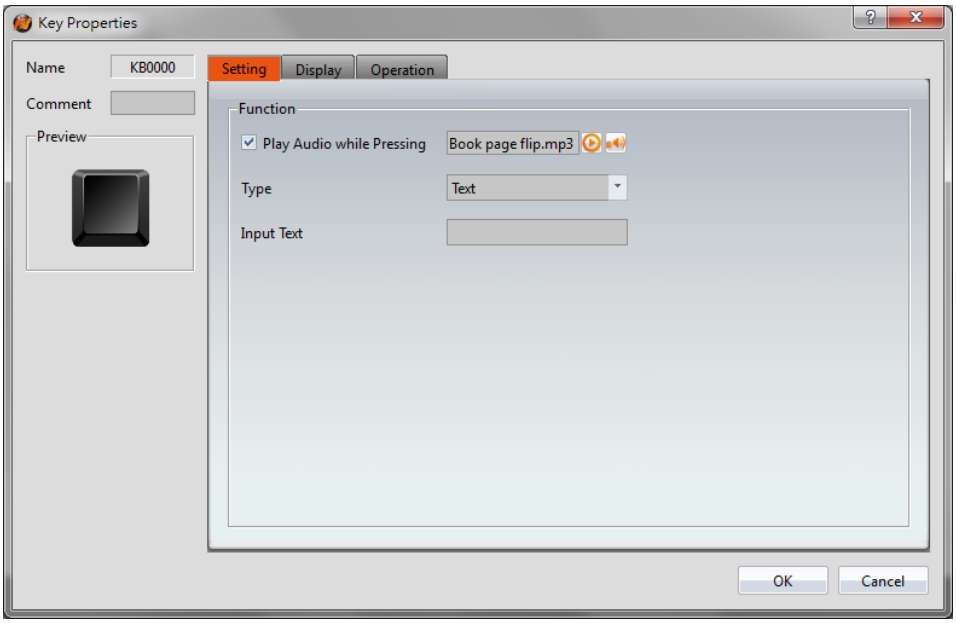


Figure 126 【Setting】Screen of【Key】

Table 85 【Setting】Properties of【Key】

Property	Description
【Preview】	Preview the appearance of this object.
【Function】	Set the function type of the key. 【Play Audio while Pressing】 Select whether to play audio when the Key is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected. 【Text】 Input text mode; the text inputted in【Input Text】will be entered on the【Keypad Screen】after this key is pressed. 【ENT】 The numeric value or text entered on the【Keypad Screen】will be submitted and the

	【Keypad Screen】will be closed after this key is pressed. 【CLR】 The numeric value or text entered on the 【Keypad Screen】 will be cleared after this key is pressed. 【BS】 A single numeric value or text prior to the position of the cursor will be deleted after this key is pressed. 【DEL】 A single numeric value or text after the position of the cursor will be deleted after this key is pressed. 【LEFT】 The cursor will move one space forward after the user presses this key. 【RIGHT】 The cursor will move one space backward after the user presses this key. 【Caps Lock】 The case mode of the text input will be changed after this key is pressed. 【CANCEL】 The【Keypad Screen】will be closed and input will be cancelled after the user presses this key.

3.3.15.2【Display】

The【Key】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

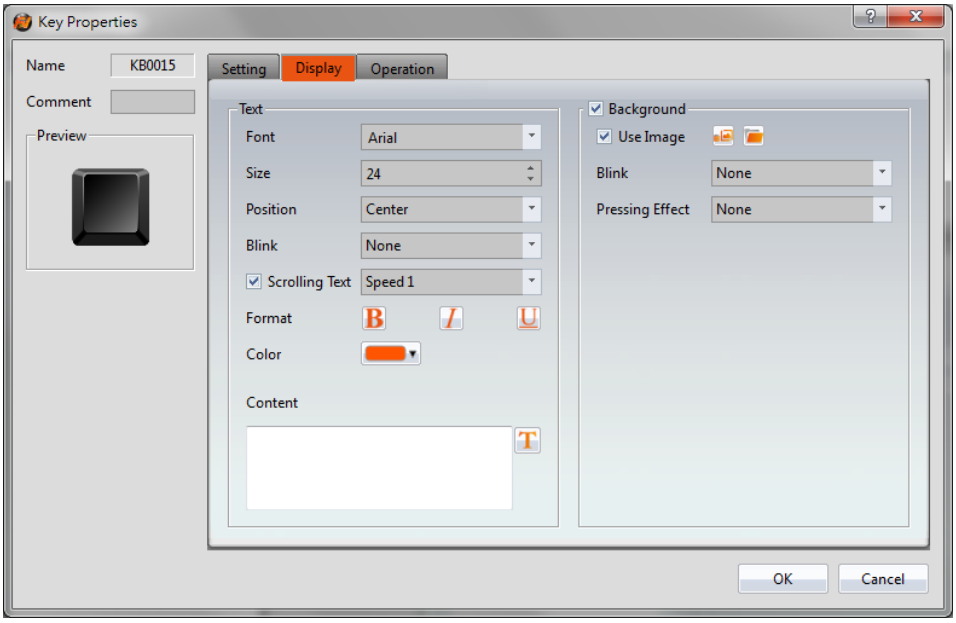


Figure 127 【Display】Setting Screen of【Key】

Table 86 【Display】Setting Properties of【Key】

Property	Description
【Text】	【Font】 Set the font of the text displayed for the key. 【Size】 Set the size of the text displayed for the key. 【Position】 Set the position of the text displayed for the key. 【Blink】 Set the blinking function for the text of the key. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】 Set the scrolling text function for the text of the key. There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for the key, including Bold, Italics and Underline. 【Color】

	Set the color of the text displayed for the key. 【Content】 Set the displayed text of the key; it can be inputted directly or acquired from the【Text Library】.
【Background】	Background setting for the key. The displayed background of the key can be edited below if background setting is selected, otherwise the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the key. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of the key. This setting item will appear if 【Use Image】 was not selected. 【Blink】 Set the blinking function for the displayed background of the key. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Pressing Effect】 Set the pressing effect of the key. There are two effects available for selection: None and Highlight.

3.3.15.3【Operation】

The【Key】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

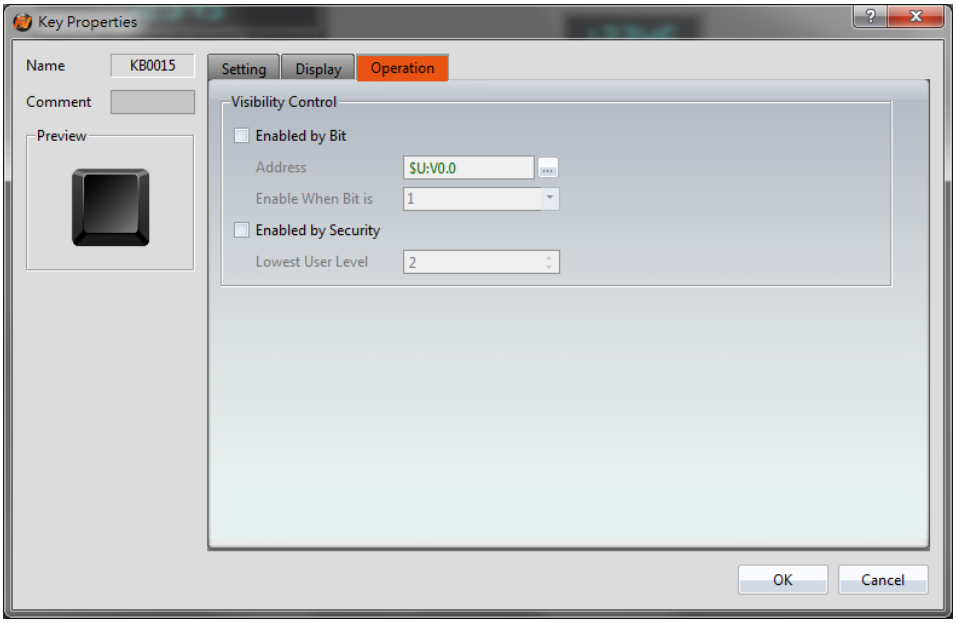


Figure 128 【Operation】Setting Screen of【Key】

Table 87 【Operation】Setting Properties of【Key】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.

3.3.16 【Limit Value Display】

【Limit Value Display】is used on the【Keypad Screen】, it can display the maximum

or minimum input value allowed for the current keypad.

The【Limit Value Display】setting page is as shown in the figure below, the meanings of each setting item are listed below:

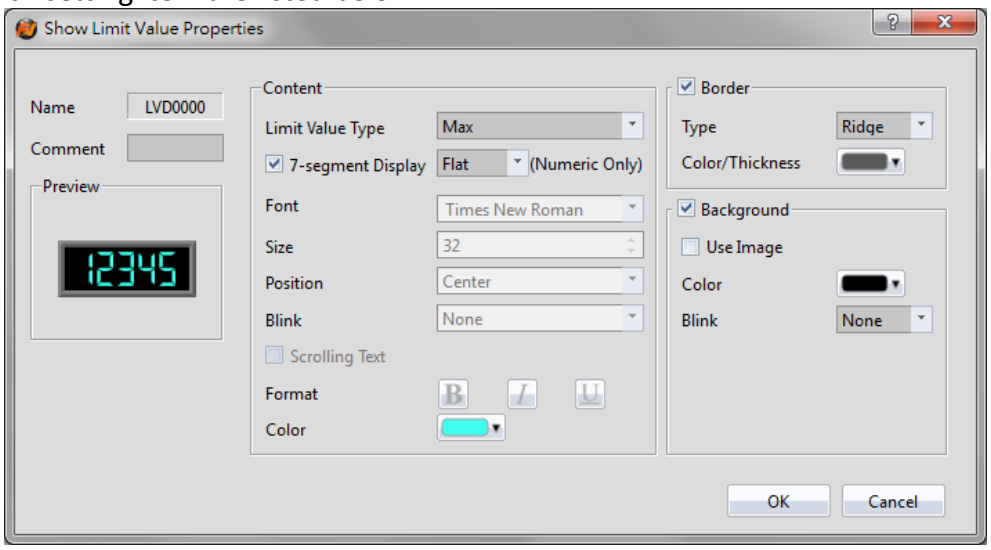


Figure 129 Setting Dialog of【Limit Value Display】

Table 88 Setting Properties of【Limit Value Display】

Property	Description
【Preview】	Previews the appearance of this object.
【Content】	【Limit Value Type】 Set whether to display【Max】or【Min】for Limit Value Display. 【7-segment Display】 Set whether to allow the 7-segment display function for the Limit Value Display object. If this option is selected, related setting items for setting of style of the 7-segment display will appear. Note: while this option is selected, it can only show part of text (0/O, 1, 2, 3, 4, 5/S, 6, 7, 8, 9/g, A, B, C, D, E, F, h, H, L, o, P, r, u, U, Y). 【Font】 Set the font of the text displayed for Limit Value Display. 【Size】 Set the size of the text displayed for Limit Value Display. 【Position】 Set the position of the text displayed for Limit Value Display.

	【Blink】 Set the blinking function for the text of Limit Value Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】 Set the scrolling text function for the text of Limit Value Display. There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for Limit Value Display, including Bold, Italics and Underline. 【Color】 Set the color of the text displayed for Limit Value Display.
【Border】	Border setting for Limit Value Display. The displayed border of Limit Value Display can be edited below if border setting is selected, otherwise the Limit Value Display will be displayed with no border. 【Color/Thickness】 Set the color and thickness for the displayed border of Limit Value Display. 【Blink】 Set the blinking function for the border of Limit Value Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.
【Background】	Background setting for Limit Value Display. The displayed background of Limit Value Display can be edited below if background setting is selected, otherwise the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of Limit Value Display. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】

	Set the displayed background color of Limit Value Display. This setting item will appear if 【Use Image】 was not selected. 【Blink】 Set the blinking function for the displayed background of Limit Value Display. There are four blinking speeds available to choose from: None, Slow, Medium and Fast.

3.3.17 【Animated Graphic】

【Animated Graphic】can set multiple sets of states, and the state, position and size displayed by【Animated Graphic】can be changed by setting specific control addresses in order to achieve animated effects such as moving objects, zooming in and zooming out etc.

3.3.17.1 【Setting】

The【Animated Graphic】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

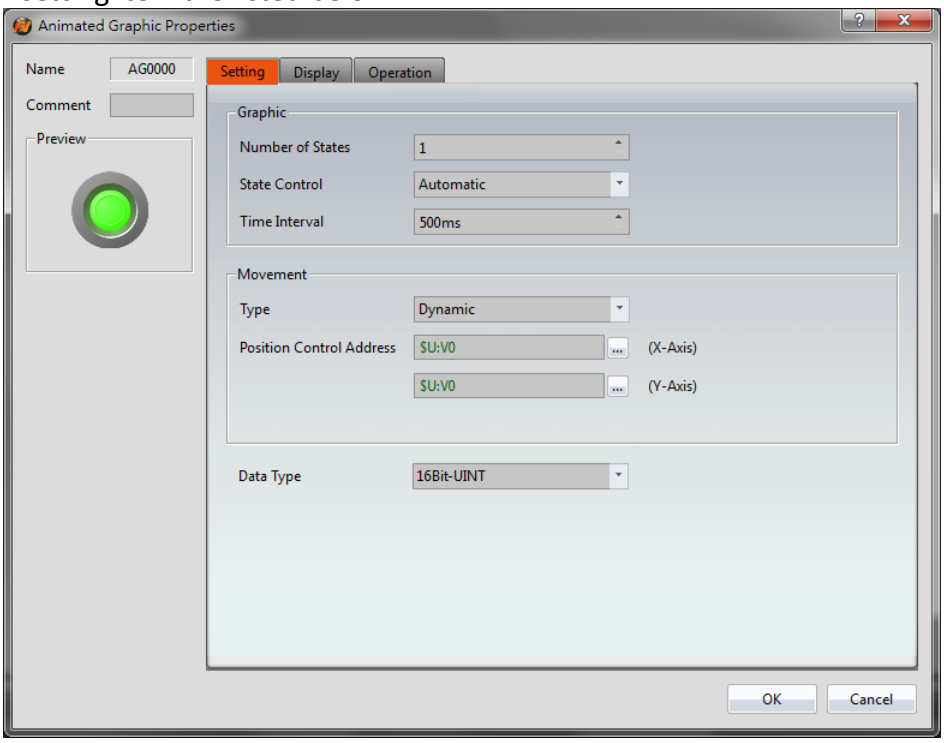


Figure 130 【Setting】Screen of【Animated Graphic】

Table 89 【Setting】Properties of【Animated Graphic】

Property	Description
【Preview】	Preview the appearance of this object.

【Graphic】	【Number of States】 Set the number of states for animated graphic. 【State Control】 Set the state changing method of the animated graphic; 【Automatic】mode means that the state of the animated graphic will change regularly. 【Time Interval】 Set the state change time interval for the animated graphic.
【Movement】	【Type】 Set the position changing method of the animated graphic. 【Dynamic】mode means that the position of the animated graphic will change according to the numeric value saved on the【Position Control Address】.【Still】mode means that the position of the animated graphic will remain the same without changing. 【Position Control Address】 Divided into X-axis and Y-axis control address. If the【Type】is【Dynamic】, the user can move the animated graphic by changing the numeric value saved on the X-axis and Y-axis control address.
【Data Type】	Set the data type of the animated graphic; this setting item will appear when selection of the【Type】for【State Control】or【Movement】is controlled by specific addresses.

3.3.17.2 【Display】

The【Animated Graphic】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

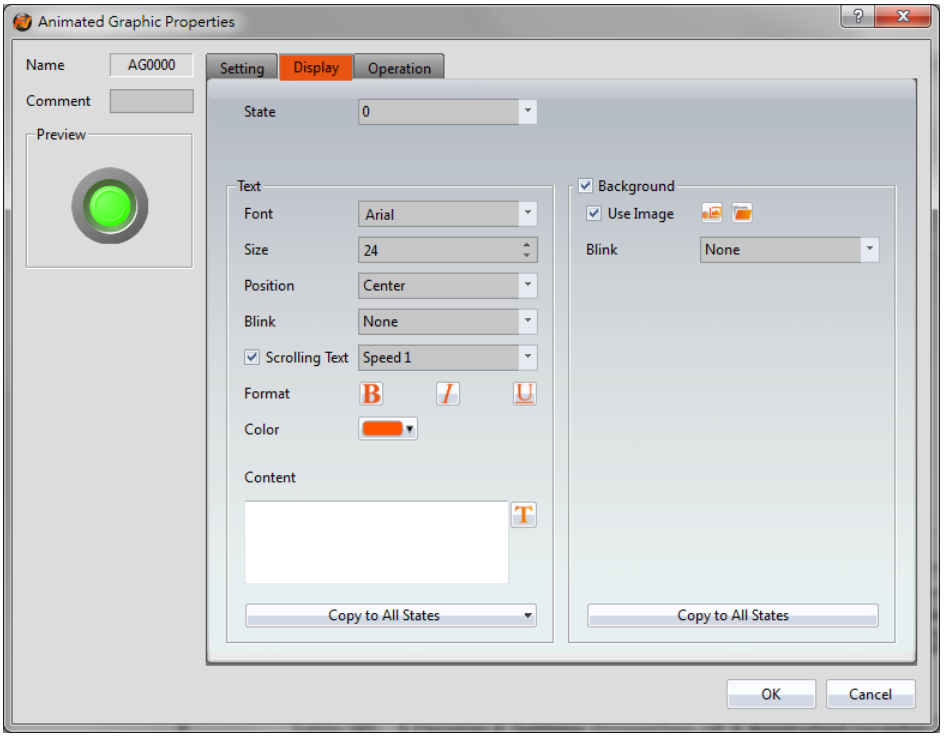


Figure 131 【Display】Setting Screen of【Animated Graphic】

Table 90 【Display】Setting Properties of【Animated Graphic】

Property	Description
【State】	Select the state needed to be edited.
【Text】	【Font】 Set the font of the text displayed for the currently editing state. 【Size】 Set the size of the text displayed for the currently editing state. 【Position】 Set the position of the text displayed for the currently editing state. 【Blink】 Set the blinking function for the text of the currently editing state. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Scrolling Text】 Set the scrolling text function for the text of the currently

	editing state. There are four scrolling speeds available to choose from slow to fast. 【Format】 Set the format of the text displayed for the currently editing state, including Bold, Italics and Underline. 【Color】 Set the color of the text displayed for the currently editing state. 【Content】 Set the displayed text of the currently editing state. It can be inputted directly or acquired from the【Text Library】. 【Copy to All States】 Apply the settings of the text for the currently editing state to all states.
【Background】	Background setting for the currently editing state. The displayed background of the animated graphic can be edited below if background setting is selected; otherwise, the background of the currently editing state will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the currently editing state. When this option is checked, an【Image Selector】will appear asking the user to select an image either from the【Image Library】or from a file. 【Color】 Set the displayed background color of the currently editing state. This setting item will appear if 【Use Image】 was not selected. 【Blink】 Set the blinking function for the displayed background of the currently editing state. There are four blinking speeds available to choose from: None, Slow, Medium and Fast. 【Copy to All States】 Apply the settings of the background for the currently editing state to all states.

3.3.17.3【Operation】

The【Animated Graphic】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

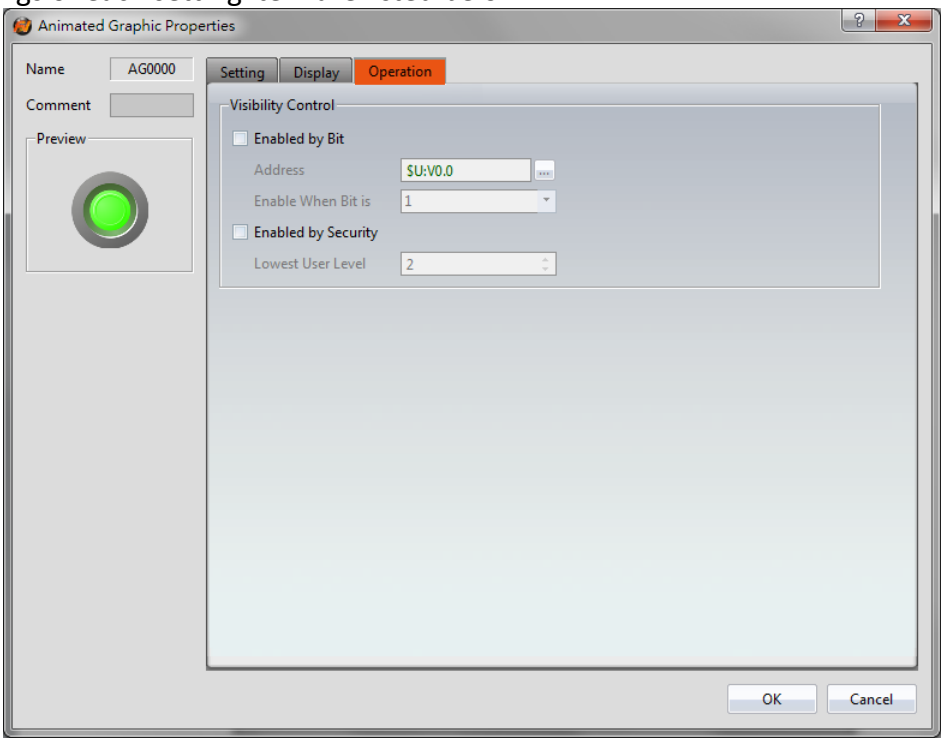


Figure 132 【Operation】Setting Screen of【Animated Graphic】

Table 91 【Operation】Setting Properties of【Animated Graphic】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in.

	【Lowest User Level】 Set the minimum level of the user logged in to display the object.

3.3.18 【Historic Trend】

【Historic Trend】is a curve object used to read the data in the (Recording Buffer) of the【Data Logger】, in which the X value is the time and the Y value is the data captured by the【Data Logger】. Its functions are as follows:

- View the data of the【Data Logger】.
- Pause or start updating the data of the【Data Logger】through the【Sub Switch】, and clear the displayed data. It can also zoom or move the figure.

Introduction to the【Historic Trend】property settings dialog boxes are as follows:

3.3.18.1 【General】

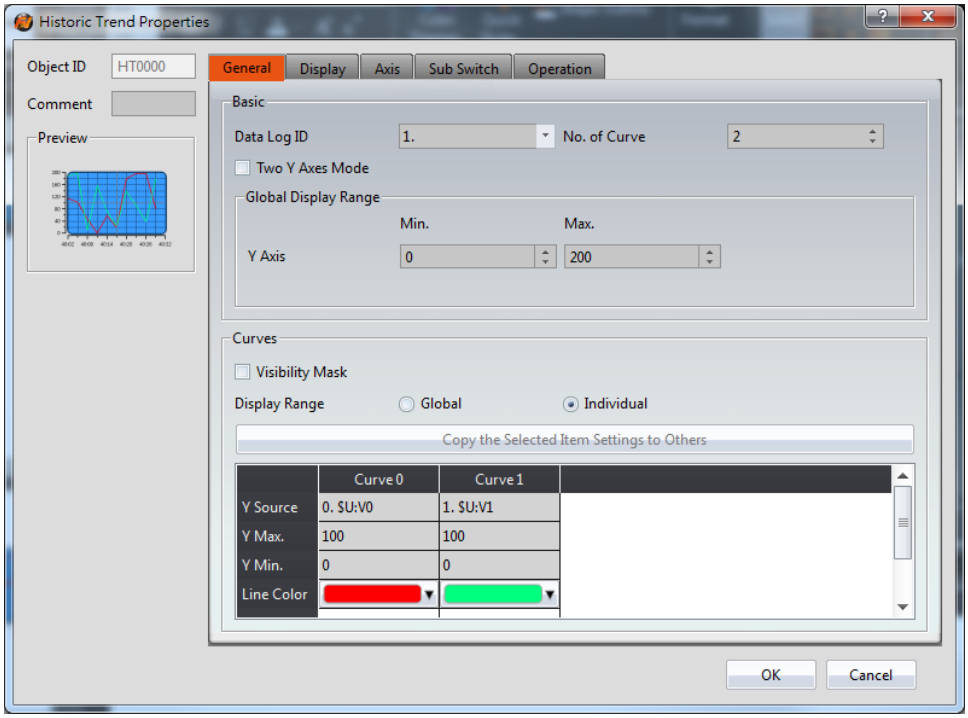


Figure 133 【General】Setting Screen of【Historic Trend】

Table 92 【General】Setting Properties of【Historic Trend】

Property	Description
【Preview】	Preview the appearance of this object.
【Basic】	【Data Logger ID】 Set the ID of the Data Logger group to display.

	【No. of Curve】 Set the number of curves.
【Global Display Range】	Represents the range that can be displayed. 【Min】 Set the minimum Global Range value for the Y-axis. 【Max】 Set the maximum Global Range value for the Y-axis. Note: The【Global Display Range】represents the range that can be displayed. If【Max】is 100 and【Min】is 0, data exceeding this range will not be able to be displayed.
【Curves】	【Visibility Mask】 Select whether to use visibility mask to control the visibility of the each curve. While selecting, use should assign the 32bit UINT register as the mask, in which the 0 bit control the display of the curve 0, and so on. 【Display Range】 Used to set the display mode for the display range of the curve. It is usually one of the two following types: ➢ 【Global】 The display ranges of all the curves are identical to the【Global Display Range】. ➢ 【Individual】 The display range of all the curves can be different from the【Global Display Range】. Explanation: When to set【Display Range】as【Individual】- When the value ranges of the number of curves are different, for example when the value range of curve a is 0~10, and curve b is 0~1000, it can be discovered that the degree of changes for curve a will be difficult to observe if the two curves are placed in the same figure. This is when【Display Range】can be set as【Individual】and the display range of each curve can be defined. The system will automatically zoom the value of the curves according to the value in【Global Display Range】. Take this case for example, if the value in【Global Display Range】is

	s 0~100, when the value of curve a is 5, the system will zoom it to 50 and when the value of curve b is 500, the system will also zoom it into 50, and so on. The statements of curve properties in the table are as below: 【Y Source】 Set the source for the Y value of the curve; the selection of the source depends on the setting of the【Data Logger】. 【Y Max】 Set the maximum Individual Display Range value for the Y value of the curve. 【Y Min】 Set the minimum Individual Display Range value for the Y value of the curve. 【Y Axis】 If【Two Y Axes Mode】is selected, the setting is used to decide the curve's reference y-axis. 【Line Color】 Set the line color of the curve. 【Line Type】 Set the line type of curve.

3.3.18.2【Display】

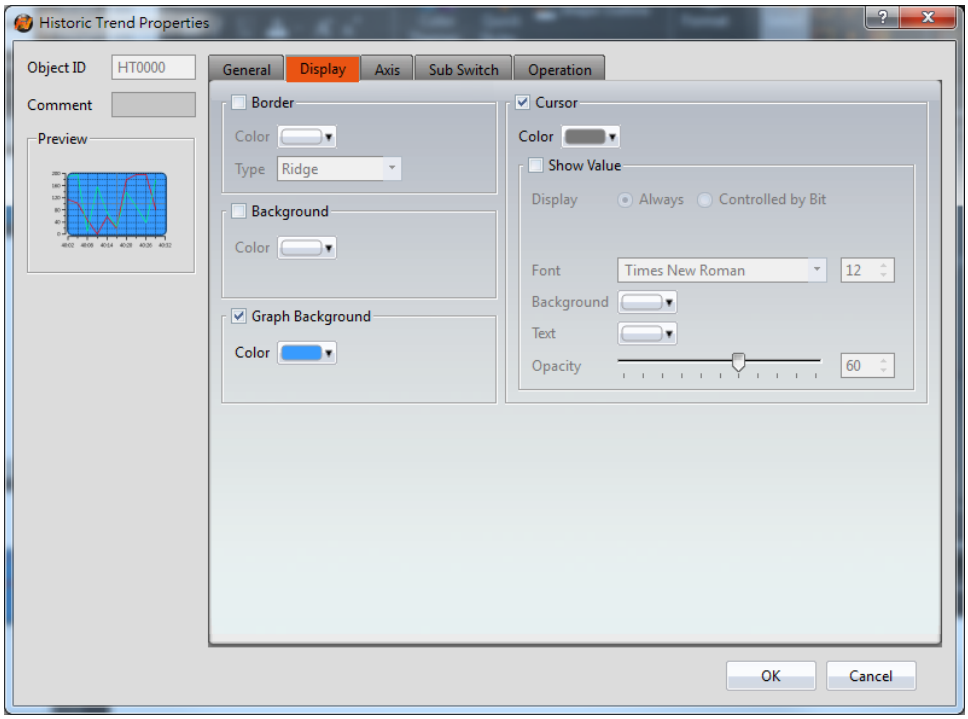


Figure 134 【Display】Setting Screen of【Historic Trend】

Table 93 【Display】Setting Properties of【Historic Trend】

Property	Description
【Border】	Select whether to display the border. 【Color】 Set the color of the border. 【Type】 Set the border type.
【Background】	Select whether to display the background. 【Color】 Set the color of the background.
【Graph Background】	Select whether to display the graph background. 【Color】 Set the color of the graph background.
【Cursor】	Select whether to display the cursor. 【Color】 Set the color of the cursor.
【Cursor】【Show Value】	Select whether to display the cursor value. 【Display】 Set the way of cursor value visibility. If【Always】is set, the cursor value is always shown. If【Controlled by Bit】is

	selected, the visibility of cursor value depends on a certain bit. 【Font】 Set the font type and size of cursor value. 【Background】 Set the background color of the cursor value. 【Text】 Set the text color of the cursor value. 【Opacity】 Set the background opacity of the cursor value.

3.3.18.3 【Axis】

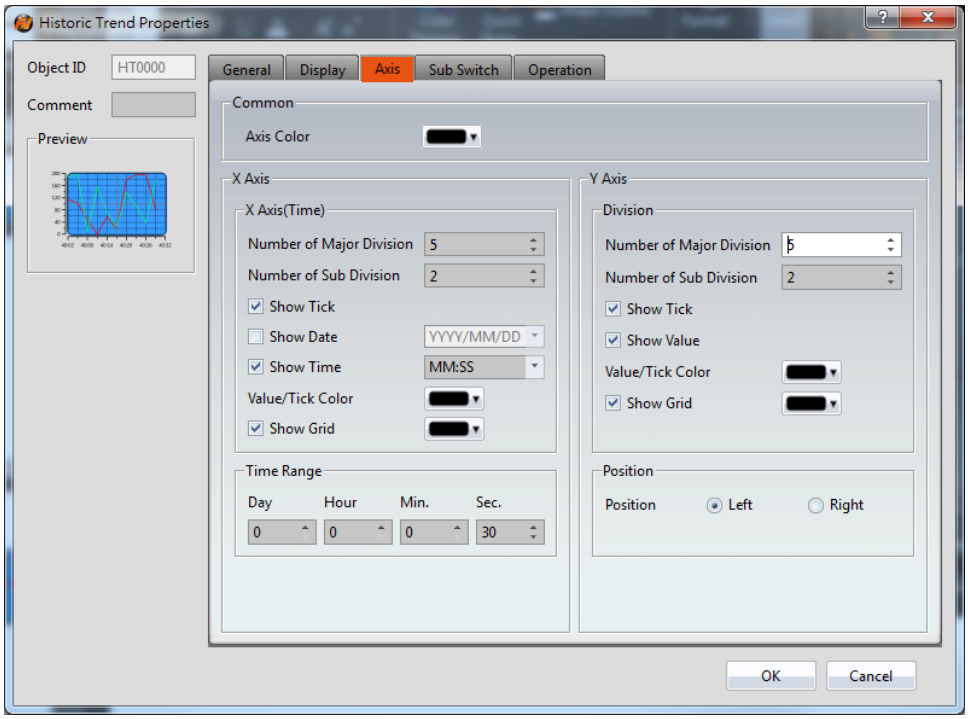


Figure 135 【Axis】Setting Screen of【Historic Trend】

Table 94 【Axis】Setting Properties of【Historic Trend】

Property	Description
【Common】	【Axis Color】 Set the color of the axis.
【Time Range】	Set the time range of the X-axis

	【Day】 Set the number of days. 【Hour】 Set the number of hours. 【Min.】 Set the number of minutes. 【Sec.】 Set the number of seconds.
【X-axis (Time)】 **【Division】**	【Number of Major Division】 Set the number of major divisions for the X-axis. 【Number of Sub Division】 Set the number of sub divisions for the X-axis. 【Show Tick】 Select whether to display the tick. 【Show Date】 Select whether to display the date on the X-axis, and sets the display format of the date. 【Show Time】 Select whether to display the time on the X-axis, and sets the display format of the time. 【Time/Tick Color】 Set the colors of the time and tick. 【Show Grid】 Select whether to display vertical grids, and sets the color of the grids.
【Position】	Set the position of the Y-axis; there are【Left】and【Right】available for selection.
【Y-axis】【Division】	【Number of Major Division】 Set the number of major divisions for the Y-axis. 【Number of Sub Division】 Set the number of sub divisions for the Y-axis.

	【Show Tick】 Select whether to display the tick on the Y-axis. 【Show Value】 Select whether to display the value on the Y-axis. 【Value/Tick Color】 Set the colors of the value and tick. 【Show Grid】 Select whether to display horizontal grids, and sets the color of the grids.
【Y-axis】【Position】	【Position】 Set the Y-axis position.

3.3.18.4【Sub Switch】

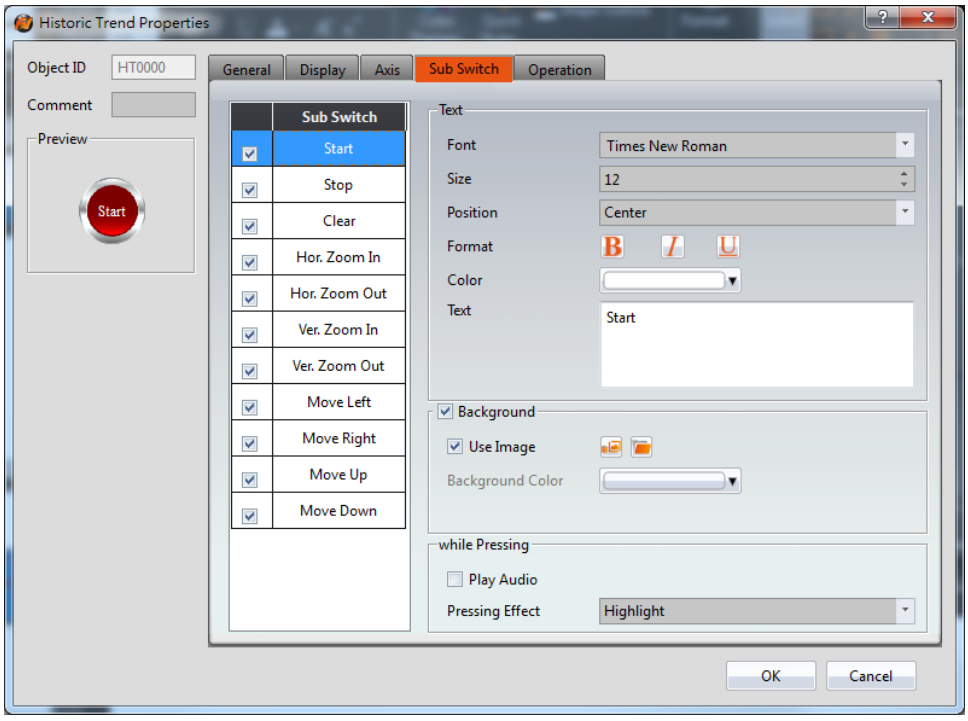


Figure 136 【Sub Switch】Setting Screen of【Historic Trend】

Table 95 【Sub Switch】Setting Properties of【Historic Trend】

Property	Description
【Sub Switch List】	【Sub Switch List】that can be selected for【Historic Trend】.Sub switches can be enabled after selecting them.

	Setting options for the appearance of the selected sub switches will also appear on the right. When different sub switches are selected from the list, the setting contents of the appearance setting items to the right will be updated according to the sub switches selected. In which the Sub Switches are divided into: ➢ 【Start】-Start updating the curve to display the data captured by the 【Data Logger】on the curve. ➢ 【Stop】-Stop updating the curve; which means stop updating the data captured by the【Data Logger】. ➢ 【Clear】-Clear the curve, but the data recorded in the【Data Logger】 will be retained. ➢ 【Hor. Zoom In】—Horizontal zoom in. ➢ 【Hor. Zoom Out】—Horizontal zoom out. ➢ 【Ver. Zoom In】—Vertical zoom in. ➢ 【Ver. Zoom Out】—Vertical zoom out. ➢ 【Move Left】—Move Left. ➢ 【Move Right】—Move Right. ➢ 【Move Up】—Move Up.
【Text】	【Font】 Set the displayed text font of the sub switch currently selected. 【Size】 Set the displayed text size of the sub switch currently selected. 【Position】 Set the displayed text position of the sub switch currently selected. 【Format】 Set the displayed text format of the sub switch currently selected, including Bold, Italics and Underline. 【Color】 Set the displayed text color of the sub switch currently selected.

	【Text】 Set the displayed text of the sub switch currently selected.
【Background】	Set the background of the sub switch currently selected. Check it to activate background settings, and the displayed background of the sub switch currently selected can be edited below. If this option is not checked, the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the sub switch currently selected. When this option is checked, an image selection setting item will appear asking the user to select an image either from the【Image Library】or from a file. 【Background Color】 Set the displayed background color of the sub switch currently selected. This setting item will appear if 【Use Image】was not selected.
【while Pressing】	【Play Audio】 Select whether to play audio when the sub switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected. 【Pressing Effect】 Set the pressing effect of the sub switch currently selected. There are two effects available for selection:【None】and【Highlight】.

3.3.18.5【Operation】

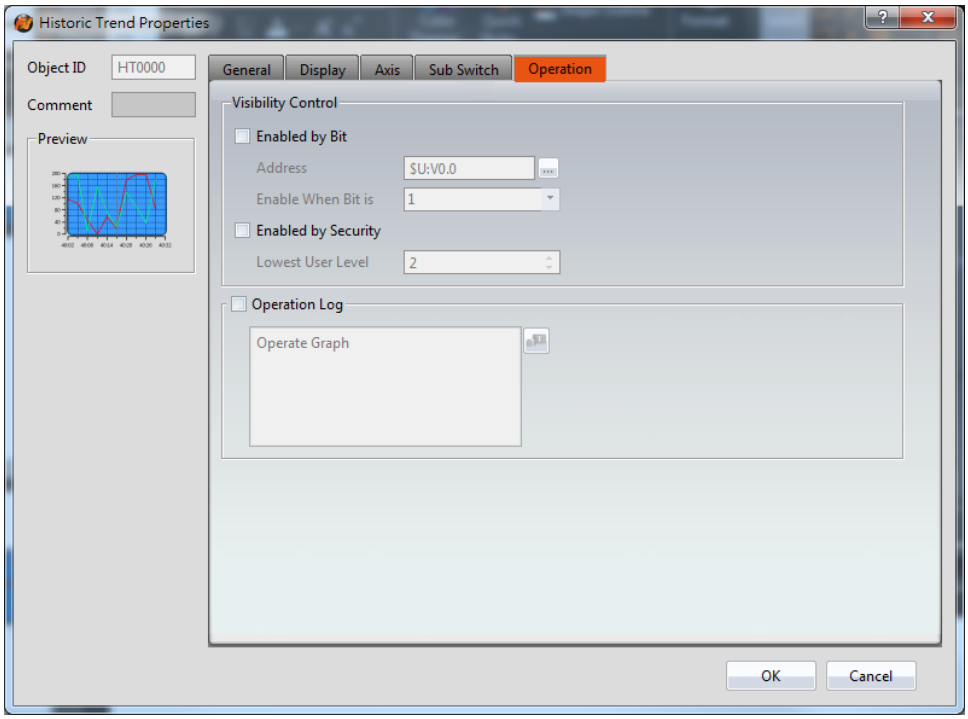


Figure 137 【Operation】Setting Screen of【Historic Trend】

Table 96 【Operation】Setting Properties of【Historic Trend】

Property	Description
【Visibility Control】	Visibility control of the object can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be

	inputted directly or acquired from the【Text Library】.

3.3.19 【Historic XY Scatter】

【Historic XY Scatter】is a curve object used to read the【Recording Buffer】data of the【Data Log】, in which the X/Y values are both data captured by the【Data Log】. Its main functions are as follows:

- View the Recording Buffer data of the【Data Log】.
- Pause or start updating the data of the【Data Log】through the【Sub Switch】and clear the displayed data.

Introduction to the property setting dialog box are as follows:

3.3.19.1 【General】

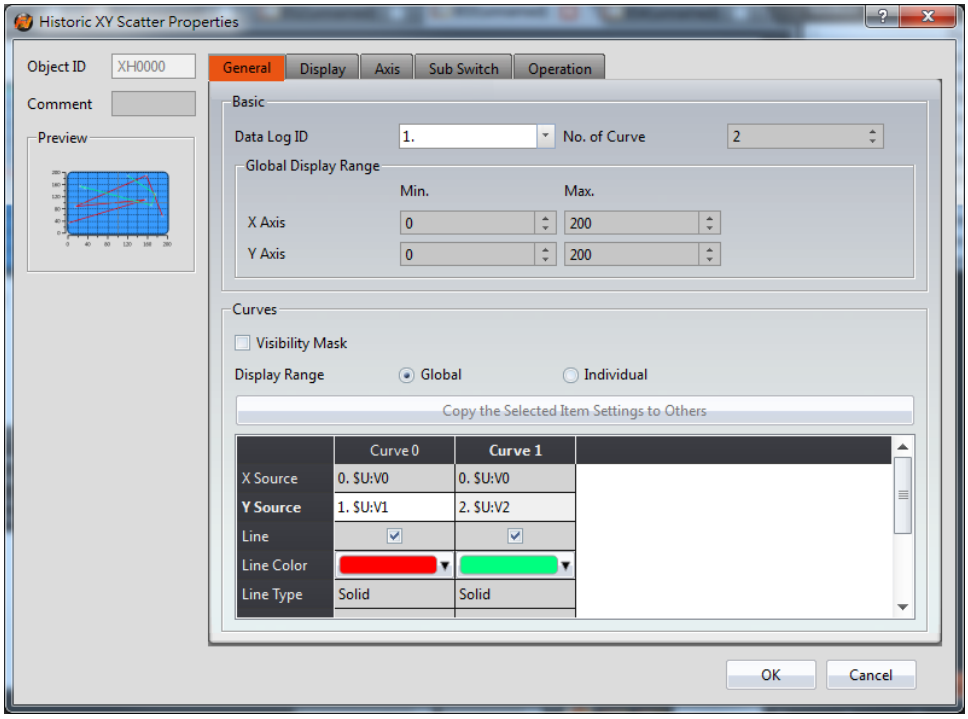


Figure 138 【General】 Setting Screen of 【Historic XY Scatter】

Table 97 【General】 Setting Screen of 【Historic XY Scatter】

Property	Description
【Preview】	Preview the appearance of this object.
【Basic】	【Data Log ID】 Set the ID of the Data Log group to display.

	【No. of Curve】 Set the number of curves.
【Global Display Range】	Set the range that can be displayed. 【Max】 Set the maximum Global Range value for the X-axis/Y-axis. 【Min】 Set the minimum Global Range value for the X-axis/Y-axis. Note: The【Global Display Range】represents the range that can be displayed. If【Max】is 100 and【Min】is 0, data exceeding this range will not be able to be displayed.
【Curves】	【Visibility Mask】 Select whether to use visibility mask to control the visibility of the each curve. While selecting, use should assign the 32bit UINT register as the mask, in which the 0 bit control the display of the curve 0, and so on. 【Display Range】 Set the display mode for the display range of the curve. It is usually one of the two following types: ➢ 【Global】 The display ranges of all the curves are identical to the 【Global Display Range】. ➢ 【Individual】 The display range of all the curves can be different from the 【Global Display Range】. Explanation: When to set【Display Range】as【Individual】-When the value ranges of several curves are different, for example when the X and Y value range of curve a is 0~10, and the X and Y value range of curve b is 0~1000, it can be discovered that the degree of changes for curve a will be difficult to observe if the two curves are placed in the same figure. This is when【Display Range】can be set as【Individual】and the display range of each curve can be defined; the system will automatically zoom the value of the curves according to the value in【Global Display Range】. Take this case for example: if the X-axis【Global Display Range】value is 0~100 and the Y-axis【Global Display Range】value is 0-50, when the value of curve a is (5, 5), the system will zoom it to (50, 25). When the value of curve b is (500, 100), the system will also zoom it into (50, 5) and so on. The statements of curve properties in the table are as

	below: 【X/Y Source】 Set the source for the X/Y value of the curve; the selection of the source depends on the setting of the【Data Logger】. 【X/Y Max】 Set the maximum Individual Display Range value for theX/ Y value of the curve. 【X/Y Min】 Set the minimum Individual Display Range value for the X/Y value of the curve. 【Line】 Select whether to display the curve line. 【Line Color】 Set the line color of the curve. 【Line Type】 Set the line type of curve. 【Symbol】 Select whether to display the curve symbols. 【Symbol Color】 Set the color of the symbols. 【Symbol Type】 Set the symbol type.

3.3.19.2【Display】

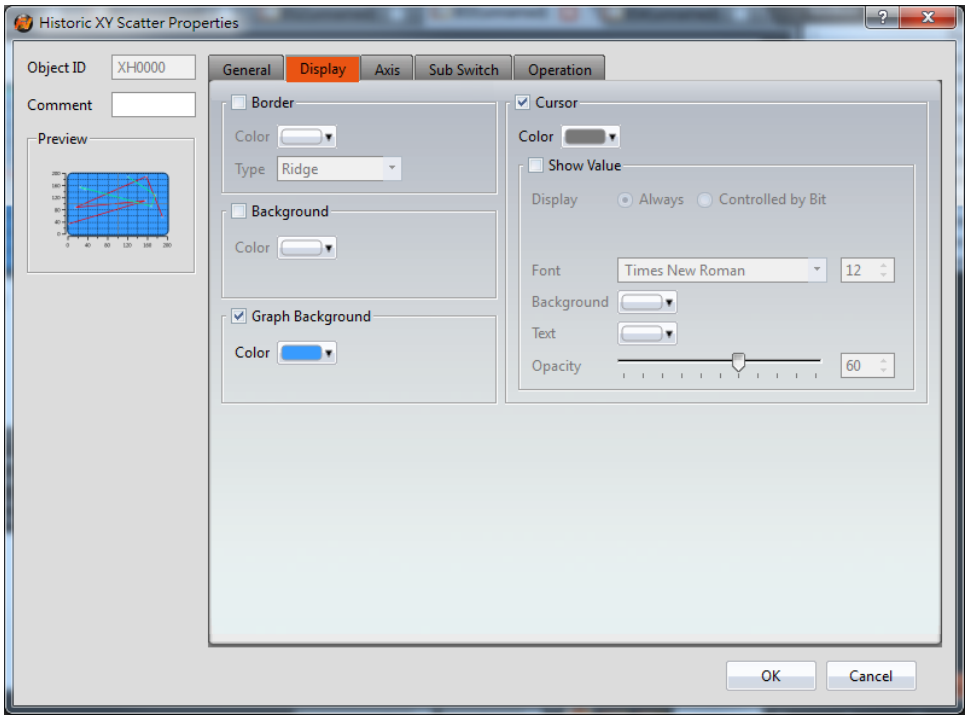


Figure 139 【Display】 Setting Screen of 【Historic XY Scatter】

Table 98 【Display】 Setting Properties of 【Historic XY Scatter】

Property	Description
【Border】	Select whether to display the border. 【Color】 Set the color of the border. 【Type】 Set the border type.
【Background】	Select whether to display the background. 【Color】 Set the color of the background.
【Graph Background】	Select whether to display the graph background. 【Color】 Set the color of the graph background.
【Cursor】	Select whether to display the cursor. 【Color】 Set the color of the cursor.
【Cursor】【Show Value】	Select whether to display the cursor value. 【Display】 Set the way of cursor value visibility. If【Always】is set, the cursor value is always shown. If【Controlled by Bit】is selected, the visibility of cursor value depends on a certain

	bit. 【Font】 Set the font type and size of cursor value. 【Background】 Set the background color of the cursor value. 【Text】 Set the text color of the cursor value. 【Opacity】 Set the background opacity of the cursor value.

3.3.19.3 【Axis】

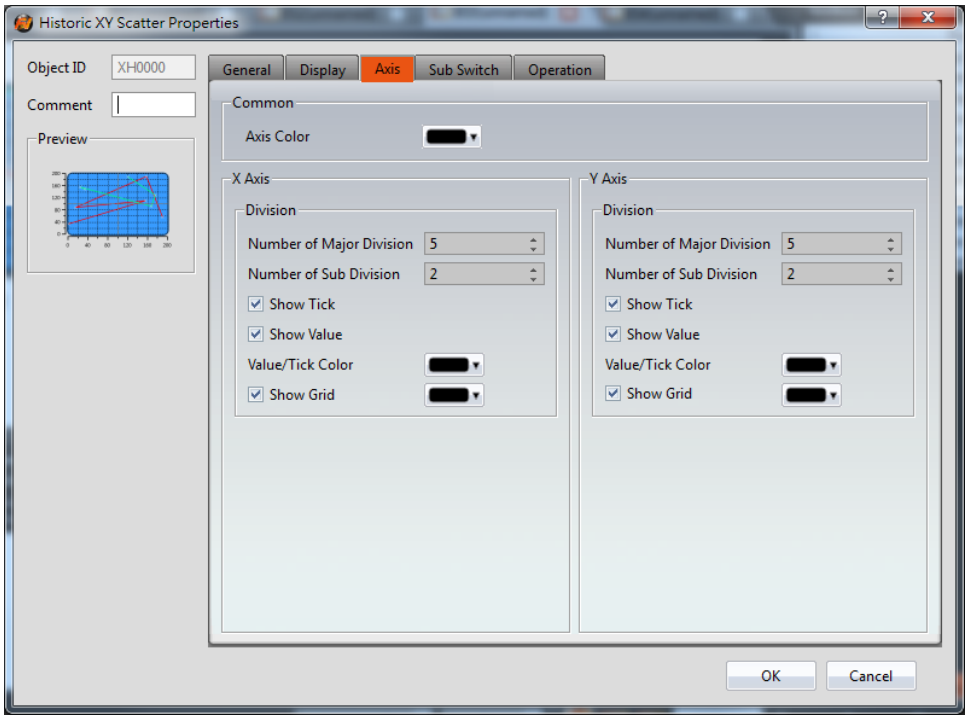


Figure 140 【Axis】 Setting Screen of 【Historic XY Scatter】

Table 99 【Axis】 Setting Properties of 【Historic XY Scatter】

Property	Description
【Common】	【Axis Color】 Set the color of the axis.
【X-axis】【Division】	【Number of Major Division】 Set the number of major divisions for the X-axis.

	【Number of Sub Division】 Set the number of sub divisions for the X-axis. 【Show Tick】 Select whether to display the tick. 【Show Value】 Select whether to display the value on the X-axis. 【Value/Tick Color】 Set the colors of the value and tick. 【Show Grid】 Select whether to display vertical grids and sets the color of the grids.
【Y-axis】【Division】	【Number of Major Division】 Set the number of major divisions for the Y-axis. 【Number of Sub Division】 Set the number of sub divisions for the Y-axis. 【Show Tick】 Select whether to display the tick on the Y-axis. 【Show Value】 Select whether to display the value on the Y-axis. 【Value/Tick Color】 Set the colors of the value and tick. 【Show Grid】 Select whether to display horizontal grids, and sets the color of the grids.

3.3.19.4【Sub Switch】

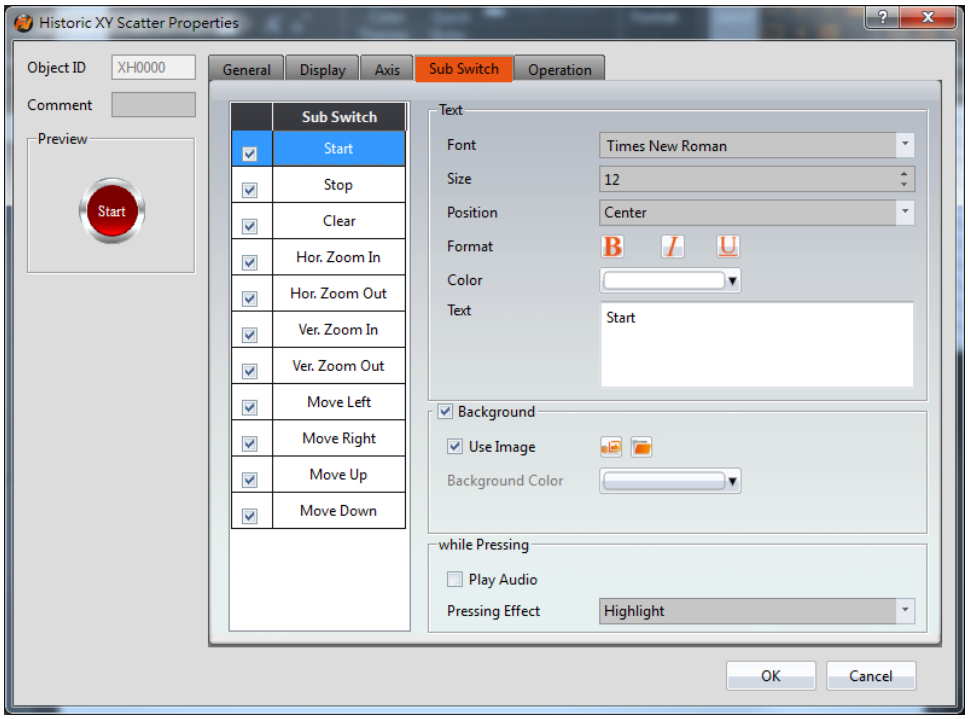


Figure 141 【Sub Switch】Setting Screen of【Historic XY Scatter】

Table 100 【Sub Switch】Setting Properties of【Historic XY Scatter】

Property	Description
【Sub Switch List】	【Sub Switch List】that can be selected for Alarm Display. Sub switches can be enabled after selecting them. Setting options for the appearance of the selected sub switches will also appear on the right. When different sub switches are selected from the list, the setting contents of the appearance setting items to the right will be updated according to the sub switches selected. In which the【Sub Switches】are divided into: ➢ 【Start】—Start updating curve and displays the data captured by 【Data Log】on the curve. ➢ 【Stop】—Stop updating curve, which is stop updating the data captured by【Data Log】. ➢ 【Clear】—Clear the curve, but the data recorded in【Data Log】will be preserved. ➢ 【Hor. Zoom In】—Horizontal zoom in. ➢ 【Hor. Zoom Out】—Horizontal zoom out. ➢ 【Ver. Zoom In】—Vertical zoom in.

	➢ 【Ver. Zoom Out】—Vertical zoom out. ➢ 【Move Left】—Move Left. ➢ 【Move Right】—Move Right. ➢ 【Move Up】—Move Up.
【Text】	【Font】 Set the displayed text font of the sub switch currently selected. 【Size】 Set the displayed text size of the sub switch currently selected. 【Position】 Set the displayed text position of the sub switch currently selected. 【Format】 Set the displayed text format of the sub switch currently selected, including Bold, Italics and Underline. 【Color】 Set the displayed text color of the sub switch currently selected. 【Text】 Set the displayed text of the sub switch currently selected.
【Background】	Set the background of the sub switch currently selected. Check it to activate background settings, and the displayed background of the sub switch currently selected can be edited below. If this option is not checked, the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the sub switch currently selected. When this option is checked, an image selection setting item will appear asking the user to select an image either from the【Image Library】or from a file. 【Background Color】 Set the displayed background color of the sub switch

	currently selected. This setting item will appear if 【Use Image】was not selected.
【while Pressing】	【Play Audio】 Select whether to play audio when the sub switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected. 【Pressing Effect】 Set the pressing effect of the sub switch currently selected. There are two effects available for selection:【None】and【Highlight】.

3.3.19.5【Operation】

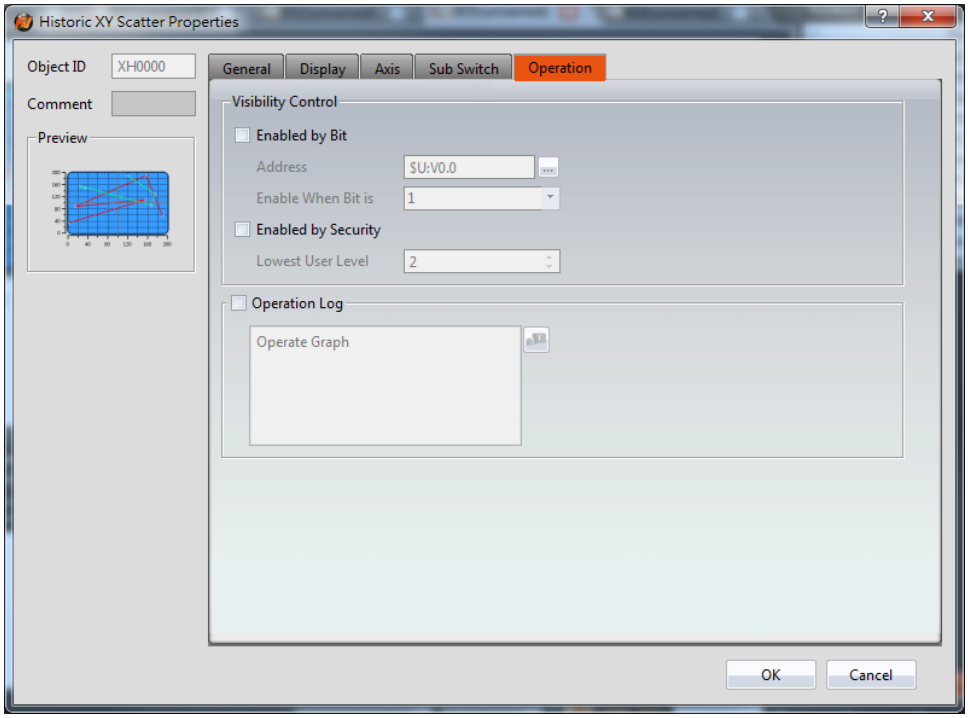


Figure 142 【Operation】Setting Screen of【Historic XY Scatter】

Table 101 【Operation】Setting Properties of【Historic XY Scatter】

Property	Description
【Visibility Control】	Visibility control of the object can be controlled by a specific Bit or User Level.

	【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Log】	Select whether to enable the 【Operation Log】 of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the Text Library.

3.3.20 【Historic Data Table】

【Historic Data Table】is a table object used the read the Recording Buffer data of the 【Data Log】. Its main functions are as follows:

- View the Recording Buffer data of the【Data Log】.
- Pause or start updating the data of the【Data Log】through the【Sub Switch】, and clear the displayed data.

Introduction to the property setting dialog is as follows:

3.3.20.1 【General】

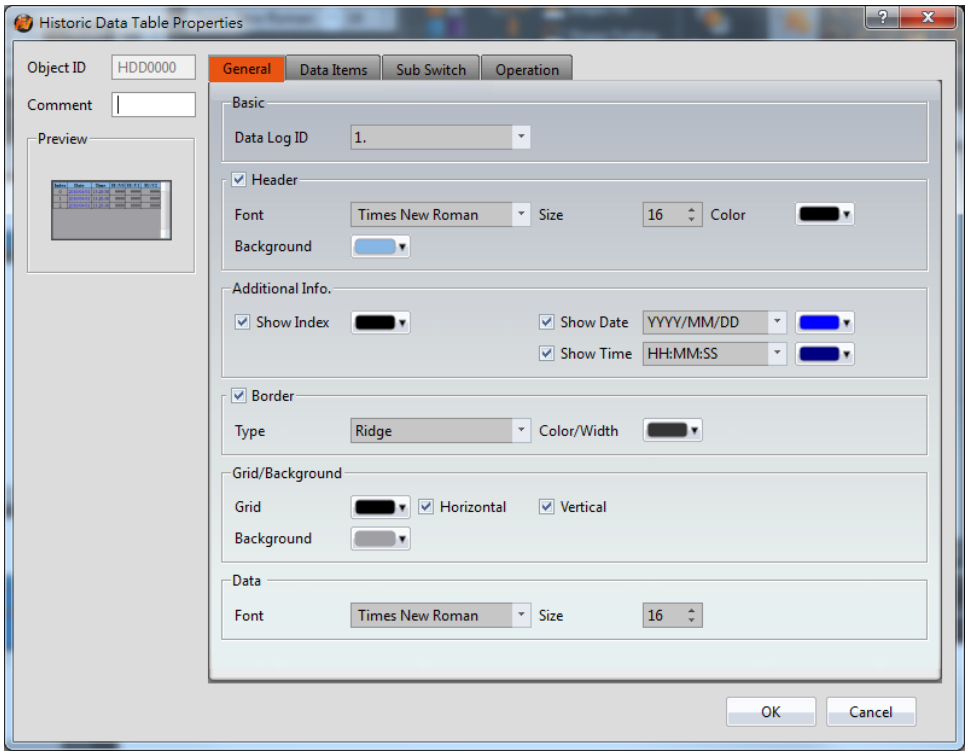


Figure 143 【General】Setting Screen of【Historic Data Table】

Table 102 【General】Setting Properties of【Historic Data Table】

Property	Description
【Preview】	Preview the appearance of this object.
【Basic】	【Data Log ID】 Set the ID of the Data Log group to display.
【Header】	Select whether to display the header. 【Font】 Set the font of the header. 【Size】 Set the size of the header. 【Color】 Set the color of the header. 【Background】 Set the background color of the header.
【Additional Information】	【Show Index】 Select whether to display the index, and set its display color. 【Show Date】

	Select whether to display the date, and set its display color the format. 【Show Time】 Select whether to display the time, and set its display color and format.
【Border】	Select whether to display the border. 【Type】 Set the border type. 【Color】 Set the color of the border.
【Grid/Background】	【Grid】 Set the color of the grid. 【Horizontal】 Select whether to display horizontal grids. 【Vertical】 Select whether to display Vertical grids. 【Background】 Set the color of the background.
【Data】	【Font】 Set the font of the data. 【Size】 Set the font size of the data.

3.3.20.2【Data Items】

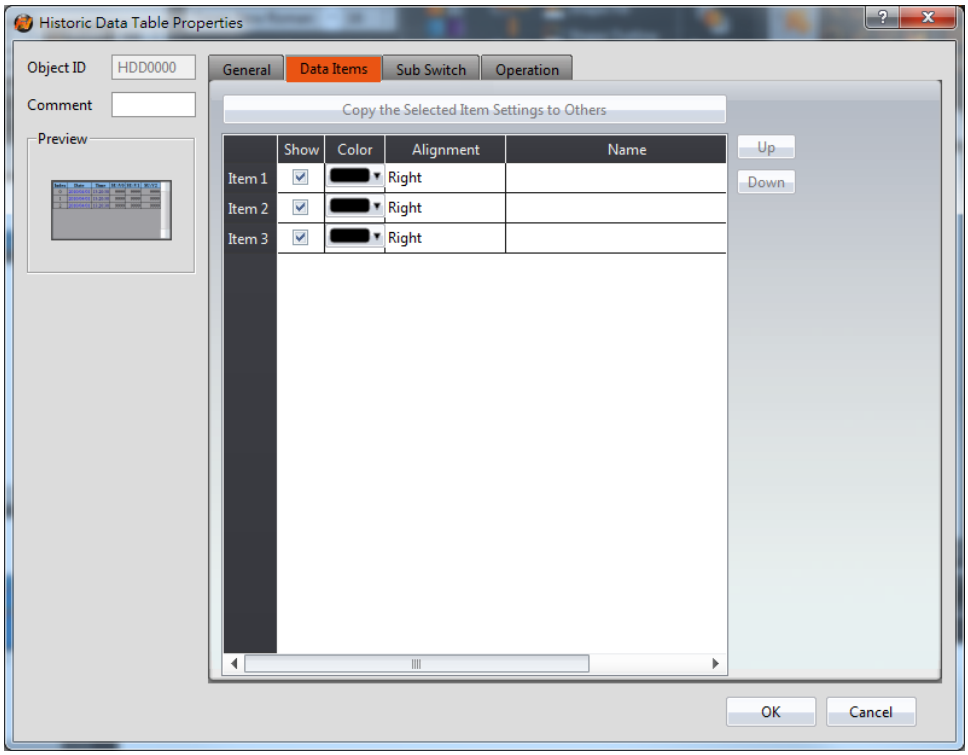


Figure 144 【Data Items】Setting Screen of【Historic Data Table】

Table 103 【Data Items】Setting Properties of【Historic Data Table】

Property	Description
【Data Items】	【Copy the Selected Item Settings to Others】 This button will be enabled when an entire row is selected. Users can use this button to copy the setting value of the selected item into other items. This simplifies the setting process for the user and further increases setting efficiency. 【Up】 This button will be enabled when an entire row is selected; users can use this button to change the order of the item. 【Down】 This button will be enabled when an entire row is selected; users can use this button to change the order of the item. The items within the table are determined by the【Data Log】, in which the item settings include: ➢ 【Display】 Select whether to display this item. ➢ 【Customized】 The display color of the item.

	➢ 【Alignment】 The alignment method of the item. ➢ 【Name】 This is only used to view the names set by the【Data Log】and cannot be set. Please go to the setting page of the【Data Log】to change the name of the item.

3.3.20.3 【Sub Switch】

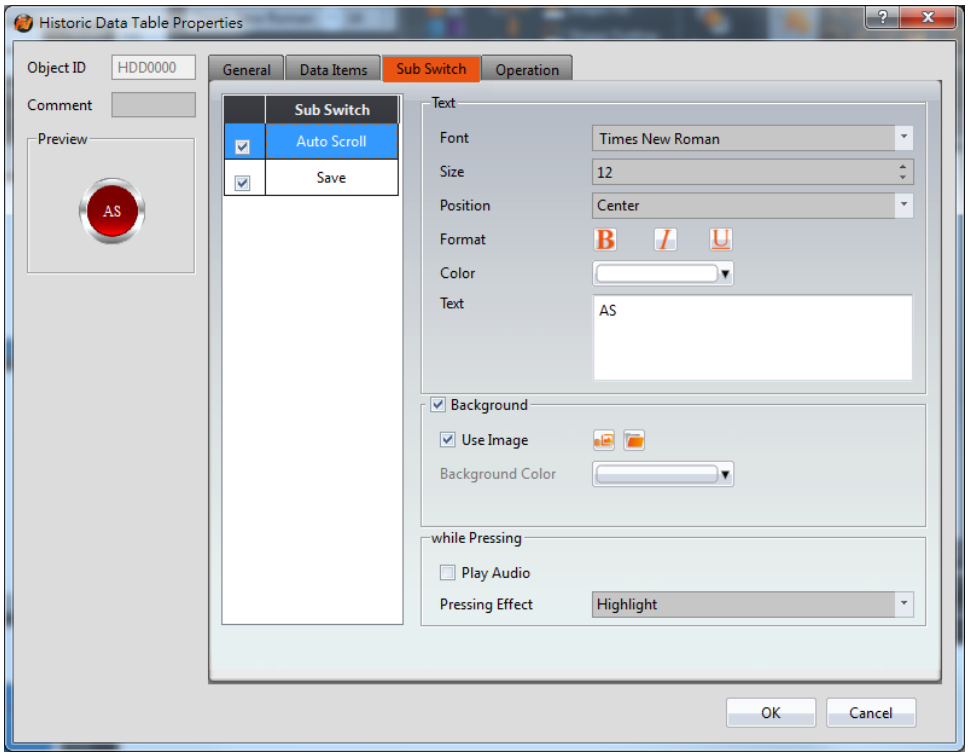


Figure 145 【Sub Switch】Setting Screen of【Historic Data Table】

Table 104 【Sub Switch】Setting Properties of【Historic Data Table】

Property	Description
【Sub Switch List】	【Sub Switch List】that can be selected for【Historic Data Table】. Sub switches can be enabled after selecting them; setting options for the appearance of the selected sub switches will also appear on the right. When different sub switches are selected from the list, the setting contents of the appearance setting items to the right will be updated according to the sub switches selected. In which the【Sub Switches】are divided into:

	➢ 【Auto Scroll】- Auto Scroll ON/OFF; this is an inverted switch. When new data is updated to the 【Historic Data Table】, if the Auto Scroll switch is ON, the table will automatically scroll to the location of the newest data, otherwise the table will not scroll automatically. ➢ 【Save】- Save all data in 【Data Log】. And the saving way depends on the settings of 【Data Log】.
【Text】	【Font】 Set the displayed text font of the sub switch currently selected. 【Size】 Set the displayed text size of the sub switch currently selected. 【Position】 Set the displayed text position of the sub switch currently selected. 【Format】 Set the displayed text format of the sub switch currently selected, including Bold, Italics and Underline. 【Color】 Set the displayed text color of the sub switch currently selected. 【Text】 Set the displayed text of the sub switch currently selected.
【Background】	Set the background of the sub switch currently selected. Check it to activate background settings, and the displayed background of the sub switch currently selected can be edited below. If this option is not checked, the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the sub switch currently selected. When this option is checked, an image selection setting item will appear asking the user to select an image either from the 【Image Library】 or from a file.

	【Background Color】 Set the displayed background color of the sub switch currently selected. This setting item will appear if 【Use Image】was not selected.
【while Pressing】	【Play Audio】 Select whether to play audio when the sub switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected. 【Pressing Effect】 Set the pressing effect of the sub switch currently selected. There are two effects available for selection:【None】and【Highlight】.

3.3.20.4【Operation】

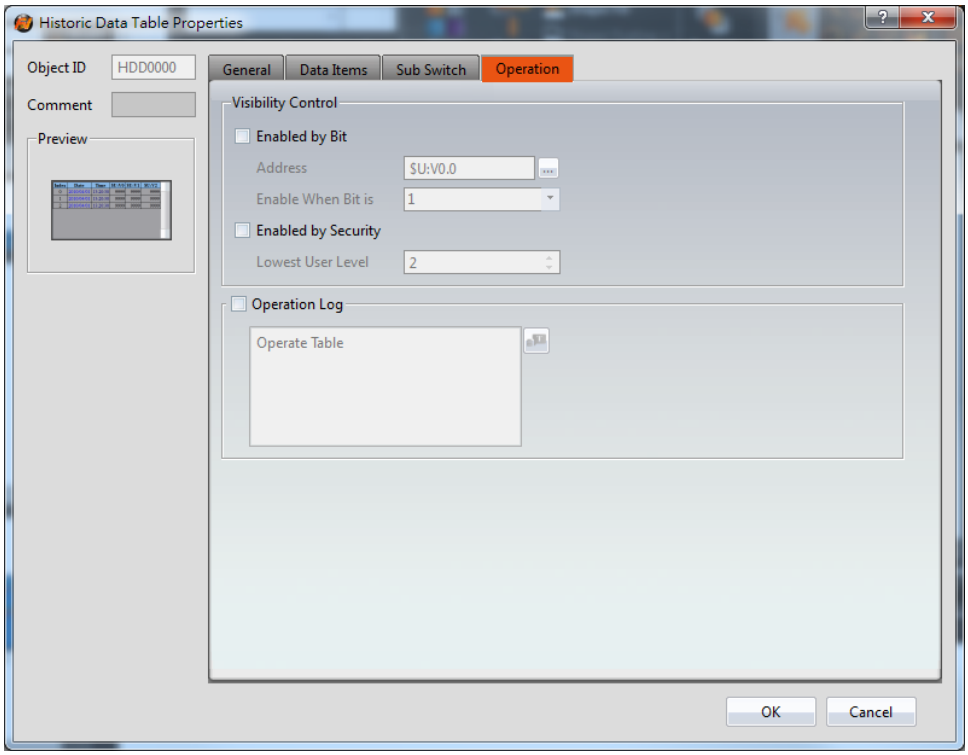


Figure 146 【Operation】Setting Screen of【Historic Data Table】

Table 105 【Operation】Setting Properties of【Historic Data Table】

Property	Description
【Visibility Control】	Visibility control of the object can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be

	inputted directly or acquired from the【Text Library】.

3.3.21 【Alarm Display】

【Alarm Display】is used to display the status of alarms that occurred during project execution. It can notify the operator of alarm related contents including alarm messages, levels occurrences, acknowledgement and recovery time etc.

3.3.21.1 【Setting】

The【Alarm Display】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

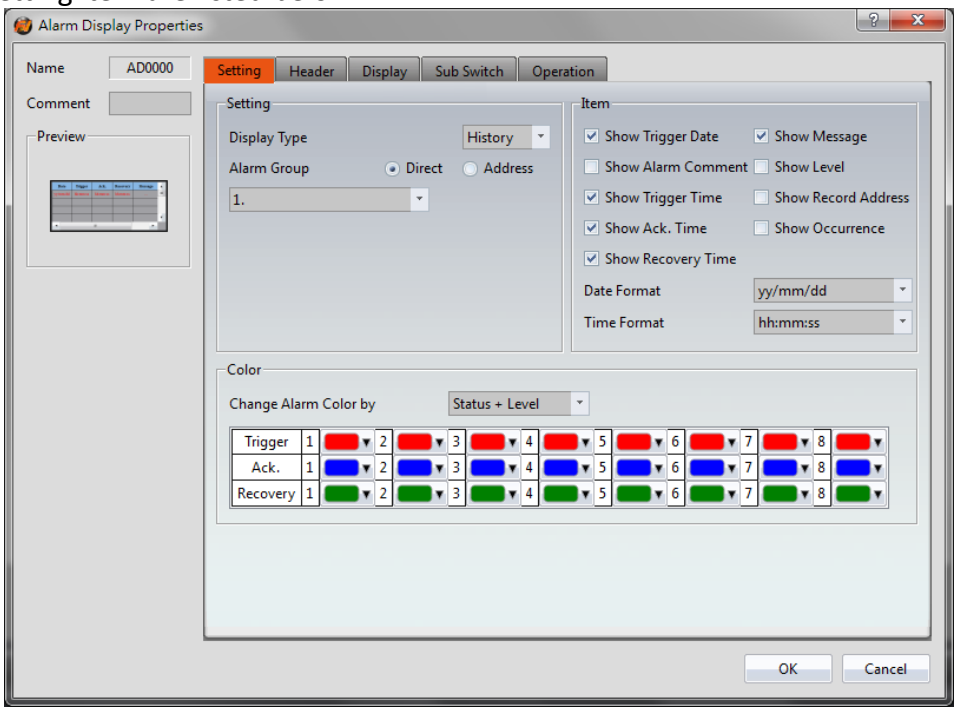


Figure 147 【Setting】Screen of【Alarm Display】

Table 106 【Setting】Properties of【Alarm Display】

Property	Description
【Preview】	Preview the appearance of this object.
【Setting】	【Display Type】 Set the display type of the Alarm Display. When【History】is selected, the Alarm Display will give a complete display of alarm related messages. When【Log】is selected, the Alarm Display will display the various changes of alarm state entry by entry. When【Active】is selected, the Alarm Display will only display alarms that have not yet recovered.

	【Alarm Group】 Set the displayed Alarm Group of the Alarm Display. If option 【Direct】 is selected, the Alarm Display will only display the alarm groups set below; if option 【Address】 is selected, the alarm group displayed by Alarm Display will be determined by the numeric value of the address set below.
【Item】	Set the display contents of the Alarm Display. 【Show Trigger Date】 Set whether to allow Alarm Display to display the trigger date. 【Show Alarm Comment】 Set whether to allow Alarm Display to display the alarm comment. 【Show Trigger Time】 Set whether to allow Alarm Display to display the trigger time. 【Show Ack. Time】 Set whether to allow Alarm Display to display the alarm acknowledgement time. 【Show Recovery Time】 Set whether to allow Alarm Display to display the alarm recovery time. 【Show Message】 Set whether to allow Alarm Display to display the alarm message. 【Show Level】 Set whether to allow Alarm Display to display the alarm level. 【Show Record Address】 Set whether to allow Alarm Display to display the saved numeric value of the alarm record address. 【Show Occurrence】 Set whether to allow Alarm Display to display the alarm occurrences.

	【Date Format】 This option will appear if【Show Trigger Date】is selected. It can be used to select the display format of the date for the Alarm Display. 【Time Format】 This option will appear if【Show Trigger Time】,【Show Ack. Time】or【Show Recovery Time】is selected. It can be used to select the display format of the time for the Alarm Display.
【Color】	【Change Alarm Color by】 Set the condition for the displayed color change of the Alarm Display. When【Status】is selected, the Alarm Display will determine the display color according to the status of the alarm. When【Level】is selected, the Alarm Display will determine the display color according to the level of the alarm. When【Status + Level】is selected, the Alarm Display will determine the displayed color according to the status and level of the alarm.

3.3.21.2【Header】

The【Alarm Display】【Header】page is as shown in the figure below, the displayed headers of the Alarm Display can be modified in this page.

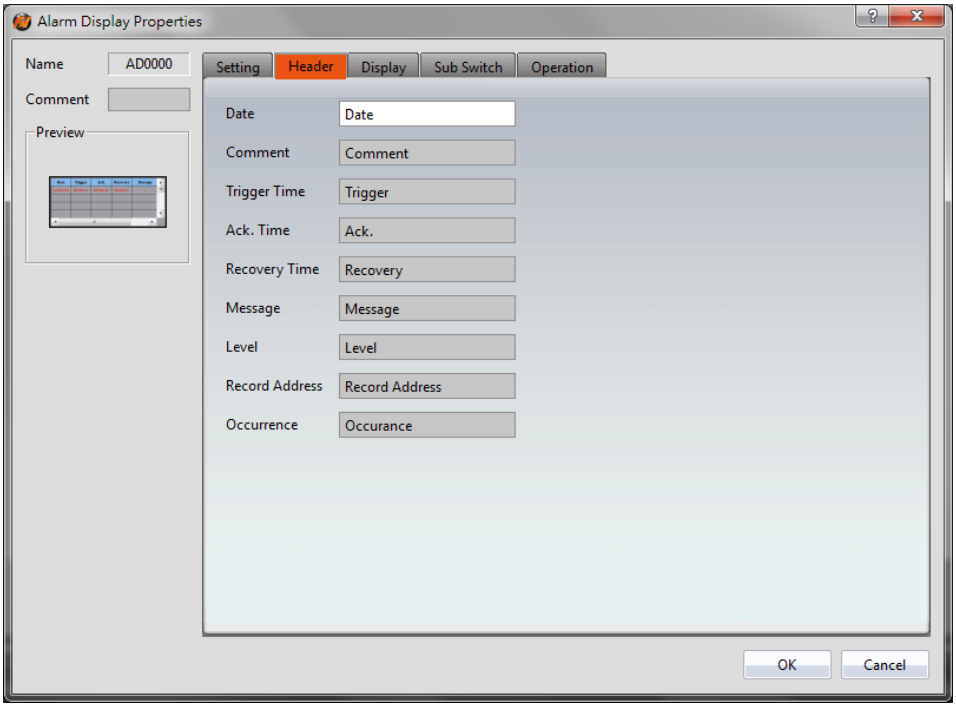


Figure 148 【Display】Setting Screen of【Alarm Display】

3.3.21.3【Display】

The【Alarm Display】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

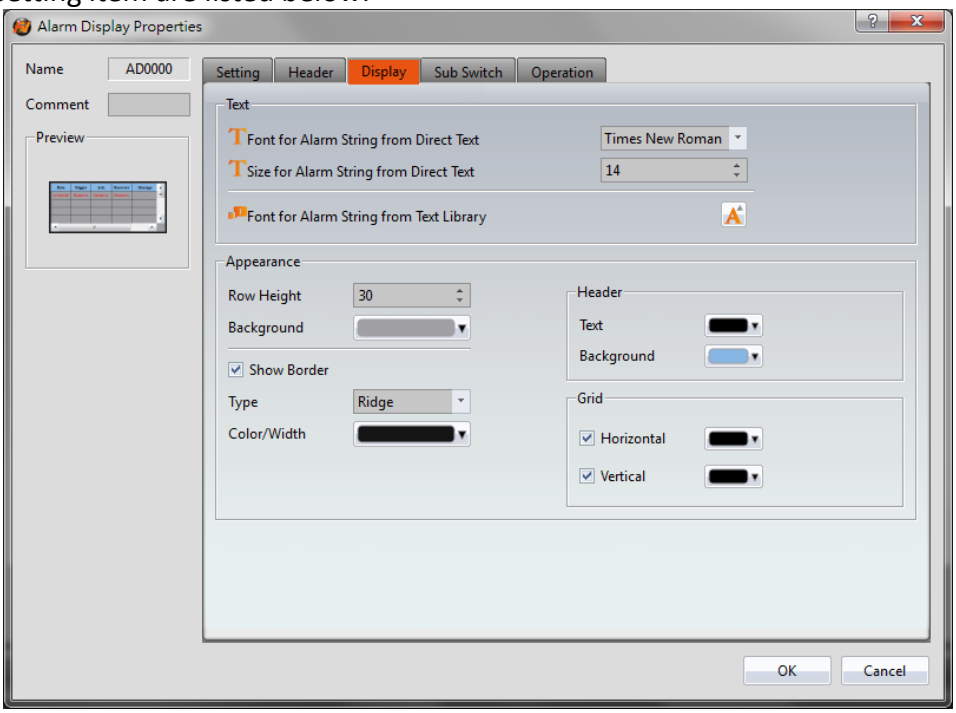


Figure 149 【Display】Setting Screen of【Alarm Display】

Table 107 【Display】Setting Properties of【Alarm Display】

Property	Description
【Text】	【Font for Alarm String from Direct Text】 While the alarm string displayed for the Alarm Display is from direct text, the font of the alarm string can be set here. 【Size for Alarm String from Direct Text】 While the alarm string displayed for the Alarm Display is from direct text, the size of the alarm string can be set here. 【Font for Alarm String from Text Library】 While the alarm string displayed for the Alarm Display is from text library, the font and size of the alarm string can be set here.
【Appearance】	【Row Height】 Set the displayed row height of the Alarm Display. 【Background】 Set the displayed background color of the Alarm Display. 【Show Border】 Check to set whether to display the border. When it is checked, the color, width and type of the border can be set at the bottom. 【Type】 Set the displayed border type of the Alarm Display. 【Border Color/Width】 Set the displayed border color and border thickness of the Alarm Display. 【Header】 Set the displayed header appearance of the Alarm Display. It includes【Text】to set the text color of the header and【Background】to set the background color of the header. 【Grid】 Set whether to display the【Horizontal】and【Vertical】grids of the Alarm Display; if display is selected, the color of the grid can be set below.

3.3.21.4 【Sub Switch】

The【Alarm Display】【Sub Switch】page is as shown in the figure below, the meanings of each setting item are listed below:

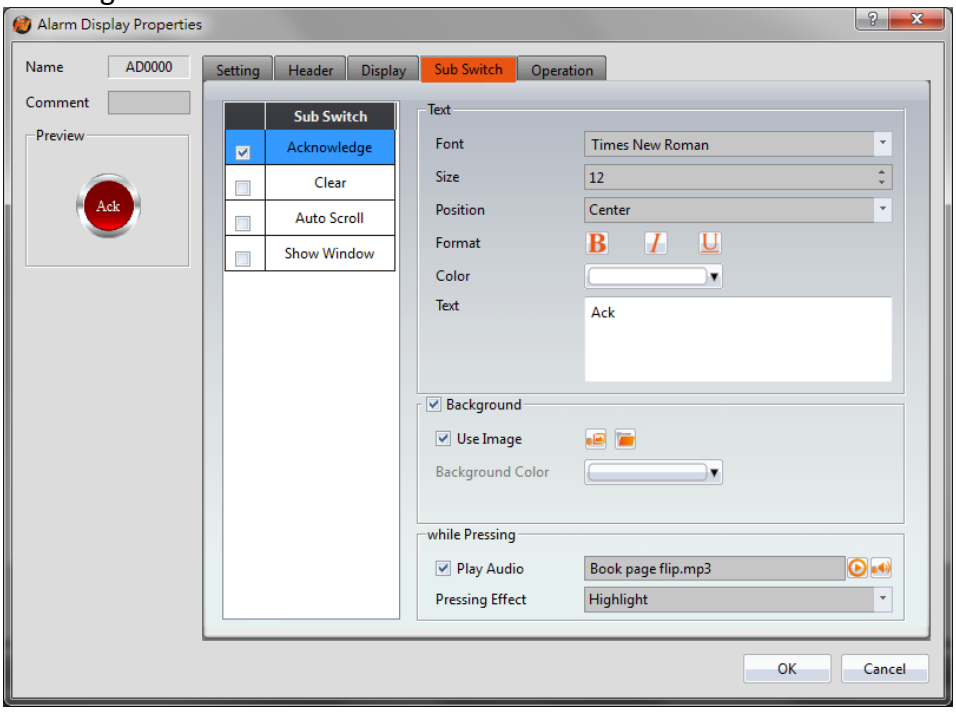


Figure 150 【Sub Switch】Setting Screen of【Alarm Display】

Table 108 【Sub Switch】Setting Properties of【Alarm Display】

Property	Description
【Sub Switch List】	【Sub Switch List】that can be selected for Alarm Display. Sub switches can be enabled after selecting them. Setting options for the appearance of the selected sub switches will also appear on the right. When different sub switches are selected from the list, the setting contents of the appearance setting items to the right will be updated according to the sub switches selected. "Sub Switches" that can be used by Alarm Display includes【Acknowledge】,【Clear】,【Auto Scroll】and【Show Window】; their functions are as follows: 【Acknowledge】 Change the status of the currently selected alarm to acknowledge.

	【Clear】 Clear all alarms displayed on Alarm Display. 【Auto Scroll】 Set whether to enable the auto scroll function. If enabled, when a new alarm occurs, the Alarm Display will automatically scroll to the position of the newest alarm. 【Show Window】 When this switch is pressed, the system will display the 【Window Screen】that corresponds to the currently selected alarm in the【Alarm】setting.
【Text】	【Font】 Set the displayed text font of the sub switch currently selected. 【Size】 Set the displayed text size of the sub switch currently selected. 【Position】 Set the displayed text position of the sub switch currently selected. 【Format】 Set the displayed text format of the sub switch currently selected, including Bold, Italics and Underline. 【Color】 Set the displayed text color of the sub switch currently selected. 【Text】 Set the displayed text of the sub switch currently selected.
【Background】	Set the background of the sub switch currently selected. Check it to activate background settings, and the displayed background of the sub switch currently selected can be edited below. If this option is not checked, the background will be transparent. 【Use Image】

	Set whether to use an image for the displayed background of the sub switch currently selected. When this option is checked, an image selection setting item will appear asking the user to select an image either from the【Image Library】or from a file. 【Background Color】 Set the displayed background color of the sub switch currently selected. This setting item will appear if 【Use Image】was not selected.
【while Pressing】	【Play Audio】 Select whether to play audio when the sub switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected. 【Pressing Effect】 Set the pressing effect of the sub switch currently selected. There are two effects available for selection:【None】and【Highlight】.

3.3.21.5【Operation】

The【Alarm Display】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

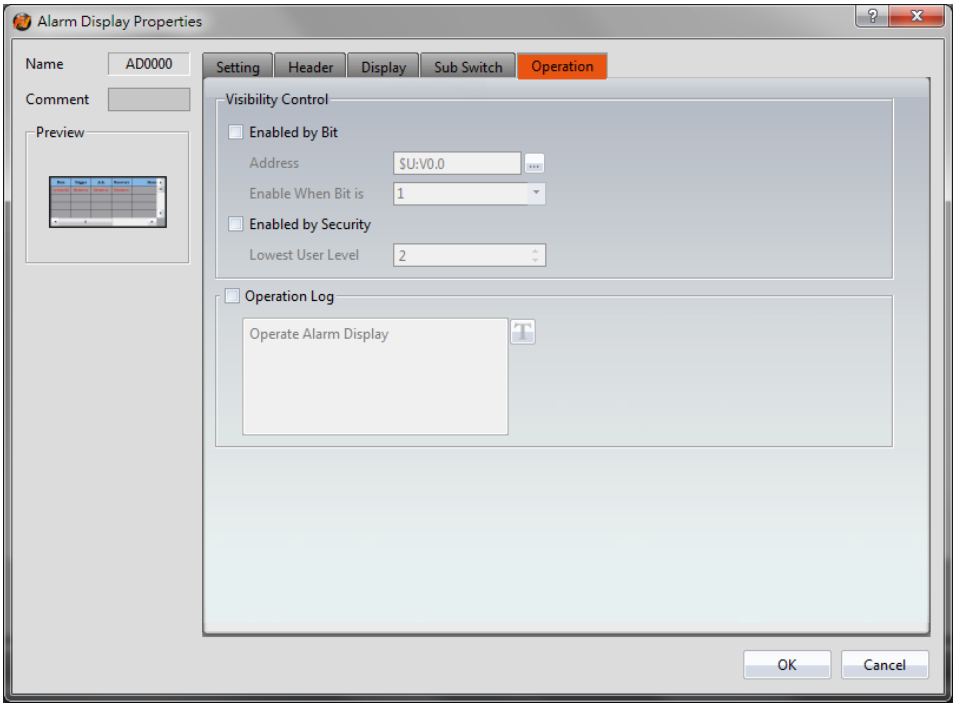


Figure 151 【Operation】Setting Screen of【Alarm Display】

Table 109 【Operation】Setting Properties of【Alarm Display】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can

	be inputted directly or acquired from the Text Library.

3.3.22 【Alarm Scrolling Text】

Alarm Scrolling Text is also used to display alarm states that occurred during project execution. The difference between Alarm Display and Alarm Scrolling Text is that Alarm Scrolling Text uses scrolling text to display the contents of the alarm currently occurring, including alarm messages, level, occurrences, acknowledgement and recovery time etc.

3.3.22.1 【Setting】

The【Alarm Scrolling Text】【Setting】page is as shown in the figure below, the meanings of each setting item are listed below:

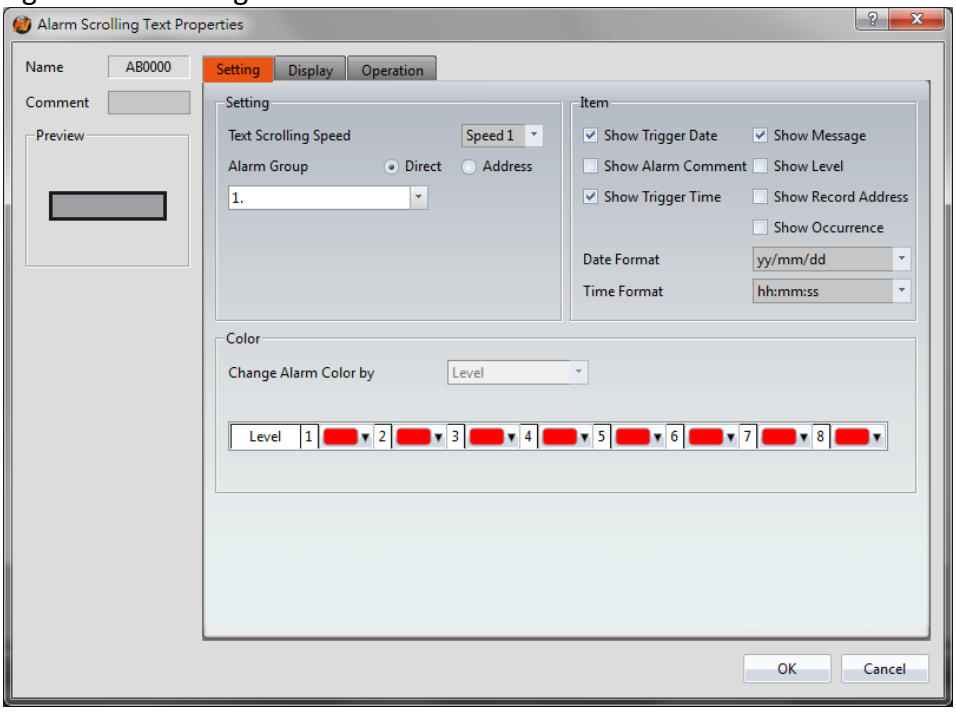


Figure 152 【Setting】Screen of【Alarm Scrolling Text】

Table 110 【Setting】Properties of【Alarm Scrolling Text】

Property	Description
【Preview】	Previews the appearance of this object.
【Setting】	【Text Scrolling Speed】 Set the text scrolling speed of Alarm Scrolling Text. There are four speeds that can be set from slow to fast:【Speed 1】to【Speed 4】. 【Alarm Group】

	Set the displayed Alarm Group of the Alarm Scrolling Text. If option 【Direct】 is selected, the Alarm Scrolling Text will only display the alarm groups set below; if option 【Address】 is selected, the alarm group displayed by Alarm Scrolling Text will be determined by the numeric value of the address set below.
【Item】	Set the display contents of Alarm Scrolling Text. 【Show Trigger Date】 Set whether to allow Alarm Scrolling Text to display the trigger date. 【Show Alarm Comment】 Set whether to allow Alarm Scrolling Text to display the alarm comment. 【Show Trigger Time】 Set whether to allow Alarm Scrolling Text to display the trigger time. 【Show Message】 Set whether to allow Alarm Scrolling Text to display the alarm message. 【Show Level】 Set whether to allow Alarm Scrolling Text to display the alarm level. 【Show Record Address】 Set whether to allow Alarm Scrolling Text to display the saved numeric value of the alarm record address. 【Show Occurrence】 Set whether to allow Alarm Scrolling Text to display the alarm occurrences. 【Date Format】 This option will appear if【Show Trigger Date】is selected. It can be used to select the display format of the date for the Alarm Scrolling Text. 【Time Format】

	This option will appear if【Show Trigger Time】is selected. It can be used to select the display format of the time for the Alarm Scrolling Text.
【Color】	【Change Alarm Color by】 Set the condition for the displayed color change of the Alarm Scrolling Text. The Alarm Scrolling Text will determine the display color according to the level of the alarm.

3.3.22.2 【Display】

The【Alarm Scrolling Text】【Display】page is as shown in the figure below, the meanings of each setting item are listed below:

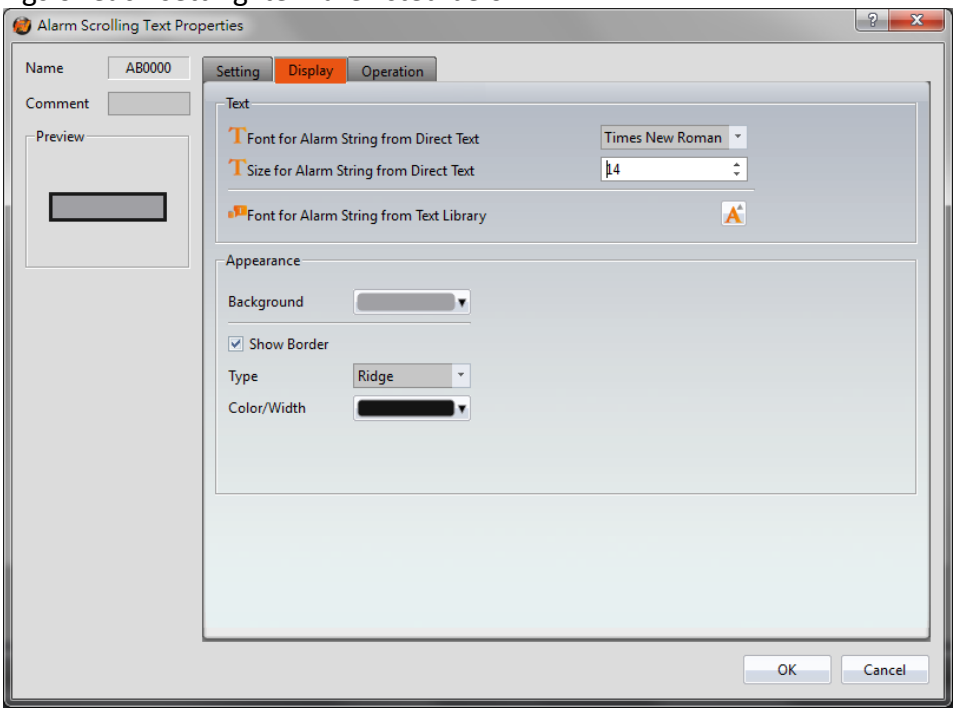


Figure 153 【Display】Setting Screen of【Alarm Scrolling Text】

Table 111 【Display】Setting Properties of【Alarm Scrolling Text】

Property	Description
【Text】	【Font for Alarm String from Direct Text】 While the alarm string displayed for the Alarm Scrolling Text is from direct text, the font of the alarm string can be set here. 【Size for Alarm String from Direct Text】 While the alarm string displayed for the Alarm Scrolling Text is from direct text, the size of the alarm string can be set here. 【Font for Alarm String from Text Library】

	While the alarm string displayed for the Alarm Scrolling Text is from text library, the font and size of the alarm string can be set here.
【Appearance】	【Background】 Set the displayed background color of the Alarm Scrolling Text. 【Show Border】 Check to set whether to display the border. When it is checked, the color, width and type of the border can be set at the bottom. 【Type】 Set the displayed border type of the Alarm Scrolling Text. 【Border Color/Width】 Set the displayed border color and border thickness of the Alarm Scrolling Text.

3.3.22.3 【Operation】

The【Alarm Scrolling Text】【Operation】page is as shown in the figure below, the meanings of each setting item are listed below:

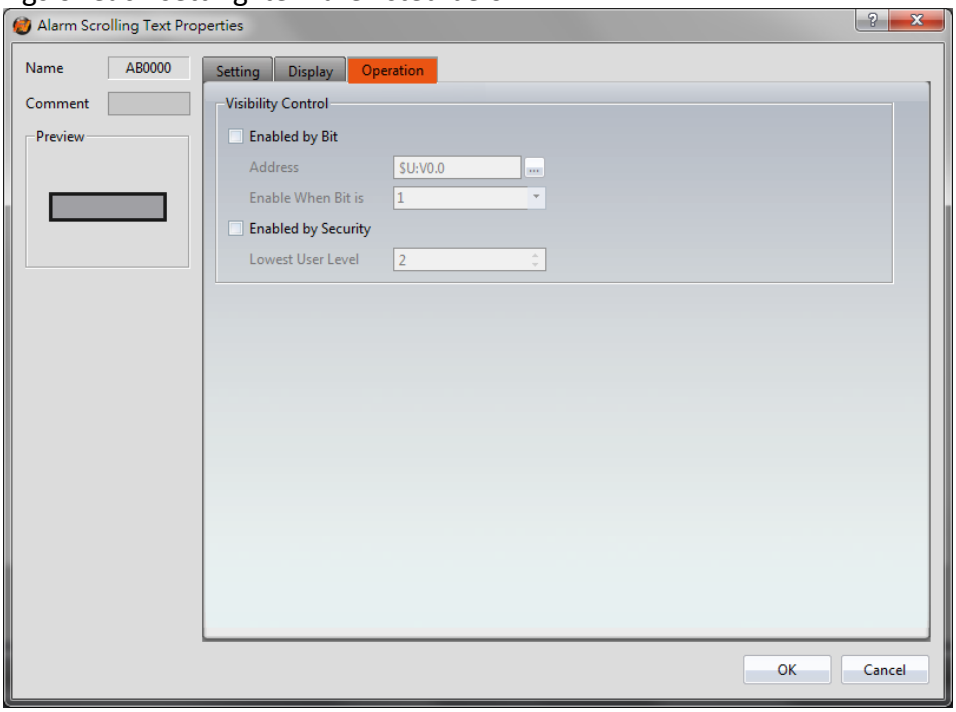


Figure 154 【Operation】Setting Screen of【Alarm Scrolling Text】

Table 112 【Operation】Setting Properties of【Alarm Scrolling Text】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.

3.3.23 【Recipe Selector】

【Recipe Selector】allows user to select a specific recipe in a recipe group during execution. Please refer to **Chapter 8–【Recipe】** for functions related to recipe function.
Introduction to the property setting dialog is as follows:

3.3.23.1 【General】

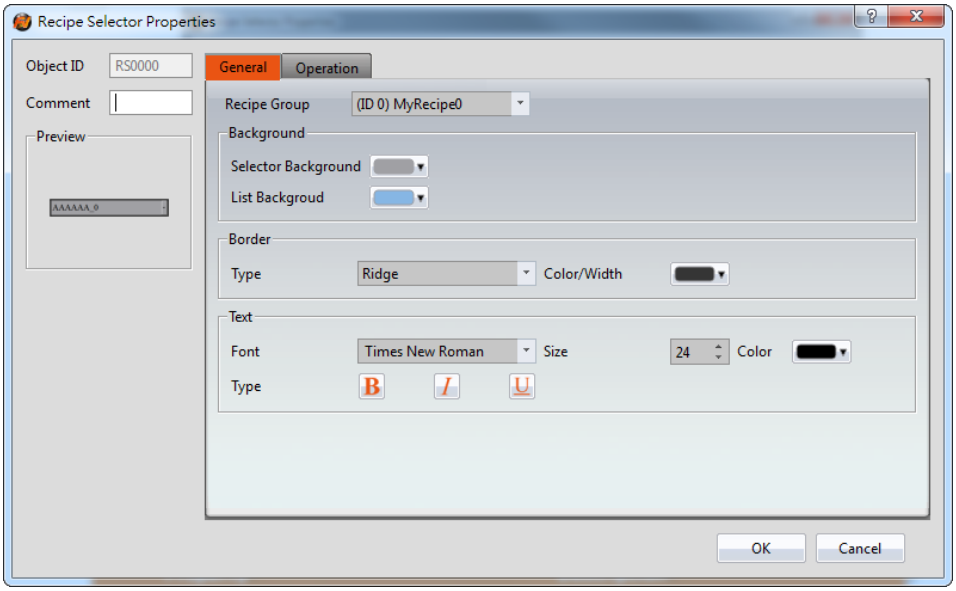


Figure 155 【General】Setting Page of【Recipe Selector】

Table 113 【General】Setting Properties of【Recipe Selector】

Property	Description
【Comment】	Comment concerning this object.
【Preview】	Preview the appearance of this object.
【Recipe Group】	If the user adds a new recipe group in the recipe setting function, the ID and name of the recipe group will be displayed here. The user must select a recipe group before the【OK】button is pressed.
【Background】	【Selector Background】 Set the background color of the selector. 【List Background】 Set the background color of the drop-down list.
【Border】	【Type】 Set the border type. 【Color】 Set the border color.
【Text】	【Font】 Set the text font. 【Size】 Set the text font size.

	【Color】 Set the text color. 【Type】 Determine whether to use Bold, Italic and Underline for the text.

3.3.23.2【Operation】

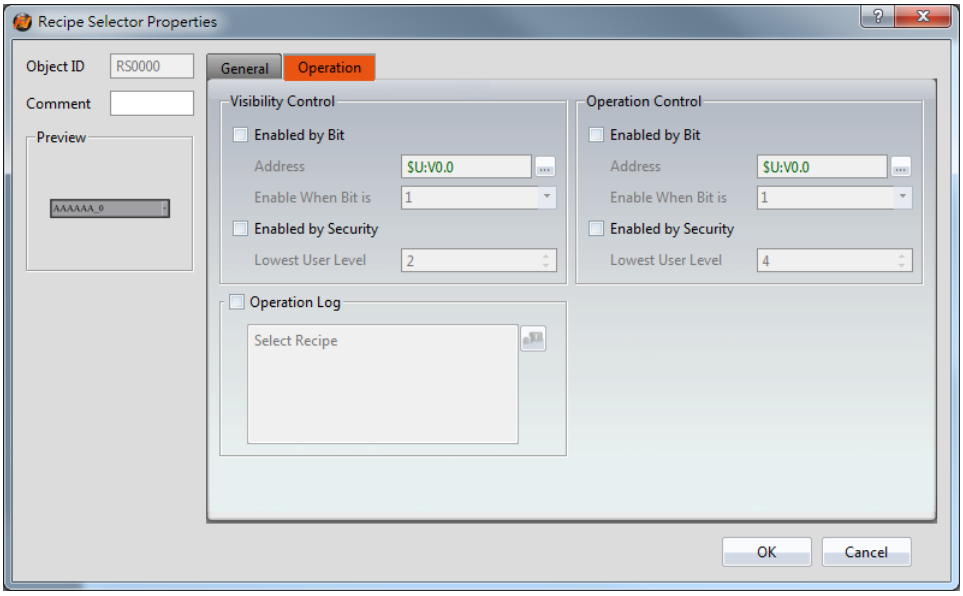


Figure 156 【Operation】Setting Page of【Recipe Selector】

Table 114 【Operation】Setting Properties of【Recipe Selector】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific bit or user level. 【Enable by Bit】 Select whether to control visibility by a specific bit. 【Address】 Set the address of the visibility control bit. 【Enable When Bit is】 Set whether to display the object when the control bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in.

	【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Log】	Select whether to enable the【Operation Logger】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the【Text Library】.
【Operation Control】	Operation control of the object, which can be controlled by a specific bit or user level. 【Enable by Bit】 Select whether to control operation by a specific bit. 【Address】 Set the address of the operation control bit. 【Enable When Bit is】 Set whether to operate the object when the control bit is 1 or 0. 【Enabled by Security Manager】 Select whether operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.

3.3.24 【Recipe Table】

【Recipe Table】is used to read the recipe group data set in the【Recipe】function. Users can also dynamically change the data in the recipe table during execution. Please refer to **Chapter 8–【Recipe】** for functions related to recipe function. Recipe Table has the following functions:

- To view the complete data of recipe group please select【Show All】or just 【Only Show Current Recipe】.
- Use the【Sub Switch】to load or save the recipe group file.

Introduction to the property setting dialog is as follows:

3.3.24.1 【General】

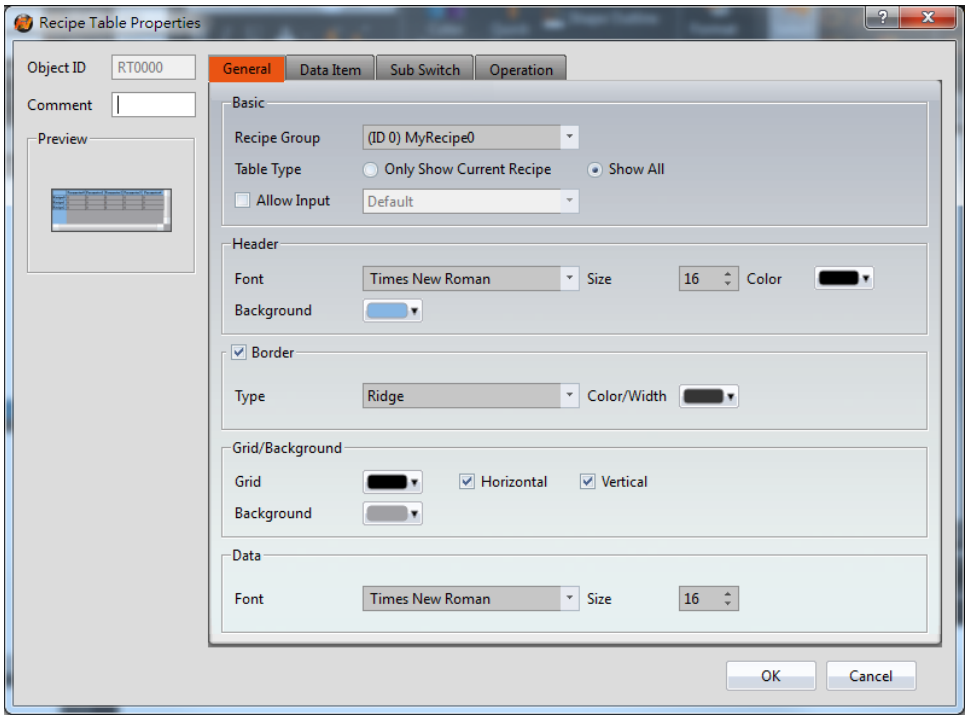


Figure 157 【General】Setting Page of【Recipe Table】

Table 115 【General】Setting Properties of【Recipe Table】

Property	Description
【Comment】	Comment concerning this object.
【Preview】	Preview the appearance of this object.
【Basic】	【Recipe Group】 If the user adds a new recipe group in the recipe setting function, the ID and name of the recipe group will be displayed here. The user must select a recipe group before the【OK】button is pressed. 【Table Type】 If【Only Show Current Recipe】is selected, the current recipe will be displayed according to the【Control Address of Recipe No.】 in the recipe setting. If【Show All】is selected, all contents of the recipe group will be displayed. 【Allow Input】 The user will be able to dynamically change the parameter contents and the recipe names in the recipe table during execution if this option is selected.

【Header】	【Font】 Set the header font. 【Size】 Set the header font size. 【Color】 Set the header font color. 【Background】 Set the header background color.
【Border】	【Type】 Set the border type. 【Color】 Set the border color.
【Grid/Background】	【Grid】 Set the grid line color. 【Horizontal】 Select whether to display the horizontal grid line. 【Vertical】 Select whether to display the vertical grid line. 【Background】 Set the background color.
【Data】	【Font】 Set the data font. 【Size】 Set the data font size.

3.3.24.2 【Data Item】

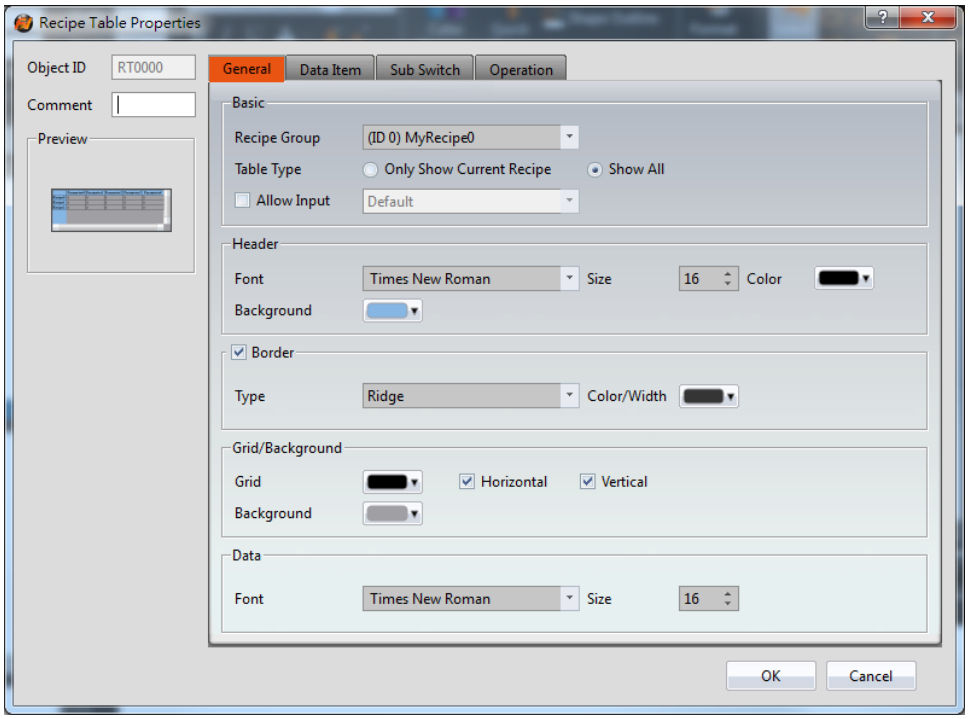


Figure 158 【Data Item】Setting Page of【Recipe Table】

Table 116 【Data Item】Setting Properties of【Recipe Table】

Property	Description
【Copy the Selected Item Settings to Others】	Select a parameter name from below, and then click this button to change the settings of other items to the same as the settings of the item selected.
【Color】	Set color of the parameter data.
【Alignment】	Determine the alignment method of the parameter data.

3.3.24.3 【Sub Switch】

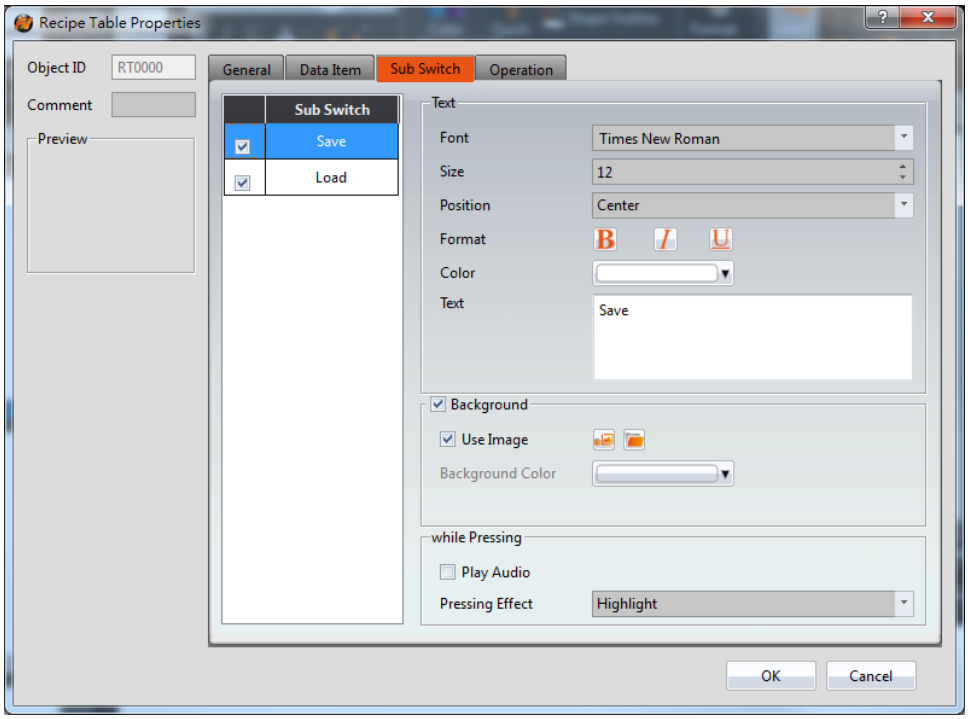


Figure 159 【Sub Switch】Setting Page of【Recipe Table】

Table 117 【Sub Switch】 Setting Properties of【Recipe Table】

Property	Description
【Sub Switch List】	If the【Save】or【Load】button is selected from the table, corresponding buttons will also appear at the top-right side of the recipe table in the workspace after pressing the【OK】button. 【Save】 If the user presses this button during execution, the current parameter contents of the【Recipe Table】will be saved to the recipe group file configured in the recipe setting. 【Load】 If the user presses this button during execution, the contents of the recipe group file configured in the recipe setting will be loaded into the【Recipe Table】.
【Text】	【Font】 Set the displayed text font of the sub switch currently selected. 【Size】 Set the displayed text size of the sub switch currently selected. 【Position】

	Set the displayed text position of the sub switch currently selected. 【Format】 Set the displayed text format of the sub switch currently selected, including Bold, Italics and Underline. 【Color】 Set the displayed text color of the sub switch currently selected. 【Text】 Set the displayed text of the sub switch currently selected.
【Background】	Set the background of the sub switch currently selected. Check it to activate background settings, and the displayed background of the sub switch currently selected can be edited below. If this option is not checked, the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the sub switch currently selected. When this option is checked, an image selection setting item will appear asking the user to select an image either from the【Image Library】or from a file. 【Background Color】 Set the displayed background color of the sub switch currently selected. This setting item will appear if 【Use Image】was not selected.
【while Pressing】	【Play Audio】 Select whether to play audio when the sub switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio Selector】can be pressed to play the audio selected. 【Pressing Effect】 Set the pressing effect of the sub switch currently selected. There are two effects available for selection:【None】and【Highlight】.

3.3.24.4【Operation】

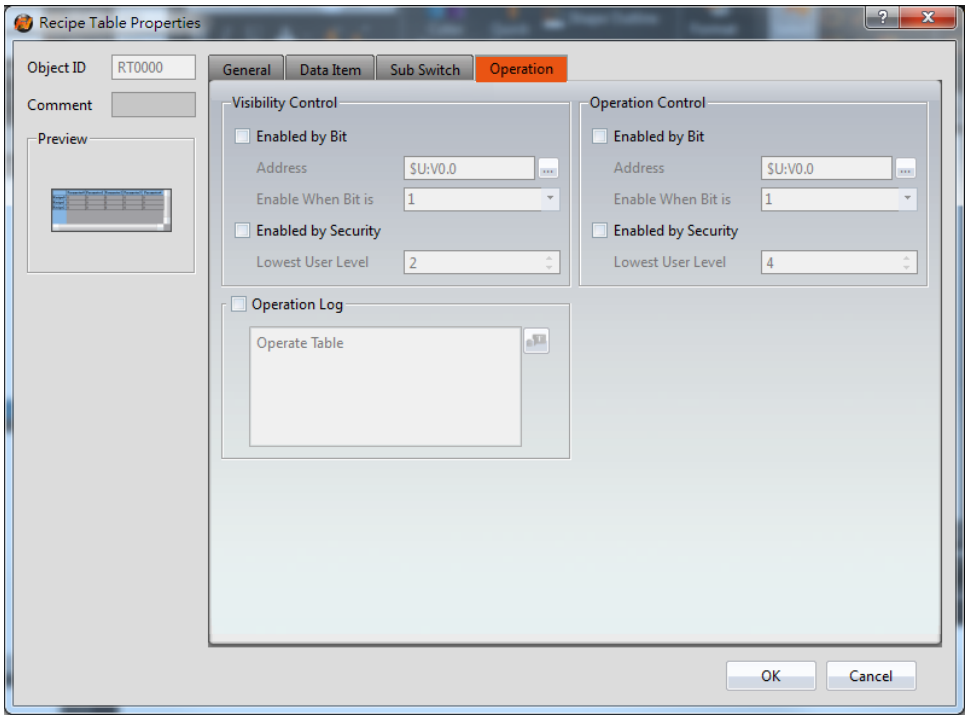


Figure 160 【Operation】Setting Page of【Recipe Table】

Table 118 【Operation】Setting Properties of【Recipe Table】

Property	Description
【Visibility Control】	Visibility control of the object. It can be controlled by a specific bit or user level. 【Enable by Bit】 Select whether to control visibility by a specific bit. 【Address】 Set the address of the visibility control bit. 【Enable When Bit is】 Set whether to display the object when the control bit is 1 or 0. 【Enabled by Security Manager】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Log】	Select whether to enable the【Operation Logger】of the object. It can also edit operation messages in which the message can be

	inputted directly or acquired from the【Text Library】.
【Operation Control】	Operation control of the object, which can be controlled by a specific bit or user level. 【Enable by Bit】 Select whether to control operation by a specific bit. 【Address】 Set the address of the operation control bit. 【Enable When Bit is】 Set whether to operate the object when the control bit is 1 or 0. 【Enabled by Security Manager】 Select whether operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.

3.3.25 【Operation Viewer】

【Operation Viewer】is an object used to read the Recording Buffer data of the【Operation Log】. Its main functions are as follows:

- View the Recording Buffer data of the【Operation Log】.
- Data filter function, which is only displaying items that the user is interested in.
- Pause or start updating the data of the Recording Buffer through the【Sub Switch】, and clear or save the data in the Recording Buffer.

Introduction to the property settings dialog is as follows:

3.3.25.1 【General】

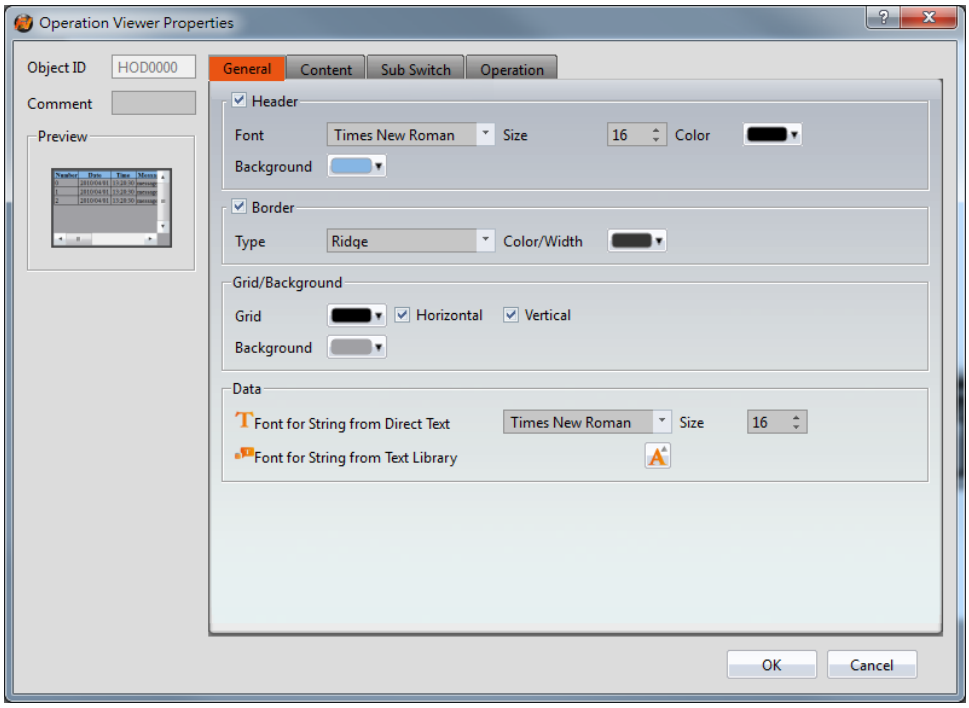


Figure 161 【General】Setting Screen of【Operation Viewer】

Table 119 【General】Setting Properties of【Operation Viewer】

Property	Description
【Preview】	Preview the appearance of this object.
【Header】	Select whether to display the header. 【Font】 Set the font of the header. 【Size】 Set the size of the header. 【Color】 Set the color of the header. 【Background】 Set the background color of the header.
【Border】	Select whether to display the border. 【Type】 Set the border type. 【Color】 Set the color of the border.

【Grid/Background】	【Grid】 Set the color of the grid. 【Horizontal】 Select whether to display horizontal grids. 【Vertical】 Select whether to display Vertical grids. 【Background】 Set the color of the background.
【Data】	【Font for String from Direct Text】 While the string displayed is from direct text, the font of the string can be set here. 【Size】 Set the font size for the direct text. 【Font for String from Text Library】 While the string is from text library, the font and size of the string can be set here.

3.3.25.2 【Content】

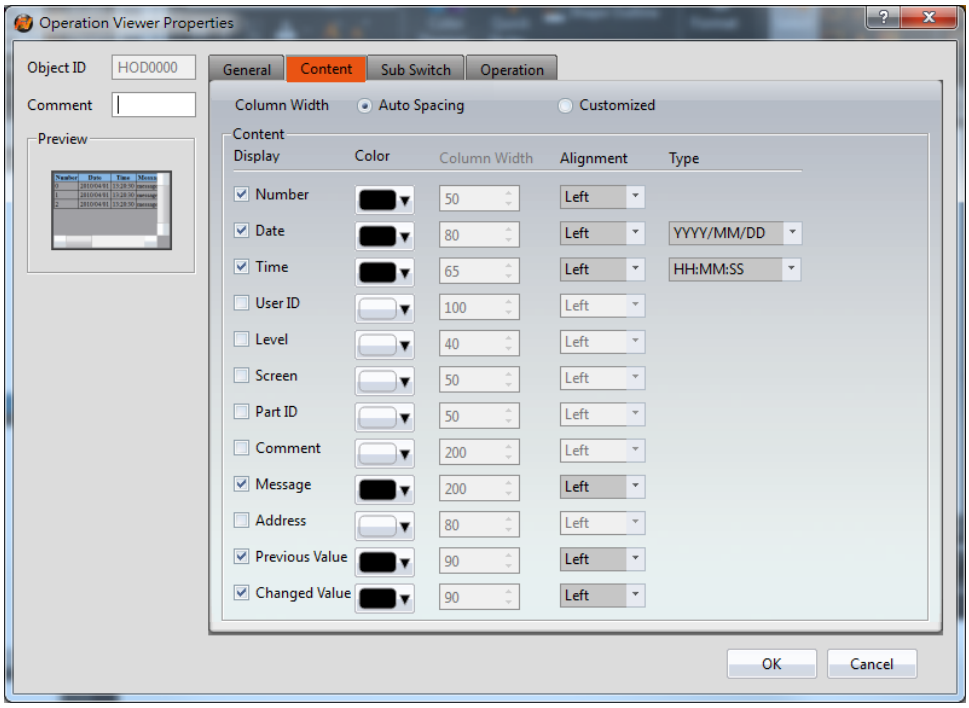


Figure 162 【Content】Setting Screen of【Operation Viewer】

Table 120 【Content】Setting Properties of【Operation Viewer】

Property	Description
【Column Width】	【Column Width】can be divided into two types: ➢ 【Auto Spacing】 The system will automatically adjust the column width according to the contents in the table. ➢ 【Customized】 User defines the column width of each item displayed; the column width will not be automatically adjusted according to the contents when HMI is executing.
【Content】	Every Operation Log data entry includes severalinformation; users can choose to display the items they are interested in. The following are the descriptions of each item: ➢ 【Number】 Operation Log serial number. ➢ 【Date】 Operation Log date. ➢ 【Time】 Operation Log time. ➢ 【User ID】 The current user name; when【Security Manager】->【Mode】

	is【Level】, no information will be recorded in this field. ➢ 【Level】 The level of the current user. ➢ 【Screen】 The screen which the operating object is located. ➢ 【Part ID】 The ID of the operating object. ➢ 【Comment】 The comment of the operating object. ➢ 【Message】 The operating message of the operating object. ➢ 【Address】 The access address of the operating object. ➢ 【Previous Value】 The previous value of the access address content for the operating object. ➢ 【Changed Value】 The current value of the changed access address content for the operating object. The setting of the items can be divided into: ➢ 【Display】 Select whether to display this item. ➢ 【Color】 The display color of this item. ➢ 【Column Width】 The column width of this item; users can only set this item when the【Column Width】is【Customized】. ➢ 【Alignment】 The alignment method of this item. ➢ 【Type】 This setting is only available for【Date】and【Time】. It sets the display format for them.

3.3.25.3 【Sub Switch】

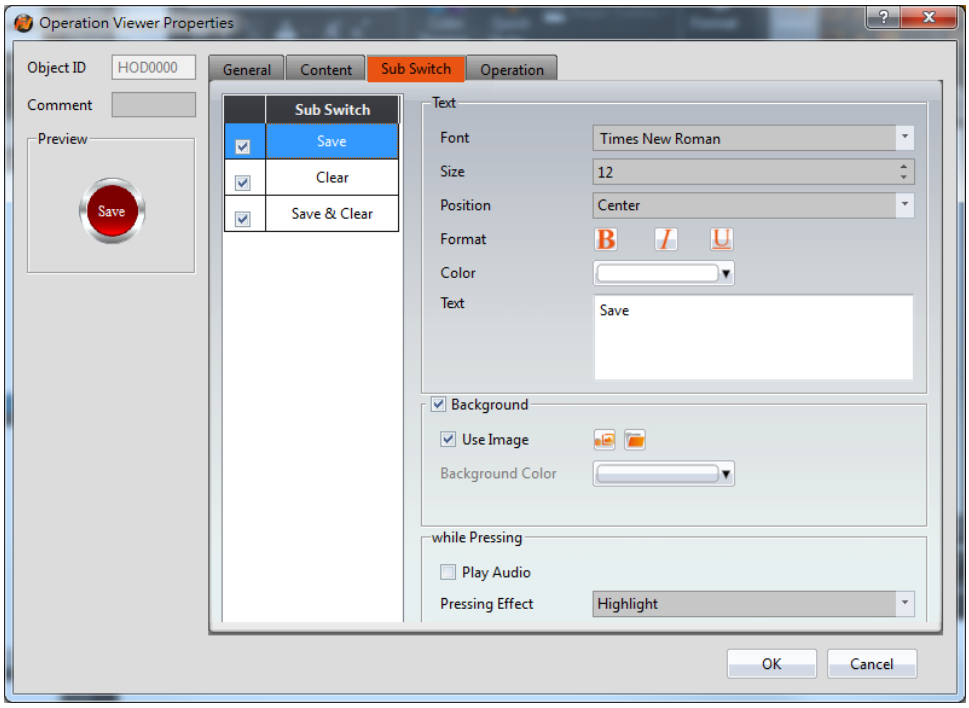


Figure 163 【Sub Switch】Setting Screen of【Operation Viewer】

Table 121 【Sub Switch】Setting Properties of【Operation Viewer】

Property	Description
【Sub Switch List】	【Sub Switch List】that can be selected for【Operation Viewer】. Sub switches can be enabled after selecting them; setting options for the appearance of the selected sub switches will also appear on the right. When different sub switches are selected from the list, the setting contents of the appearance setting items to the right will be updated according to the sub switches selected. In which the【Sub Switches】are divided into: ➢ 【Save】- Save the Recording Buffer data of the【Operation Log】into a CSV file. ➢ 【Clear】- Clear the Recording Buffer data of the【Operation Log】. ➢ 【Save & Clear】- First save the Recording Buffer data of the【Operation Log】into a CSV file and then clear the data.
【Text】	【Font】 Set the displayed text font of the sub switch currently selected.

	【Size】 Set the displayed text size of the sub switch currently selected. 【Position】 Set the displayed text position of the sub switch currently selected. 【Format】 Set the displayed text format of the sub switch currently selected, including Bold, Italics and Underline. 【Color】 Set the displayed text color of the sub switch currently selected. 【Text】 Set the displayed text of the sub switch currently selected.
【Background】	Set the background of the sub switch currently selected. Check it to activate background settings, and the displayed background of the sub switch currently selected can be edited below. If this option is not checked, the background will be transparent. 【Use Image】 Set whether to use an image for the displayed background of the sub switch currently selected. When this option is checked, an image selection setting item will appear asking the user to select an image either from the【Image Library】or from a file. 【Background Color】 Set the displayed background color of the sub switch currently selected. This setting item will appear if 【Use Image】was not selected.
【while Pressing】	【Play Audio】 Select whether to play audio when the sub switch is pressed. An【Audio Selector】will appear on the right when enabled. The switch on the right of the【Audio Selector】can be pressed to select an audio and the switch on the left of the【Audio

	Selector】can be pressed to play the audio selected. 【Pressing Effect】 Set the pressing effect of the sub switch currently selected. There are two effects available for selection:【None】and【Highlight】.

3.3.25.4【Operation】

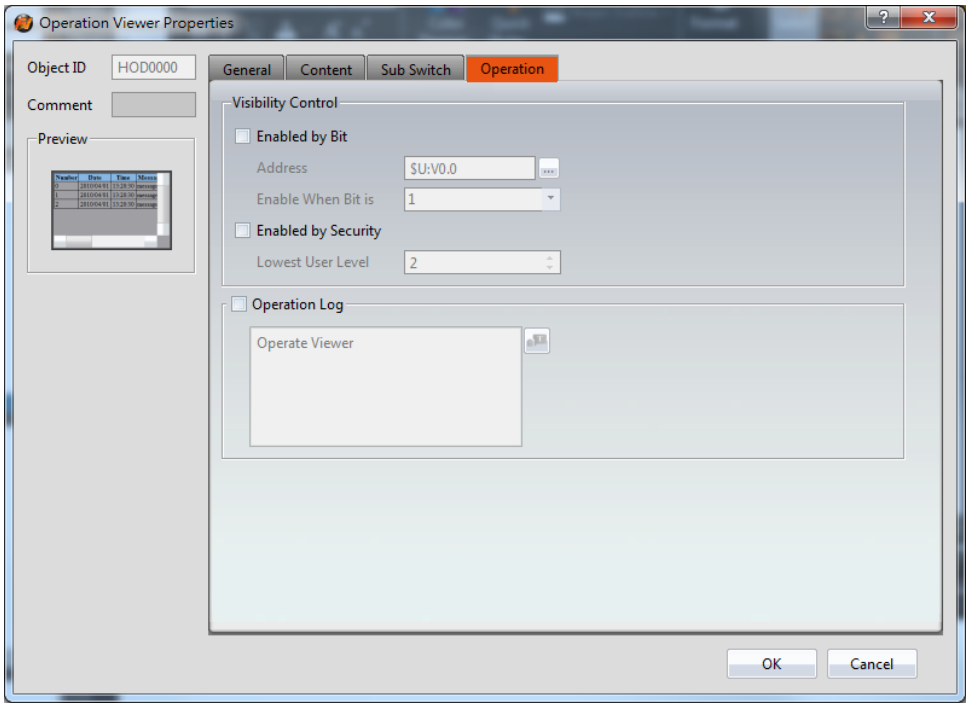


Figure 164 【Operation】Setting Screen of【Operation Viewer】

Table 122 【Operation】Setting Properties of【Operation Viewer】

Property	Description
【Visibility Control】	Visibility control of the object can be controlled by a specific Bit or User Level. 【Enable by Bit】 Select whether to control visibility by a specific Bit. 【Address】 Set the address of the visibility control Bit. 【Enable When Bit is】 Set whether to display the object when the control Bit is 1 or 0.

	【Enabled by Security】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages in which the message can be inputted directly or acquired from the【Text Library】.

4. 【Servers】

This chapter will introduce the various servers provided by the HMI; users can use these servers to achieve needs such as remote file access and remote screen control, etc.

4.1 FTP Server

FTP Server allows users to access files on the internal storage, SD card and USB storage device of the HMI. There are two ways to deploy the FTP server on the HMI, one is through the system settings of the HMI and the other is through settings of the project. Project setting will override system setting at project startup.

4.1.1 Deploying FTP Server using System Settings of HMI

The following screen will appear when the【Server Settings】page in the system settings of the HMI is opened:

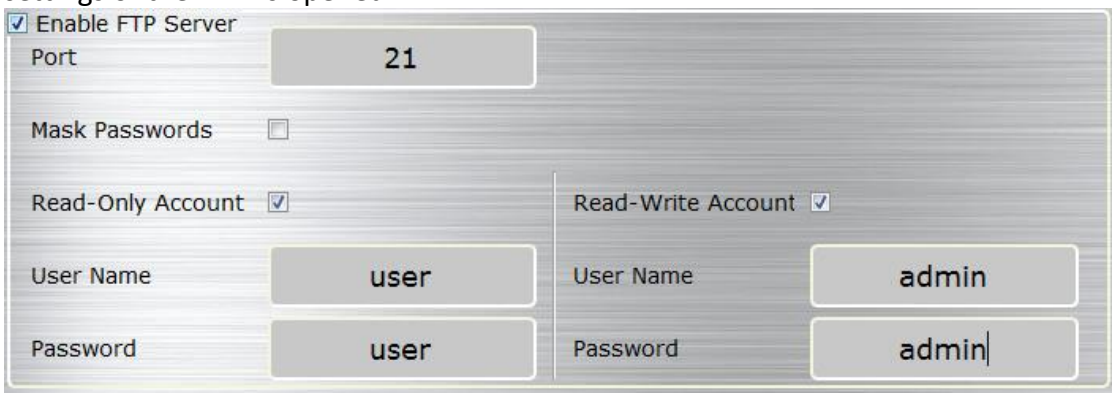


Figure 165 FTP Server Setting–HMI

The following are the descriptions of each field in the figure above:

Table 123 FTP Server Settings

Field	Description
【Enable FTP Server】	Determine whether to enable the FTP server; other fields can only be set when FTP Server is enabled.
【Port】	Specifie the port to listen for FTP Server; the default port is 21.
【Mask Passwords】	Control whether the password will be displayed as plain text.
【Read-Only Account】 【User Name】 【Password】	Determine whether to enable read-only accounts. A set of user name and password can be created once this option is enabled, and users who log in to FTP Server with this account can only read files and cannot perform operations including creating, modifying or deleting files.
【Read-Write Account】 【User Name】 【Password】	Determine whether to enable read-write accounts. A set of user name and password can be created once this option is enabled, and users who log in to FTP Server with this account not only can access files, they can also perform operations including creating, modifying or deleting files.

4.1.2 Deploying FTP Server using Project Settings

Click on【Server】in the【Functions】window of the【Project Explorer】to the left of the FvDesigner to enter the【Server】setting screen where the【FTP】tab page can be used to setup FTP Server, as shown in the figure below:

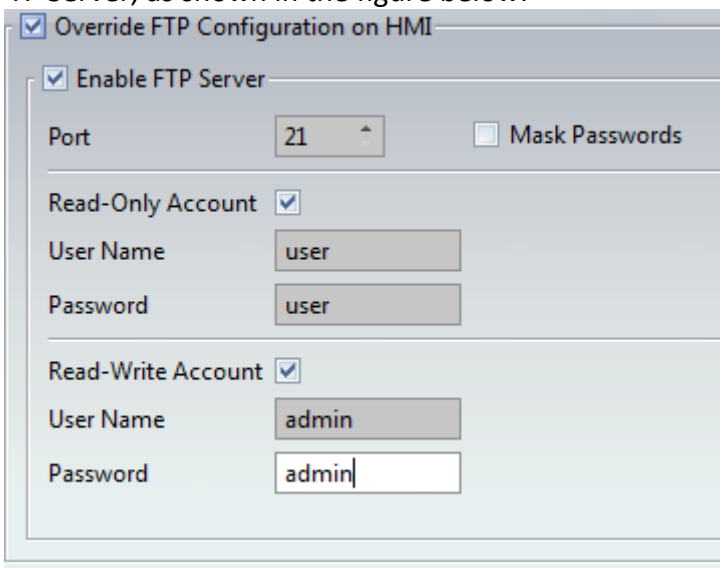


Figure 166 FTP Server Setting–Project

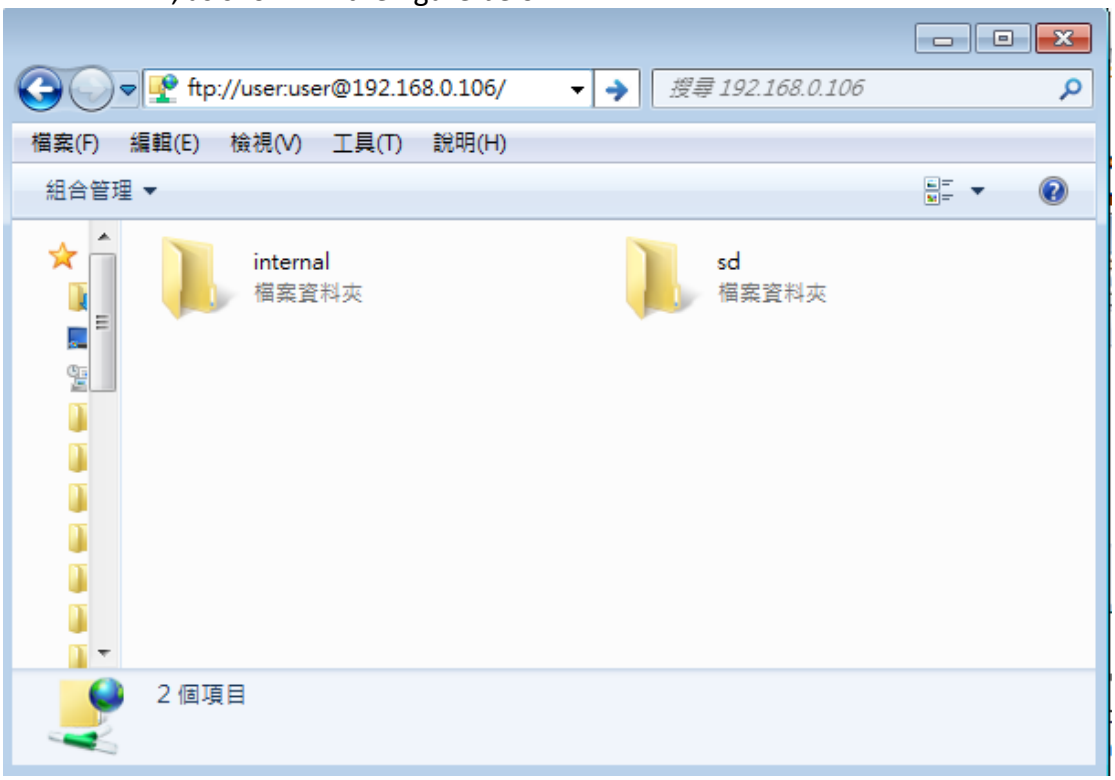
The FTP settings of the project can be used to override the setting of FTP Server when the project is loaded once 【Overwrite FTP Configuration on HMI】 is checked. The other settings are identical to the setting screen on the HMI; please refer to the

explanations in **Chapter 19.1.4【Servers】**.

4.1.3 FTP Server Example

We will use the following steps to illustrate how to use FTP Server:

1. Enter the system settings of the HMI during boot up and then open 【Server Settings】; setup FTP Server as shown in **Figure 279 Server setting page**.
2. Use Windows Explorer to open the address:ftp://user:password@HMI IP Address to see the files on the HMI, as shown in the figure below:



4.2 VNC Server

VNC Server allows users to remotely view and operate the HMI functions through an Internet connection so that users can check the data on the HMI or operate the HMI without having to come close to the HMI. There are two ways to deploy the VNC server on the HMI, one is through the system settings of the HMI and the other is through settings of the project. Project settings will have a higher priority if both settings were set.

4.2.1 Deploying VNC Server using System Settings of HMI

The following screen will appear when the 【Server Settings】page in the system settings interface of the HMI is opened:

Figure 167 VNC Server Setting-HMI

The following are the descriptions of each field in the figure above:

Table 124 VNC Server Settings

Field	Description
【Enable VNC Server】	Determine whether to enable the VNC server; other fields can only be set when the VNC server is enabled.
【Mask Passwords】	Control whether the password should be displayed as plain text.
【Password】	The password used to login to the VNC server.

4.2.2 Deploying VNC Server using Project Settings

Click on【Server】in the【Functions】window of the【Project Explorer】to the left of FvDesigner to enter 【Server】setting, in which the【VNC】tab page can be used to set the VNC server, as shown in the figure below:

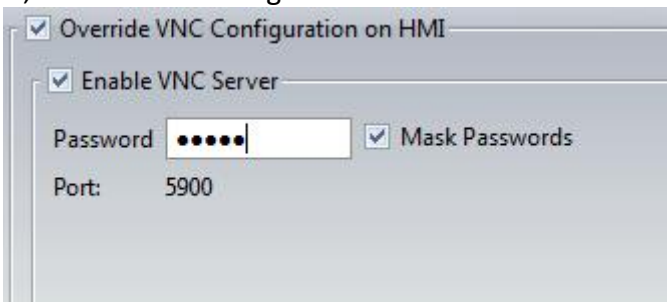


Figure 168 VNC Server Setting-Project

The VNC settings of the project can be used to change the behavior of the VNC server when the project is loaded once【Overwrite VNC Configuration on HMI】is selected. The other settings are identical to the setting screen on the HMI; please refer to the explanations in **Chapter 19.1.4【Servers】**.

4.2.3VNC Server Example

We will use the following steps to illustrate how to use the VNC server:

1. Create a new project and set the settings in the【VNC】tab page of the 【Server】setting screen as shown in **Figure 168 VNC Server Setting-Project**.
2. Install a VNC client software; VNC Viewer 5.1.1(https://www.realvnc.com/download/viewer/) by RealVNC is used in

this example.

3. The following screen can be seen once VNC Viewer is opened:

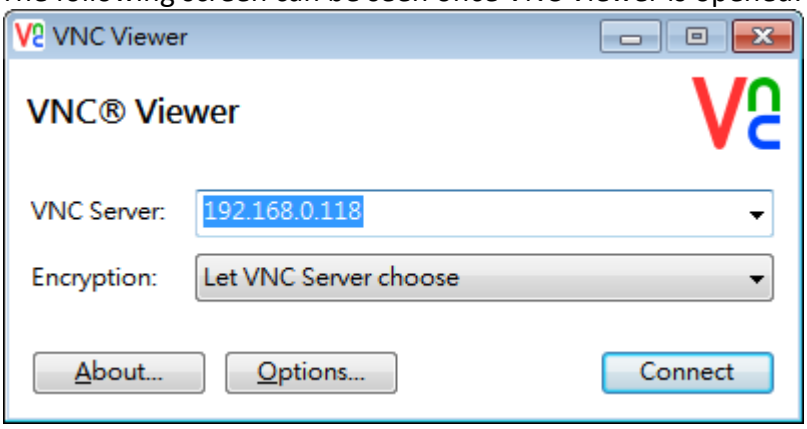


Figure 169 VNC Viewer Connection Screen

Press Connect after entering the IP of the HMI, and a prompt will appear asking the user to enter the password:

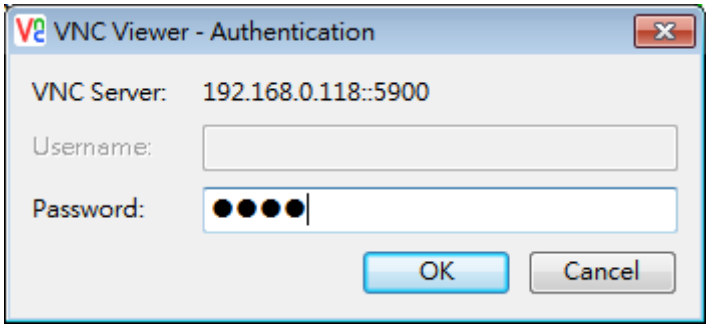
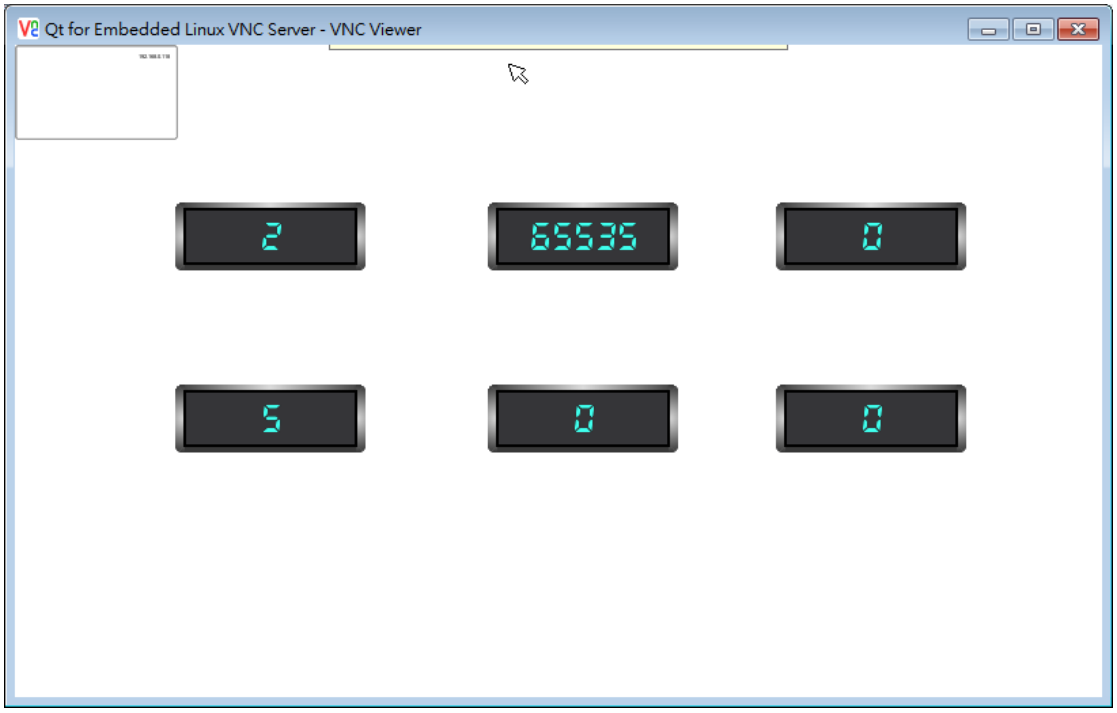


Figure 170 VNC Viewer Password Confirmation Screen

4. Press OK after entering the password and real-time screens on the HMI can be seen.



Note: Please adjust the settings of the VNC Viewer if the HMI screens did not appear after entering the correct password; just set the value of FullColor in Options->Advanced->Expert to True.

5. 【Security】

Different operating levels are usually set for different objects during HMI operations so that different objects can be used and seen when different users log into the HMI; this is to prevent operating errors or to ensure the security of the data.

5.1 【Security】 Settings

【Security】can be clicked on the【System】window in the【Project Explorer】to the left of the FV Designer to enter its setting screen as shown below:

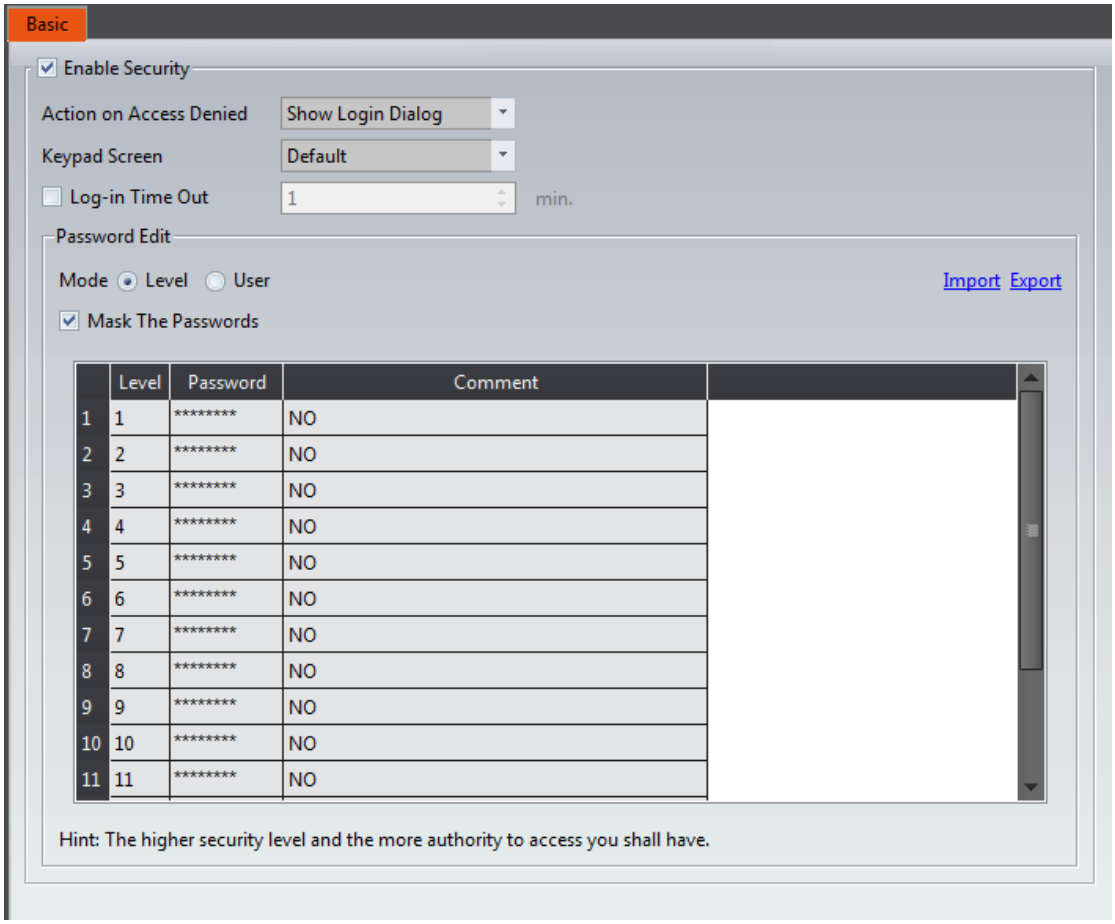


Figure 171 Setting Screen for【Security】

Table 125 Setting Properties of【Security】

Property	Description
【Enable Security】	Select whether to enable【Security】; this is the main switch of【Security】. 【Action on Access Denied】 When the【Lowest User Level】operated by a certain object is higher than the level where the user currently logged in,【Security】will deny this execution action. This setting is used to determine the behavior of【Security】after denying the execution; it can be divided into the following three types: ➢ 【None】 No response ➢ 【Show Login Dialog】 Shows the enter password (or even the user name) login dialog ➢ 【Show Denied Message】 Shows the default denied message of the system

	【Keypad Screen】 Set the keypad screen to use when the login dialog is displayed. 【Log-in Timeout】 Set whether to make the HMI logout to the lowest user level when the HMI has not been operated for a certain amount of time.
【Password Edit】	【Mode】 The mode can be divided into the following two types: ➢ 【Level】 Only the password needs to be entered during login, there is level1~level15, the higher security level with the more authority to access. ➢ 【User】 The password and user name both needs to be entered during login, to a maximum of 100 user accounts. 【Mask Passwords】 This thoughtful function is used to prevent others from seeing your password when the user is editing the password form below. It has no meaning when the HMI is actually operating. 【Import】 Import CSV files with specific formats and updates it directly into the password from below and mode. 【Export】 Export the password form below into a CSV file with a specific format directly. Tip: Multiple users might need to be planned when the【Mode】is 【User】; this is when【Export】can be used to generate a default CSV file for editing, and then use【Import】to update the project.

5.2 Security Settings of Objects

The function settings of 【Security】were described above, but every object (except for drawing objects) has corresponding settings themselves that must also be set in order to achieve security management.

The image below is the setting screen of objects; the security setting of objects can

be found in the【Operation】tab page as shown in the image frame below, in which the green frame is the security control of visibility and the blue frame is the security control for operations.

Note: Objects will not have security control for operations if the object itself does not have operation functions, such as meters etc.

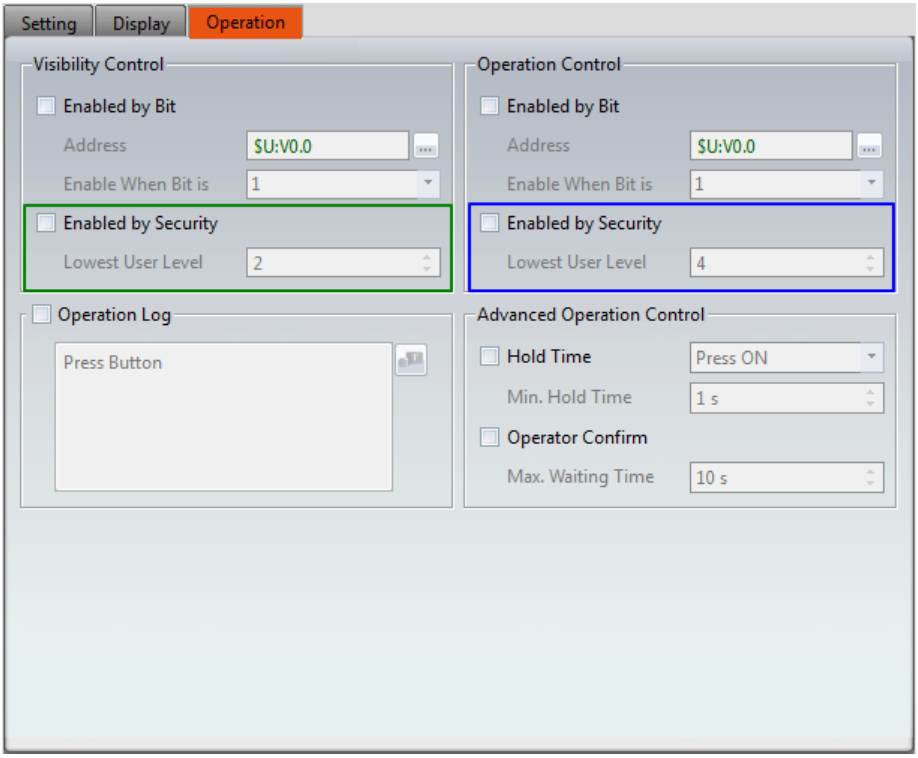


Figure 172 Security Settings for Objects

Table 126 Security Setting Properties of Objects

Property	Description
【Visibility Control】	【Controlled by Security】 Select whether visibility is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to display the object.
【Operation Control】	【Controlled by Security】 Select whether the operation is controlled by the level of the user logged in. 【Lowest User Level】 Set the minimum level of the user logged in to operate the object.

5.3 Exporting/Importing CSV Files

As described below, the exported/imported CSV file can be divided into【Level】and【User】, and they are not compatible with one another.

- **CSV file for【Level】-**

As shown in the figure below where the section marked with the red frame is used by the system and no changes can be made; the section marked with the green frame can be edited.

Mode	Level_Mode	
Level	Password	Comment
1	1	NO
2	2	NO
3	3	NO
4	4	NO
5	5	NO
6	6	NO
7	7	NO
8	8	NO
9	9	NO
10	10	NO
11	11	NO
12	12	NO
13	13	NO
14	14	NO
15	15	NO

Figure 173 CSV File for【Level】

- **CSV file for【User】-**

As shown in the figure below where the section marked with the red frame is used by the system and no changes can be made; the section marked with the green frame can be edited where the “Level” must be an integer between 1~15. Also, the section marked with the green frame can be added or deleted directly in order to achieve the function of adding/deleting a user.

Mode	User_Mode		
Level	Name	Password	Comment
1	aaa	111	
2	bbb	222	
3	ccc	333	
4	ddd	444	
5	eee	555	

Figure 174 CSV File for【User】

6. 【Data Log】

Objects such as【Lamp】or【Numeric Input/Display】can be used to read the real-time changes of certain values when the HMI is operating. However, in order to understand long-term changes of the value, the【Data Log】function must be used; the【Data Log】function is used to log the values of the address set regularly or when certain conditions are satisfied to provide users with the long-term change trends of the value of the address set.

This chapter will explain Data Log related screens and the setting methods and how to export the data for the user to view and analyze after the data is logged.

6.1 Data Log List

Click on【Data Log】in the【Project Explorer】of FV Designer, and the【Data Log List】will pop up; the current【Data Log Groups】that were already set will be displayed on the list according to the order of the【Group ID】set.

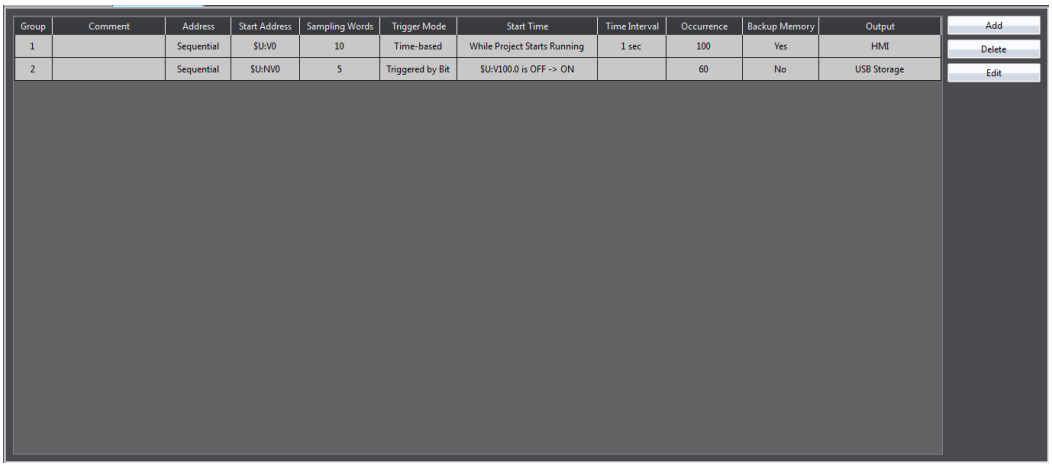


Figure 175 【Data Log List】Screen

To set a new Data Log Group, click on the【Add】button to the right and the【Data Log Group】setting dialog will appear for the user to operate.

To edit a【Data Log Group】that has already been set, double-click on the【Data Log Group】entry or first select the【Data Log Group】entry and then click on the【Edit】button to the right; at this time the properties setting dialog of this【Data Log Group】entry will appear for the user to modify.

To delete a【Data Log Group】that has already been set, select the【Data Log Group】entry and then click on the【Delete】button to the right to delete this【Data Log Group】entry.

6.2 Data Log Group Settings

Settings of the【Data Log Group】are divided into three parts:【Setting】,【Logging Address List】and【Export Data】;where the【Setting】is used to set the behavior for the【Data Log Group】to log the data, the【Data Address List】is used to edit the address list logged by the【Data Log Group】, and the【Export Data】is used to set the export behavior of the logged data.

6.2.1 【Setting】

The【Setting】screen is as shown in the figure below. The meanings of each setting option are also listed below:

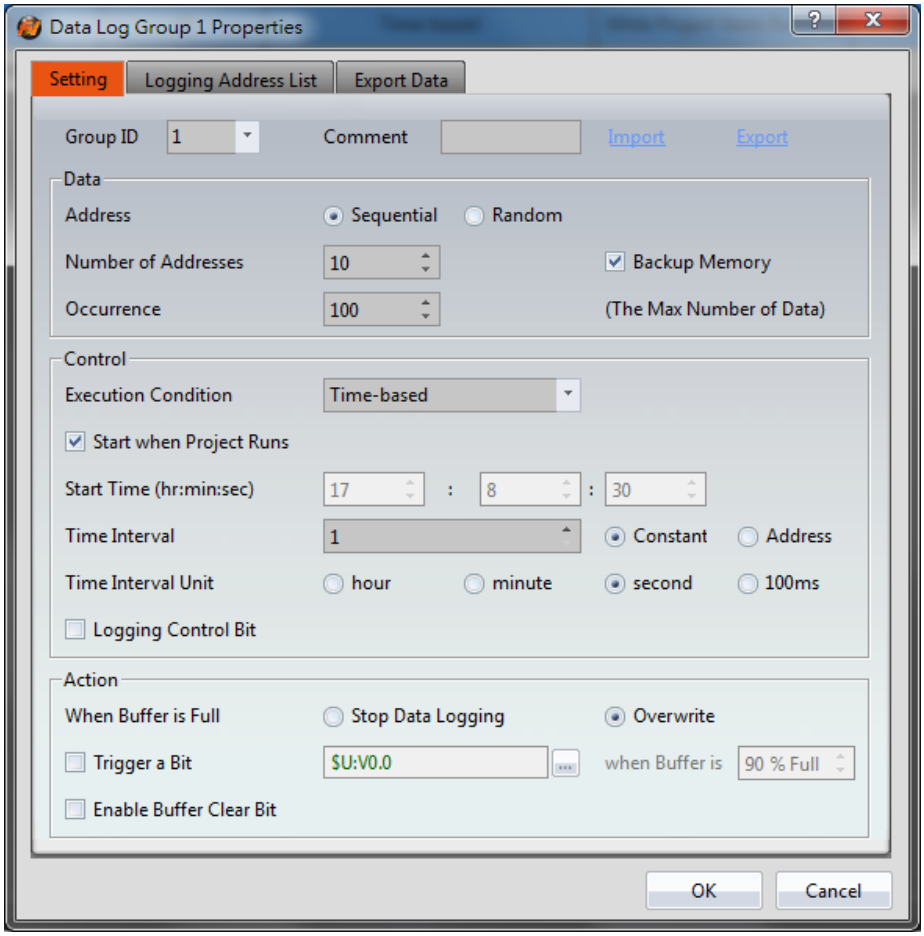


Figure 176 【Setting】of【Data Log Group】

Table 127 【Setting】Properties of【Data Log Group】

Property	Description
【Group ID】	Set the Group ID of the【Data Log Group】.
【Comment】	Set the comment of the【Data Log Group】.
【Import】	A CSV file can be selected after clicking on this button, and all the logged addresses included in the CSV file will be applied to the【Data Log Group】settings.
【Export】	The settings of the current【Data Log Group】can be saved into a CSV file after clicking on this button.
【Data】	Set the data content logged by the【Data Log Group】. 【Address】 Set the type of the logged address to【Sequential】or【Random】.【Sequential】means that the logged addresses will be sequential; only the【Start Address】needs to be set and the other addresses will be filled out automatically and

	cannot be changed.【Random】means that the addresses logged can be random addresses; the【Start Address】and other addresses can be set individually. 【Start Address】 Set the first address for the【Data Log Group】to log. 【Backup Memory】 Set whether to enable Backup Memory. 【Number of Addresses】 Set the number of addresses for the【Data Log Group】to log. 【Occurrence】 Set the number of times for the【Data Log Group】to log data.
【Control】	Set the conditions for the【Data Log Group】to execute data logging. 【Execution Condition】 Set the condition to execute data logging.【Time-based】means that the【Data Log Group】will log data on a regular basis.【Triggered by Bit】means that address logging will be executed when the status changes of the【Logging Control Bit】satisfy the conditions set in【Trigger Condition】. 【Start when Project Runs】 Whether to start logging data when the project runs can be set if the【Execution Condition】is set as【Time-based】. 【Start Time】 The time for the【Data Log Group】to start logging data can be set when the【Execution Condition】 is set as【Time-based】and【Start when Project Runs】is not selected; The three time units that can be entered are hour, minute and second. 【Time Interval】

	The time interval between each time the【Data Log Group】executes data logging can be set if【Execution Condition】is set as【Time-based】. The time interval will be a fixed value if【Constant】is selected below, and the time interval will be determined by the value of the address set if【Address】is selected; the data type of the address data read is fixed as【32Bit-UINT】. 【Time Interval Unit】 The time unit of the【Time Interval】can be set if the【Execution Condition】is set as【Time-based】. The maximum value of the time interval is 1 day and the maximum value that can be entered for the【Time Interval】is 24 if the【Time Interval Unit】is set as【Hour】. The maximum value that can be entered is 1440 if it is set as【Minute】 and the maximum value that can be entered is 86400 if it is set as【Second】. If the【Time Interval Unit】is set as【100ms】, the maximum value that can be entered for the【Time Interval】is fixed as 9. 【Logging Control Bit】 Controls the addresses where data logging can be executed by the【Data Log Group】.If the【Execution Condition】is set as【Time-based】and the【Time Interval】set had been reached, and the status of the【Logging Control Bit】is 0, data logging still will not be executed by the【Data Log Group】. If【Execution Condition】is set as【Triggered by Bit】, every time the status changes of the【Logging Control Bit】satisfy the settings of the【Trigger Condition】, data logging will be executed 1 time. 【Trigger Condition】 If【Execution Condition】is set as【Triggered by Bit】, conditions for the【Data Log Group】to execute data logging once can be set.

【Action】	【When Buffer is Full】 Set the action to take when the【Data Log Group】has completed the number of data logging set in【Occurrence】. If【Stop Data Logging】is selected, data logging will be stopped; if【Overwrite】is selected,then the【Data Log Group】will continue to log data and the data previously saved will be overwritten by the new data logged. 【Trigger a Bit】 Set whether to trigger a specific bit when the data is full; the triggering address and the time to trigger the address can be set on the right if this is enabled. 【Enable Buffer Clear Bit】 Set whether the enable buffer clear bit; the【Buffer Clear Bit】can be set at the right if this is enabled. When the status of this address is 1, the data saved in the buffer will be cleared.

6.2.2【Logging Address List】

The【Logging Address List】screen is as shown in the figure below, the meanings of each setting option are listed below:

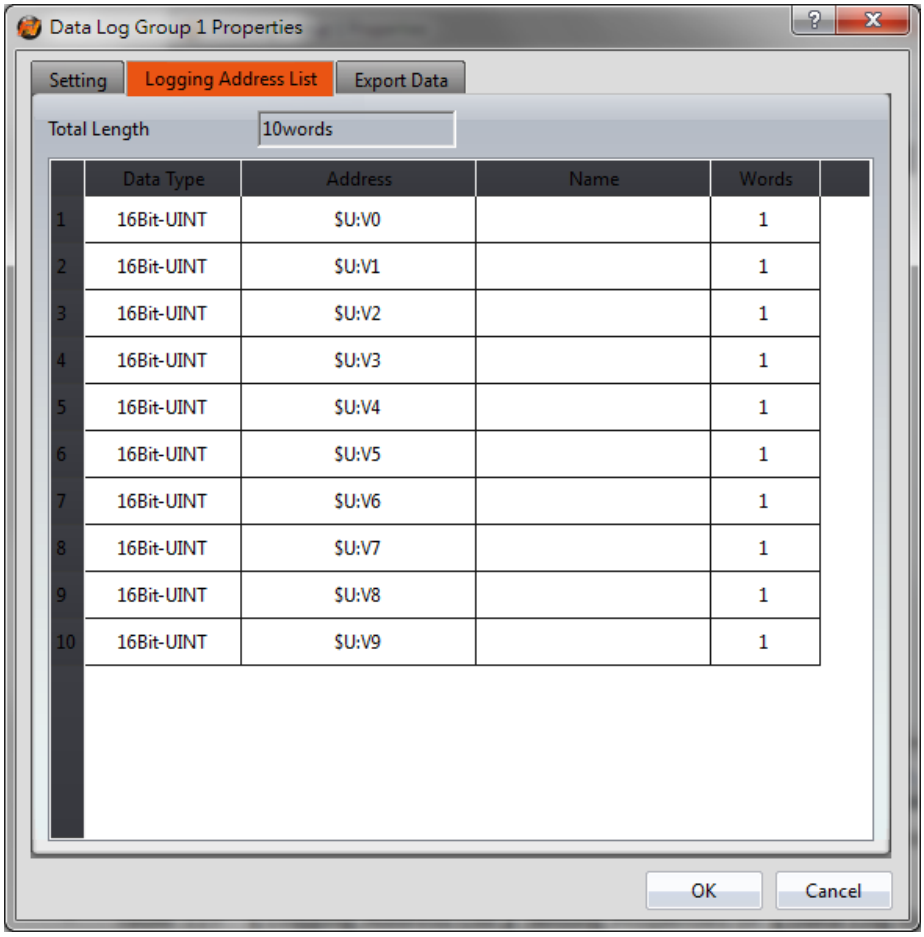


Figure 177 【Logging Address List】Setting Screen of【Data Log Group】

Table 128 【Logging Address List】Setting Properties of【Data Log Group】

Property	Description
【Total Length】	Display the total length of the data logged.
【Data Type】	Set the data type of the data logged. Only the first row can be modified if the type of address logged is set as 【Sequential】.
【Address】	Set the address of the data logged.Only the first row can be modified if the type of address logged is set as【Sequential】.
【Name】	Set the address name of the data logged; the default name is the address itself if no name is entered.
【Words】	Display the length of the data logged by 【Data Type】. 【Words】 can be modified if 【Data Type】 is set as 【Ascii String】.

6.2.3 【Export Data】

The【Export Data】screen is as shown in the figure below, the meanings of each

setting option are listed below:

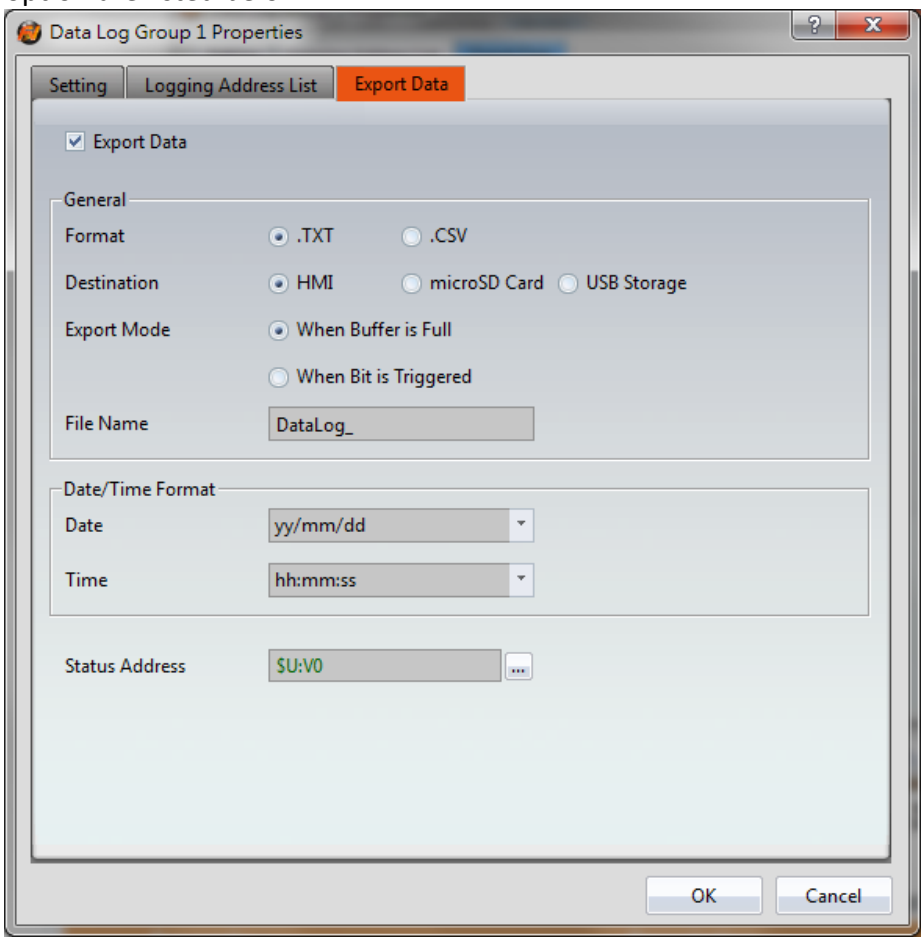


Figure 178 【Export Data】Setting Screen of【Data Log Group】

Table 129 【Export Data】Setting Properties of【Data Log Group】

Property	Description
【Export Data】	Set whether to enable to export data function; export setting options will appear below if this function is enabled.
【General】	【Format】 Set the format of the output file; TXT file or CSV file can be selected. 【Destination】 Set the destination of the output files; available selections include HMI, microSD card or USB storage device. A FTP connection can be used to connect to the HMI to access the saved file if exporting into a file. 【Export Mode】 Set the time to export the file; the file will be automatically

<table>
<tr><td></td><td>exported when the【Data Log Group】has completed the number of times set in【Occurrence】if【When Buffer is Full】is selected. The data will be exported when the bit set is triggered if【When Bit is Triggered】is selected.

【File Name】
Set the name of the exported file; the file name of the actual exported file will include the save date and time (such as: DataLog_140519_1517356.txt).</td></tr>
<tr><td>【Date/Time Format】</td><td>【Date】
Set the display format of the date when exporting files.

【Time】
Set the display format of the time when exporting files.</td></tr>
<tr><td>【Status Address】</td><td>Set the saving address of the error code.

<table><tr><th>Error Code</th><th>Description</th></tr><tr><td>0</td><td>No Error</td></tr><tr><td>1</td><td>Read Error</td></tr><tr><td>2</td><td>Write Error</td></tr><tr><td>5</td><td>Open Error</td></tr></table></td></tr>
</table>

6.3 Data Log Related Objects

This chapter will introduce objects related to【Data Log】.

- The【Historic Trend】is a curve object used to read the data recorded in the recording buffer of the【Data Log】, in which the x value is the time and the y value is the data captured by the【Data Log】. For detailed explanations, please refer to **Chapter 3.3.18–【Historic Trend】**.
- The【Historic XY Scatter】is a curve object used to read the data recorded in the recording buffer of the【Data Log】, in which both the X/Y values are data captured by the【Data Log】. For detailed explanations, please refer to **Chapter 3.3.19–【Historic XY Scatter】**.
- The【Historic Data Table】is a table object used to read the data recorded in the recording buffer of the【Data Log】.For detailed explanations, please refer to **Chapter 3.3.20–【Historic Data Table】**.

7. 【Alarm】

When the HMI is operating, the【Alarm】function can be used if real-time detection for excessive changes in certain numeric value is required. The【Alarm】function is used to monitor specific addresses of the PLC or HMI; when the numeric value of the monitored address reaches the set range, the HMI will give out an alarm. In addition, the user can also record the numeric value of 1~8 addresses during the occurrence of the alarm in order to analyze possible reasons for causing the alarm.

This chapter will explain alarm related pages, the setting methods, and how to export the alarm data for the user to view and analyze.

7.1 Alarm List

Click on【Alarm】,which is located in the feature list on the left side of FV Designer; the【Alarm List】will pop up and the【Alarm】which has already been set will be displayed on the list according to the【Group ID】set.

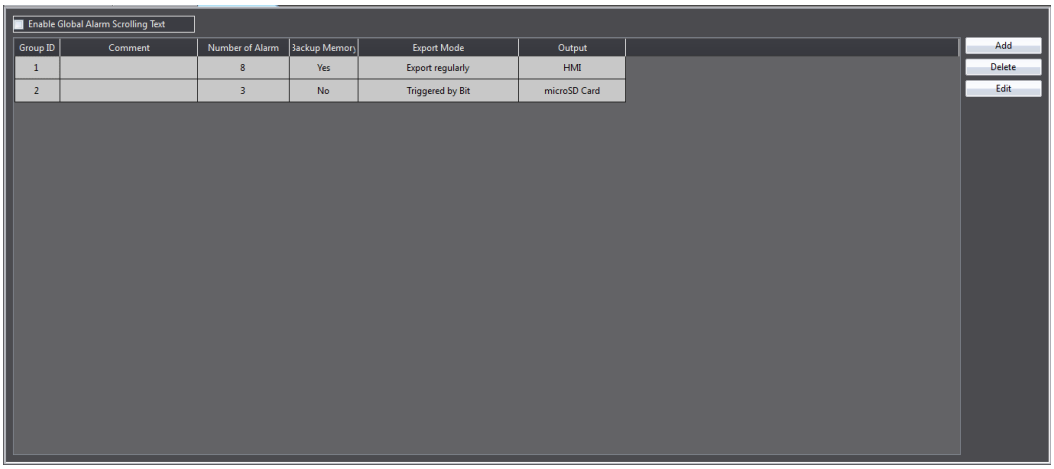


Figure 179 【Alarm List】Screen

Press the【Add】button if a new set of alarm needs to be set; the【Alarm】setting dialog will appear for the user to operate.

To edit an【Alarm】that was already set, double click on the【Alarm】on the list or first click the【Alarm】entry and then click the【Edit】button on the right. The setting dialog of this【Alarm】entry will appear for the user to modify.

To delete an【Alarm】that was already set, select the【Alarm】entry and then click on the【Delete】button to the right to delete this【Alarm】entry.

If【Enable Global Alarm Scrolling Text】is selected, then the【Global Alarm Scrolling Text】function is enabled. After enabling this option, click on the【Setting】button to the right to perform setting for【Global Alarm Scrolling Text】. Please refer to Section **chapter 3.3.22【Alarm Scrolling Text】** for detailed explanation on settings.

7.2 Alarm Setting

The setting of【Alarm】is divided into【Setting】and【Export】, in which【Setting】is used to set the behavior and occurrence conditions of the【Alarm】and【Export】is used to set the export behaviors of data on alarms that already occurred.

7.2.1【Setting】

The "Setting" screen is as shown in the figure below, the meanings of each setting option are listed below:

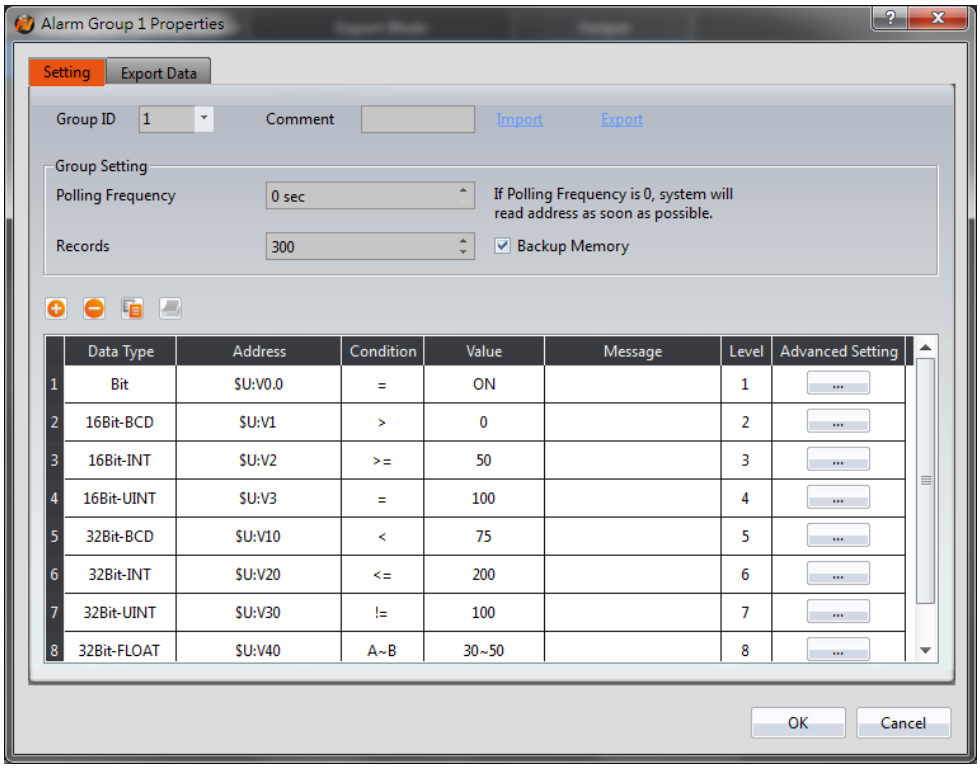


Figure 180 【Setting】Screen of【Alarm】

Table 130 【Setting】Properties of【Alarm】

Property	Description
【Group ID】	Set the Group ID of the【Alarm】.
【Comment】	Set the comment of the【Alarm】.
【Import】	A CSV file can be selected after clicking this option, and all of

	the【Alarm】contents will be applied to the current【Alarm】settings.
【Export】	The settings of the current【Alarm】can be saved into a CSV file after clicking this option.
【Group Setting】	Set the group behavior of【Alarm】. 【Polling Frequency】 Sets the Polling Frequency of【Alarm】. When the Polling Frequency is set to 0, the system will read the monitoring address as quickly as possible. If the Polling Frequency is set to be greater than 0, the system will read the monitoring address according to the time set. This is able to lower the load of the system. 【Records】 Set the maximum number of alarms to save for the current【Alarm】group. 【Backup Memory】 Set whether to enable Backup Memory.
【Add】 	Add an alarm entry to the bottom of the alarm table when this button is pressed.
【Delete】 	The alarm data selected in the alarm table below will be deleted when this button is pressed.
【Copy】 	The alarm data selected in the alarm table below will be copied when this button is pressed.
【Paste】 	A new alarm data entry will be added and the alarm settings copied will be filled into this new alarm entry when this button is pressed.
【Alarm Table】	Set the occurrence condition of the【Alarm】. 【Data Type】 Set the data type for the monitoring address of the【Alarm】. 【Address】 Set the monitoring address of the【Alarm】. 【Condition】 Set the condition to determine that an【Alarm】has occurred. When【Data Type】is Bit, the【Condition】is fixed to “Equal

	to (=)". And when【Data Type】is not Bit, the【Condition】can be set as "Greater than (>)" "Greater than or equal to (>=)" "Equal to (=)" "Less than (<)" "Less than or equal to (<=)" "Not equal to (!=)" "Range (A~B)" 【Value】 Set the value to determine that an【Alarm】has occurred. If the【Condition】is set to "Range (A~B)", the value must be filled in according to the (A~B) format. For example 0~100 means that the alarm range is for the value of the monitoring address to be greater than or equal to 0 and less than or equal to 100. 【Message】 Set the message to display when an【Alarm】has occurred. 【Level】 Set the level (1~8) of this【Alarm】entry. This can be used to distinguish between different levels of alarm. 【Advanced Setting】 When the【Advanced Setting】button is pressed, a pop up dialog will appear for users to set the advanced settings for【Alarm】.

7.2.2【Advanced Setting】

The【Advanced Setting】properties setting dialog is as shown in the figure below, the meanings of each setting option are listed below:

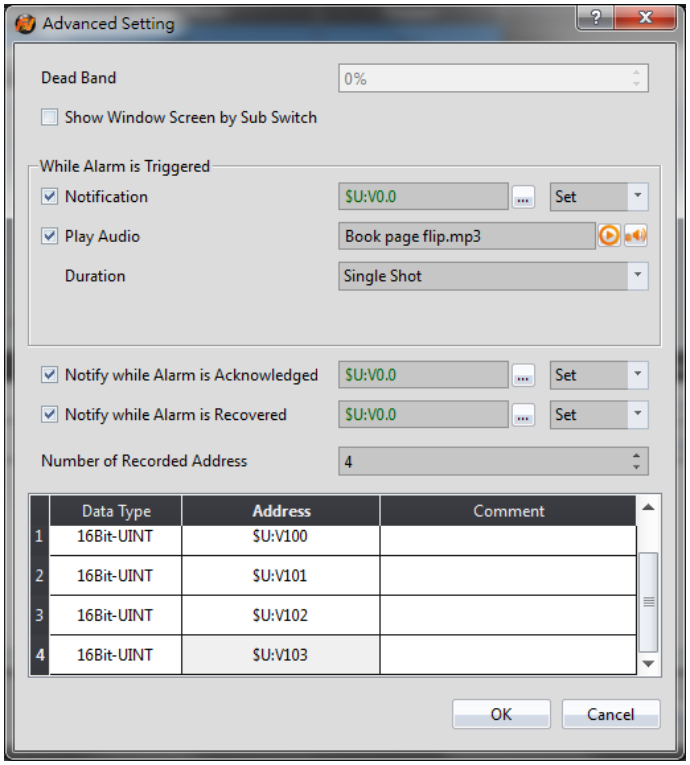


Figure 181 【Advanced Setting】Property Setting Dialog of【Alarm】

Table 131 【Advanced Setting】Properties of【Alarm】

Property	Description
【Dead Band】	Set the confirmed alarm recovery area after an 【Alarm】occurred. For example, if the alarm occurrence condition is set as x>100, and【Dead Band】is set as 5%, then when x>100 the alarm occurs and when x<95 the alarm will recover.
【Show Window Screen by Sub Switch】	Set whether to enable the【Show Window Screen by Sub Switch】function. The corresponding 【Window Screen】for this alarm entry can be selected on the right once this option is enabled. If this function is enabled when the alarm occurs, the【Show Window】sub switch can be pressed on the【Alarm Display】object to display the【Window Screen】set for this alarm.
【While Alarm is Triggered】	Set whether to execute other behaviors when an alarm is triggered.

	【Notification】 Set whether to notify specific addresses when an alarm is triggered. If this option is enabled, the notification address set on the right will be set or reset when an alarm occurs. 【Play Audio】 Set whether to play an audio when an alarm is triggered. If this option is enabled, the audio set on the【Audio Selector】on the right will be played when an alarm occurs. The【Duration】for the playback of the audio is controlled by the setting items below;【Single Shot】,【Time-based】and【Until Acknowledged or Recovered】are available for selection.
【Notify while Alarm is Acknowledged】	Set whether to notify specific addresses when an alarm is acknowledged. If this option is enabled, the notification address set on the right will be set or reset when an alarm is acknowledged.
【Notify while Alarm is Recovered】	Set whether to notify specific addresses when an alarm is recovered. If this option is enabled, the notification address set on the right will be set or reset when an alarm recovers.
【Number of Recorded Address】	Set the number of address to read when an alarm is triggered; it can be set between 1~8. When the number set is changed, the number of rows in the address record table below will also change accordingly.
【Data Type】	Set the data type of the address to read when an alarm is triggered.
【Address】	Set the address to read when an alarm is triggered.
【Comment】	Set the comment of the address to read when an alarm is triggered. This comment can allow users to identify what the address represents.

7.2.3【Export】

The【Export】screen is as shown in the figure below, the meanings of each setting option are listed below:

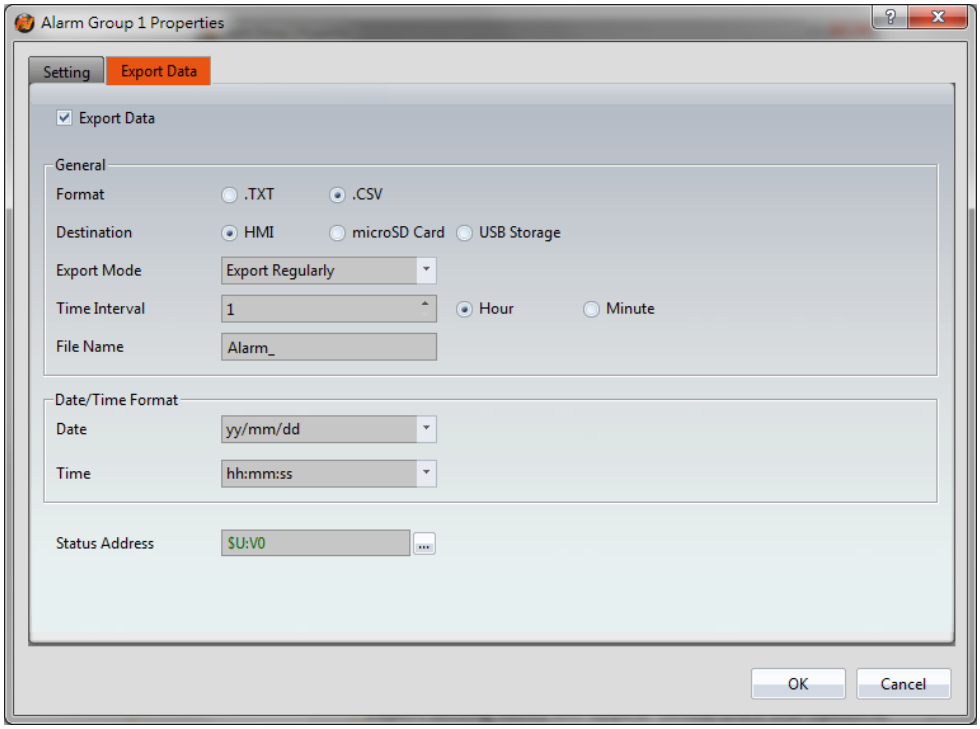


Figure 182 【Export】Setting Screen of【Alarm】

Table 132 【Export】Setting Properties of【Alarm】

Property	Description
【Export Data】	Set whether to enable the export function of the alarm data. Export setting items will appear below once this option is selected.
【General】	【Format】 Set the format of the export file; TXT file or CSV file can be selected. 【Destination】 Set the destination of the exported file; HMI, microSD card or USB storage device can be selected. If exporting into a file, a FTP connection can be used with the HMI to read the saved file. 【Export Mode】 Set the time to export the file. If【Export Regularly】is selected, the alarm occurrence data saved by【Alarm】will be exported on a regular basis. If【Triggered by Bit】is selected, the alarm occurrence data saved by【Alarm】will be exported when the set bit is triggered.

<table>
<tr><td></td><td>【Time Interval】
Set the time interval between each exporting of the alarm occurrence data saved by【Alarm】; the time interval can be set on the right and the unit of the time can be hours or minutes. This setting item will appear when the【Export Mode】is set as【Export Regularly】.

【Trigger Bit】
Set the control address to export the alarm occurrence data saved by【Alarm】. This setting item will appear when【Export Mode】is set as【Triggered by Bit】.

【File Name】
Set the name of the exported file; the actual exported file name will include the date and time the file was saved (for example: Alarm_140519_1517356.txt).</td></tr>
<tr><td>【Date/Time Format】</td><td>【Date】
Set the display format of the date when exporting file.

【Time】
Set the display format of the time when exporting file.</td></tr>
<tr><td>【Status Address】</td><td>Set the save address for error codes.

<table><tr><th>Error Code</th><th>Description</th></tr><tr><td>0</td><td>No Error</td></tr><tr><td>1</td><td>Read Error</td></tr><tr><td>2</td><td>Write Error</td></tr><tr><td>5</td><td>Open Error</td></tr></table></td></tr>
</table>

7.3 Alarm Related Objects

The following objects can be used if the user needs to view various alarm data records in real-time while the HMI is operating:

【Alarm Display】: Displays alarm related messages using a table.

【Alarm Scrolling Text】: Displays alarm related messages using scrolling text.

【Global Alarm Scrolling Text】: Displays alarm related messages using scrolling text.

If this option is enabled, the【Global Alarm Scrolling Text】will be displayed at the bottom of the screen when an alarm occurs no matter what screen the HMI is currently displaying.

8. 【Recipe】

In practical applications, settings with similar properties or behaviors but have different data contents for parameters are frequently used on equipment for manufacturing processes or actions; the collection of these parameter contents is what is called Recipe. Excellent recipe management helps increase engineering or production efficiencies.

8.1 Recipe Data Flow

Before we start explaining the data flow of recipes on HMI, we must first understand what recipe group files, recipe groups and recipes are.

Recipe

For instance, if a machine is able to produce bread and cakes, and their ingredients are both flour, eggs, butter and chocolate, the ingredients can be viewed as the parameters of the machine. However, because the ratio of ingredients for making bread is different from making cakes, the ingredient ratios of the two can be made into two sets of parameters: one for making bread and one for making cakes. The two sets of parameters described above are two different recipes; and every recipe will have a unique number.

Recipe Group

A group of recipes that have the same parameters is called a Recipe Group; take the example above for instance, the two recipes (bread and cake) can form a Recipe Group. The recipe function allows users to edit multiple recipe groups, and every recipe group will have a unique Recipe Group ID. All the recipes in the recipe group will have a unique number starting from 0. (For example, the number of bread is 0 and the number of cake is 1)

Recipe Group File

There are two types of file formats: One is the common format csv file which the user can use text editors on their own computers or the Recipe Editor in the recipe function to edit the csv file. The other format is a binary file format that is dedicated to this software which the user must use the Recipe Editor to edit the binary file. A recipe group file saves all the data of a recipe group, including all the parameter names and parameter values in the recipe.

Recipe Data Flow

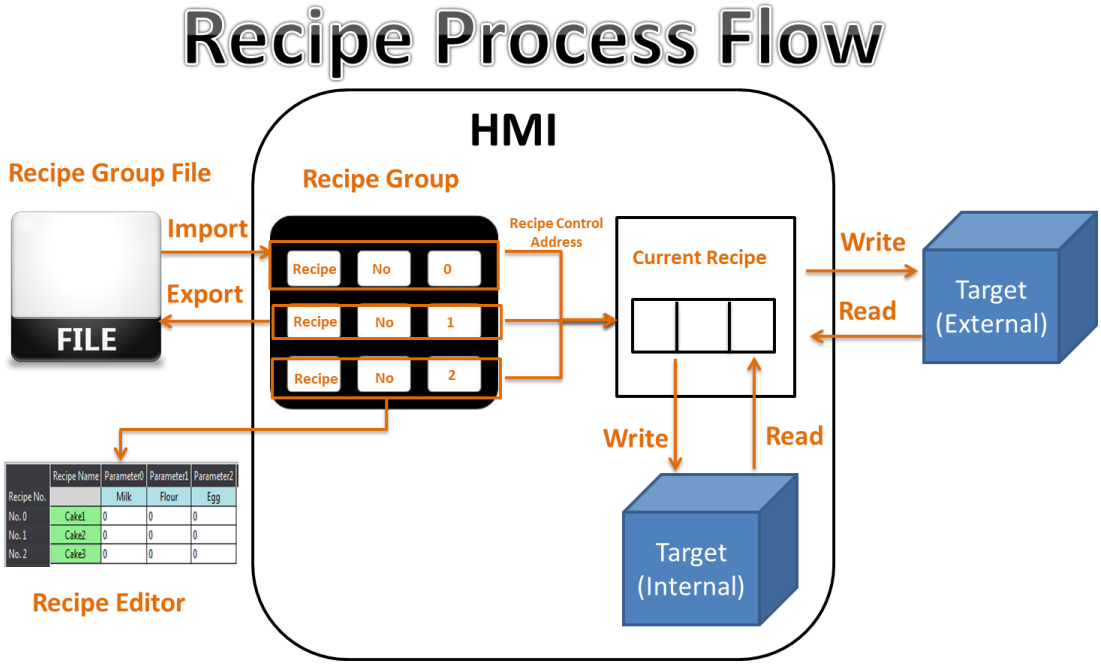
When projects are executing on the HMI, all of the parameter data are saved

in the recipe group file first, and the user can use the function switch object to import the file into the HMI. Complete parameter contents can be seen if the project has the recipe table object.

There is a buffer in the HMI used to save the data of the current recipe; which recipe to save in this buffer is determined by the Control Address of Recipe No., and the Control Address of Recipe No. is set in the recipe function. Please note that no matter what the Recipe No. currently is, once the import file function is used, the Recipe No. will be reset to 0.

The export function can be used to export the recipe group of the HMI into the recipe group file if the user changed the parameter data of the recipe group, and the contents in the original recipe group file will be overwritten.

The function switch object can be used to write the contens of the current recipe of the HMI to the target address (usually the PLC controller), and it can write the data of the target address into the current recipe of the HMI.



Import → Use Function Switch: Import Recipe Group from File
Export → Use Function Switch: Export Recipe Group back to File
Write → Use Function Switch: Write Current Recipe to Target Address
Read → Use Function Switch: Read from Target Address to Current Recipe

Figure 183 Recipe Data Flow

8.2 Recipe Settings

The recipe function can be found by clicking【Recipe】in the【Functions】window of【Project Explorer】located on the left side, to enter【Recipe Group List】.

Note: Every project can have a maximum of 16 recipe groups.

The【Add】or【Delete】button on the right can be clicked to add a new recipe group or delete the selected recipe group; items in the recipe group list can also be

double-clicked to edit the selected recipe group. On the left side of every recipe group in the recipe group list has a unique ID. This is called the recipe group ID.

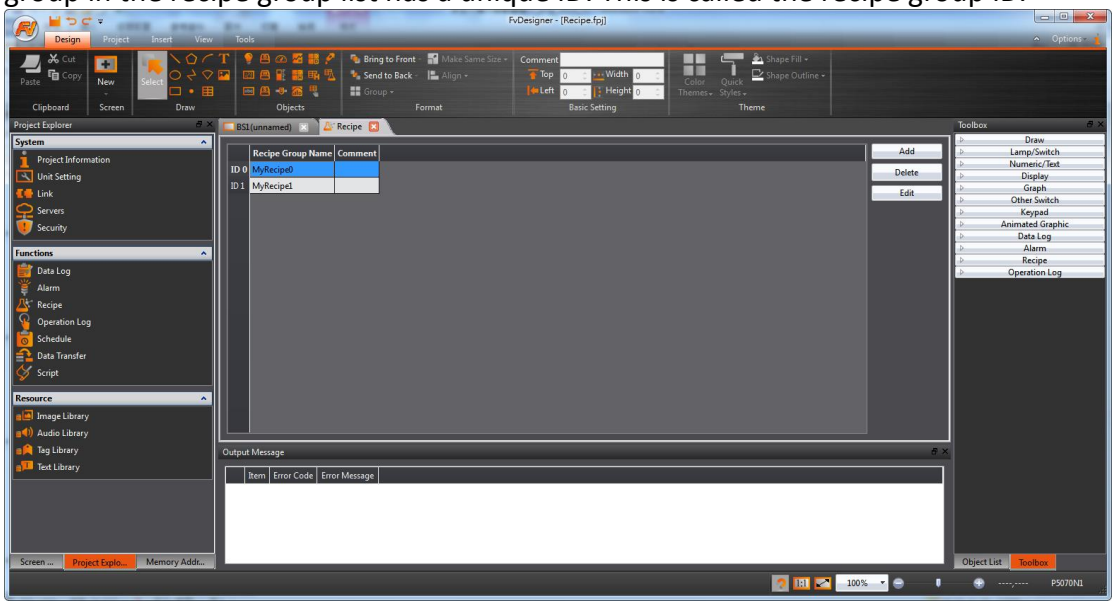


Figure 184 Recipe Settings Screen

【Recipe】in the【Insert】page function group of the Ribbon workspace can also be clicked to add a new recipe group directly and enter its【Recipe Group Properties】editing page. The new recipe group will be added after pressing the【OK】button.

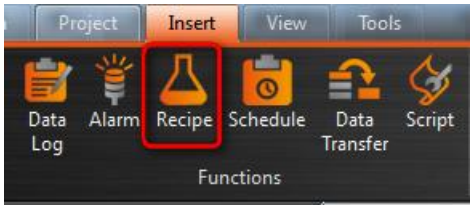


Figure 185 Insert Recipe Screen

The following are detailed explanations of the【Recipe Group Properties】.

8.2.1【General】

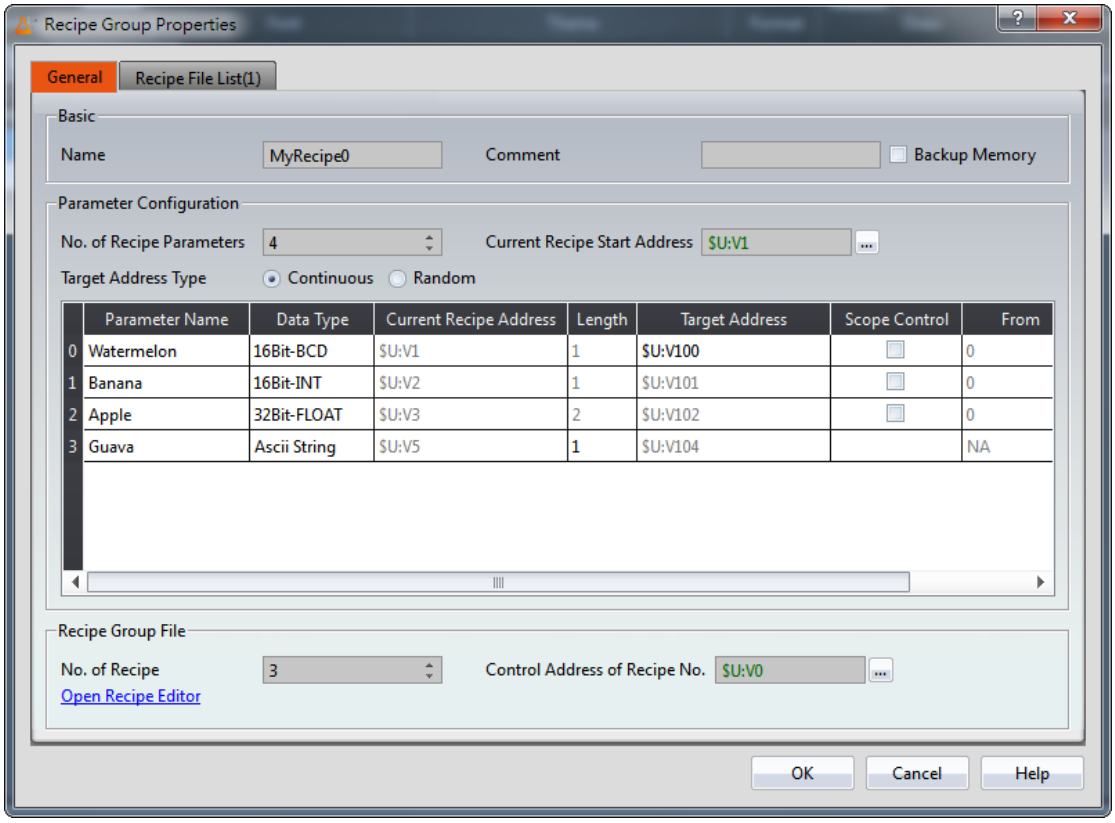


Figure 186 【General】Screen of【Recipe】

Table 133 【General】Properties of【Recipe】

Property	Description
【Basic】	【Name】 The name of the recipe group. 【Comment】 Comment about this recipe group. 【Backup Memory】 Select whether to save the recipe data of the HMI in the backup memory of the HMI when the power of the HMI is interrupted in order to avoid loss of data.
【Parameter Configuration】	【No. of Recipe Parameters】 Determine the number of parameters for this recipe group. 【Current Recipe Start Address】 Every recipe group has a buffer memory space equal to the size of a recipe on the HMI, and the current recipe start address determines which address to start this buffer memory.

【Target Address Type】

a. 【Continuous】

The target address can only be set for the first parameter of the target (usually PLC) address in the parameter configuration table below. The addresses of the other parameters will be generated automatically and the user cannot modify them.

b. 【Random】

The user can set the target address for every parameter, but the addresses cannot be the same.

The following are the explanations for parameter settings.

【Parameter Name】

The parameter name cannot be blank and each parameter should have a unique name.

【Data Type】

Available selections include【16Bit-BCD】,【16Bit-INT】, 【16Bit-UINT】,【32Bit-BCD】,【32Bit-INT】,【32Bit-UINT】, 【32Bit-FLOAT】and【Ascii-String】.

【Current Recipe Address】

The current recipe address of the parameter is determined by the current recipe start address set by the user. The user cannot change it here.

【Length】

If the data type is 16-bit, it will take up the size of 1 word; if the data is 32-bit, it will take up 2 words. If the data type is Ascii-String, the user can determine how many words this parameter will take up and every 1 word can contain 2 characters.

【Target Address】

Determine the address of the target (usually PLC) register.

【Scope Control】

Allow the user to determine whether the value range for this parameter is restricted. If not selected, the default value range of the parameter will be the range set by the【From】and【To】columns.

【From】

Determine the minimum value of this parameter; this value cannot be less than the absolute minimum value for the parameter. The default value for this field is the absolute minimum value.

【To】

Determine the maximum value of this parameter; this value cannot be greater than the absolute maximum value for the parameter. The default value for this field is the absolute maximum value.

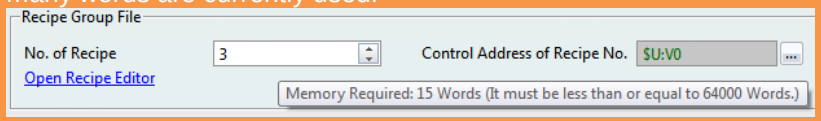
Data Type	Absolute Minimum Value	Absolute Maximum Value
16Bit-BCD	0	9999
16Bit-INT	-32768	32767
16Bit-UINT	0	65535
32Bit-BCD	0	99999999
32Bit-INT	-2147483648	214783647
32Bit-UINT	0	4294967295
32Bit-FLOAT	-3.4E+38	3.4E+38

【Recipe Group File】

【No. of Recipe】

Determine the number of recipe for this recipe group.

Note: The memory size of every recipe group cannot exceed 64000 words, which means that (the total number of words for every parameter) x (the number of recipe) ≦ 64000. If the user is uncertain whether the limit has been exceeded, the user can move the mouse cursor onto the text and a tooltip will tell the user how many words are currently used.



【Control Address of Recipe No.】

The register data of this address is a 16-bit positive integer, and it is used to represent the number of the current recipe. The used recipe in a recipe group durning HMI execution is called current recipe.

Note: The Control Address of Recipe No. cannot be the same as the Current Recipe Start Address.

【Open Recipe Editor】

	The recipe editor will appear allowing the user to add a new recipe group file when this button is pressed or allowing the user to edit a recipe group file saved on the PC storage. Note: ➢ The parameter name of the file must be the same as the parameter name in the recipe setting when modifying an existing file. ➢ When you use the function of simulation, the recipe group file will be put in the path: C:\Users\User Account\Documents\Fatek\FvDesigner\run\storage\internal \recipe

8.2.2【Recipe File List】

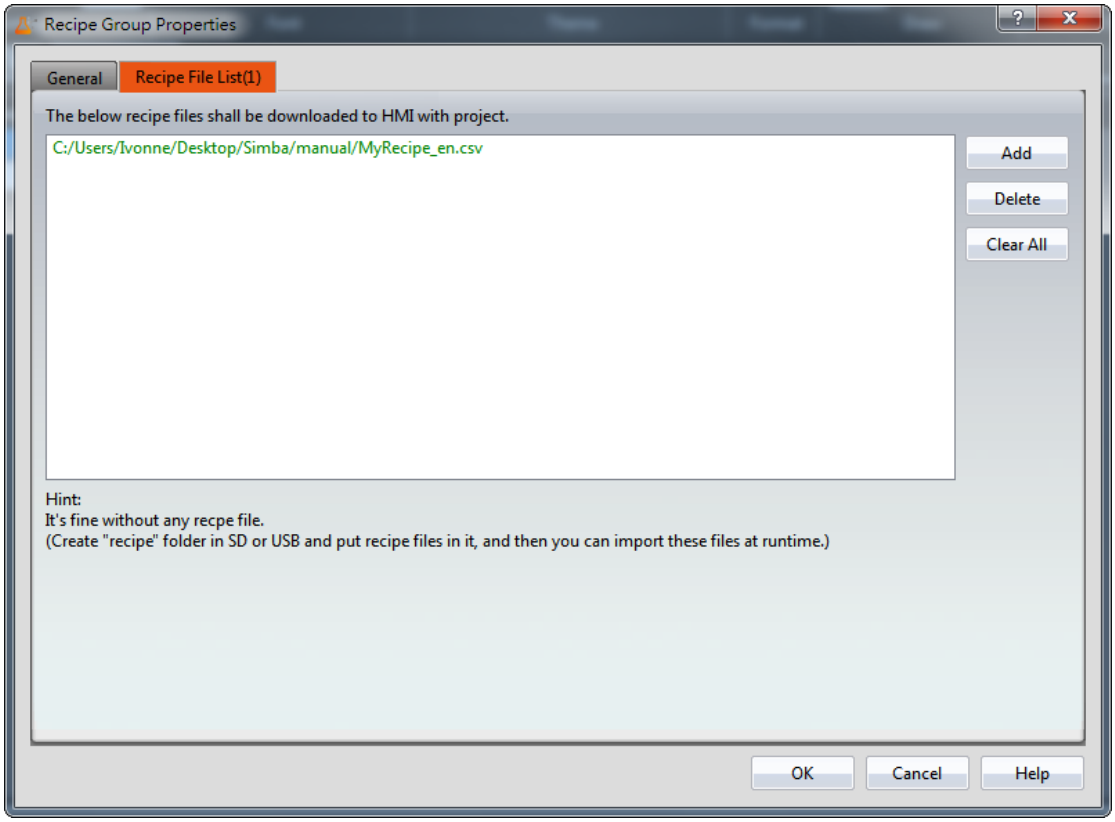


Figure 187 【Recipe File List】Screen of【Recipe】

Table 134 【General】Properties of【Recipe】

Property	Description
【Add】	Add a recipe group file already existed to the recipe file list.
【Delete】	Delete an item in the recipe file list.

【Clear All】	Delete all the items in the recipe file list.

8.3 【Recipe Editor】

This function allows the user to add a new recipe group file or edit an existing recipe group file.

The recipe editor can be opened from【Open Recipe Editor】in the【Recipe Group Properties】setting function.

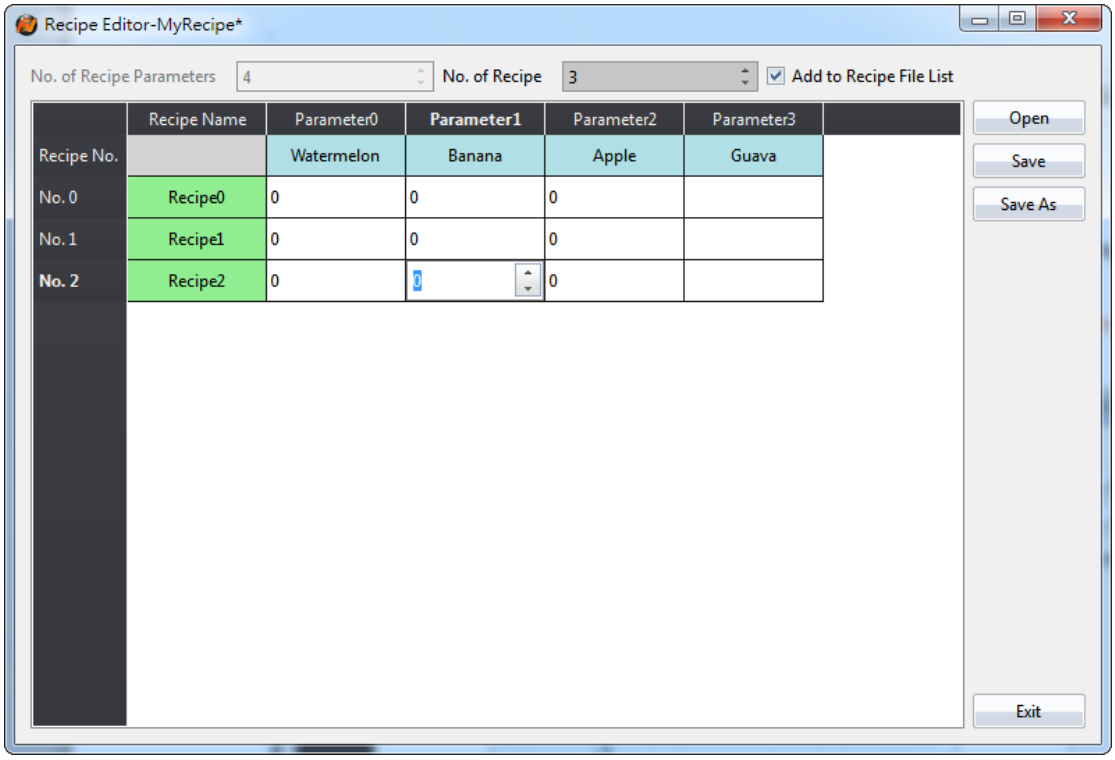


Figure 188 【Recipe Editor】Screen

Table 135 【Recipe Editor】Functions

Property	Description
【No. of Recipe Parameters】	The No. of Recipe Parameters cannot be set if the user is adding a recipe group file. The No. of Recipe parameters can be set if the user is modifying an existing file.
【No. of Recipe】	Determine how many recipes this recipe group file has. A number will be automatically generated on the left side of the recipe.
【Add to Recipe File List】	If the user has checked it, this file will be added to the recipe file list automatically after finishing editing.
【Open】	Open an existing file for editing.
【Save】	Save the currently edited recipe group contents into a recipe group file. The user can select whether to save it as a csv file or a

	binary file.
【Save As】	Save the currently edited recipe group contents into a new file; the user can select whether to save it as a csv file or a binary file.
【Edit】	Exit the recipe editor.

Note:
Please note that when the user is editing the value of the parameters, this value cannot exceed the limit between the minimum and maximum value of this parameter, in which the data type of the parameter usually defines the maximum/minimum value. However, the value set for the【Scope Control】will be referred to if the user selects【Scope Control】in parameter settings.
If this parameter is an Ascii String, the length of characters entered by the user cannot exceed the length configured for the parameter x2. If the parameter in the file opened by the user exceeded the restricted range, the background will be displayed in red.

8.4 【Recipe Table】

The【Recipe Table】is used to view or edit the contents of the recipe group. In addition, the user can decide whether to use【Sub Switch】in the recipe table.【Sub Switch】allows users to load the data in the recipe group file into the【Recipe Table】, or save the parameter contents in the【Recipe Table】into a recipe group file.

The【Recipe Table】object can be found in the【Recipe】category of the【Toolbox】to the right; it can also be found by clicking the icon in the【Object】group of the【Design】page on the Ribbon workspace. Please refer to the **chapter 3.3.24–【Recipe Table】** for detailed introduction to the properties of this object; the following is only introduction to special properties and functions related to recipes.

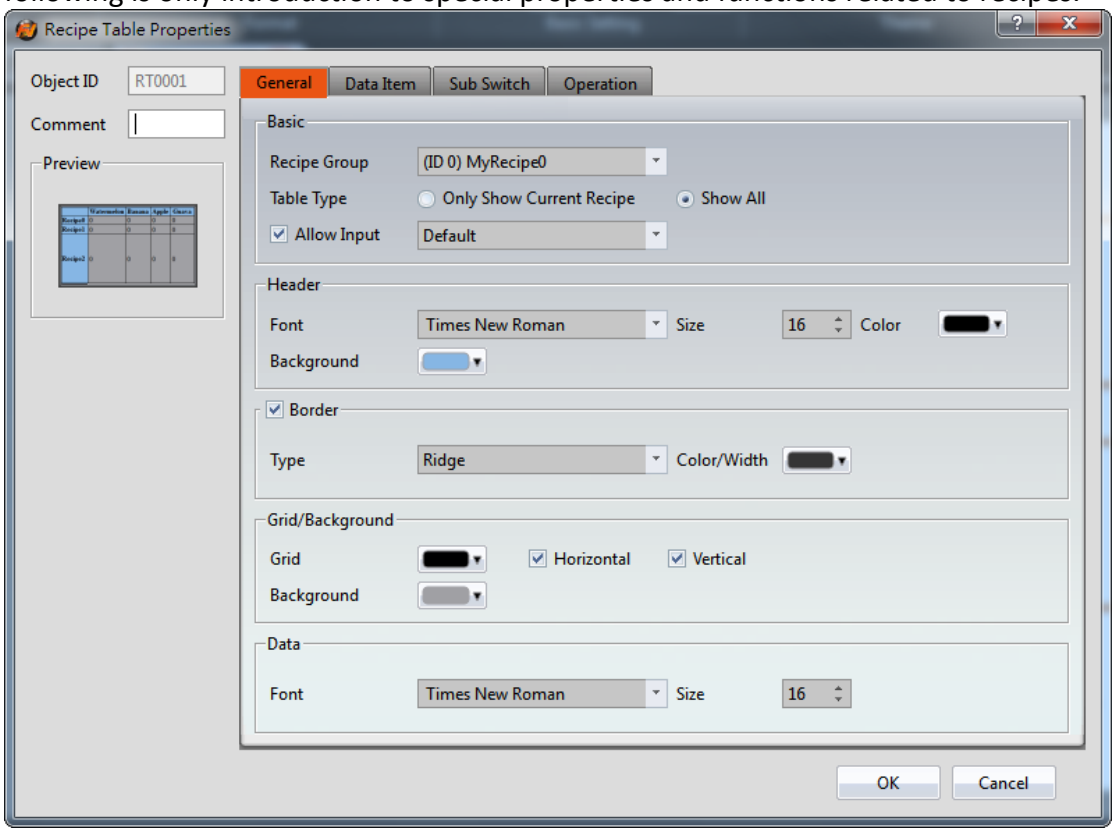
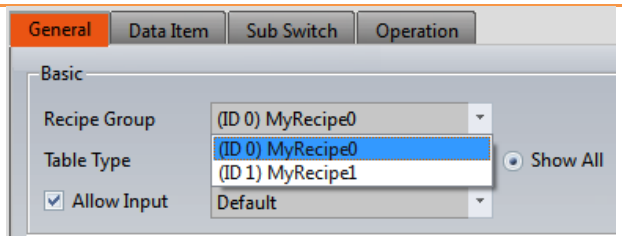
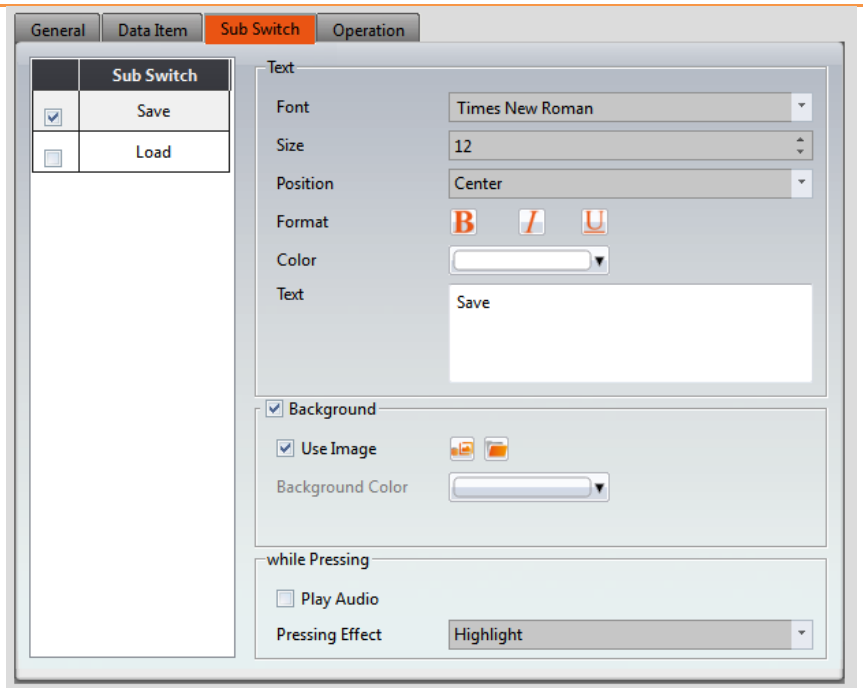


Figure 189 【Recipe Table】Property Setting Screen

Table 136 【Recipe Table】Functions

Property	Description
【Recipe Group】	The recipe group ID and recipe group name can be seen here if the user added a new recipe group in the recipe settings function. The【OK】button can only be pressed after the user has selected a recipe group.

	
【Table Type】	【Only Show Current Recipe】 Display the current recipe according to the Control Address of Recipe No. in recipe settings. The default value for index is 0. 【Show All】 Show all contents of the recipe group.
【Allow Input】	The user will be able to change the parameter contents in the recipe table during execution if this option is selected. If【Function Switch】or【Sub Switch】in the Toolbox is also used, the user can save the value contents of the recipe table into a recipe group file, or change the parameter of the controller.
【Sub Switch】	If the【Save】or【Load】button on the page is selected, corresponding buttons will also appear on the top-right of the recipe table editing section screen when the【OK】button is pressed. 【Save】 Once the user clicked this button during execution, the parameter contents of the current【Recipe Table】will be saved onto the recipe group file in recipe settings. 【Load】 Once the user clicked this button during execution, the contents of this file will be loaded into the【Recipe Table】according to the recipe group file in recipe settings.



8.5 【Recipe Selector】

The【Recipe Selector】is used to select current recipe; because the operator can only see the name of the recipe on the HMI and cannot know the contents of the recipe parameters, it can also keep the parameter data confidential.

The【Recipe Selector】object can be found in the【Recipe】category of【Toolbox】, it can also be found by clicking the icon in the【Object】group of the【Design】page on the Ribbon workspace. Please refer to the **chapters3.3.23–【Recipe Selector】** for detailed introduction to the properties of this object; the following is only introduction to special properties and functions related to recipes.

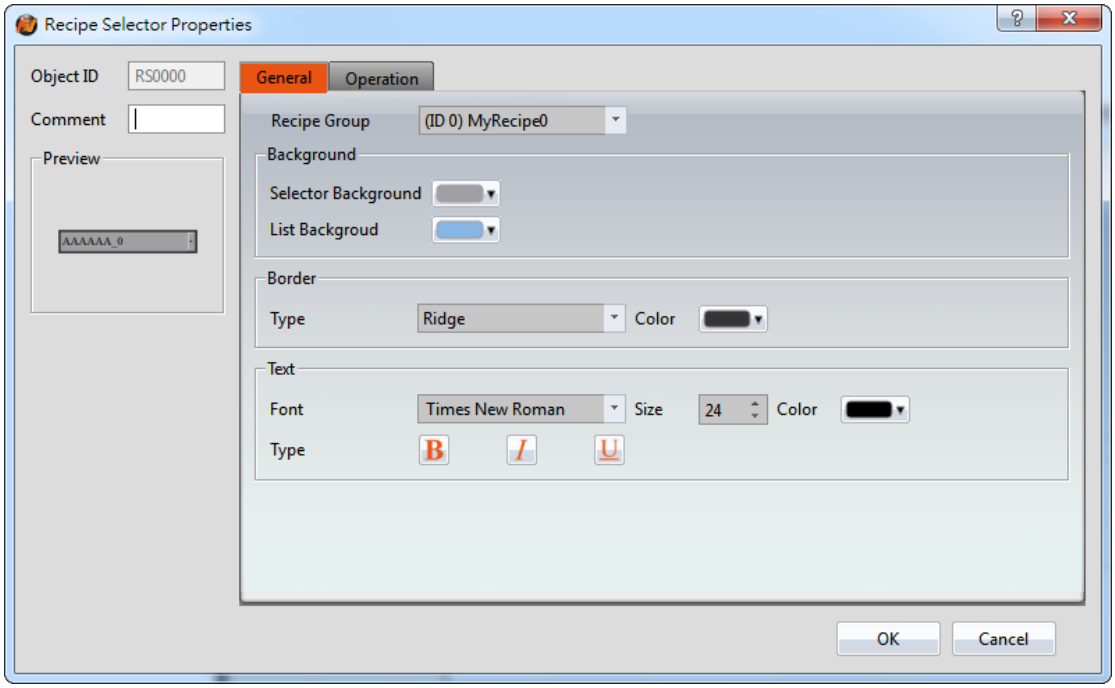
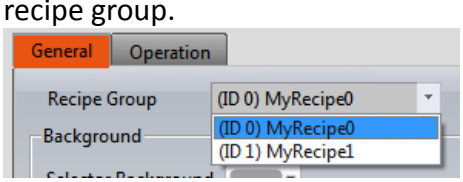


Figure 190 【Recipe Selector】Property Setting Screen

Table 137 【Recipe Selector】Functions

Property	Description
【Recipe Group】	The recipe group ID and recipe group name can be seen here if the user added a new recipe group in the recipe settings function. The【OK】button can only be pressed after the user has selected a recipe group. 
【Background】	【Background Selector】 Set the background color. 【List Background】 Set the background color of the list.

8.6 【Function Switch】

There are a few functions in the【Function Switch】component related to recipe; users can select these functions according to their needs. Please refer to the following table for detailed introductions to these functions.

The【Function Switch】object can be found in the【Lamp/Switch】category of the

【Toolbox】to the right. Please refer to the **Chapter3.3.2.4–【Function Switch】** for detailed introduction to the properties of this object. The following is only introduction to special properties and functions related to recipe.

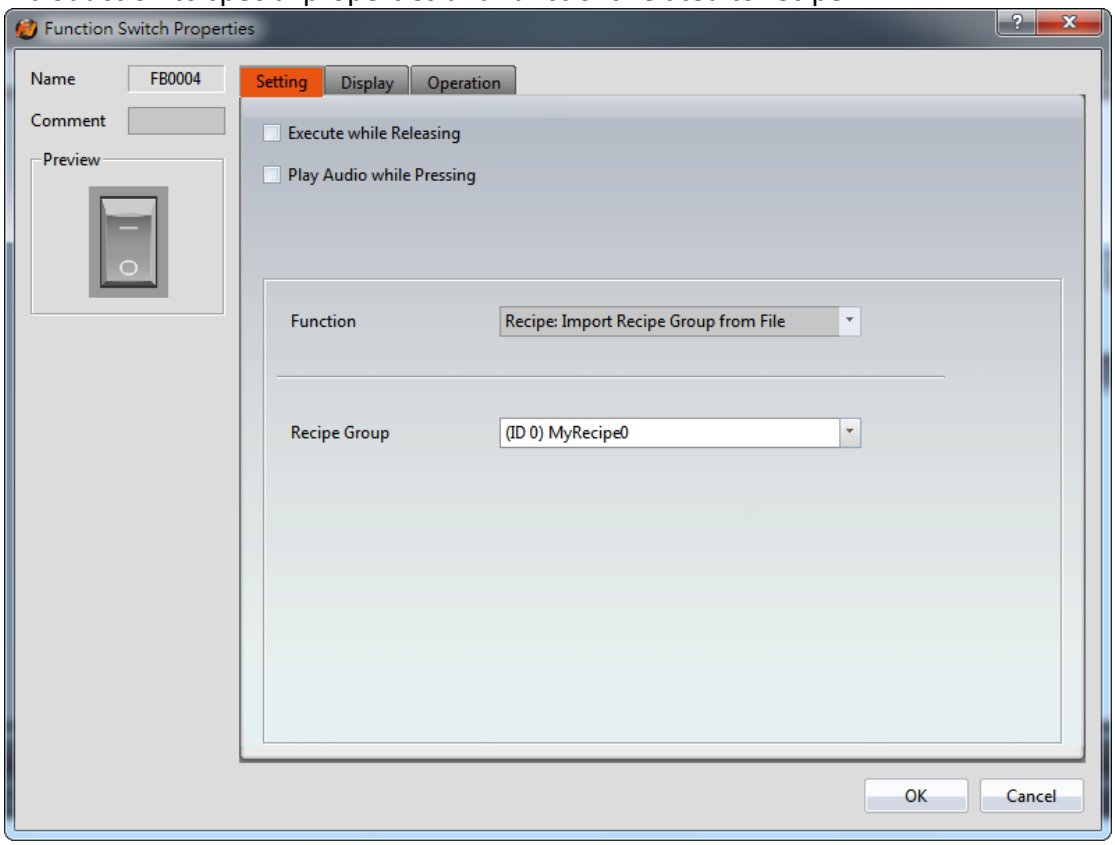
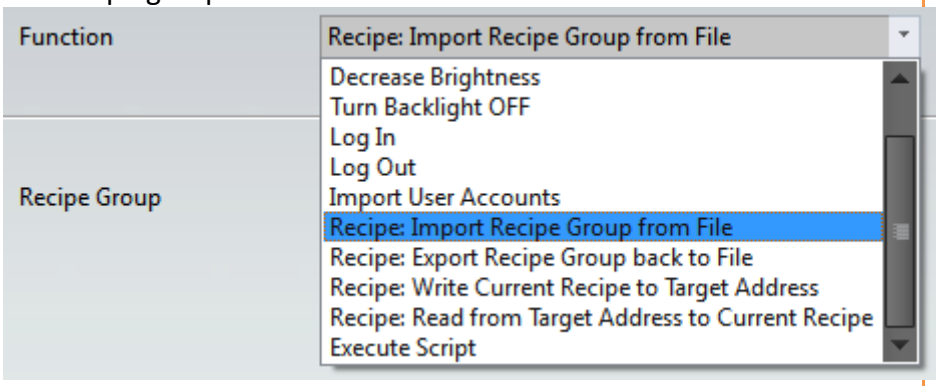


Figure 191 【Function Switch】Property Setting Screen

Table 138 【Function Switch】Recipe Functions

Property	Description
【Function】	【Recipe: Import Recipe Group from File】 Import the contents of the recipe group file; if recipe table exists, the user will be able to see complete recipe group contents. If the register addresses of some displayed objects are the same as the current recipe address in the recipe settings, users will also be able to see the value changes of the displayed objects. A drop-down list will appear once this function is used; the user must decide which recipe group to use for this function switch. Note: The current recipe of this recipe group will be Recipe No. 0 when this function is used. 【Recipe: Export Recipe Group back to File】 Export the contents of the recipe group into a recipe group file. The user can choose to export a new file or overwrite the original recipe group file. A drop-down list will appear once this function is used; the

	user must decide which recipe group to use for this function switch. 【Recipe: Write Current Recipe to Target Address】 A drop-down list will appear once this function is used; the user must decide which recipe group to use for this function switch. The parameter value of the current recipe of the HMI will be written to the register of the target address according to the setting of this recipe group. 【Recipe: Read from Target Address to Current Recipe】 A drop-down list will appear once this function is used; the user must decide which recipe group to use for this function switch. The register contents of the target address will be read and the value will be written to the current recipe of the HMI according to the setting of this recipe group. 
【Recipe Group】	Set the corresponding recipe group for this function switch.

8.7 Example

The following example can allow the users to better understand how to use the recipe functions and components related to recipes.

1. Adding a new recipe group in the recipe settings function, this recipe group uses 4 parameters and 3 recipes; please refer to the following figure for details on the settings:

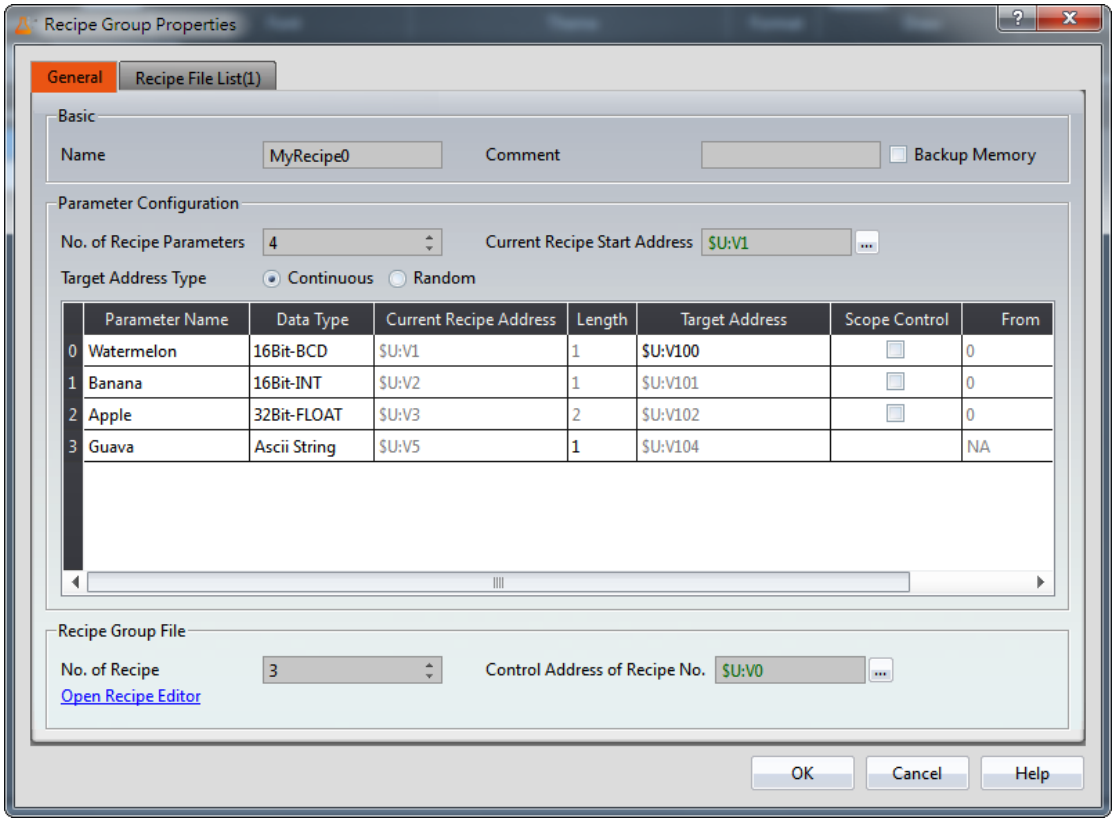


Figure 192 Recipe Settings Example

2. Press the【Open Recipe Editor】function and the【Recipe Editor】will appear on the screen; the parameter contents inside will be the same as the recipe settings, including the maximum and minimum value that the user will be able to input. Refer to the following figure for editing contents, and remember to save the file when editing is completed; please remember to check 【Add to Recipe File List】.

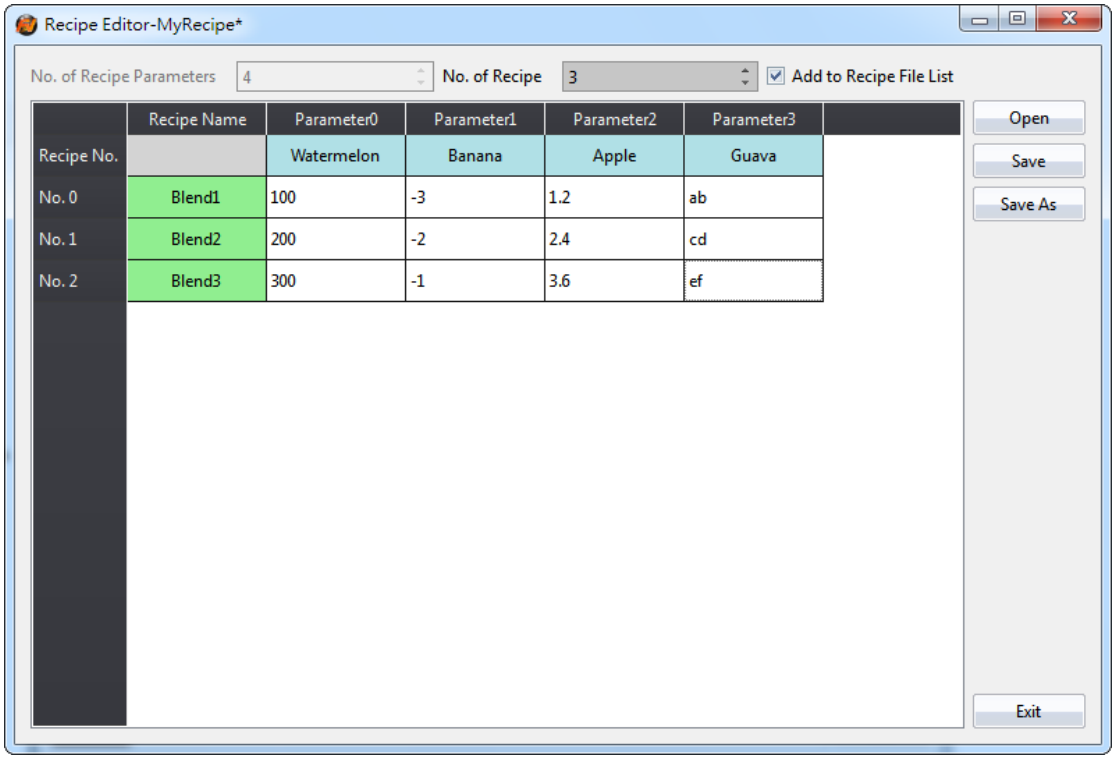


Figure 193 【Recipe Editor】Example

3. Pull two【Recipe Table】from【Toolbox】to the editing section of the screen, and select (ID 0) MyRecipe0 for【Recipe Group】. Please select【Only Show Current Recipe】for one of the recipe table and【Show All】and【Allow Input】for the other recipe table.
4. Pull a【Recipe Selector】from【Toolbox】to the editing section of the screen, and select (ID 0) MyRecipe0 for recipe group.
5. Pull four【Function Switch】from【Toolbox】to the editing section of the screen, and select (ID 0) MyRecipe0 for recipe group. The functions of these four switches are【Recipe: Import Recipe Group from File】,【Recipe: Export Recipe Group back to File】,【Recipe: Write Current Recipe to Target Address】and【Recipe: Read from Target Address to Current Recipe】respectively. In order to avoid confusion, the texts: Import, Export, 2PLC and 2HMI can be added to the function switches.
6. Pull six【Numeric Input/Display】and two【Text Input/Display】from【Toolbox】to the editing section of the screen; the【Monitor Address】of these 8 components corresponds to the【Current Recipe Address】and【Target Address】in recipe settings, and the【Data Type】of the【Numeric Input/Display】component is also the same as the【Data Type】of the parameter. Set the maximum value and minimum value of these components within a reasonable range.

7. Pull a【Numeric Input/Display】from【Toolbox】to the editing section of the screen; the【Monitor Address】of this component is the same as the【Control Address of Recipe No.】in recipe settings. Please also select【Allow Input】.【Max.】is 2.【Min.】is 0 (because there are only 3 recipes, therefore the values used is 0~2).

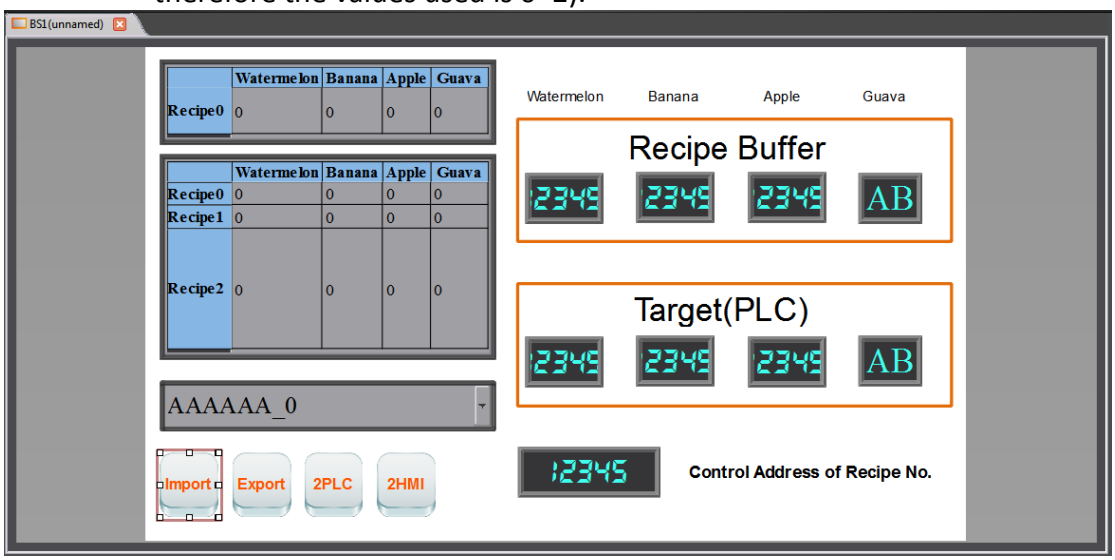


Figure 194 Example Screen

8. We can use the【Simulation】function once the project is created to simulate the behavior of this project in the HMI on the computer. Click【Simulation】in the【Project】function tab of the Ribbon taskbar. It will ask the user to build the project first before executing the function. The starting simulation screen is as shown below:

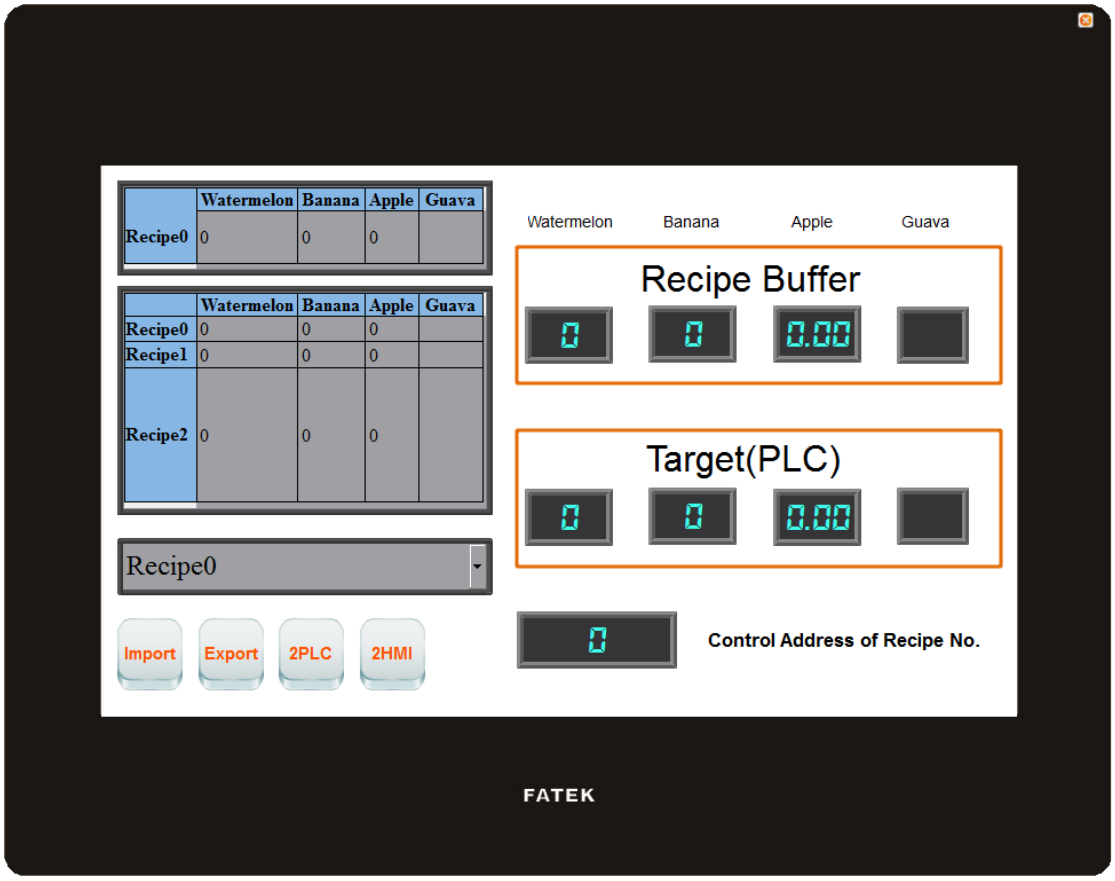


Figure 195 Simulation Screen 1

9. Click the import function switch; this operation will read the contents of the recipe group file into the HMI, including the current recipe and recipe table. If the monitor addresses of the displayed objects are the same as the current recipe address of the recipe settings, the displayed numeric value or text will also changes accordingly. The contents of the recipe selector will also changes accordingly. The current recipe will be reset to Recipe No. 0 every time a file is imported, so the content of the recipe selector will be the Blend1 with a number of 0. During this time the screen will be displayed as follows:

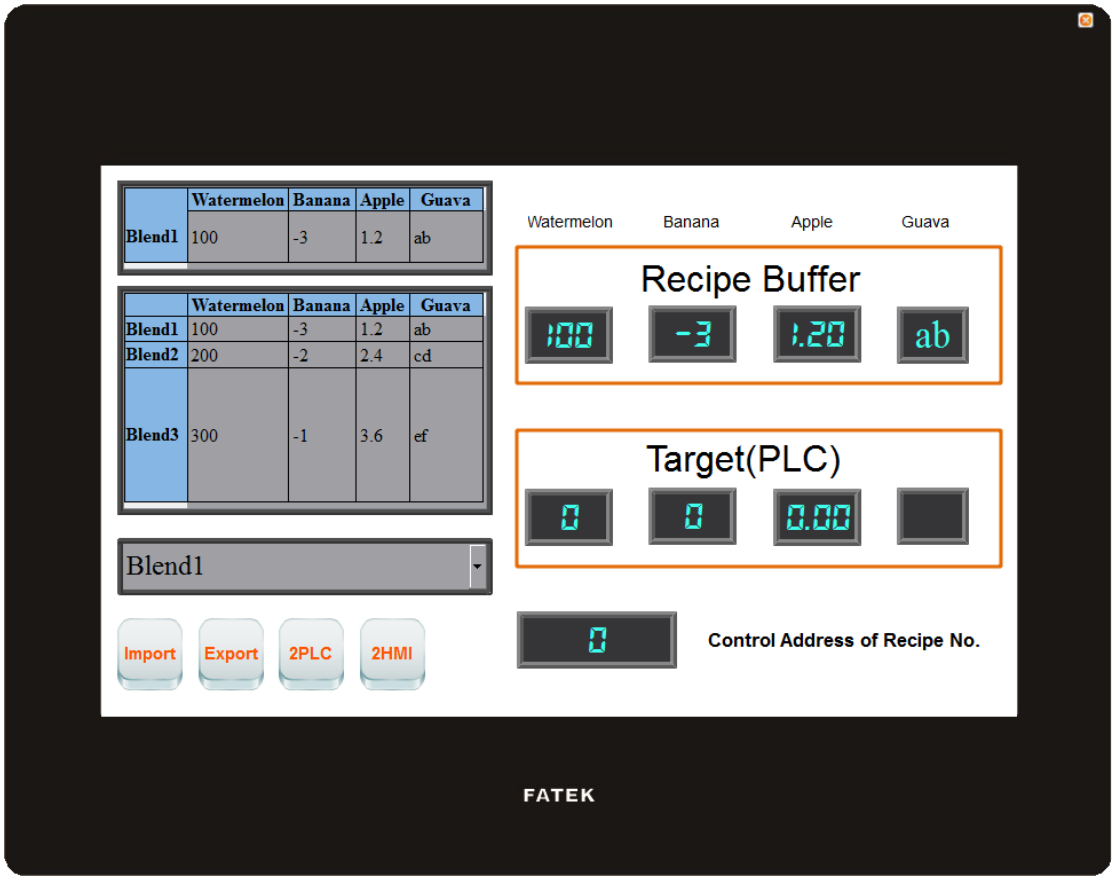


Figure 196 Simulation Screen 2

10. Change the numeric input of the Control Address of Recipe No., please input 2; the current recipe will change to Blend3.

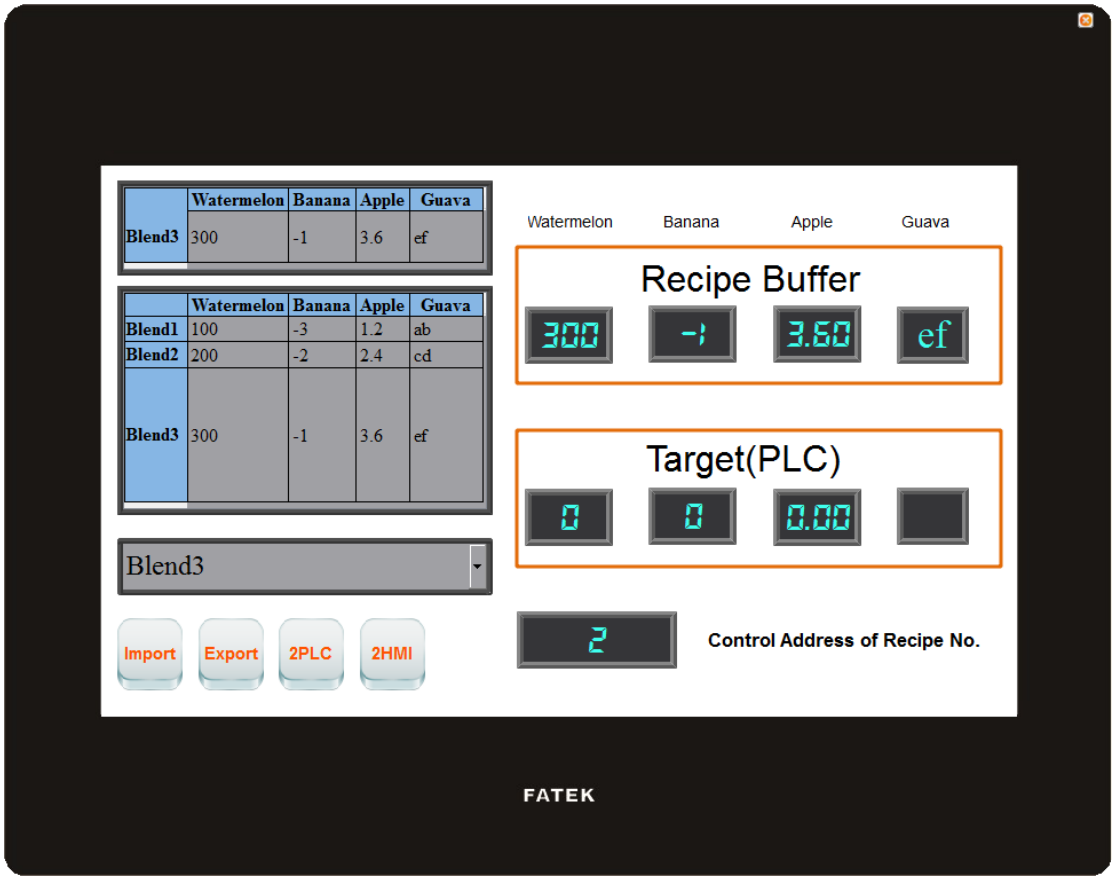


Figure 197 Simulation Screen 3

11. Click on the 2PLC function switch; this operation will write the data content of the current recipe into the register of the target address (usually the controller). It can be noticed that the displayed objects in the target area are also the parameter data of Blend3 after clicking the switch.

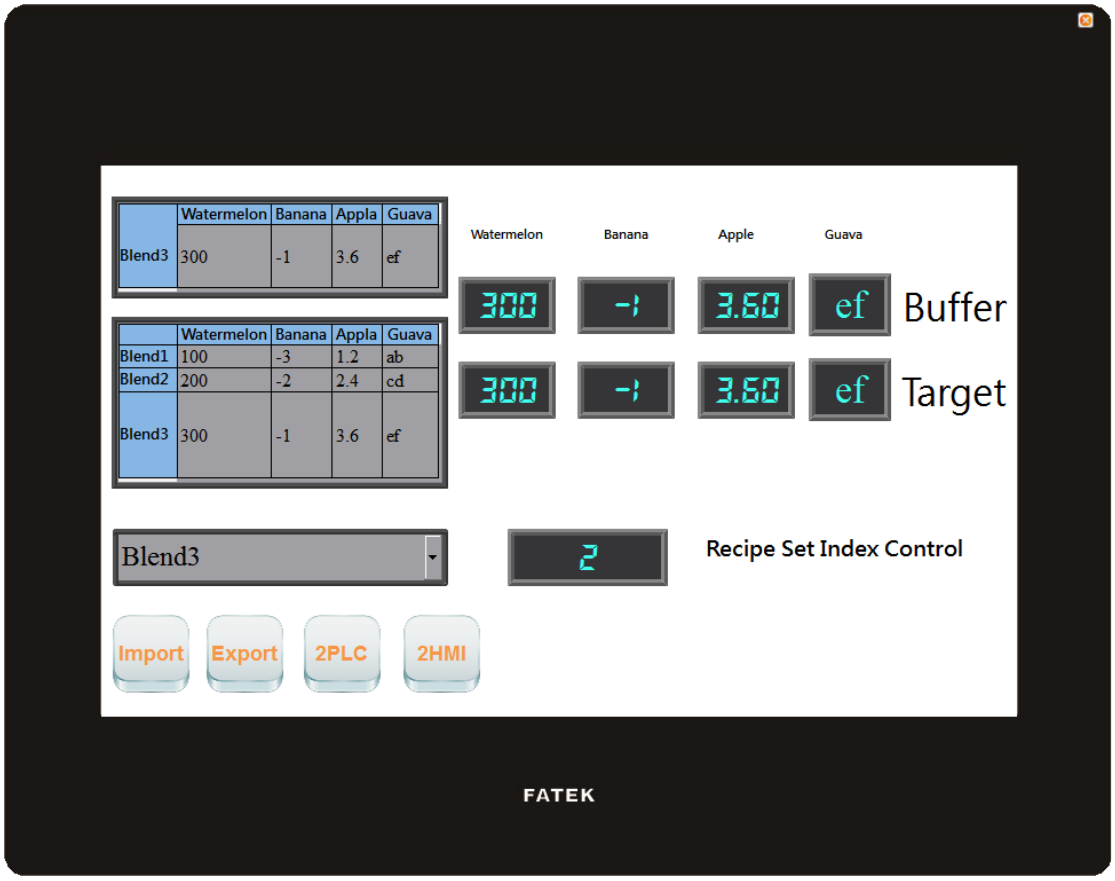


Figure 198 Simulation Screen 4

12. A keypad will appear allowing the user to input a numeric value once the watermelon field in the recipe table below is clicked; please enter 400 and press OK. It can be noticed that the displayed objects for the recipe table and current recipe also changed to 400.

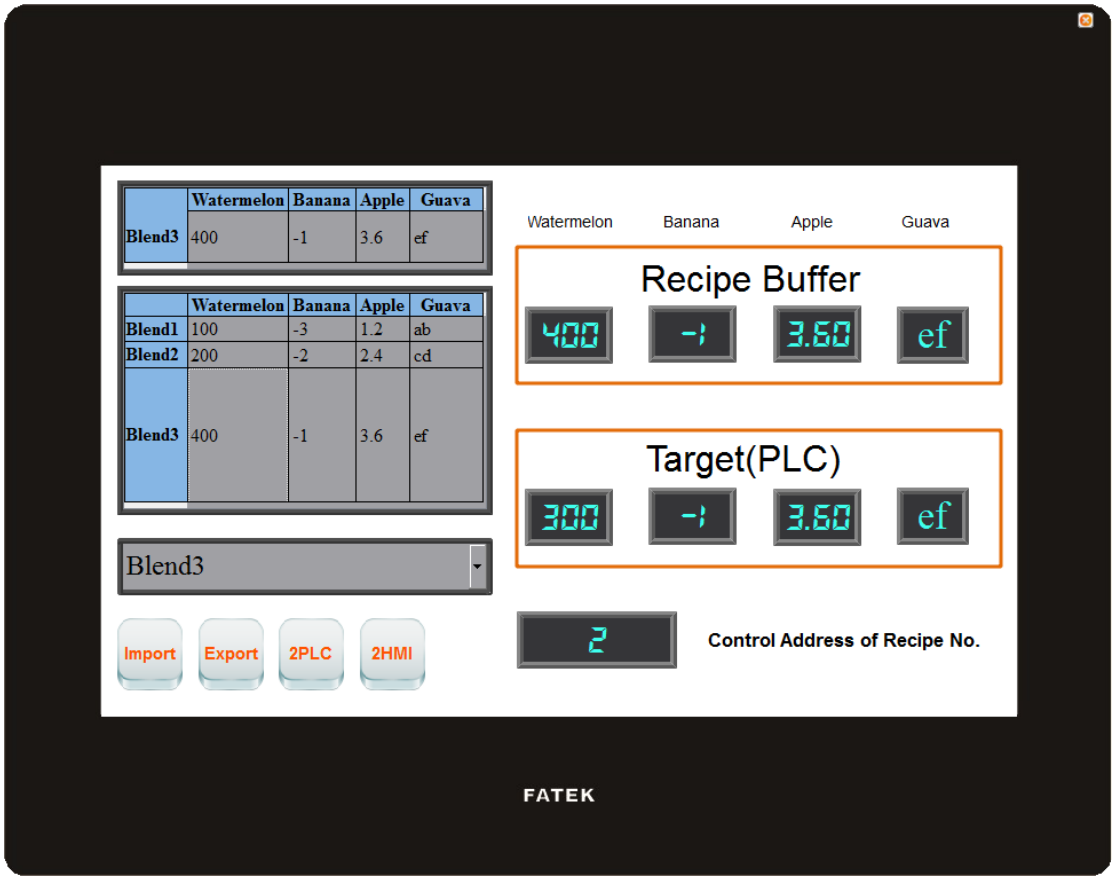


Figure 199 Simulation Screen 5

13. Click the Export function switch; this operation will export the parameter contents of this recipe group in the HMI onto the original file. Because we changed the watermelon parameter data of Blend3, so the recipe group file will also save the changed data.
14. Click the 2HMI function switch; this operation will write the contents of the target register back into the current recipe of the HMI. At this time, it can be noticed that the value of the watermelon parameters of Blend3 for the current recipe and recipe table have changed back to 300.

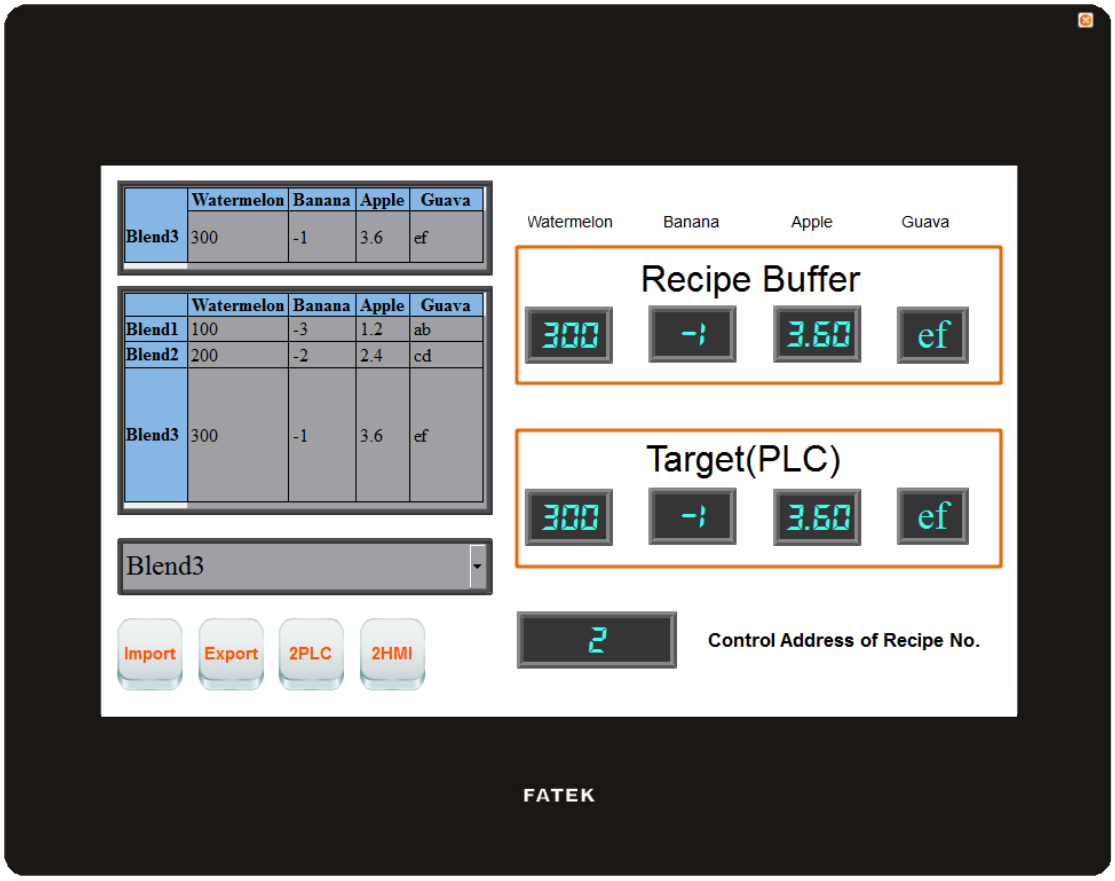


Figure 200 Simulation Screen 6

15. Click the Import function switch and it can be noticed that the watermelon parameter of Blend3 changed to 400 again. This is because we used the export function before, so the contents of the file have also been changed. However, because the file was imported again, the number of the current recipe was reset to Recipe No. 0, so the current recipie will show the data of Blend1.

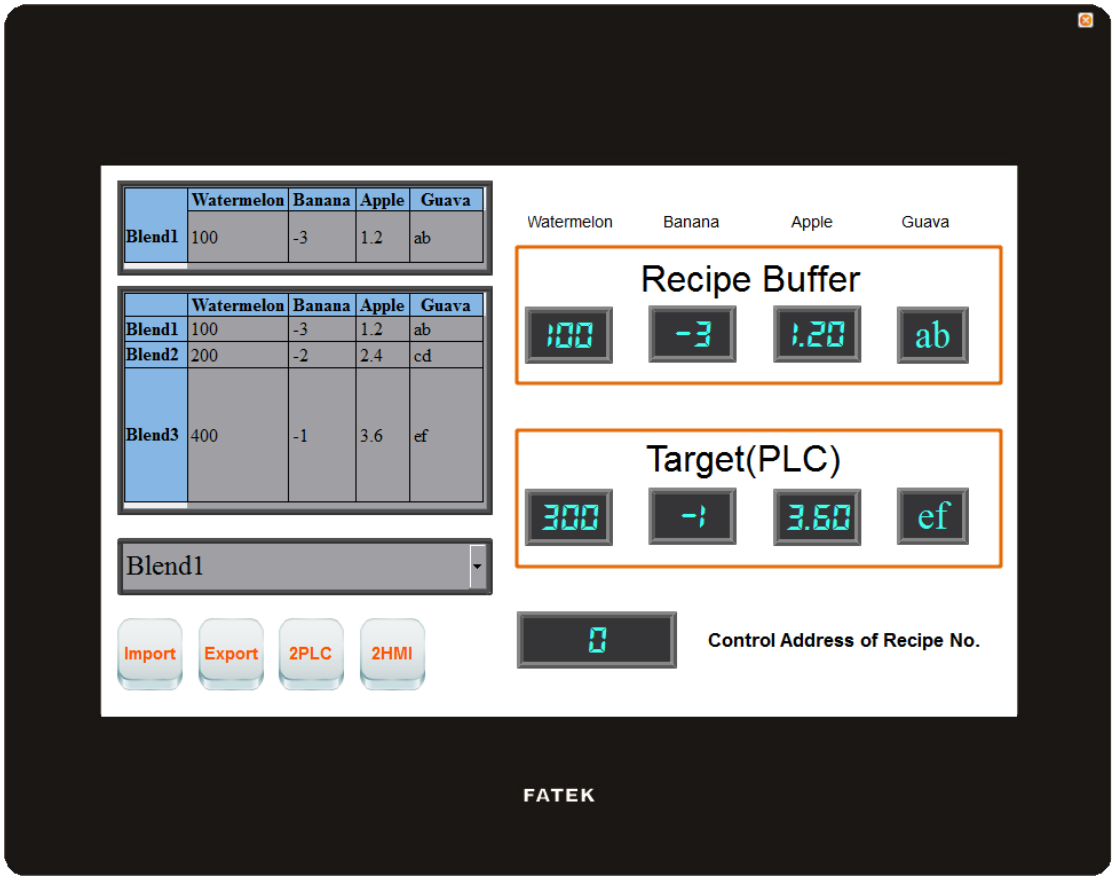


Figure 201 Simulation Screen 7

9. 【Operation Log】

Historic logs are frequently required for the parameters and controls of certain equipment in many applications in order to track phenomenon that users care about, and this is the function requirement that the 【**Operation Log**】provides. It can record the HMI operating processes performed by the user into the memory and also save it as a CSV file so that the user can view it afterwards.

9.1 【Operation Log】Settings

【Operation Log】can be clicked from the【Function】window located in the【Project Explorer】to the left of the FV Designer to enter its setting screen as shown below:

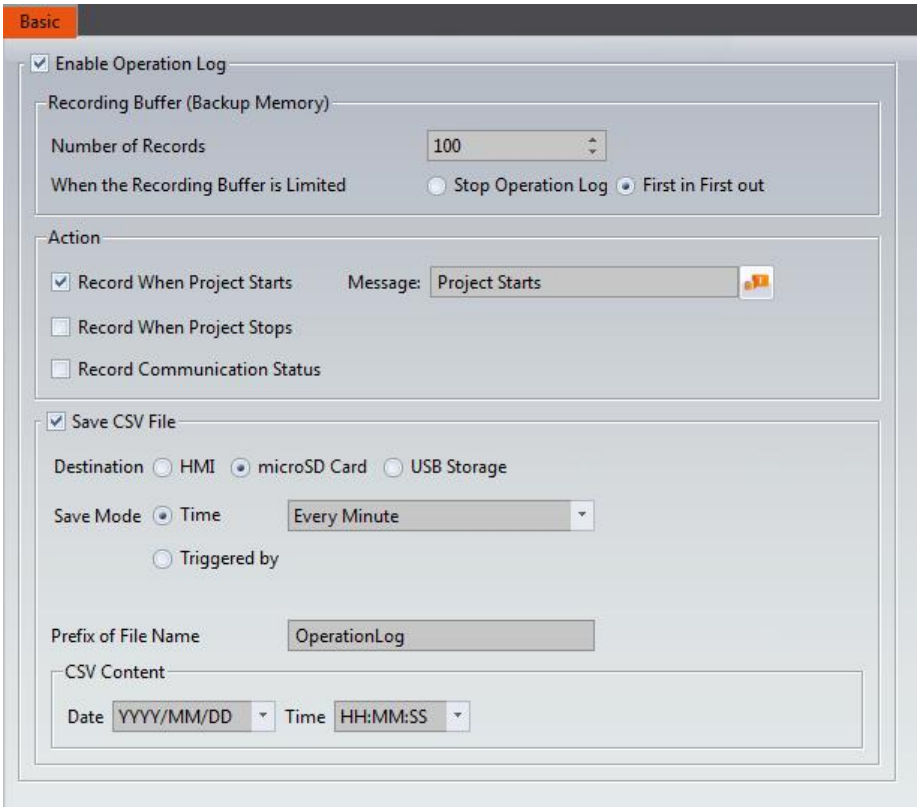
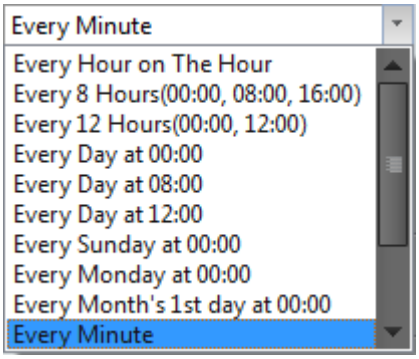
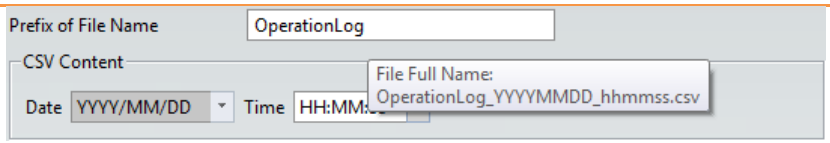
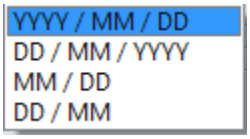
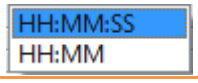


Figure 202 Setting Screen of【Operation Log】

Table 139 Setting Properties of【Operation Log】

Property	Description
【Enable Operation Log】	Check whether to enable the【Operation Log】; this is the master switch of the【Operation Log】.
【Recording Buffer (Non-volatile)】	【Number of Records】 Set the number of logs that the recording buffer can record. 【When the Recording Buffer is Limited】 This can be divided into the following two behaviors: ➢ 【Stop Operation Log】 Stop logging immediately; any operations afterwards will no longer be recorded in the recording buffer. It can only start logging again once the recording buffer is cleared. ➢ 【First in First out】 Delete the oldest log and places the newest log information in the recording buffer.
【Action】	【Record When Project Starts】 Check whether to record data in the recording buffer when the project starts.

	【Message】 Set the messages to record when【Record When Project Starts】is selected. 【Record When Project Stops】 Check whether to record data in the recording buffer when the project ends. 【Message】 Set the messages to record when【Record When Project Stops】is selected.
【Save CSV File】	Check whether to save the operation log recorded in the recording buffer into a CSV file. 【Destination】 Set the save location of the CSV file. 【Save Mode】 This can be divided into the following two modes: ➢ 【Time】 Save into CSV files at fixed times, in which the time selections are as follows:  ➢ 【Triggered by】 Use a certain triggering bit as the basis for saving the CSV files. 【Prefix of File Name】 Set a prefix for the CSV file name; the system will use this prefix with the date and time to form a unique file name when writing CSV files. The user only has to move the mouse cursor over the input field and the full name of the file will be displayed in the reminder immediately, as shown in the figure below:

	
【CSV Content】	【Date】 Set the date format of the CSV content, in which the selections are as follows:  【Time】 Set the time format of the CSV content, in which the selections are as follows: 

9.2 【Operation Log】Settings of Objects

The descriptions above are for the function settings of the【Operation Log】, but every object with operating behaviors has their own corresponding settings that must also be set completely in order to use the Operation Log.

The following figure shows the setting screen of objects with operating behaviors; the Operation Log setting of the objects can be found under the【Operation】tab, as shown by the frame in the figure below.

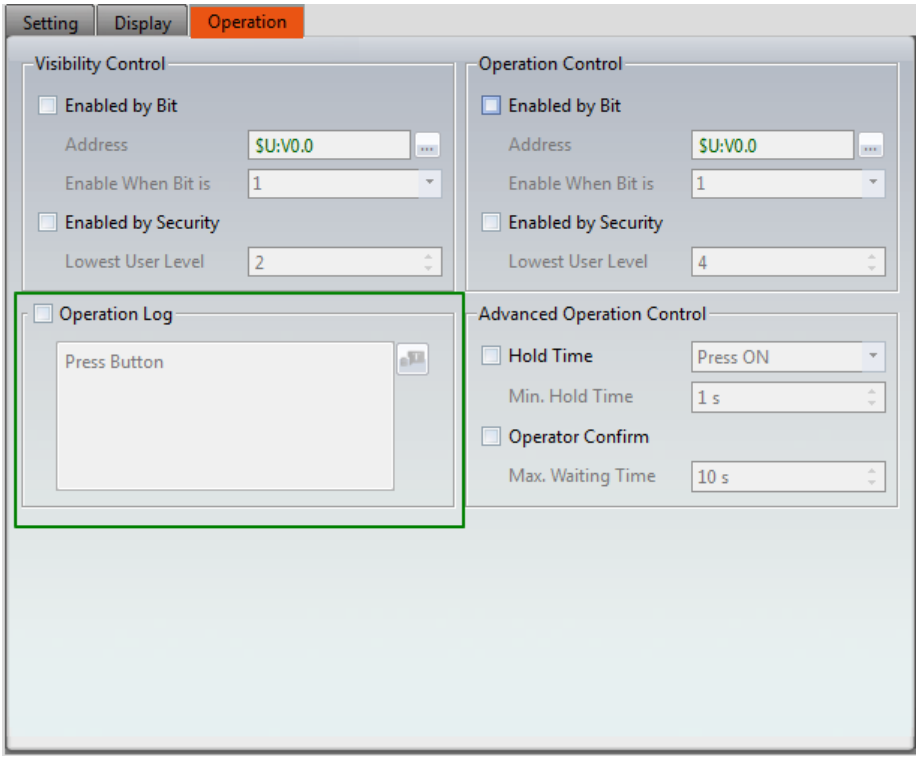


Figure 203 Setting Screen of Objects with Operation Behaviors

Table 140 Object Setting Properties of【Operation Log】

Property	Description
【Operation Log】	Select whether to enable the【Operation Log】of the object. It can also edit operation messages where the message can be inputted directly or acquired from the【Text Library】.

9.3 Introduction to the Operation Log CSV File

The CSV file contents of the Operating Log are as follows:

- **【Number】**

Operation Log serial number

- **【Date】**

Operation Log date

- **【Time】**

Operation Log time

- **【User】**

The user name at the time; no data will be recorded for this field when【Security Manager】->【Mode】is set as【Level】.

- **【Level】**

The user level at the time

- **【Screen】**

The screen where the operation object is located

- **【Part ID】**

The ID of the operation object

- **【Comment】**

Comments of the operation object

- **【Message】**

Operating message of the operation object

- **【Address】**

Access address of the operation object

- **【Pre Value】**

The pre value of the operation object's access address content

- **【Changed Value】**

The current value after the operation object's access address content has changed

10. 【Schedule】

The【Schedule】function can be used if users want the HMI to automatically execute specific actions regularly for long periods of time while the HMI is operating; the【Schedule】function can automatically execute the action selected by the user according to the date and time set by the user.

This chapter will explain the Schedule related screens and their setting methods.

10.1 Schedule List

Click on【Schedule】in the【Project Explorer】of the FV Designer and the【Schedule List】will appear; current【Schedules】that were already set will be displayed on the list in order according to the【Group ID】set for each schedule.

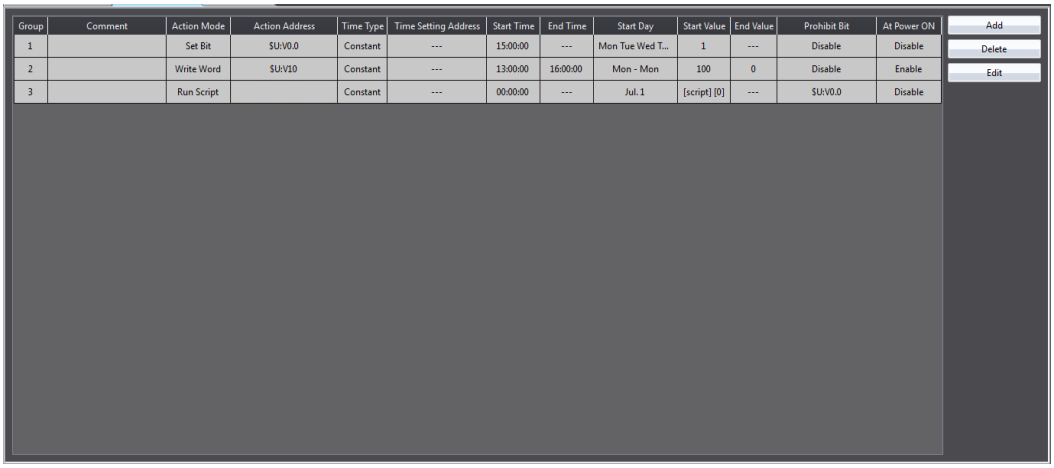


Figure 204 【Schedule】List Screen

To set a new set of schedule, click on the【Add】button to the right and a【Schedule】property setting dialog will appear for the user to operate.

To edit a【Schedule】that was already set, double-click on the【Schedule】entry on the list or first select the【Schedule】entry and then click on the【Edit】button to the right; at this time the property setting dialog for this【Schedule】entry will appear for the user to modify.

To delete a 【Schedule】 that was already set, select the 【Schedule】entry and click on the【Delete】button to the right to delete this【Schedule】entry.

10.2 Schedule Settings

The setting screen of the【Schedule】function is as shown in the figure below, the meanings of each setting option are listed below:

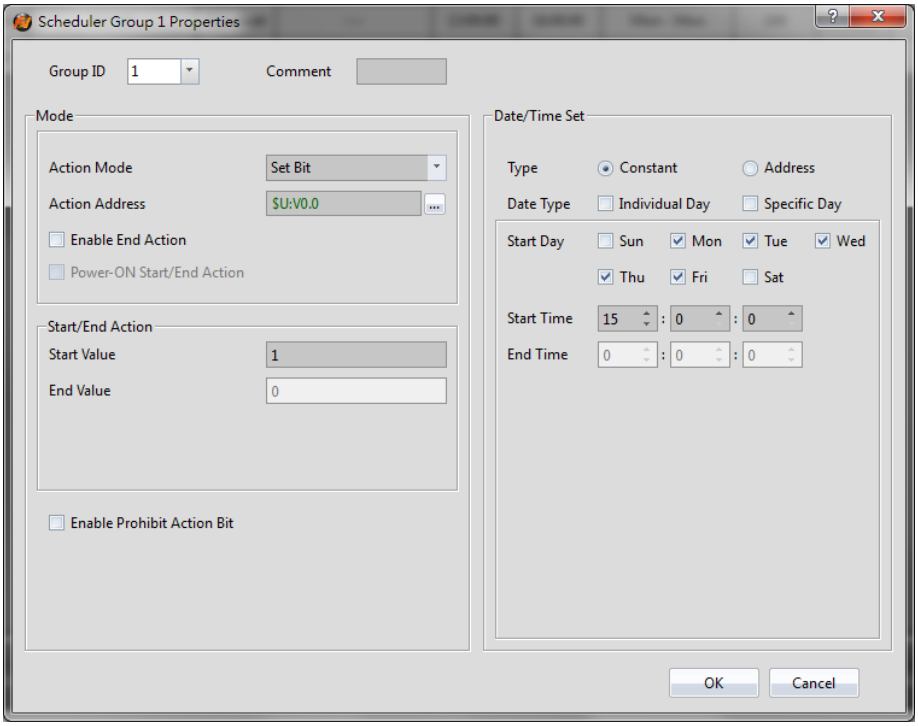


Figure 205 【Schedule】Setting Screen

Table 141 【Schedule】Setting Properties

Property	Description
【Group ID】	Set the Group ID of the【Schedule】.
【Comment】	Set the comments of the【Schedule】.
【Mode】	Set the execution action behavior of the【Schedule】. 【Action Mode】 Set the execution action mode of the【Schedule】. 1 【Set Bit】: If the【Action Mode】is set to this mode, when the system time reaches the【Start Time】set, the HMI will automatically set the【Action Address】as 1. 2 【Reset Bit】: If the【Action Mode】is set to this mode, when the system time reaches the【Start Time】set, the HMI will automatically set the【Action Address】as 0. 3 【Write Word】: If the 【Action Mode】 is set to this mode, when the system time reaches the【Start Time】set, the HMI will automatically set the【Action Address】as the【Start Value】.

4 【Run Script】: If the 【Action Mode】is set to this mode, when the system time reaches the 【Start Time】set, the HMI will automatically execute the 【Start Script】.

【Action Address】

Set the action address of the 【Schedule】.

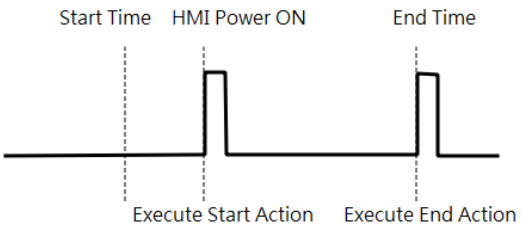
【Enable End Action】

Set whether to enable end action. The 【End Value】, 【End Script】 and 【End Time】 of the 【Schedule】 can be set when this option is enabled; when the system time reaches the 【End Time】 set, the HMI will automatically execute the end action set.

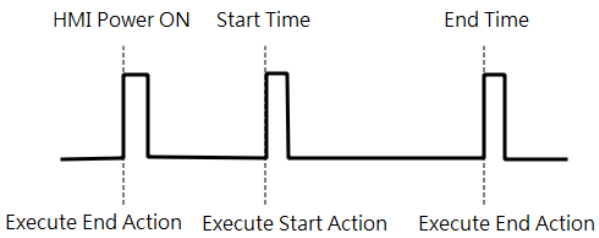
【Power-ON Start/End Action】

Set whether to enable the Power-ON Start/End Action, This function can only be enabled after selecting 【Enable End Action】.

When Power-ON Start/End Action is enabled, if the HMI was turned on between the Start and End Time interval set for the 【Schedule】, the HMI will automatically execute the Start action once.



When Power-ON Start/End Action is enabled, if the HMI was turned on outside the Start and End Time interval set for the 【Schedule】, the HMI will automatically execute the End action once.



【Start Value】

Set the value to write into the【Action Address】when the【Schedule】executes the Start Action. The【Start Value】cannot be changed if the【Action Mode】is set as【Set Bit】or【Reset Bit】.

【End Value】

Set the value to write in the【Action Address】when the【Schedule】executed the end action. The【End Value】cannot be changed when the 【Action Mode】is set as【Set Bit】or【Reset Bit】.

【Type】

This setting item will appear when the 【Action Mode】is set as【Write Word】;it allows the setting of the【Start Value】and【End Value】type. The【Start Value】and【End Value】are fixed values when the type is set as【Constant】, and the【Start Value】and【End Value】will be the saved value of the address set when the type is set as【Address】.

【Data Type】

This setting item will appear when the【Action Mode】is set as【Write Word】; it allows the setting of the data type for the【Start Value】and【End Value】setting address.

【Start Script】

This setting item will appear when the【Action Mode】is set as【Run Script】; it allows setting of the script for the HMI to

	execute when the system time reaches the【Start Time】that was set. 【End Script】 This setting item will appear when the 【Action Mode】is set as【Run Script】; it allows setting of the script for the HMI to execute when the system time reaches the【End Time】that was set. Please note that this setting item cannot be operated if【Enable End Action】was not selected. 【Enable Prohibit Action Bit】 The prohibit action bit can be set on the right when this function is enabled. If the prohibit action bit is enabled when the HMI is operating, once the value of the prohibit action bit reaches 1, the Start Action or End Action that was set will not be executed even if the system time as reached the【Start Time】or【End Time】.
【Date/Time Set】	Set the date and time for the【Schedule】 to execute the action. 【Type】 Set the type of the【Date/Time Set】;the date and time will both have fixed values when the date/time set is set as【Constant】,and the date and time for the【Schedule】to execute actions will be dynamically determined by the【Time Setting Address】that was set when the date/time set is set as【Address】. 【Date Type】 The date type can be set when the【Type】is set as【Constant】. Individual start day and end day can be set if【Individual Day】is selected, and the start day can be set as a specific date within a year if【Specific Day】is selected. If neither【Individual Day】nor【Specific Day】was selected, the start day can be set as a specific date within a week. 【Start Month】

Set the month for the start month of the【Schedule】. This setting item can only be set when the【Date Type】is set as【Specific Day】.

【Start Day】

Set the date for the【Schedule】to start execution.

【End Day】

Set the date for the【Schedule】to end execution. This setting item can only be set when the【Date Type】is set as【Individual Day】.

【Start Time】

Set the time for the【Schedule】to start execution.

【End Time】

Set the time for the【Schedule】to end execution.

【Time Setting Address】

The【Time Setting Address】can be set when the【Type】is set as【Address】. Once the【Time Setting Address】is set, it will use 11 continuous addresses starting from itself and the corresponding data type will be fixed as【16Bit-UINT】. The meaning of the values each address saves is as shown in the table below; please refer to Chapter 10.3 for examples:

Time Setting Address	When the bit 0 of this address is set as 1, the HMI will read the 9 continuous addresses from【Action Mode】to【End Time(Sec.)】, and change the start and end dates and time of the【Schedule】according to the values read.
Status	【Time Setting Address】+ 1 When the bit 0 of the Time

	Setting Address is set as 1, the HMI will start to read the following 9 continuous addresses. This address will be set as 1 when the reading is successful, and be set as 2 if the reading failed; this address will be set as 3 if the date or time read is an invalid setting.
Action Mode	【Time Setting Address】+ 2 The End Action will be enabled when the bit 0 of this address is set as 1. 【Individual Day】will be enabled if the bit 1 of this address is set as 1. 【Specific Day】will be enabled if the bit 2 of this address is set as 1. The action mode will be set as【Individual Day】if the bit 1 and bit 2 of this address are both set as 1.
Start Time(Day)	【Time Setting Address】+ 3 Sets the date for the 【Schedule】to start execution. The value of this address will be 1~7, which corresponds to Monday~Sunday, respectively. if the Action Mode is set as【Individual Day】. The value of this address will be 1~12, which corresponds to January~December,

	respectively, and value 13 will correspond to all months if the Action Mode is set as 【Specific Day】. If the Action Mode was not set as 【Individual Day】 or 【Specific Day】, the bit 0~6 of this address will correspond to Monday~Sunday, respectively.
Start Time(Hour)	【Time Setting Address】+ 4 Sets the hour of the Start Time for the 【Schedule】 to start execution.
Start Time(Min.)	【Time Setting Address】+ 5 Sets the minute of the Start Time for the 【Schedule】 to start execution.
Start Time(Sec.)	【Time Setting Address】+ 6 Sets the second of the Start Time for the 【Schedule】 to start execution.
End Time(Day)	【Time Setting Address】+ 7 Sets the date for the 【Schedule】 to end execution. The value of this address will be 1~7, which corresponds to Monday~Sunday, respectively, if the Action Mode is set as 【Individual Day】. The value of this address will

		be 1~31, which corresponds to the 1st~31st respectively, if the Action Mode is set as 【Specific Day】.
	End Time(Hour)	【Time Setting Address】+ 8 Sets the hour of the End Time for the【Schedule】to end execution.
	End Time(Min.)	【Time Setting Address】+ 9 Sets the minute of the End Time for the【Schedule】to end execution.
	End Time(Sec.)	【Time Setting Address】 + 10 Sets the second of the End Time for the【Schedule】to end execution.

10.3 Examples

Example 1: Execute start action at fixed times weekly.

Address	Value	Function
【Time Setting Address】	1	Start reading the【Time Setting Address】, and changes the【Schedule】settings according to the value read.
【Time Setting Address】+2	Bit 0: 0	Do not enable end action.
	Bit 1: 0	Do not enable【Individual Day】.
	Bit 2: 0	Do not enable【Specific Day】.
【Time Setting Address】+3	Bit 0: 0	Set not to execute【Schedule】on Monday.
	Bit 1: 1	Set to execute【Schedule】on Tuesday.
	Bit 2: 0	Set not to execute【Schedule】on Wednesday.
	Bit 3: 1	Set to execute【Schedule】on

		Thursday.
	Bit 4: 1	Set to execute【Schedule】on Friday.
	Bit 5: 0	Set not to execute【Schedule】on Saturday.
	Bit 6: 0	Set not to execute【Schedule】on Sunday.
【Time Setting Address】+4	8	Set the hour of the Start Time for the【Schedule】to start execution as 8 A.M.
【Time Setting Address】+5	30	Set the minute of the Start Time for the【Schedule】to start execution as 30 minutes.
【Time Setting Address】+6	0	Set the second of the Start Time for the【Schedule】to start execution as 0 seconds.

Example 2: Individually setting the date and time to execute start action and end action weekly.

Address	Value	Function
【Time Setting Address】	1	Start reading the【Time Setting Address】, and changes the【Schedule】settings according to the value read.
【Time Setting Address】+2	Bit 0: 1	Enable End Action.
	Bit 1: 1	Enable【Individual Day】; the end day and start day can be set individually.
	Bit 2: 0	Do not enable【Specific Day】.
【Time Setting Address】+3	1	Set the start day for the【Schedule】to start execution as Monday.
【Time Setting Address】+4	8	Set the hour of the Start Time for the【Schedule】to start execution as 8 A.M.
【Time Setting Address】+5	30	Set the minute of the Start Time for the【Schedule】to start execution as 30 minutes.
【Time Setting Address】+6	0	Set the second of the Start Time for the【Schedule】to start execution as 0 seconds.
【Time Setting Address】	7	Set the end day for the 【Schedule】

+7		to end execution as Sunday.
【Time Setting Address】+8	17	Set the hour of the End Time for the 【Schedule】 to end execution as 5 P.M.
【Time Setting Address】+9	0	Set the minute of the End Time for the 【Schedule】 to end execution as 0 minutes.
【Time Setting Address】+10	30	Set the second of the End Time for the 【Schedule】 to end execution as 30 seconds.

Example 3: Execute start action on specific day and time.

Address	Value	Function
【Time Setting Address】	1	Start reading the 【Time Setting Address】, and changes the 【Schedule】 settings according to the value read.
【Time Setting Address】+2	Bit 0: 0	Do not enable end action.
	Bit 1: 0	Do not enable 【Individual Day】.
	Bit 2: 1	Enable 【Specific Day】. 【Time Setting Address】+3 and 【Time Setting Address】+7 will save the start month and start day settings respectively.
【Time Setting Address】+3	6	Set the start month as June.
【Time Setting Address】+4	0	Set the hour of the Start Time for the 【Schedule】 to start execution as 0 A.M.
【Time Setting Address】+5	30	Set the minute of the Start Time for the 【Schedule】 to start execution as 30 minutes.
【Time Setting Address】+6	0	Set the second of the Start Time for the 【Schedule】 to start execution as 0 seconds.
【Time Setting Address】+7	30	Set the start day as the 30th.

11. 【Data Transfer】

The【Data Transfer】function can be used if the user wants the HMI to execute data transfer actions under specific conditions while the HMI is operating; the【Data Transfer】function will execute data transfer according to the conditions set by the user.

This chapter will explain【Data Transfer】related pages and the setting methods.

11.1 Data Transfer List

Click on【Data Transfer】in【Project Explorer】of the FV Designer and the【Data Transfer List】 will appear; 【Data Transfer】that are currently set will be displayed on the list in the order of the【Group ID】set for them.

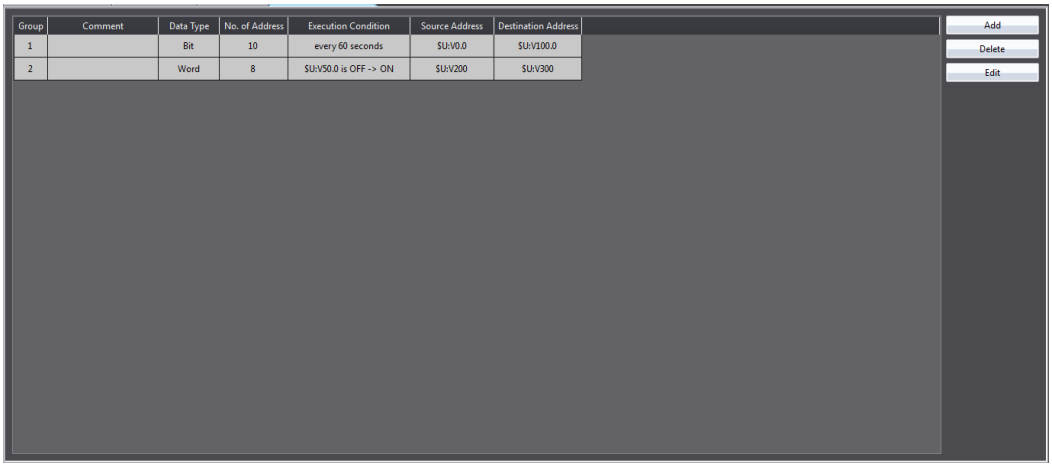


Figure 206 【Data Transfer】List Screen

To set a new Data Transfer, click on the【Add】button to the right, and the【Data Transfer】setting dialog will appear for the user to operate.

To edit a【Data Transfer】that was already set, double-click on the【Data Transfer】entry or first select the【Data Transfer】entry and then click on the【Edit】button to the right; at this time the properties setting dialog of this【Data Transfer】entry will appear for the user to modify.

To delete a【Data Transfer】that was already set, select the【Data Transfer】entry and then click on the【Delete】button to the right to delete this【Data Transfer】entry.

11.2 Data Transfer Settings

The setting screen of the【Data Transfer】functions is as shown in the figure below and the meanings of each setting option are listed below:

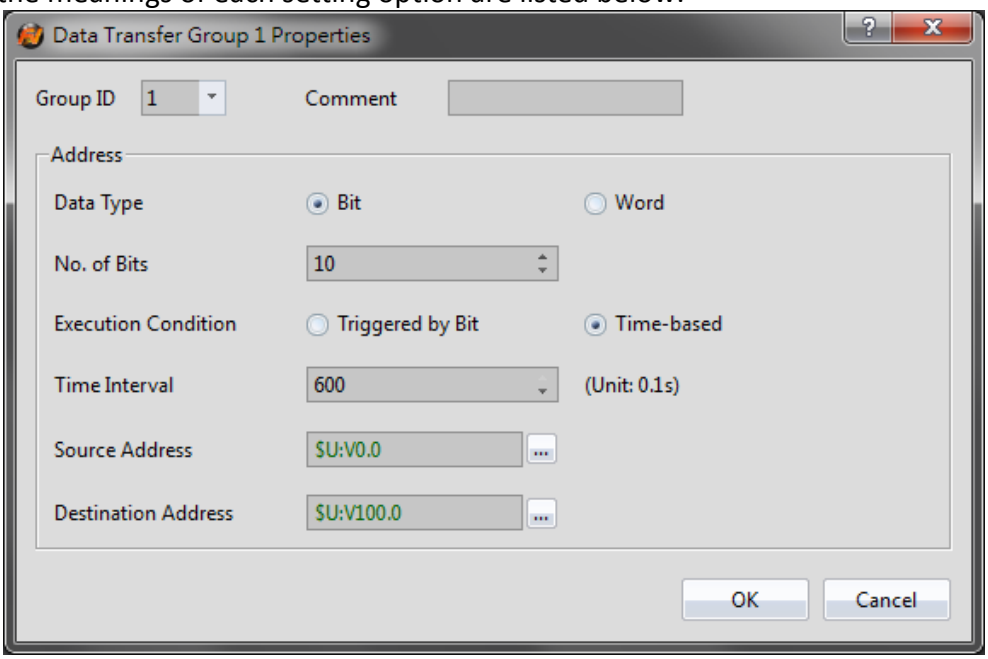


Figure 207 Setting Dialog of【Data Transfer】

Table 142 Setting Properties of【Data Transfer】

Property	Description
【Group ID】	Set the group ID of the【Data Transfer】.
【Comment】	Set the comment of the【Data Transfer】.
【Address】	Set the behavior of the【Data Transfer】. 【Data Type】 Set the data type of the【Data Transfer】. 【No. of Bits】 Set the number of bits per transfer; it can be set between1~65535 bits. The more number of bits per transfer, the longer it will take for the transfer to be completed, therefore make sure that there is sufficient time for the data transfer to be completed every time it is executed. 【No. of Words】 Set the number of words per transfer; it can be set between 1~65535 words. The more number of words per transfer, the longer it will take for the transfer to be completed, therefore

	make sure there is sufficient time for data transfer to be completed every time it is executed. 【Execution Condition】 Set the condition to execute【Data Transfer】. The【Trigger Bit】and【Trigger Condition】can be set below if the execution condition is set as【Triggered by Bit】; the data transfer will be executed when the status changes satisfy the conditions set. The【Time Interval】can be set below if the execution condition is set as【Time-based】; the HMI will execute the data transfer according to the time interval set. 【Source Address】 Set the source address for executing the【Data Transfer】; the HMI will read the No. of Bits or No. of Words set from the source address and write them into the【Destination Address】when the data transfer is executed. 【Destination Address】 Set the destination address for executing the【Data Transfer】; the HMI will read the No. of Bits or No. of Words set from the source address and write them into the【Destination Address】when the data transfer is executed.

12. 【Script】

Script is a simple language that allows users to write their own programs. An executable script usually contains many statements; Available statements include logical judgments, numerical computations and loop executions etc. Users can flexibly use the statements provided by the system to complete a complex task that cannot easily be accomplished with general objects; scripts that were previously created could also be reused in different projects to save development time.

12.1 When to execute script

Scripts can be set to be triggered and executed at the following different times:

- **Global**
  1. Project startup: Execute when the project starts.
  2. Timer: After the script has finished executing, wait a fixed period of time and then execute again.

3. Trigger by Bit: Execute the script when the status or changes of a specific bit meets the conditions(Please refer to **Table 159 Script Editor–Script Properties Descriptions** on the explanations for【Trigger】).

- **Screen**
  1. Screen open: Execute the script when a specific screen is opened.
  2. Screen close: Execute the script when a specific screen is closed.
  3. Screen cycle: Execute the script periodically when a specific screen is displayed in the foreground.
- **Object**
  1. Bit Switch: Execute scripts when the actions meets the conditions.
  2. Function Switch: Execute scripts when a switch is pressed.
- **Schedule**
  1. Execute scripts at the beginning or ending of a scheduled time.

12.2 Script Syntaxes

12.2.1 Registers

Scripts can use the following registers to access registers inside the HMI or registers of external devices connected to the HMI:

Table 143 Script–Registers

Register	Description
Internal Registers	Registers provided by the HMI; the access speed is generally faster than the external registers. **16Bits-UINT** data type is used to access the value in the register when internal registers are used in a script; for example: $U:V2 Volatile register $U:NV2 Non-volatile register Internal registers can also be specified to access a specific bit directly; the following syntax will use **Bit** as the data type to access the value of the register: $U:V0.0 The 0 bit (lowest bit) of register $U:V0 $U:NV1.15 The 15 bit (highest bit) of register$U:NV1
External Registers	Registers of devices connected to the HMI; the access speed is generally slower compared to Internal registers, therefore it is recommended to store temporary values during computation on the internal register when writing a script, and then write the final computed results into the external registers in order to get better performance. The value will be accessed as **Bit** data type when the bit width of the external register is 1, otherwise it will be accessed as **16Bits-UINT**. Use the Fatek FBs PLC connection for example(let's assume that the name of the connecting PLC device is **PLC0**): @PLC0:WY0 Allows accessing of the **16Bits-UINT** value saved

	in WY0 @PLC0:Y0 Allows accessing of the **Bit** value saved inY0
Tag	Tag provides the function to create aliases for registers, which can be set in the【Tag Library】. Tags also have extra advantages when used in scripts because the data types of the tags in the【Tag Library】are specified, so if the users want to use data types other than **16Bits-UINT** to access the value on the register, they can create a tag matching to the register they want to use and set the data type of the registers to the type they want to use it as： $T:FLOAT Allows accessing of $U:V500 to $U:V501 with **32Bits-FLOAT** $T:INT32 Allows accessing of $U:V400 to $U:V401 with **32Bits-INT**
System Register	System registers can be used to control some system settings such as the brightness level of the backlight or time setting etc.It is similar to tags in the way that the value of system registers are also accessed with the data type set for the register when used in a script; for example: $S:OP_BUZZER Access with **Bit** data type $S:SS_HMI_FREE_SPACE Access with **32Bit-UINT** data type
Index Register	Index register is a type of system register. It can be used together with the internal or external registers to access the addresses offseted by index registers, for example: $U:V0[$I1] When $S:I1 is 2, it is the same as accessing$U:V2

Table 144 Script–Tag Library settings used in examples

Name	Data Type	Address
UINT16	16Bit-UINT	$U:V100
INT16	16Bit-INT	$U:V200
UINT32	32Bit-UINT	$U:V300
INT32	32Bit-INT	$U:V400
FLOAT	32Bit-FLOAT	$U:V500
BIT	Bit	$U:V600.0
STRING	Ascii String	$U:V700
BCD16	16Bit-BCD	$U:V800
BCD32	32Bit-BCD	$U:V900

12.2.2 Constants

The following constants can be used in scripts:

Table 145 Script–Constants

Type	Description
Decimal Integer	Just use common numbers, for example: 1234 -32768
Hexadecimal Integer	Use 0x or 0X as prefix, for example: 0x1234 is equivalent to decimal integer 4660 0X1A2B is equivalent to decimal integer 6699
Binary Integer	Uses b or B as suffix, for example: 000111bis equivalent to decimal integer7
Floating point number	Decimal integer plus decimal point, for example: 123.45 -32.768
String Constant	Double quotes are added at the beginning and end of character sequences, for example: "abc" "Hello World!"

12.2.3 Comments

Comments can be used as program code explanations in the script to increase the readability of the program; comments are omitted when the scripts are compiling, therefore they will not affect the execution results of script at all. Program codes that will not be used immediately can also be added into comments and then just moved out of the comment block for use when needed.

Table 146 Script–Comments

Type	Description
Single-Line Comment	Texts between the // symbol up to the end of the line will be treated as comments For example: // This is a single line comment
Multi-Line Comment	Texts between the /* symbol and */ symbol will be treated as comments For example: /* This is a multi-line comment */

12.2.4 Assignment Operators

Assignment operators can be used to save constants into registers or save the contents of the source register into the target register.

Table 147 Script–Assignment Operators

Type	Description
Assignment **=**	Saves constants into registers, for example $U:V1 = 1234 // Saves integer 1234 into $U:V1 $T:FLOAT = 345.67 // Saves the float integer345.67 into $T:FLOAT(1) $T:STRING = "FATEK" // Saves the ASCII string into $T:STRING(2) Saves the contents of the source register into the target register, for example: $U:V0 = $U:V3 // Saves the contents of register$U:V3 into$U:V0 When the data type of the target register is different from the source register, the value read from the source register will first be converted and then saved into the target register. Rounding of decimal places and overflow may occur according to the different data types, for example: $U:V0 = 0xFFFFFFF // Only saves 0xFFFF into $U:V0(**16Bit-UINT**) $T:INT32 = 345.67 // Only saves 345 into $T:INT32(**32Bit-INT**) $T:BCD16 = 1234 /* Converted 1234 into BCD format and then save, therefore the actual value saved into $T:BCD16 is 0x1234 */

(1)Please refer to **Table 144 Script–Tag Library settings used in examples**.
(2)Note that every character in an ASCII string will take up a byte, and a 0 will be added at the end as the end of a string (which is called a null-terminating character); therefore when “FATEK” is written, the content of the 3 words starting from $T:STRING will be 0x4146('F','A'), 0x4554('T','E'), and 0x004B('K', 0) respectively.

12.2.5 Unary Operators

Table 148 Script–Unary Operators

Type	Description
Logic Not **!**	Determines the Boolean value of the operand and returns the reversed result; it will return 0 if the operand is a non-zero value and it will return 1 if the operand is 0; for example $U:V0.0 = !$U:V0.0 // reverse of bit $U:V0.0
Negative Sign **-**	Changes operand to positive or negative. If the operand is a positive value, it will return a negative value; if the operand is a negative value, it will return a positive value. For example: $T:INT16 = 123 $T:INT16 = -$T:INT16 // The value of $T:INT16 changed to -123
1's Complement **~**	Returns 1's complement of the operand, for example: $U:V0 = 0x5a5a $U:V0 = ~$U:V0 // The value of $U:V0 changed to 0xa5a5

12.2.6 Binary Operators

There are two types of Binary operators: Arithmetic Operators and Logical Operators

Table 149 Script–Arithmetic Operators

Type	Example
Addition **+**	$U:V0 = 3 + 1 // Result is 4
Subtraction **-**	$U:V0 = 6 - 2 // Result is 4
Multiplication *****	$U:V0 = 2 * 2 // Result is 4
Division **/**	$U:V0 = 8 / 2 // Result is 4
Modulus **%**	$U:V0 = 9 % 5 // Result is 4
Bitwise-and **&**	$U:V0 = 12 & 4 // Result is 4
Bitwise-or **|**	$U:V0 = 0 | 4 // Result is 4
Bitwise-xor **^**	$U:V0 = 65531 ^ 65535 // Result is 4
Left shift **<<**	$U:V0 = 1 << 2 // Result is 4
Right shift **>>**	$U:V0 = 8 >> 1 // Result is 4

Table 150 Script–Logical Operators

Type	Example
Logical and **&&**	$U:V0.0 = 1 && 1 // Result is 1
Logical or **||**	$U:V0.0 = 0 || 1 // Result is 1
Equal **==**	$U:V0.0 = 2 == 2 // Result is 1
Not equal **!=**	$U:V0.0 = 1 != 2 // Result is 1
Less than **<**	$U:V0.0 = 1 < 2 // Result is 1
Less than or equal **<=**	$U:V0.0 = 2 <= 2 // Result is 1
Greater than **>**	$U:V0.0 = 2 > 1 // Result is 1
Greater than or	$U:V0.0 = 2 >= 2 // Result is 1

equal **>=**	

When there are multiple operators for a statement, their precedence are as shown in the table below:

Table 151 Script–Operator precedence

0(Highest)	( )	Parenthesis
1	! – ~	Reverse logic, negative sign, 1's complement
2	* / %	Multiplication, division, modulus
3	+ –	Addition, subtraction
4	<< >>	Left shift, right shift
5	< <=	Less than, less than or equal
	> >=	Greater than, greater than or equal
6	== !=	Equal, not equal
7	&	Bitwise-and
8	^	Bitwise-xor
9	|	Bitwise-or
10	&&	Logical-and
11	||	Logical-or
12(Lowest)	=	Assignment operator

12.2.7 Logical Statements

Logical Statement can execute different statement blocks according to different conditions, allowing scripts to flexibly execute corresponding operations for different situations.

Table 152 Logical Statement Syntaxes

Type	Description

**if <condition>
…
End if**
	Executes the statement in the if block when ***if <condition>*** is true, for example:
	$U:V0 = 1
	if $U:V0.0
	  $U:V3 = 2 // Will be executed
	endif
	if $U:V0 > 2
	  $U:V3 = 3 // Will not be executed
	Endif

**if <condition>
…
else
…
End if**
	Execute the statement in the if block when the ***if <condition>*** is true, or else execute the statement in the else block if the ***if <condition>*** is false; for example:
	$U:V0 = 1
	if $U:V0 > 2
	  $U:V3 = 2 // Will not be executed
	else
	  $U:V3 = 3 // Will be executed
	endif

**if <condition>
…
Else if <condition1>
…
Else if <condition2>
…
End if**
	When the ***if <condition>*** is true, execute the statement in the ***if block***. Otherwise, determine the first ***else if <condition>***; if the first ***else if <condition>*** is true, execute the statement in the ***elseif block***. If the first ***else if <condition>*** is still false, try the next ***else if <condition>***, and so on. 0 or multiple ***elseif blocks*** can exist, for example:
	$U:V0 = 1
	if $U:V0 == 4
	  $U:V3 = 4 // Will not be executed
	Else if $U:V0 == 3
	  $U:V3 = 3 // Will not be executed
	Else if $U:V0 == 2
	  $U:V3 = 2 // Will not be executed
	Else if $U:V0 == 1
	  $U:V3 = 1 // Will be executed
	End if

**if <condition>
…
elseif <condition>
…
elseif <condition>
…
else
…
endif**
	When the ***if <condition>*** is true, execute the statement in the ***if block***. Otherwise, determine the first ***else if <condition>***; if the first ***else if <condition>*** is true, execute the statement in its ***else if block***. If the first ***else if <condition>*** is still false, try the next ***else if <condition>***, and so on. 0 or multiple else if blocks can exist. If the ***if <condition>*** and all of the ***else if <condition>*** are false, the statement in the ***else block*** will be executed.
	For example:

	$U:V0 = 1
	if $U:V0 == 4
	  $U:V3 = 4 // Will not be executed
	Else if $U:V0 == 3
	  $U:V3 = 3 // Will not be executed
	Else if $U:V0 == 2
	  $U:V3 = 2 // Will not be executed
	else
	  $U:V3 = 3 // Will be executed
	End if

12.2.8 Iterative Statements

Iterative Statements can execute statement blocks repeatedly according to different conditions, allowing some repetitive tasks to be completed using fewer statements.

Table 153 Iterative Statement Syntax

Type	Description

**loop <count>
…
endloop**
	Repeatedly execute the statements in the loop block <count> times
	, <count> can be a register or a positive integer constant.
	For example:
	/*Calculate the sum of 1 to 10 and save it into $U:V0 */
	$U:V0 = 0 // sum
	$U:V1 = 0
	loop 10
	  $U:V1 = $U:V1 + 1
	  $U:V0 = $U:V0 + $U:V1
	endloop

for <reg> = <start> to <end> step <n> … endfor	If <start> is less than <end>, <reg> will be set to <start>, and the ***for block*** will be executed once. Then the value of <reg> will be added by <n> and execute ***for block*** again, until <reg> plus <n> is greater than <end>. If <start> is greater than <end>, <reg> will be subtracted by <n> instead, ***for block*** will be executed every time until <reg> minus <n> is less than <end>. Note: 1. <reg> should be a register 2. <start> and <end> can be either registers or integer constants 3. <n> should be a positive integer or a register containing positive integer

	value 4. **Step <n>** can be ignored. In such case, <n> will be 1 5. If <n> is 0, ***for block*** will not be executed For example: /* Calculate the sum of $U:V0 to $U:V10 and save it into$U:V11 */ $U:V11 = 0 for $S:I0 = 0 to 10 $U:V11 = $U:V11 + $U:V0[$I0] endfor

while<condition>
…
endwhile
	Execute the statement in the ***while block*** when the ***while <condition>*** is true, and then check whether the ***while <condition>*** is true or false again to determine whether to execute again until the ***while <condition>*** is false, then exit the loop. In ***which <condition>*** can be a register or an expression combined by multiple registers and operators.
	For example:
	/* Calculate the sum of 1 to 10 and save it into$U:V0 */
	$U:V0 = 0 // sum
	$U:V1 = 0
	while $U:V1 <= 10
	  $U:V1 = $U:V1 + 1
	  $U:V0 = $U:V0 + $U:V1
	endwhile

break	**break** statement can be used in **loop**, **for**, or **while** loops; when executed up to a break statement, it will exit the current loop and continue execution. **break** statement is usually used with an **if** statement so that it will exit the loop when specific conditions are met; for example:
	/* Search for the first non-zero word between $U:V0 to $U:V10; if the value of $U:V11 is 3 when the loop ends, then $U:V3 is the first non-zero word; if no non-zero word can be found, the value of $U:V11 will remain as 11 when the loop is finally existed*/
	$U:V11 = 11
	for $S:I0 = 0 to 10
	  if $U:V0[$S:I0] != 0
	  $U:V11 = $S:I0
	  break

	end if endfor
continue	**continue** statement can be used in **loop**, **for**, and **while** loops; when executed up to a continue statement, the statements in the loops afterwards will be omitted and it will jump directly to the next iteration loop for execution, for example: $U:V0 = 0 $U:V1 = 0 loop 10 $U:V0 = $U:V0 + 1 /* Will be executed 10 times */ if $U:V1 >= 5 continue end if $U:V1 = $U:V1 + 1 /* Will only be executed the first 5 times*/ endloop

12.2.9 Built-in Functions

The script statement collection provides many built-in functions; users can use these functions to execute numerical computations, string processing, file accessing and other more complicated operations.

The built-in functions currently provided are shown in the table below; please refer to 【Built-in Function】in **Chapter 12.3.2 Script Editor** for details on using these built-in functions.

Table 154 Script Built–in Functions

Type	Function	Description
Memory Operation	memcmp	Memory block comparison
	memcpy	Copy memory block
	memsrch	Search memory block
	memset	Memory block value
Trigonometry	sin	Sine
	cos	Cosine
	tan	Tangent
	asin	Arcsine

	acos	Arccosine
	atan	Arctangent
Numeric Computation	abs	Absolute value
	max	Maximum value
	min	Minimum value
	arrmax	Maximum value for array
	arrmin	Minimum value for array
	arrsum	Sum or array
	arrxor	And-Or array
	arrswp	Swap high and low byte of array
	pow	Power
	sqrt	Square root
	log	Natural logarithm
	log10	Common logarithm
String Operations	strcat	Connect string
	strncat	Connect string (restrict length)
	strcpy	Copy string
	strncpy	Copy string (restrict length)
	strcmp	String comparison
	strncmp	String comparison (restrict length)
	stricmp	String comparison(case-insensitive)
	strlen	String length
	strsrch	Search string
	num2str	Numeric value to string
	a2i	String to integer
	a2f	String to floating point number
	a2x	String (hexadecimal) to integer
	x2a	Integer to string (hexadecimal)
File Operations	file_open	Open file (Internal Storage)
	file_read	Read file (Internal Storage)

	file_write	Write file (Internal Storage)
	file_close	Close file (Internal Storage)
	file_delete	Delete file (Internal Storage)
	mkdir	Create Directory (Internal Storage)
SD File Operations	sd_file_open	Open file (SD Card)
	sd_file_read	Read file (SD Card)
	sd_file_write	Write file (SD Card)
	sd_file_close	Close file (SD Card)
	sd_file_delete	Delete file (SD Card)
	sd_mkdir	Create Directory (SD Card)
USB File Operations	usb_file_open	Open file (USB Storage)
	usb_file_read	Read file (USB Storage)
	usb_file_write	Write file (USB Storage)
	usb_file_close	Close file (USB Storage)
	usb_file_delete	Delete file (USB Storage)
	usb_mkdir	Create Directory (USB Storage)
Date/Time Operation	get_datetime	Read date/time
	set_datetime	Set date/time

Note: Built-in functions may be added, removed or modified during software updates; please subject to the built-in functions listed on the FvDesigner if the built-in functions listed on the FvDesigner are different from the ones listed in this document.

12.2.10 Custom Functions

Users can combine the frequently used statements into custom functions; just call the created custom function if these statements need to be used in different scripts. The use of custom functions allows the scripts to be simpler and saves the time to repeatedly write the same statement combinations.

Table 155 Script–Custom function-related statements

Related Statement	Description
call <function>	Calls the custom function named <function>, and will start executing from the first statement in the custom function; it will exit the custom function and return to the script

	to continue executing the next statement after the call statement once it has finished executing the last statement in the custom function.
	The example below is used to determine whether it is working hours now, and will save the result into $U:V100; users can make it into a custom function called *IsWorkHour*
	if $S:TIME_LOCAL_HOUR >= 8 &&
	$S:TIME_LOCAL_HOUR <= 17
	$U:V100 = 1
	else
	$U:V100 = 0
	endif
	
	Just call *IsWorkHour* and then check $U:V100 when used in a script; for example:
	/* Determines whether it is working hour to set the brightness level for the backlight of the HMI */
	call IsWorkHour
	if $U:V100
	$S:OP_BACKLIGHT_LEVEL = 80
	else
	$S:OP_BACKLIGHT_LEVEL = 30
	endif

ret	**ret** statements can be used in custom functions so that it will exit the custom function and return to the script to continue executing the next statement after the call statement once it executes up to the **ret** statement; for example:
	/* If $U:V0.0 is 0, then this custom function will exit and return to the script to the line after the call statement; the if $U:V0.1 statement behind will not be executed */
	if $U:V0.0
	@PLC0:Y0 = 1
	else
	ret
	endif
	if $U:V0.1
	@PLC:Y1 = 1
	endif

12.3 Using Script

In this section, we will introduce how to create and edit the scripts and its related attributes.

12.3.1 Script List

Click on 【Script】in【Functions】of【Project Explorer】,which is located to the left side of the FvDesigner, to enter the【Script List】.

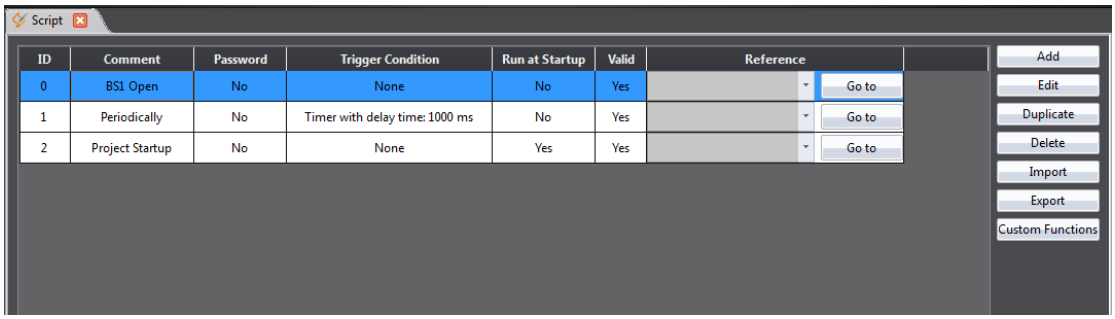


Figure 208 Script List

The following are the description of each column in the script list:

Table 156 Script List–Field descriptions

Field	Example
【ID】	Every script must have a unique ID; the legal range of the ID is from 0 to 65534, so every project allows a maximum of 65535 scripts.
【Comment】	Descriptions that help understand the contents or usage of a script.
【Password】	Whether this script is protected by password or not.
【Trigger Condition】	The conditions that the script will be triggered in the background; please refer to **Chapter 12.1 When to execute script** for detailed explanations.
【Run at Startup】	Whether to execute the script when the project starts.
【Valid】	Valid means that no errors were found when the script was compiled.
【Reference】	When a script is used in an object or function, pressing【Go to】can jump to the location where this script is used immediately.

The following are the descriptions of the buttons on the right side of the script list:

Table 157 Script List–Descriptions of the buttons on the right side

Button	Description
【Add】	Opens the【Script Editor】and edits a new empty script.

【Edit】	Opens the【Script Editor】and edits the script currently selected in the Script List; double-clicking on the script of a Script List has the same effect as selecting the script first and then pressing【Edit】.
【Duplicate】	Makes a duplicate of the currently selected script.
【Delete】	Deletes the currently selected script.
【Import】	Imports scripts.
【Export】	Exports the currently selected script.
【Custom Functions】	Opens the【Script Editor】and displays the【Custom Functions】for editing.

12.3.2 Script Editor

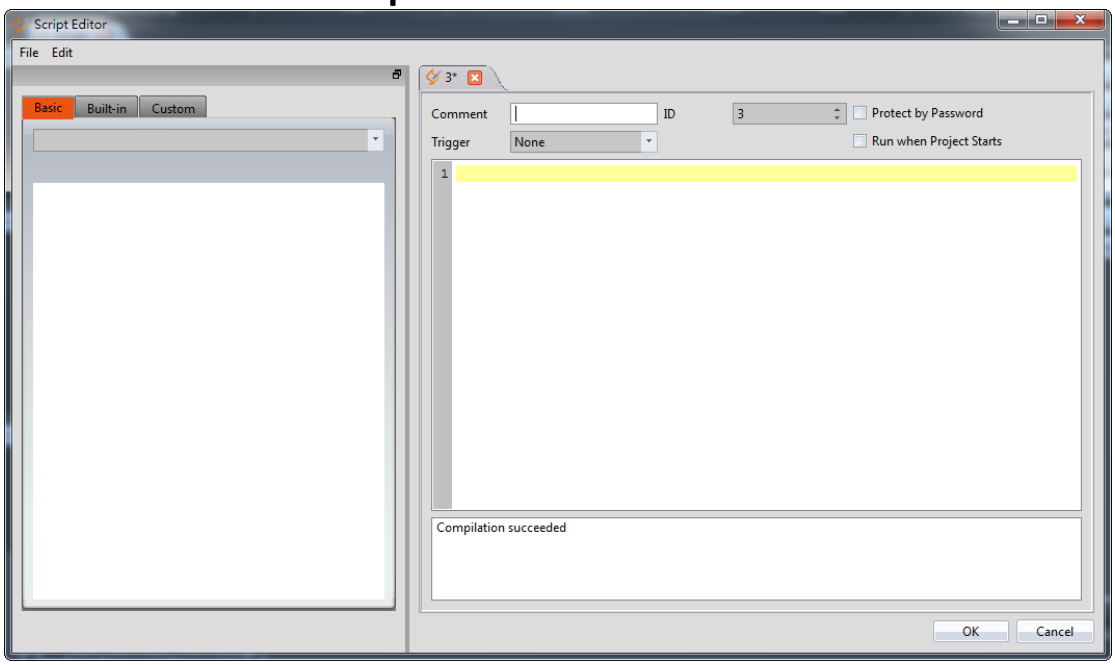
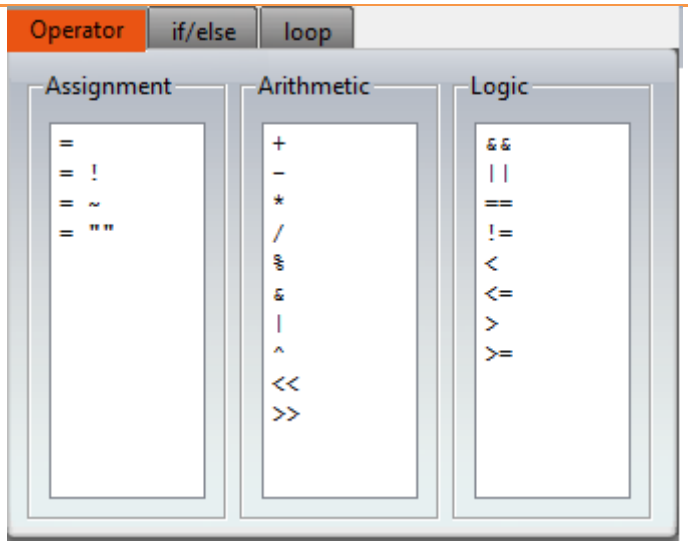


Figure 209 Script Editor Screen

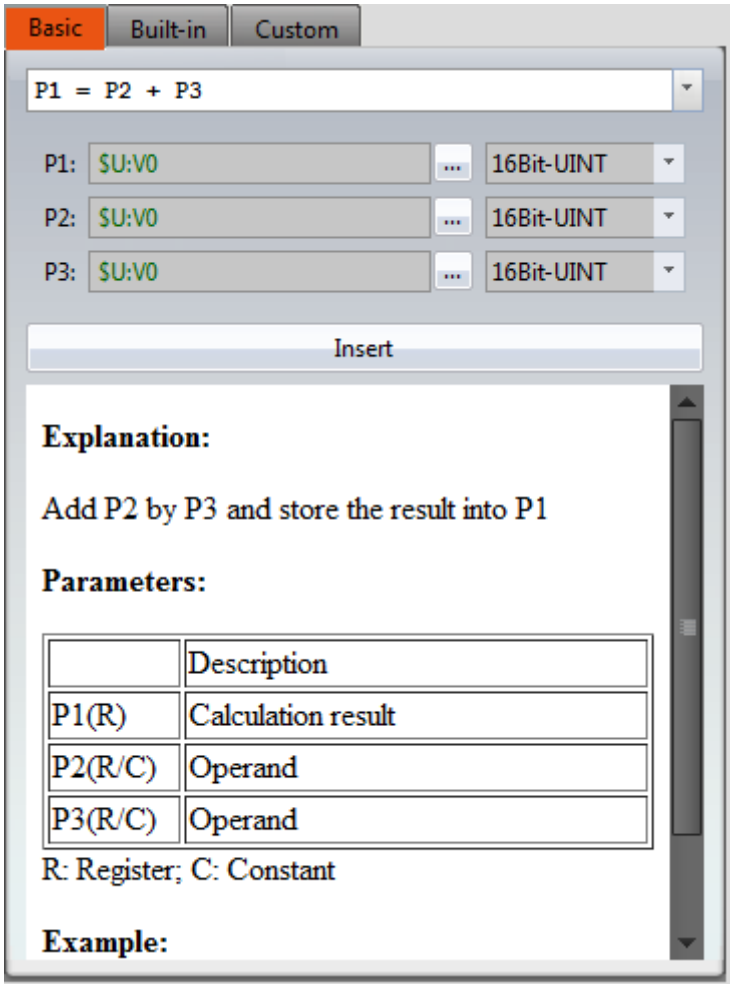
The【Function】block to the left has three tab pages available for selection; Their descriptions are as follows:

Table 158 Script Editor–Function Block Description

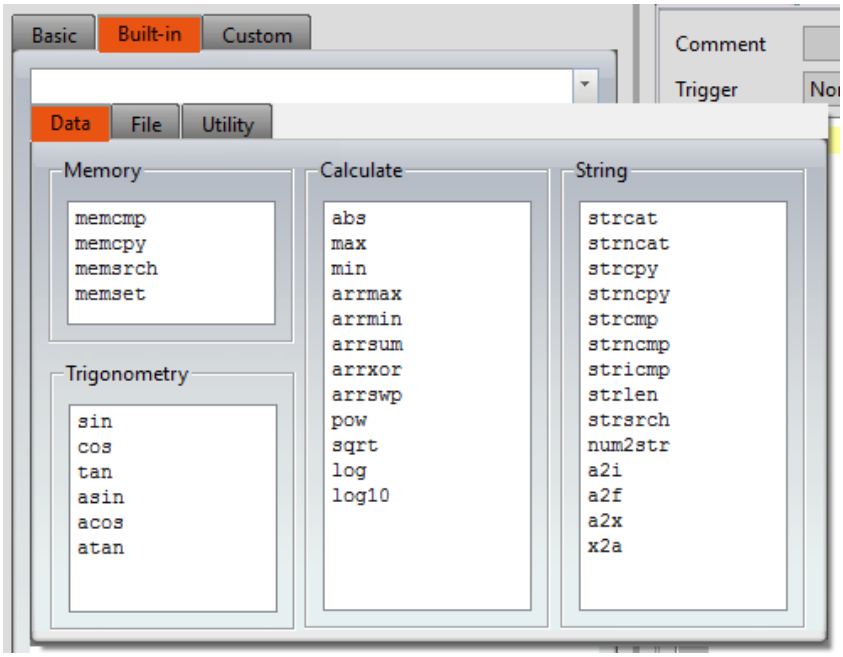
Tab Page	Description
【Basic Functions】	Provides a convenient interface for inputting various operators, logical statements and iterative statements; the following menu will appear when users click on the pull-down menu button:

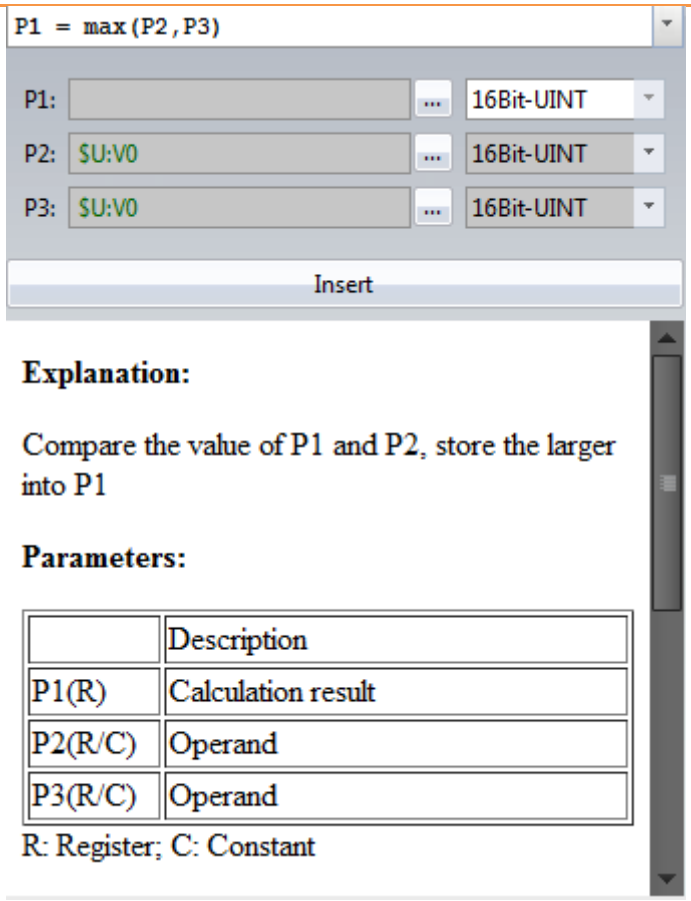


Users can select the item to use and the contents of the【Basic Function】tab page will be updated according to the selected item.

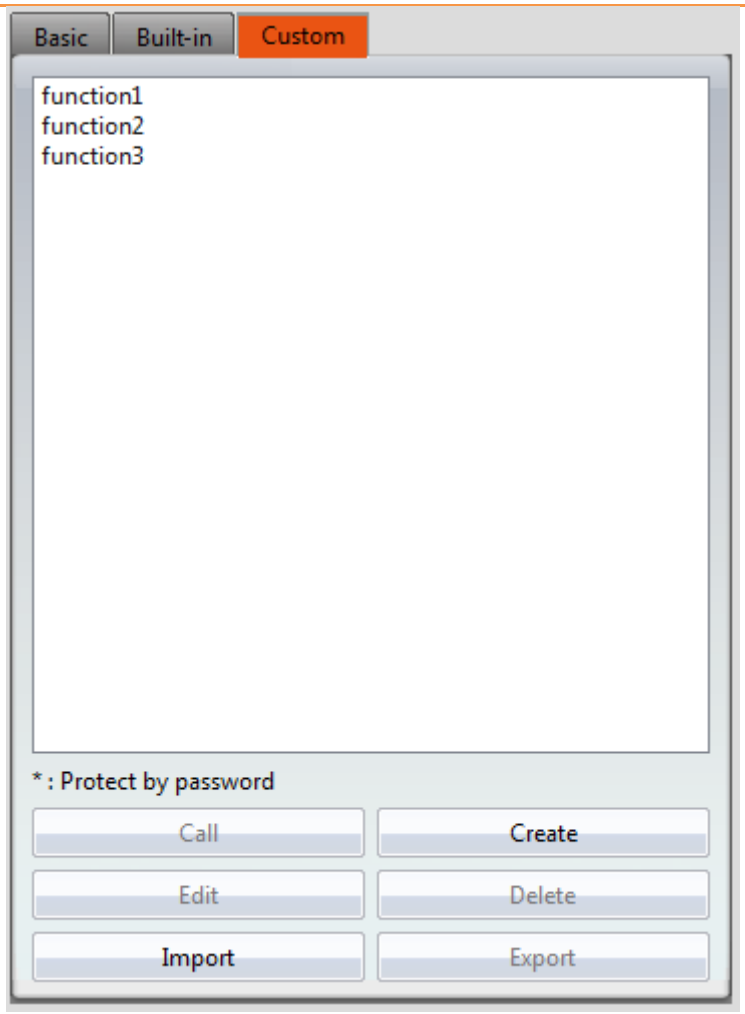


Users can quickly input or select the register and its data type that the user wants to use as parameters; once selected, press【Insert】to add the entire statement into the location where the cursor is located in the editor to the right. The usage description and examples of this statement can be checked below the【Insert】

	button.
【Built-in Function】	Provides a convenient interface to input the system's built-in functions; its usage is similar to that of 【Basic Functions】, the following menu will appear after the user clicks on the pull-down menu button:  Users can select the item to use from the menu and then the contents of the 【Built-in Function】 tab page will be updated according to the selected item.

<table>
<tr>
<td></td>
<td>


Users can quickly input or select the register and its data type that the user wants to use as parameters; once selected, press【Insert】to add the entire statement into the location where the cursor is located in the editor to the right. The usage description and examples of this built-in function can be checked below the【Insert】button.
</td>
</tr>
<tr>
<td>【Custom Functions】</td>
<td>Provides users with list of custom functions.</td>
</tr>
</table>

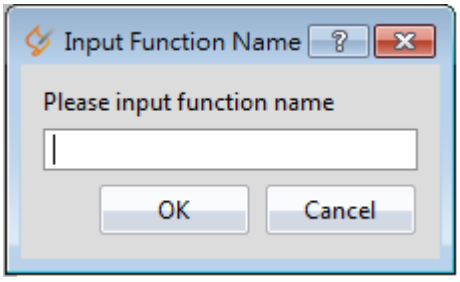


【Call】

Inserts and calls the statement of the currently selected custom function at the location where the cursor is located in the editing section to the right.

【Create】

Creates a new custom functions; the following window will appear once this button is pressed, asking for the name of the custom function.



A new editor tab page will appear in the【Editor】section to the right for editing the contents of the custom function after entering a legal function name and pressing OK.

	【Edit】 Opens a new editor tab page for editing the currently selected custom function. It has the same effect as double-clicking on the function name on the list. 【Delete】 Deletes the currently selected custom function. 【Import】 Import custom function. If it is protected by password, you have to input password before import. 【Export】 Export script.

Descriptions of the top section of the【Editor】to the right are as follows:

Table 159 Script Editor–Script Properties Descriptions

Field	Description
【Comment】	Used to input comments for the script.
【ID】	Used to set the ID of the script.
【Protect by Password】	To decide whether this script is protected by password or not.
【Trigger】	Selects when to trigger this script: 【None】 Do not select any triggering condition (but the script may still be executed when the project starts or triggered by other objects or functions). 【Timer】 Script will be triggered continuously but there will be a fixed delay time between the end of the first execution and the start of the next execution. 【When Bit Becomes 1】 Executes the script once when the 【Bit】changed from 0 to 1. 【While Bit is 1】 Executes the script continuously once the【Bit】is 1.

	【When Bit becomes 0】 Executes the script once when the 【Bit】changed from 1 to 0. 【While Bit is 0】 Executes the script continuously once the【Bit】is 0. 【When Bit is Changed】 Executes the script once when the 【Bit】 changed from 0 to 1 or 1 to 0.
【Run when Project Starts】	Determines whether to execute the script once first when the project starts.
【Name】	The other fields above will disappear when editing a custom function, only the name of the custom function can be set.

The mid-bottom section of the【Editor】is divided into the statement editing section and compilation message display section; Every time a change is made in the statement editing section it will make the script compile again immediately, and the compilation results will be displayed below. The user can fix statement errors according to the message content and line number displayed until it displays 【Compilation succeeded】.

12.4 Examples

The examples below can allow users to have a better understanding on how to use script functions:

12.4.1 Scrolling Lamp

Goal

The goal of this example is to create a scrolling lamp where the lamps will move back and forth. As shown in the figure below, there are 15 lamps on the screen and three of the lamps are lit. We wish to have a visual effect where these three lamps keep moving to the left and then move back to the right once it reaches the end and continues cycling in this manner.

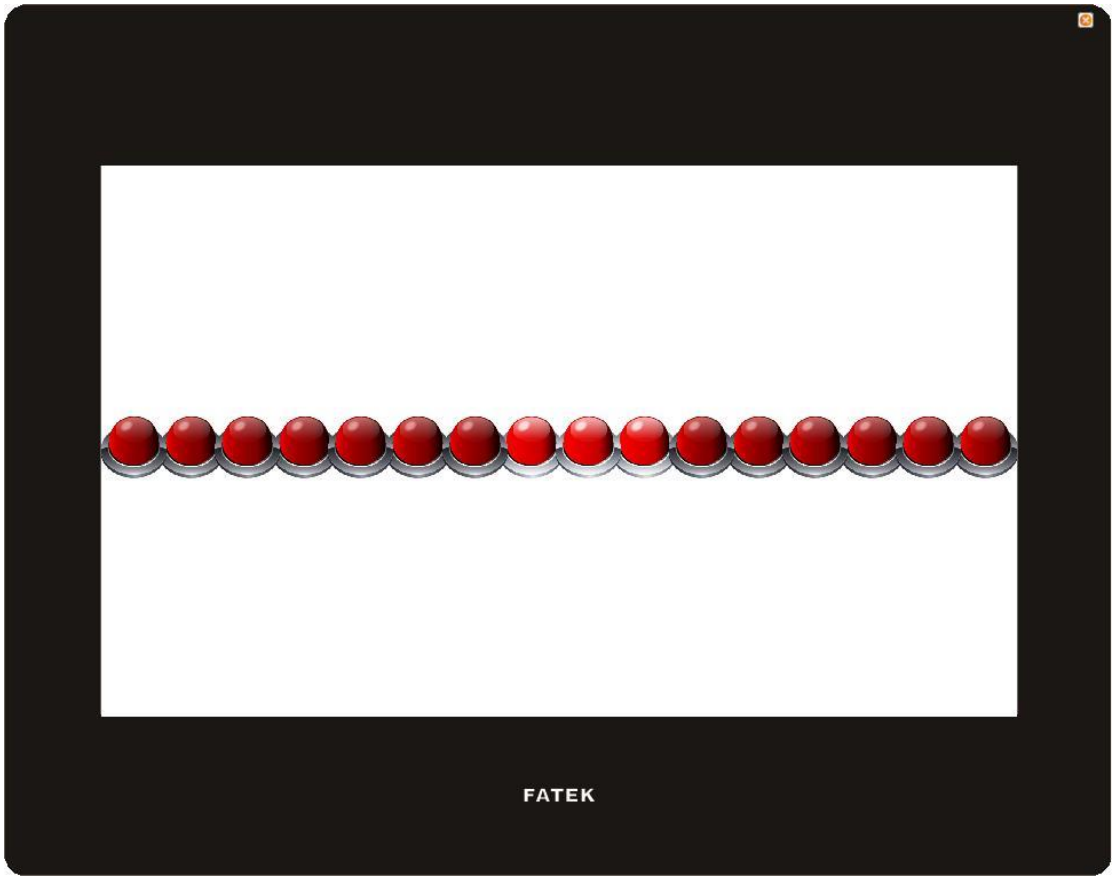


Figure 210 Scrolling Lamp Example

Idea

In order to achieve the effect of the lamps moving towards the left, we can match the 16 lamps on the screen to the 0 to 15th bit of a register word and then use scripts to execute left shift computing to this register. When the 15th bit of the register is 1, it means that the lamp has already moved to the left-most part; next the script should right shift the register until the 0th word of the register is 1 and then switch to left shift again.
Now that we have an idea, we can start implementing this example.

1. First we will place 16 lamps on the screen, and set the monitor address of the right-most lamp to $U:V0.0 and the second one to $U:V0.1, and so on and so forth, until the address of all 16 lamps have been set.

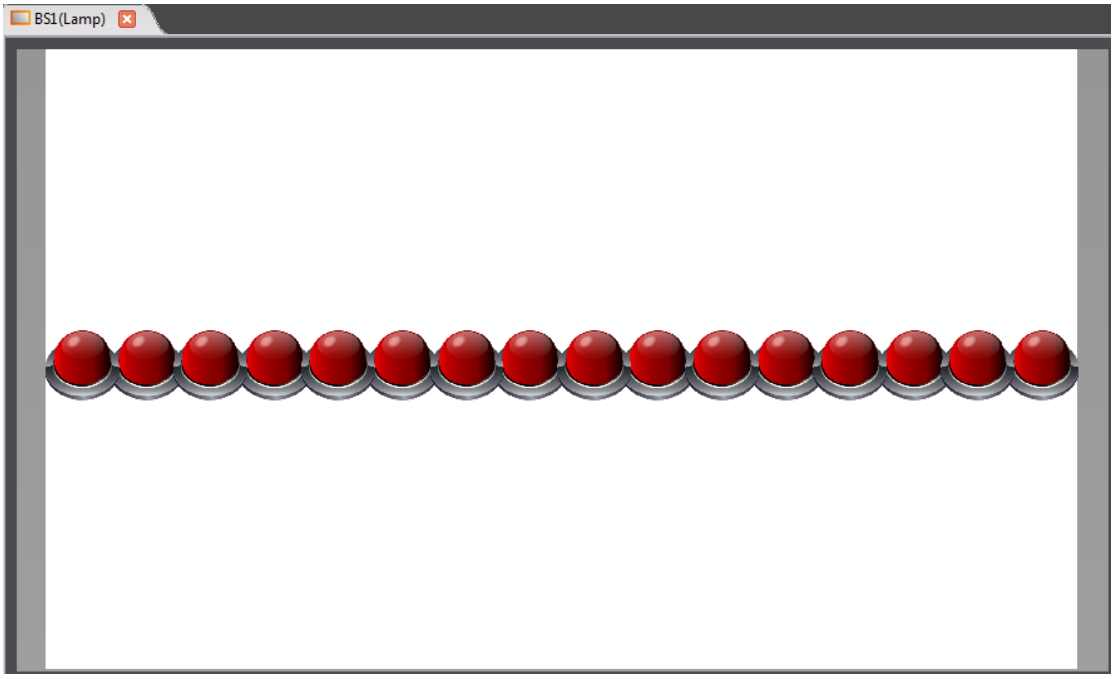


Figure 211 Scrolling Lamp Example Screen Setting

2. Next we will add a script to control the movement of the lamps; first enter the 【Script List】and press 【Add】, input **Move Lamp** for the comment and then input the following script contents and save:

```
/* When $U:V1 = 0, move left
   When $U:V1 = 1, move right */
if !$U:V1
   if !$U:V0.15    // Lamp not yet reached to the left-most position
      $U:V0 = $U:V0 << 1    // Left shift the lamp
   else
      $U:V1 = 1    // Change the lamp movement to right shift
   endif
else
   if !$U:V0.0      // Lamp not yet reached the right-most position
      $U:V0 = $U:V0 >> 1    // Right shift the lamp
   else
      $U:V1 = 0    // Change the lamp movement to left shift
   endif
endif
```

3. Next is to add another script to initialize the value of the register; input **Init Lamp** as the comment. the content is shown below:

```
$U:V0 = 7 // Light up the three right-most lamps initially
$U:V1 = 0 // Start moving the lamp to the left
```

4. Finally right click the mouse at an empty space on the screen and select 【Properties】to enter the【Screen Properties】to set the two scripts to execute when the screen opens and cycles respectively:

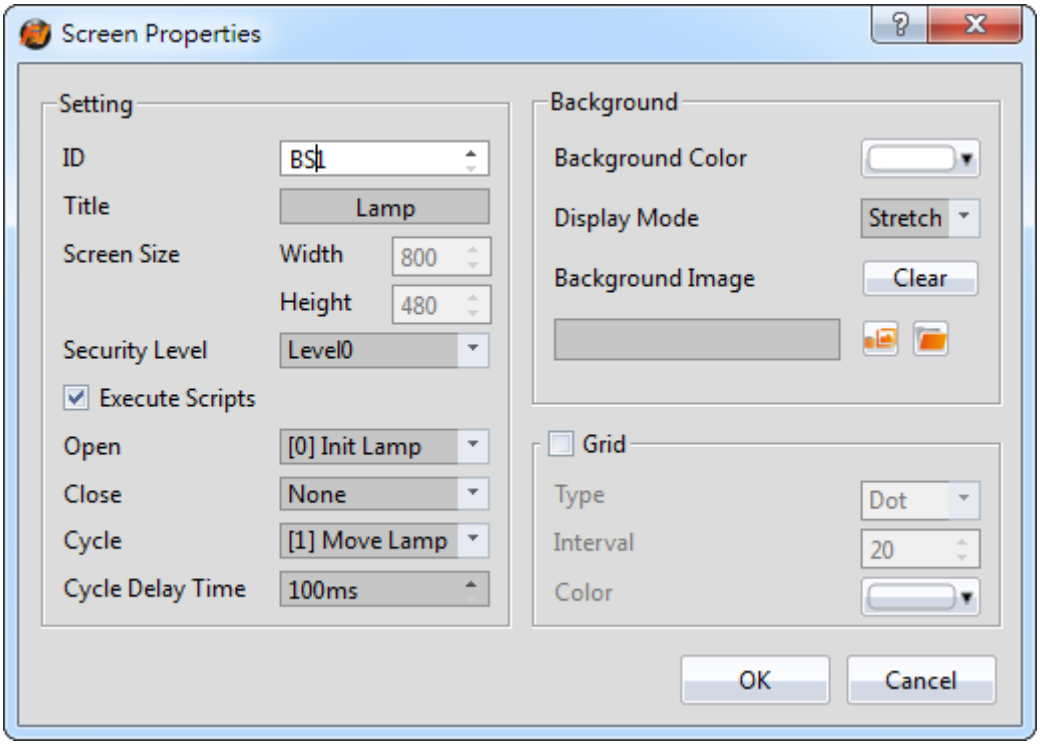


Figure 212 Using Script Setting for the Screen

Return to the【Script List】screen when the setting is complete and the following results can be seen:

ID	Comment	Password	Trigger Condition	Run at Startup	Valid	Reference	
0	Move Lamp	No	None	No	Yes	BS1.Screen.Cycle_Script	Go to
1	Init Lamp	No	None	No	Yes	BS1.Screen.Open_Script	Go to

Figure 213 Script Setting Result

5. Finally, click on 【Simulate】 which is located in the functions tab page of 【Project】located in the toolbar on the top of the main screen and we will be able to see on the simulation screen that the lamps are moving the way we expected.

12.4.2 Load Balance

Goal

The goal of this example is to find the machine with excessive usage rate among 4 units. In order to simplify the problem, let's assume that the usage rate of every machine will be between 0% and 100%, and if the usage rate of a machine is 20% over the average usage rate of the 4 units, it will be determined as the overloaded machine. As shown in the example below, the average usage rate of the 4 machines is (39+78+100+13)/4 = 57.5% and according to our definition of an overloaded machine, units 2 and 3 are overloaded machines. We will display this result in the Text Display below.

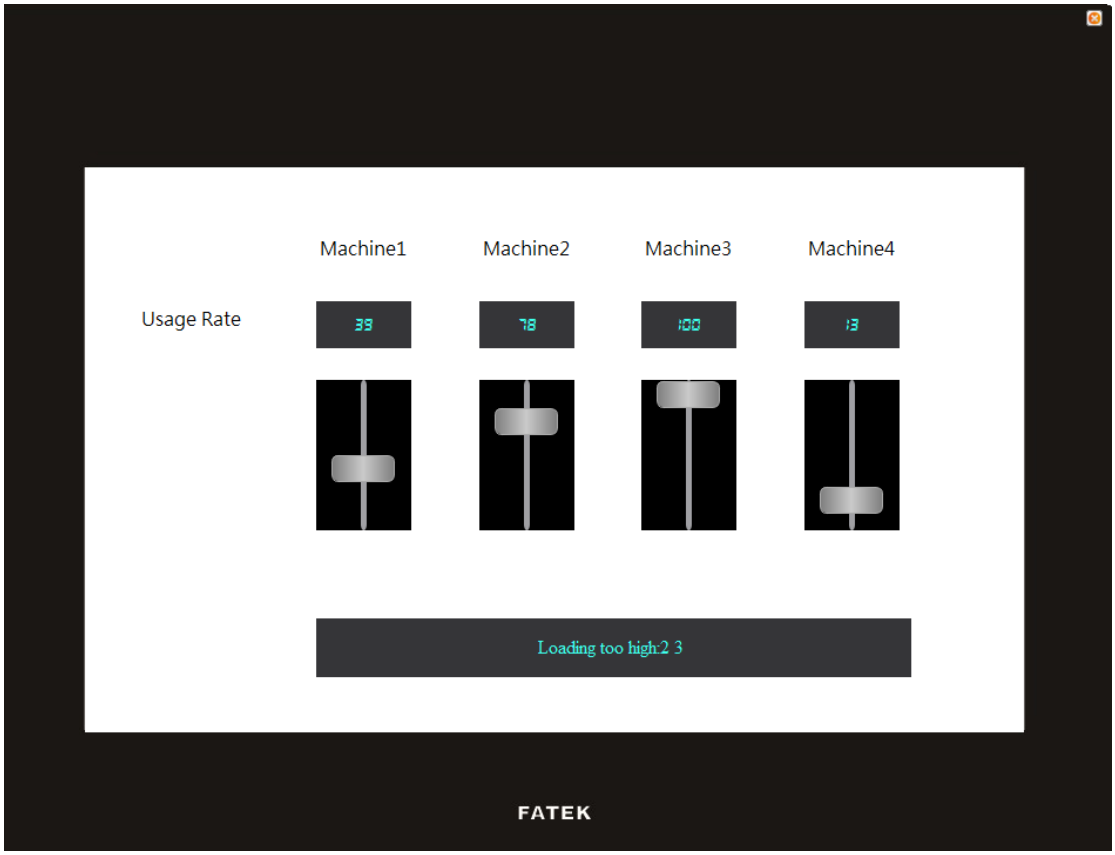
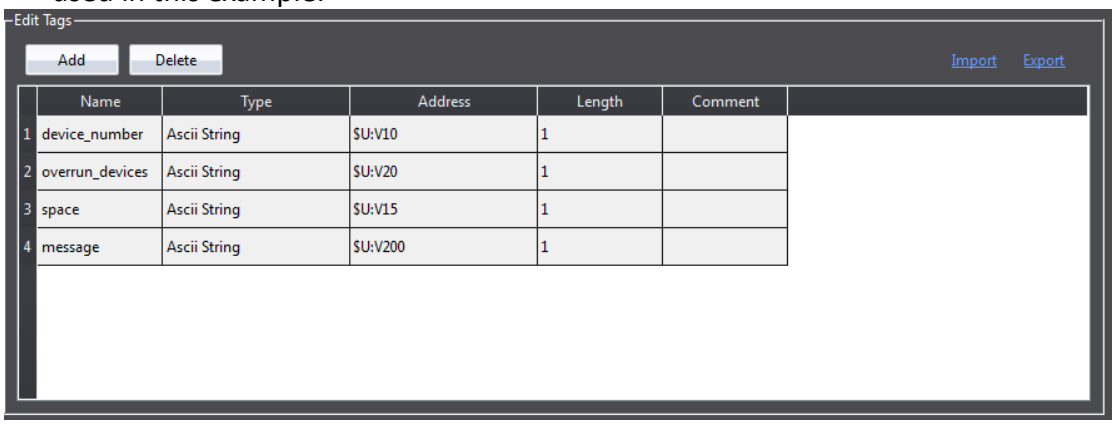


Figure 214 Example–Load Balance

Implementation Steps

1. We will use 4【Text】objects, 4【Numeric Input/Display】objects, 4【Slide Switch】objects and a 【Text Input/Display】 object to form the screen that we want, in which the monitoring address of the 4【Numeric Input/Display】and【Slide Switch】objects are set as $U:V0, $U:V1, $U:V2 and $U:V3 respectively. Since we will be using strings in the script, we must first create **Ascii String** type tags to correspond to the registers; the following figure shows the【Tag Library】settings used in this example.



	Name	Type	Address	Length	Comment
1	device_number	Ascii String	$U:V10	1	
2	overrun_devices	Ascii String	$U:V20	1	
3	space	Ascii String	$U:V15	1	
4	message	Ascii String	$U:V200	1	

Figure 215 Tag Library Setting–Load Balance Example

Next we will set the monitoring address of the【Text Input/Display】object as

$T:message, then we have completed the screen settings.

2. Next is to add a script used to determine the load balance; the content of the script are as follows:

```
$U:V100 = arrsum($U:V0, 4) / 4 // Calculates $U:V0 to $U:V3
$U:V50 = 0 // 1 : Overloaded machines discovered    0: Not discovered
$T:space = " "
$T:overrun_devices = ""
// Start searching for 4 word values from $U:V0
for $S:I0 = 0 to 3
   if $U:V0[$I0] >= 20 + $U:V100 // Determine whether the usage rate
is greater than average+20%
      $U:V50 = 1
      // Convert the overloaded machine number into text string
      num2str($T:device_number, $S:I0 + 1)
      strcat($T:overrun_devices, $T:device_number)
      strcat($T:overrun_devices, $T:space)
   endif
endfor

if $U:V50
   // Message to display when overloaded machine was discovered
   $T:message = "Loading too high:"
   strcat($T:message, $T:overrun_devices)
else
   // Message to display when no overloaded machine was discovered
   $T:message = "Loading is balanced now"
endif
```

We will set the trigger time of this script as【Timer】and set the【Delay Time】as 1000 milliseconds, which means that it will check the load status approximately every second. The set script is as shown in the figure below:

ID	Comment	Password	Trigger Condition	Run at Startup	Valid	Reference
0	check load balance	No	Timer with delay time: 1000 ms	No	Yes	Go to

Figure 216 Script Setting–Load Balance Example

3. Finally, click on【Simulate】which is located in the functions tab page of【Project】located in the toolbar on top of the main screen, and the following screen can be seen; Move each slide switch to change the usage rate of each machine to see the corresponding changes in the message displayed below.

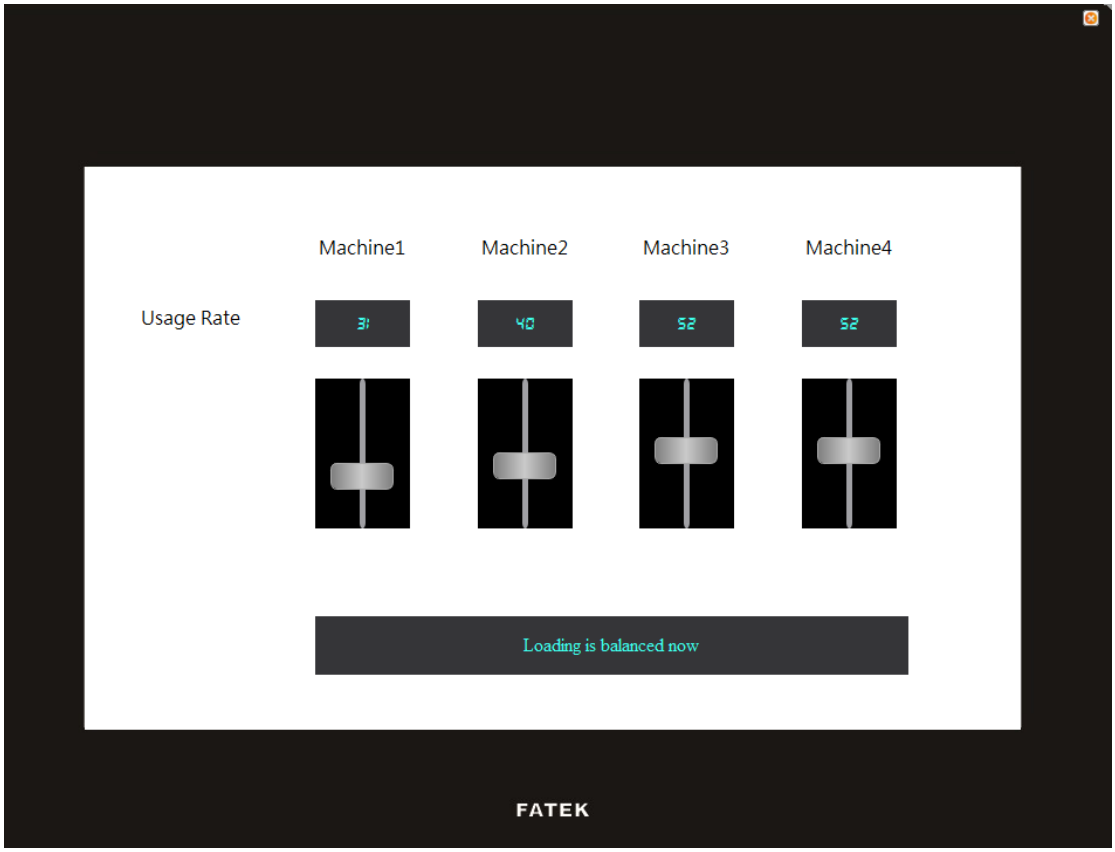


Figure 217 Simulation Result–Load Balance Example

13. Resource

13.1 【Image Library】

The【Image Library】function can be used when designing projects with the FV Designer to create images that need to be used in the【Image Library】files (*.fil) in advance so that they can be conveniently used when editing objects. In addition, the generated【Image Library】files (*.fil) can also be exported when several people are developing a project together, so that other developers can import and use the files, too.

13.1.1 Image Library Settings

Click on【Image Library】in【Project Explorer】of the FV Designer and the【Image Library】Edit Window (as shown in the figure below) will appear, where the usage methods of each setting is as shown in the table below:

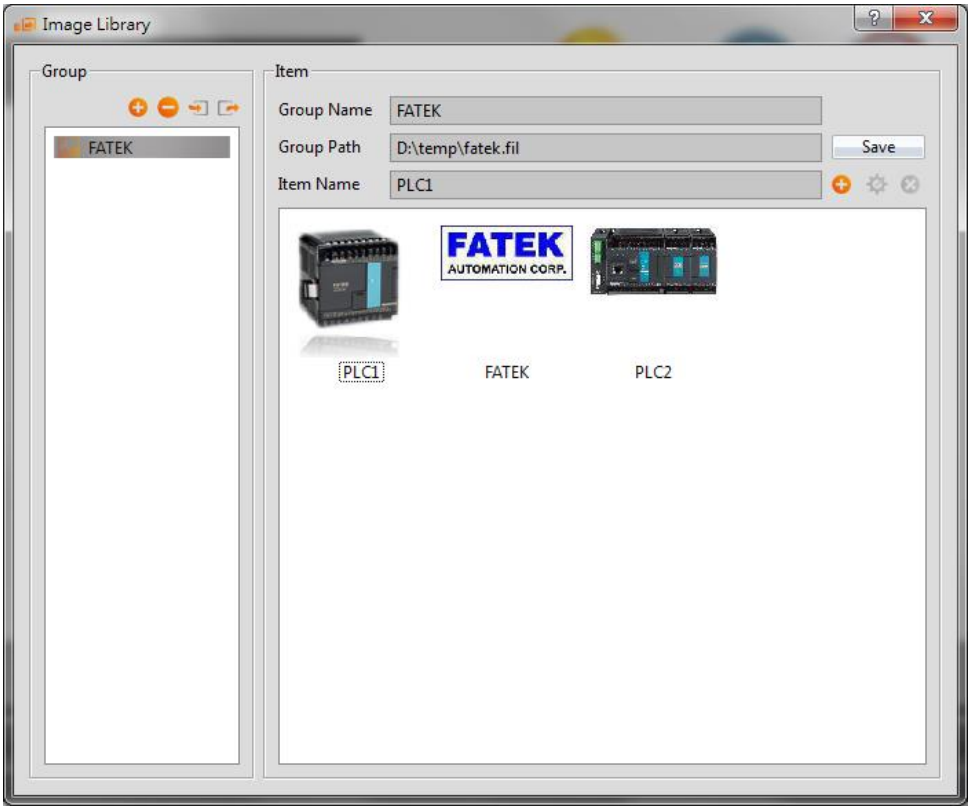


Figure 218 Image Library Editing Window

Table 160 Edit Window Setting Properties of the Image Library

Property	Description
【Add】	Add an【Image Library】group; the system will generate a new【Image Library】file (*.fil) when this button is pressed.
【Remove】	Remove an【Image Library】group; this【Image Library】will be removed from the image library when this button is pressed, but the【Image Library】file (*.fil) will not be deleted.
【Import】	Import a new【Image Library】file and generates a corresponding【Image Library】group.
【Export】	Save the current【Image Library】group into the specified path as a new file.
【Group List】	Display the【Image Library】groups currently included in the computer. When the mouse is clicked on a specific【Image Library】group, the item list on the right will display all image contents included in that【Image Library】group.
【Group Name】	Set the name for the currently selected【Image Library】group.

	Note: This name is only the displayed name of the【Image Library】group; it is not the file name of the【Image Library】file.
【Group Path】	Display the file path of the currently selected【Image Library】group.
【Item Name】	Edit the item name of the currently selected image.
【Save】	Save the contents of the currently editing【Image Library】group into the corresponding【Image Library】file.
【Add Item】	Add an image into the currently editing【Image Library】group.
【Edit Item】	Change the saved image of the currently selected item.
【Delete Item】	Delete the image of the currently selected item.
【Item List】	Display all the image contents included in the currently selected【Image Library】;the【Add Item】,【Edit Item】and【Delete Item】buttons on the top-right can be used to edit the selected【Image Library】group.

13.1.2 Image Library Usage Method

The【Image Selector】must be used if the users want to use the image library they have created or the default image libraries provided by the FV Designer. This chapter will introduce the usage method of the【Image Selector】and how to select images saved in the【Image Library】.

13.1.2.1 Image Selector

The【Image Selector】is as shown in the figure (); it allows users to select images. When the images saved in the【Image Library】need to be used, click on the "  "button to the left to select the image needed from the【Image Library】. If the image needed is saved on the user's computer, the "  " button to the right can be pressed to select the image needed from the user's computer.

13.1.2.2 Image Library Selection Window

The image selection window of the【Image Library】is as shown in the figure below. Use the pull-down menu to select the【Image Library】group where the image that the user wants to use is located when using the image selection window, and then just select the image needed from the【Item List】below. The【Item List】will

synchronize and update the display of images included in the【Image Library】group when switched to another【Image Library】group.

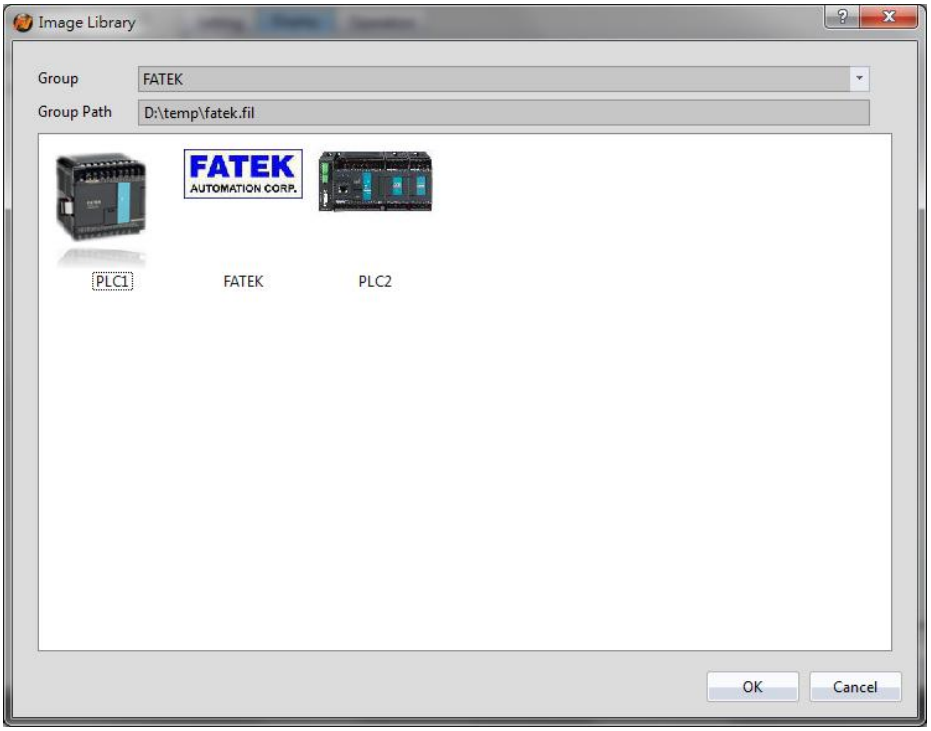


Figure 219 Image Selection Window of Image Library

13.2 【Audio Library】

The【Audio Library】function can be used while designing projects with the FV Designer to create the audio files that need to be used into the【Audio Library】files (*.fal) in advance so that they can be conveniently used when editing objects. In addition, the generated 【Audio Library】files (*.fal) can also be exported when several people are developing a project together, so that other developers can import and use the files, too.

13.2.1 Audio Library Settings

Click on【Audio Library】in【Project Explorer】of the FV Designer and the【Audio Library】Edit Window (as shown in the figure below) will appear where the usage methods of each setting is as shown in the table below:

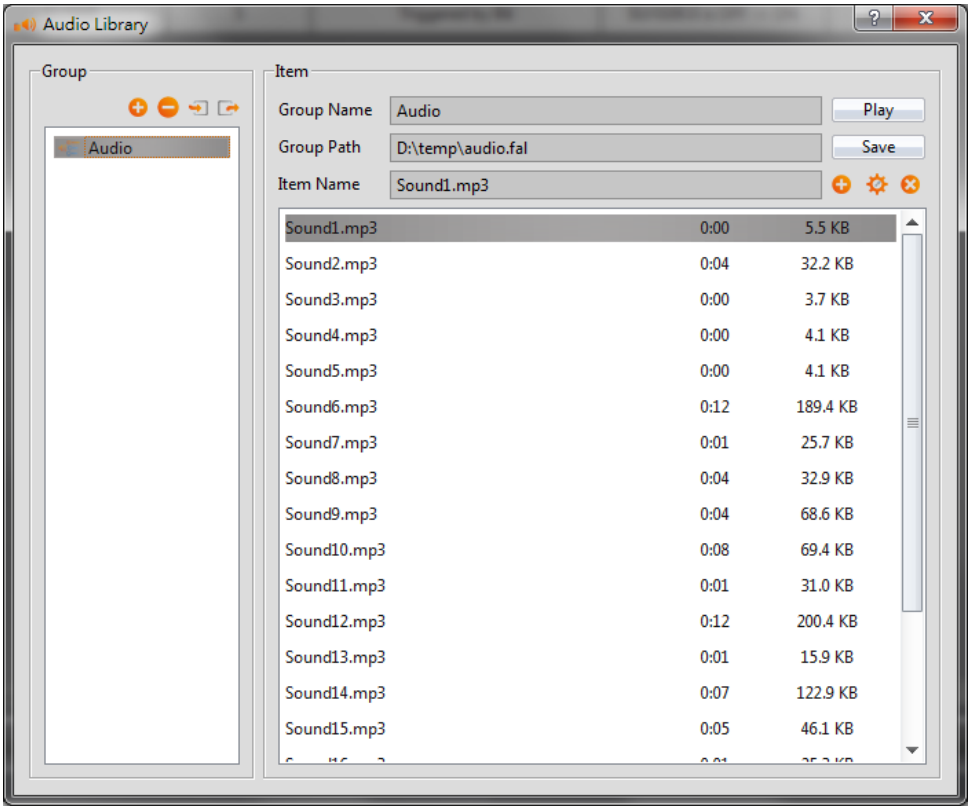


Figure 220 Audio Library Edit Window

Table 161 Edit Window Setting Properties of Audio Library

Property	Description
【Add】	Add an【Audio Library】group; the system will generate a new【Audio Library】file (*.fal) when this button is pressed.
【Remove】	Remove an【Audio Library】group; this 【Audio Library】will be removed from the audio library when this button is pressed, but the【Audio Library】file (*.fal) will not be deleted.
【Import】	Import a new【Audio Library】file and generates a corresponding【Audio Library】group.
【Export】	Save the current【Audio Library】 group into the specified path as a new file.
【Group List】	Display the【Audio Library】groups currently included in the computer. When the mouse is clicked on a specific【Audio Library】group, the item list on the right will display all audio contents included in that【Audio Library】group.
【Group Name】	Set the name for the currently selected【Audio Library】group.

	Note: This name is only the displayed name of the【Audio Library】group; it is not the file name of the【Audio Library】file.
【Group Path】	Display the file path of the currently selected【Audio Library】group.
【Item Name】	Edit the item name of the currently selected audio.
【Play】	Play the currently selected audio file. This button will change to the【Stop】function once the audio file starts to play; it can stop playing the audio file that is currently playing.
【Save】	Save the contents of the currently editing【Audio Library】group into the corresponding【Audio Library】file.
【Add Item】	Add an audio file into the currently editing【Audio Library】group.
【Edit Item】	Change the saved audio file of the currently selected item.
【Delete Item】	Delete the audio file of the currently selected item.
【Item List】	Display all the audio contents included in the currently selected【Audio Library】; the【Add Item】,【Edit Item】and【Delete Item】buttons on the top-right can be used to edit the selected【Audio Library】group.

13.2.2 Audio Library Usage Method

The【Audio Selector】must be used if the users want to use the audio files saved in the【Audio Library】. This chapter will introduce the usage method of the【Audio Selector】and how to select audio saved in the【Audio Library】.

13.2.2.1 Audio Selector

The【Audio Selector】is as shown in the figure (

); it allows users to select the audio files to be used. When an audio file saved in the【Audio Library】needs to be used, the "  " button on the right can be pressed to select the audio file from the【Audio Library】. The "  " button to the left can be pressed to play the selected audio file if the users want to check the currently selected audio file.

13.2.2.2 Audio Library Selection Window

The audio file selection window of the【Audio Library】is as shown in the figure below.

Use the pull-down menu to select the【Audio Library】group where the audio file that the user wants to use is located when using the audio selection window, and then just select the audio file needed from the【Item List】below. Click on the【Play】button located at the top-right to play the selected audio file if you want to check the currently selected audio file. The【Item List】will synchronize and update the display of audio files included in the【Audio Library】group when switched to another【Audio Library】group.

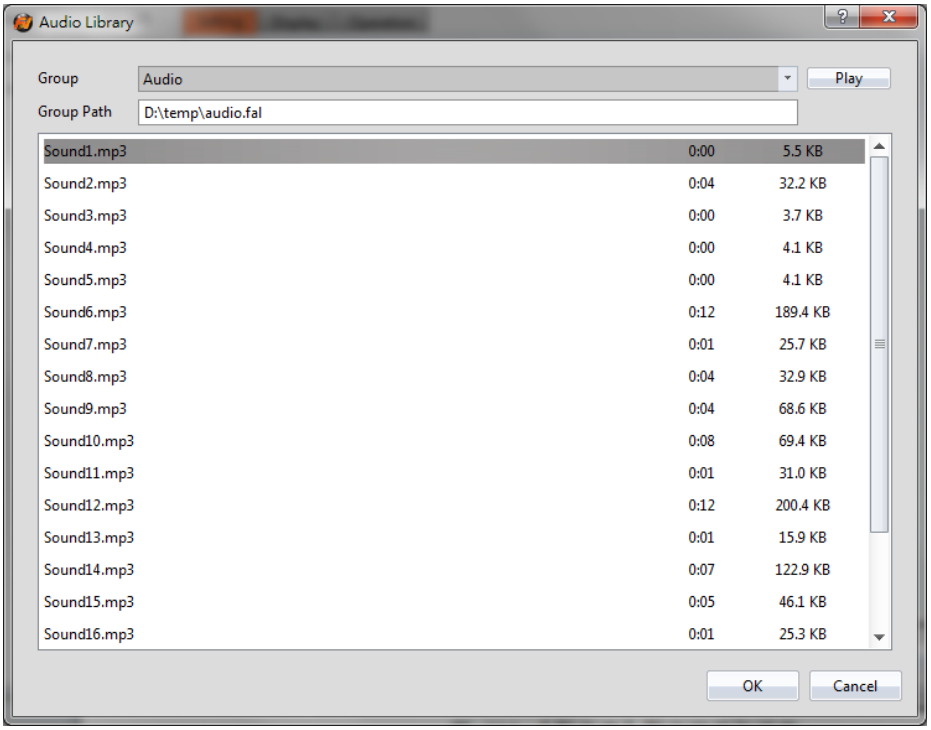


Figure 221 Audio File Selection Window of Audio Library

13.3 【Tag Library】

The【Tag Library】can be used to define the frequently used registered addresses before starting to design a project to increase readability during the system design.

13.3.1 Tag Library Settings

Click on【Tag Library】in【Project Explorer】of the FV Designer and the【Tag Library】Edit Window (as shown in the figure below) will appear where the usage methods of each setting is as shown in the table below:

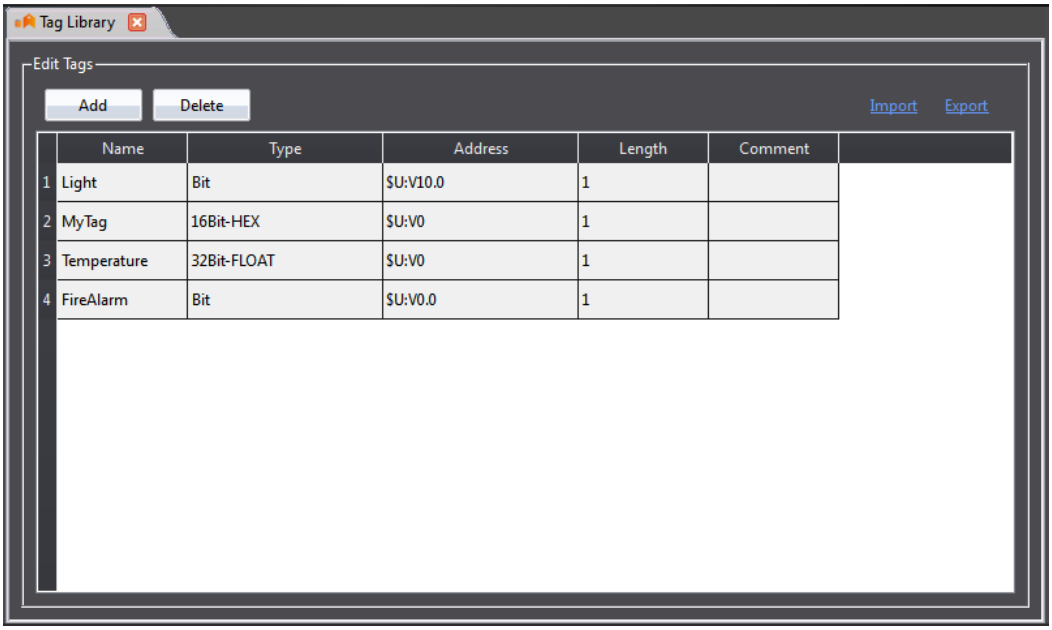


Figure 222 Tag Library Edit Window

Table 162 Edit Window Setting Properties of Tag Library

Property	Description
【Add】	Add a tag.
【Delete】	Delete the selected tag.
【Tags List Table】	The tag settings can be edited directly from the table. The settings include: 【Name】Tag name of the address. 【Type】Data type of the address. 【Address】Address of the register 【Length】The number of data for this data type. 【Comment】Comment explanations of this tag.
【Import】	Import a【Tag Library】CSV file and fills in the settings included in this file into the 【Tag Library】of the currently editing project.
【Export】	Export the【Tag Library】settings of the currently editing project into a CSV file.

13.3.2 Tag Library Usage Method

The【Address Selector】must be used to select the tag in order to use the【Tag Library】. The【Address Selector】is as shown in the figure below; the address tag can be entered directly in the edit field of the【Address Selector】, or press the button to the right of the selector to open the【Address Selector】dialog to select a tag.

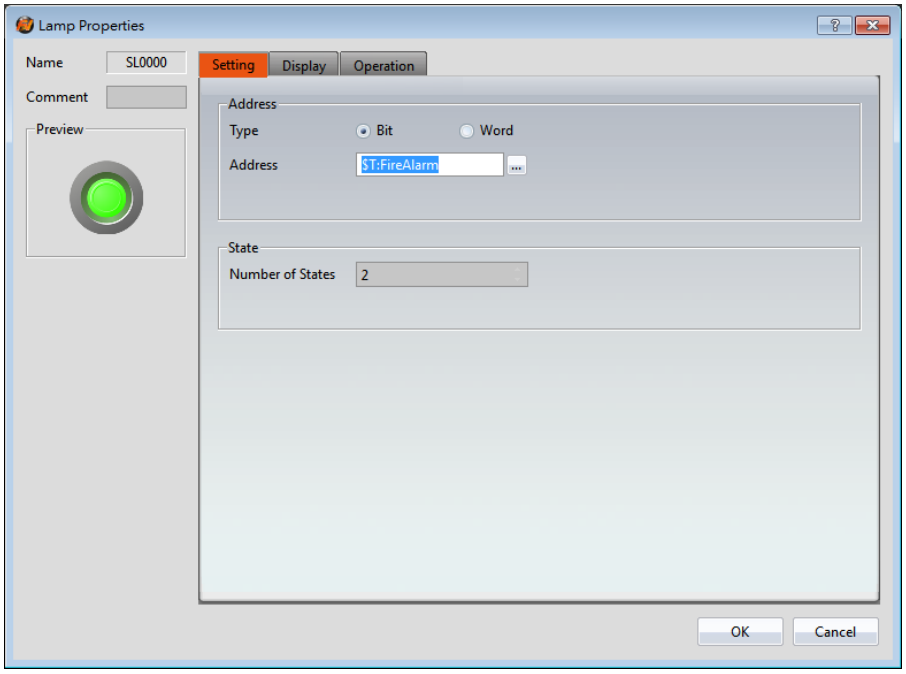


Figure 223 Inputting Address Tag in【Address Selector】Edit Field

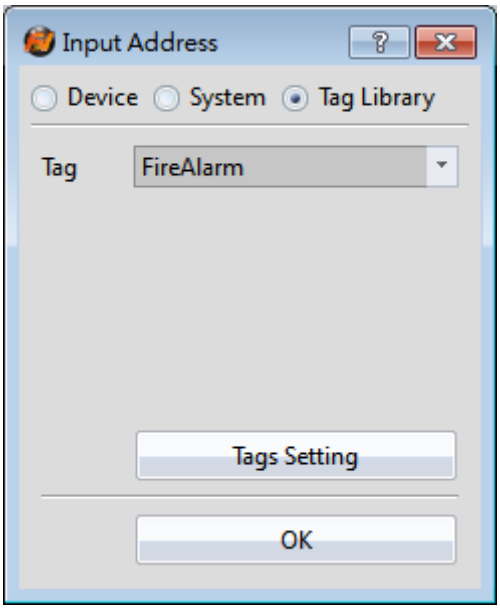


Figure 224 Selecting Address Tag in【Address Selector】Dialog

13.4 【Text Library】

If there is the need to switch displayed texts in real-time in order to achieve multi-language or other functions while designing a project using the FV Designer, the 【Text Library】can be used to edit the text to display the different needs and create them into a table, so that it can be used to switch between text groups currently displayed through the【Control Address】while the HMI is operating.

13.4.1 Text Library Settings

Click on the【Text Library】in【Project Explorer】of the FV Designer and the【Text Library】Edit Window (as shown in the figure below) will appear where the usage methods of each setting is as shown in the table below:

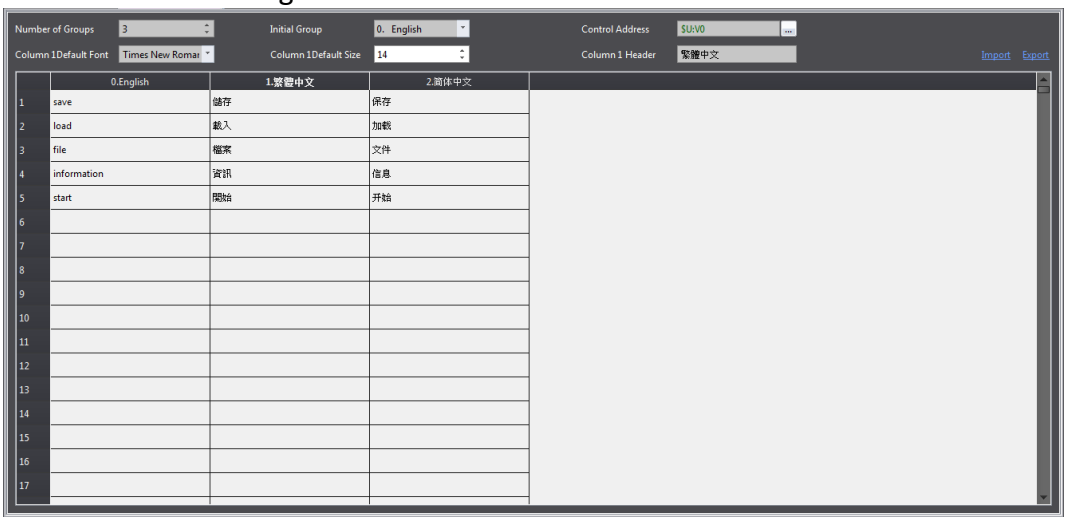
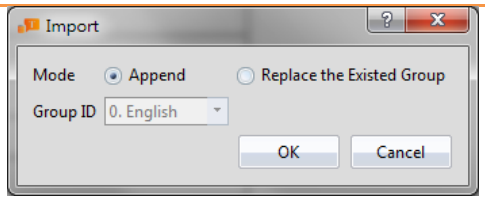


Figure 225 Text Library Edit Window

Table 163 Edit Window Setting Properties of Text Library

Property	Description
【Number of Groups】	Set the number of groups for the【Text Library】.
【Initial Group】	Set the text group to display when the HMI starts operating.
【Control Address】	Set the control address of the【Text Library】. This address is used to control the text group currently displayed by the【Text Library】; the data type used is fixed as【16Bit-UINT】, for example when the value of the【Control Address】is 0, the【Text Library】will display the text in group 0.
【Default Font】	Set the default font of the currently selected group.
【Default Size】	Set the default size of the currently selected group.
【Header】	Set the header of the currently selected group.
【Import】	 【Append】 Import a【Text Library】CSV file and fills in all the

	contents included in the file into a new text group. 【Replace the Existed Group】 Import a【Text Library】CSV file and fills in all the contents included in the file into the selected text group.
【Export】	 Export the selected text groups in【Text Table】 into CSV files and save the files in the designated folder.
【Text Table】	The text content editing table for each group included in the【Text Library】.

13.4.2 Text Library Usage Method

The【Text Selector】must be used if the users want to use the text contents saved in the【Text Library】. The【Text Selector】is as shown in the figure below; it includes two text selection modes which are used to enter texts directly or select texts from the【Text Library】, respectively. Users can switch between the two modes by using the button to the right.

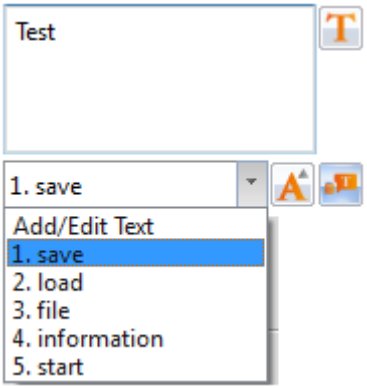


Figure 226 Text Selector

The default setting for the【Text Selector】is the direct text input mode; the users can enter the text that they want to display in the editing section to the left of the【Text

Selector】directly. To select texts saved in the【Text Library】, the button to the right must first be pressed to switch modes; at this time the left of the【Text Selector】will change into a pull-down menu and this menu includes all text contents saved in the【Text Library】for the users to choose from. When the contents currently included in the menu is inadequate for use, the user can also select the first option【Add/Edit Text】in the menu and edit the contents of the【Text Library】in the window as shown in the figure below.

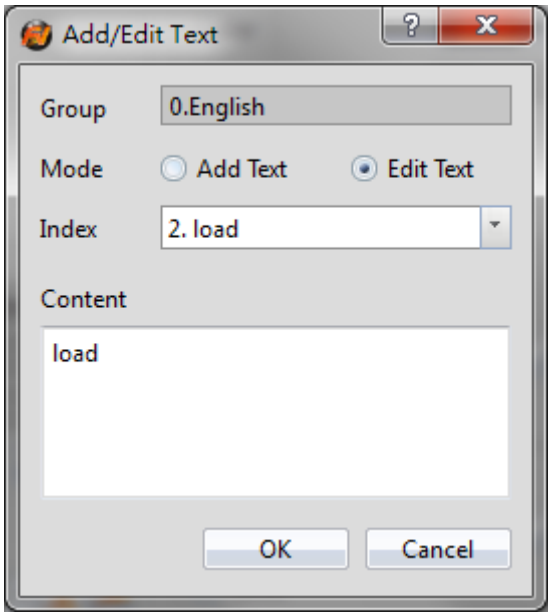


Figure 227 Add/Edit Text Window

If the displayed text is selected from【Text Library】, the dialog of setting the text font and size for different languages will appear after pressing the button  , the user can set the font and size of the text displayed in each language. If【Default Font】or【Default Size】is selected, the font or size of the displayed text will be the font or size set in the【Text Library】Edit Window(Figure 225).

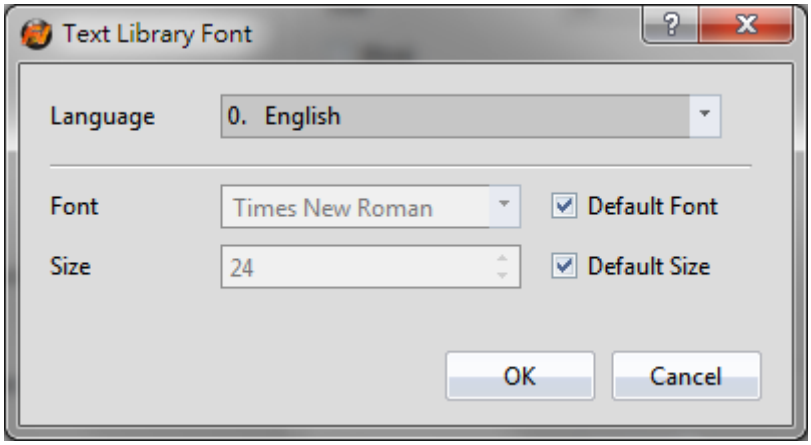


Figure 228 Text Library Font Window

14. 【User Toolbox】

Although the【Toolbox】provided by this software is able to meet the needs of most users, however, the objects provided in the 【Toolbox】are all pre-set values and cannot allow users to use objects that they changed on their own. This is why this software also provides the【User Toolbox】function because not only does it allow users to access objects that they have modified, but it also provides【Import】and【Export】functions so that the objects in the【User Toolbox】can be quickly transferred among different computers, accelerating the development speed for the user.

This chapter will explain【User Toolbox】related pages and their operating methods.

14.1 Basic Operations

Select the【User Toolbox】in the【View】page of the【Ribbon】and the【User Toolbox】will appear as shown in the figure below.

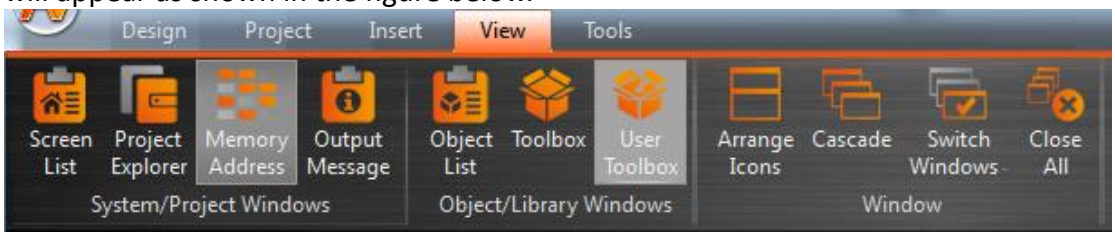


Figure 229 View page of the Ribbon

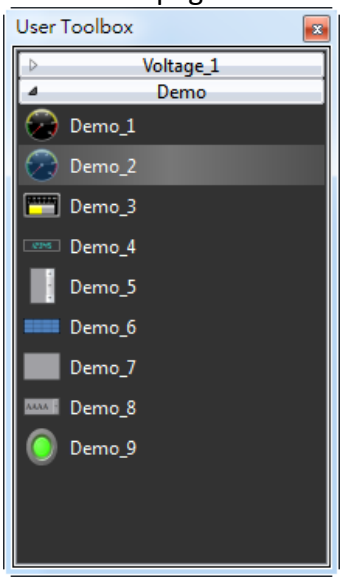


Figure 230 User Toolbox

The basic operations of the【User Toolbox】can be divided into three parts:

1. Adding objects to the【User Toolbox】.

2. Adding the objects in the【User Toolbox】to the【Work Space】.
3. Introduction to menu operations.

14.1.1 Adding objects to the User Toolbox

Move the mouse cursor over the object in the【Work Space】to add to the【User Toolbox】, then press the ctrl key and left mouse button to start dragging the object. Drag the object into the【User Toolbox】and then release the left mouse button. The object will be added to the【User Toolbox】according to the location where the mouse button was released.
The default name of the added object is “belonging category_number”, as shown in the figure below.

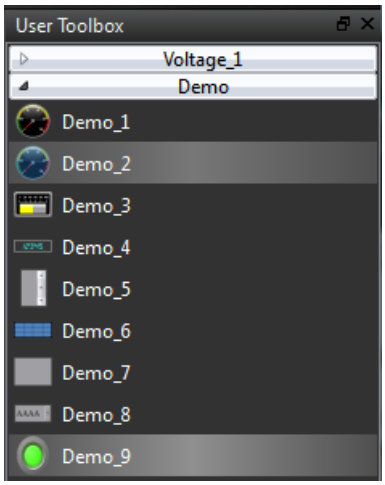


Figure 231 User Toolbox–Default name

If the left mouse button was released in the【Work Space】, the object will be added to the【Work Space】where the mouse button was released.

Note: The object names within the User Toolbox do not relate to the object names and comments in the work space.

14.1.2 Adding the objects in User Toolbox to the Work Space

Move the mouse cursor over the object in the【User Toolbox】to add to the【Work Space】, then press and hold the left mouse button to start dragging the object. Drag the object into the【Work Space】and then release the left mouse button at the location to add the object. The object will be added to the【Work Space】at the location where the mouse button was released.

If the left mouse button was released in the【User Toolbox】, the object will be moved to the location where the mouse button was released so that the user can

conveniently change the category that the object belongs to and its location in the 【User Toolbox】.

> Note: If the text library, tag library or other settings are used by the objects in the User Toolbox, please remember to import the text library, tag library and other settings when adding the object in order to guarantee that the settings of the object during use are the same as the settings when it was added.

14.1.3 Menu Introduction

A【Menu】will appear when the right mouse button is pressed in the【User Toolbox】. The options within the menu changes according to the location where the right mouse button is pressed, as shown in the figure below. Options within the 【Menu】 are as listed in the table below.

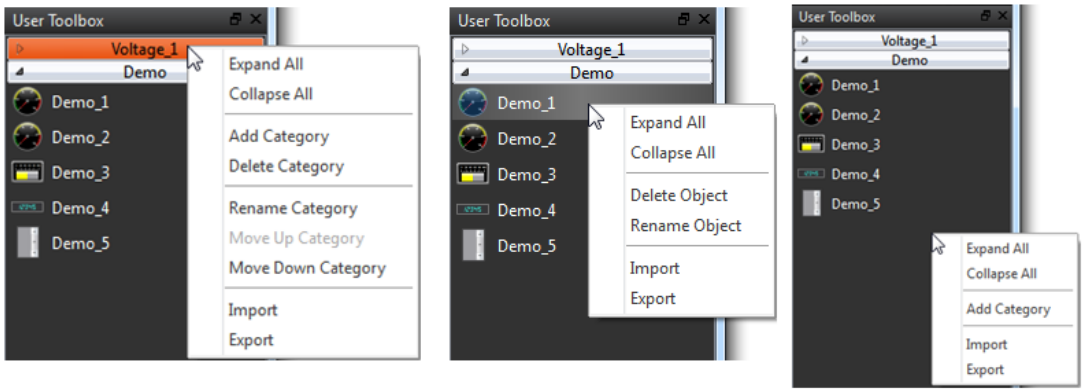
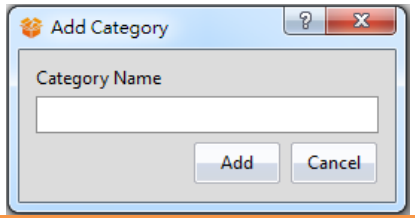
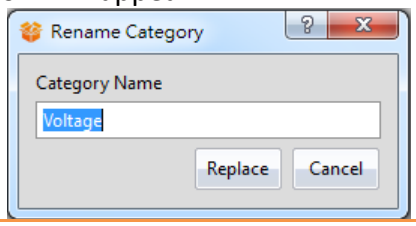
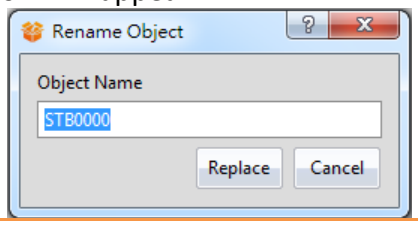


Figure 232 Menu–Mouse over category (Left); Mouse over object (Middle); Mouse not over category or object (Right)

Table 164 Options within the menu

Option	Description
【Expand All】	Expand all【Category】in the【User Toolbox】, allowing users to see all【Object】.
【Collapse All】	Collapse all【Category】in the【User Toolbox】so that users cannot see the【Object】, just the【Category】.
【Add Category】	Add a【Category】; the window below will appear. 
【Delete Category】	Delete the selected【Category】along with all the【Object】in the【Category】.
【Rename Category】	Change the name of the selected【Category】; the window

	below will appear. 
【Move Up Category】	Move the selected【Category】up a level.
【Move Down Category】	Move the selected【Category】down a level.
【Delete Object】	Delete the selected【Object】.
【Rename Object】	Change the name of the selected【Object】; the window below will appear. 
【Import】	Add the previously saved【User Toolbox】file (*.utf) into the current【User Toolbox】.
【Export】	Save the current【User Toolbox】into a file (*.utf).

14.2 Import and Export

In order for users to conveniently transfer the【User Toolbox】they are modified among the different computers and to accelerate development speed, this software provides the【Import】and【Export】functions. This section will introduce how to use these functions.

14.2.1 Import

Press the right mouse button within the【User Toolbox】and select【Import】from the menu that pops up, as shown in the figure below.

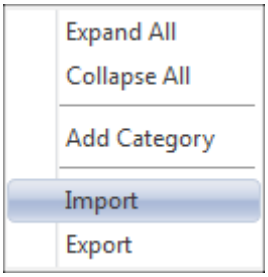


Figure 233 Menu–Import

The window below will appear. Select the file (*.utf) to import and then press【Open File】to import the file.

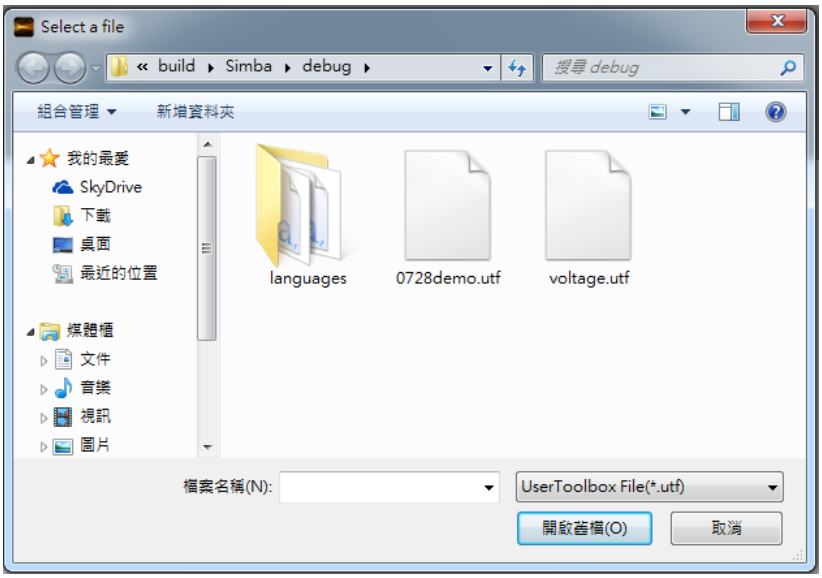


Figure 234 Select file to import

14.2.2 Export

Press the right mouse button within the 【User Toolbox】and select【Export】from the menu that pops up, as shown in the figure below.

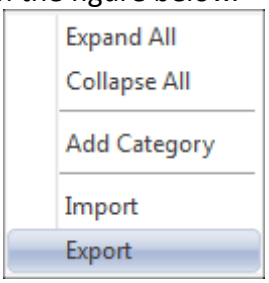


Figure 235 Menu–Export

The window below will appear; select the【Category】to export here, as shown in the figure below.

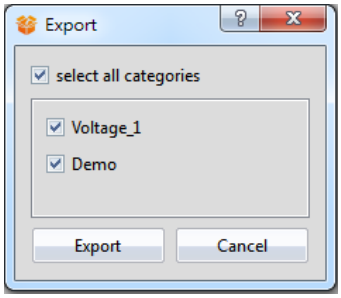


Figure 236 Select category to export

The window below will appear. Press【Save】after selecting the name and location of the file (*.utf) to export the file.

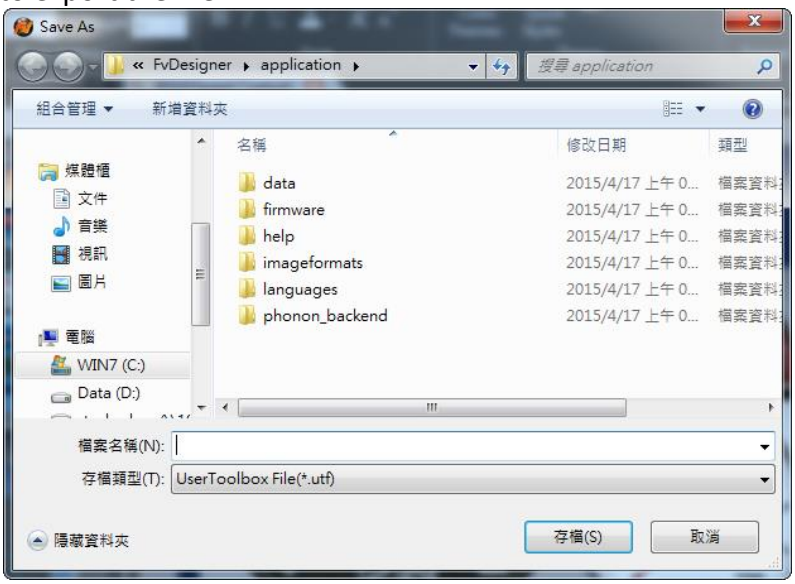


Figure 237 Select the name and location for the file export

14.3 Name Conflict

Identical【Category Names】are not allowed in the【User Toolbox】in order to prevent the users from getting confused. Similarly, identical【Object Names】are also not allowed within the same【Category】. Therefore when conflicts occur due to repeated names, the【Category Name Conflict】window or the【Object Name Conflict】window will appear according to the situation to help users solve this problem. This section will now introduce the pages related to the【Category Name Conflict】and【Object Name Conflict】windows.

Note: Identical object names are allowed if used in different categories.

14.3.1 Category Name Conflict

Usually occurs when there are identical【Category Name】during【Rename Category】or【Import】.

The following window will appear if they occurred during the 【Rename Category】, reminding the user that this name has already been used, as shown in the figure below.

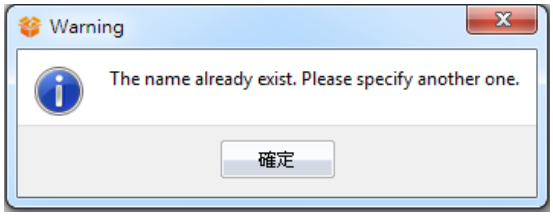


Figure 238 Repeated category name warning

The following window will appear if they occurred during【Import】, allowing the user to select what action to take next, as shown in the figure and table below.

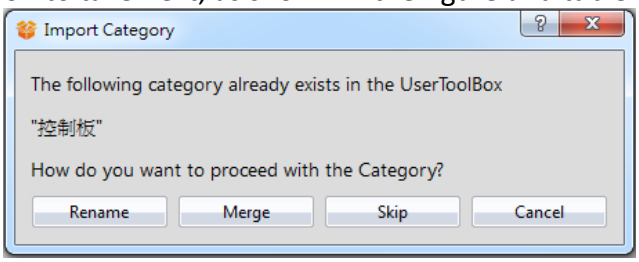


Figure 239 Category Name Conflict selection window

Table 165 Category Name Conflict options

Option	Description
【Rename】	Change the name of the category to import and then add it to the【User Toolbox】.
【Merge】	Merge the category to import with the category within the 【User Toolbox】.
【Skip】	Skip and do not process this category import.
【Cancel】	Cancel this import.

14.3.2 Object Name Conflict

Usually occurs when there are identical 【Object Name】 during the【Rename Object】 or【Import】.

The following window will appear if they occurred during【Rename Object】, reminding the user that this name has already been used, as shown in the figure below.

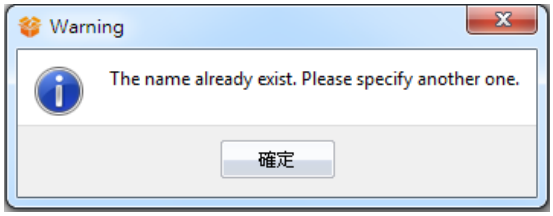


Figure 240 Repeated object name warning

The following window will appear if they occurred during 【Import】, allowing the user to select what action to take next, as shown in the figure and table below.

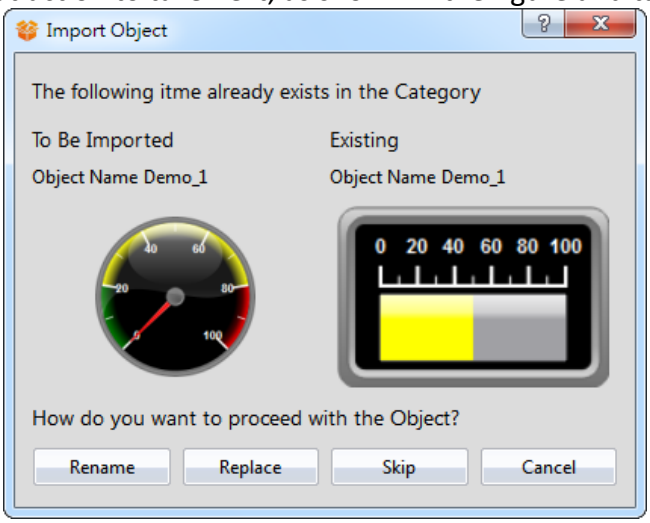


Figure 241 Object Name Conflict selection window

Table 166 Object Name Conflict options

Option	Description
【Rename】	Change the name of the object to import and then add it to the current【Category】.
【Replace】	Replace the object in the current【Category】with the object to import.
【Skip】	Skip and do not process this object import.
【Cancel】	Cancel this import.

15. Build Running Package and Simulation

15.1 【Download】

When a running package (.cfrp) has been successfully built and had no errors during simulation, it is ready to be downloaded to the HMI. Fatek provides diverse download methods. Users can download the running package from the PC to the HMI through a serial port connection, Ethernet connection or by using a USB cable.

15.1.1 Downloading the running package and operating system from a PC

The download function can be found in the【Project】function tab on the ribbon taskbar on top of the FvDesigner; click on【Download】and a dialog window will open and enter the【Download Manager】setting screen.

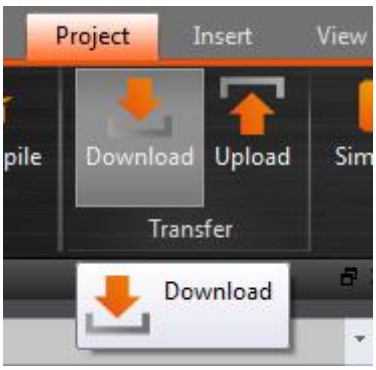


Figure 242 Open download function

The following are detailed descriptions for the【Download Manager】.

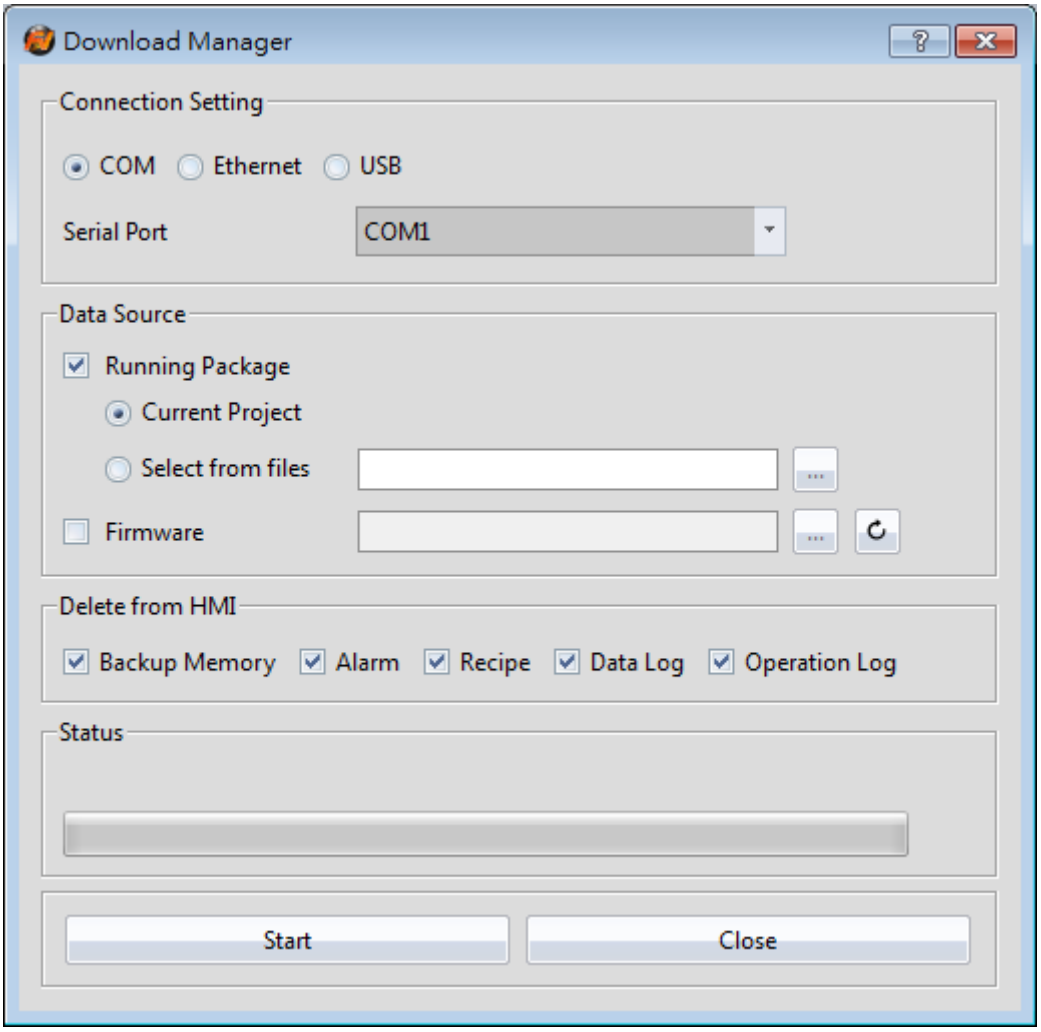


Figure 243 Download Manager function inter–face

Table 167 Download Manager–related parameters

Property	Description
【Connection Setting】	【COM】 Select to perform download through the serial port; the port number used for downloading must also be specified when this option is selected. 【Ethernet】 Select to perform download through the Ethernet. The IP address of the target HMI must also be specified when this option is selected. Press【Scan】on the right to acquire the HMI IP addresses and device names currently online. Users can also manually enter the IP address of the target HMI to perform download.

	Note: The Scan button may have no effect under certain network environments (usually when the DHCP server cannot accurately configure the IP addresses). In this case, the command prompt can be opened to execute the following commands in sequence to restore the function. 1. netsh winsock reset 2. netsh interface ipv4 reset 3. ipconfig /flushdns Please re-start the computer when completed for the settings to take effect. 【USB】 Perform download through USB.
【Data Source】	【Running Package】 Downloads the executable running package once this option is selected. Source package can be the【Current Project】or【Select from file】 by the user. 【Operating System】 The HMI operating system will be downloaded once this option is selected.

【Delete on Target】	This field determines whether to clear the existing data saved on the HMI: 【Backup Memory】 The NV and XNV memory on the HMI will be deleted when the download process is activated, if this option is selected. 【Alarm】 The existing alarm log on the HMI will be deleted when the download process is activated, if this option is selected, which means HMI will clear all the files under /internal/alarm/. 【Recipe】 The existing recipe files on the HMI will be deleted when the download process is activated, if this option is selected, which means HMI will clear all the files under /internal/recipe/. 【Data Log】 The existing data log on the HMI will be deleted when the download process is activated, if this option is selected, which means HMI will clear all the files under /internal/datalog/. 【Operation Log】 The existing operation log on the HMI will be deleted when the download process is activated, if this option is selected, which means HMI will clear all the files under /internal/operationlog/.
【Status】	Display the current download status and download progress.
	【Start】 Press this switch to start downloading once setting is complete. 【Close】 Press this switch to end downloading and close the download window.

15.1.2 Download Security

If system password is set, HMI will ask user for this password to proceed before downloading. Download procedure will abort if the wrong password was entered.

15.2 【Upload】

Users can upload the running package (.cfrp) saved on the HMI which includes the project, recipe and font, etc. onto the computer so that users can easily transplant the running package onto different HMIs. This is very helpful in situations such as

when expanding similar plants where a network or computer equipment is under-developed.

15.2.1 Uploading running package to a computer from the HMI

The upload function can be found in the【Project】function tab on the ribbon taskbar on top of the WinProDesigner. Click on【Upload】 and a dialog window will open and enter the【Upload Manager】setting screen.

Figure 244 Open the upload function

The following are detailed descriptions for the【Upload Manager】.

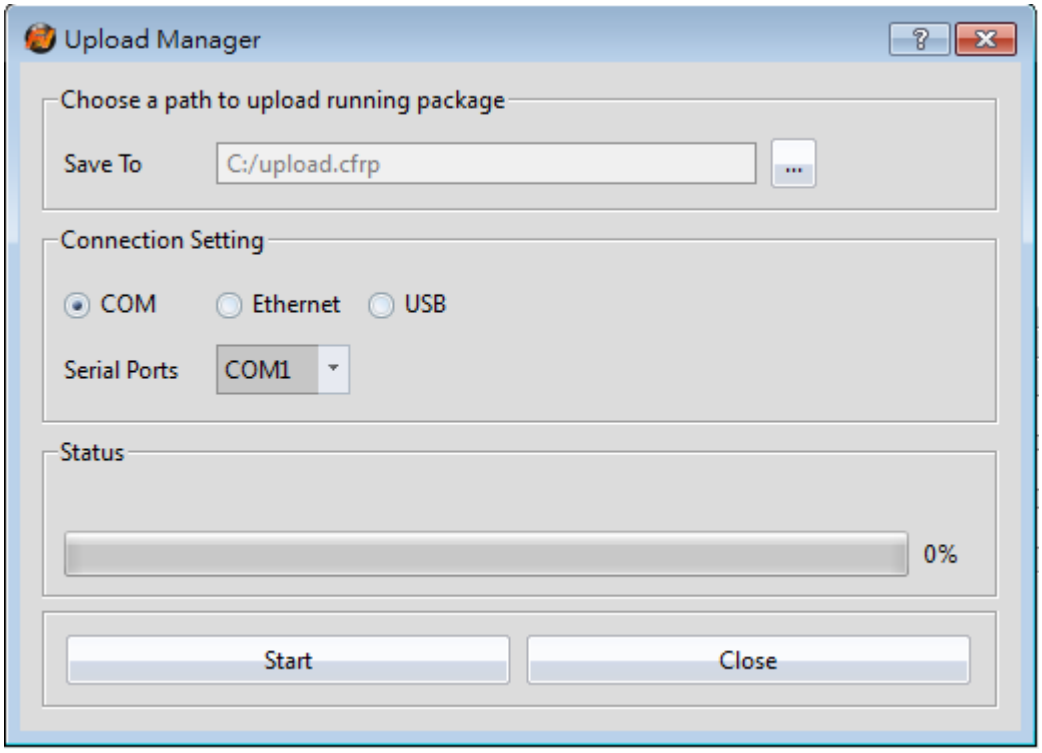


Figure 245 Upload Manager function interface

Table 168 Upload Manager-related parameters

Property	Description
【Running Package Path】	【Save To】 Specify the storage path after the running package is uploaded.
【Connection Setting】	【COM】 Select to perform the upload through the serial port. The port number used for uploading must also be specified when this option is selected. 【Ethernet】 Select to perform the upload through the Ethernet. The IP address of the target HMI must also be specified when this option is selected. Press【Scan】on the right to acquire the HMI IP addresses and device names currently online. Users can also manually enter the IP address of the target HMI to perform the upload. Note: The Scan button may have no effect under certain network environments (usually when the DHCP server cannot accurately configure the IP addresses). In this case, the command window can be opened to execute the following commands in sequence to restore the function. 1. netsh winsock reset 2. netsh interface ipv4 reset 3. ipconfig /flushdns Please re-start the computer when completed for the settings to take effect. 【USB】 Perform the upload through USB.
【Status】	Display the current upload status and upload progress.
	【Start】 Press this switch to start uploading once setting is completed. 【Close】 Press this switch to end uploading and close the upload window.

15.2.2 Upload Security

If system password is set, HMI will ask user for this password to proceed before uploading. Upload procedure will abort if the wrong password was entered.

15.3 【Compile】

15.3.1 Compile Introduction

Compile is used mainly to confirm the accuracy of the current plan and also converts the HMI plan project into a running package that can be placed into the HMI. The running package includes settings and the converted language required for the HMI in order for it to be used by the HMI.

The compiling running packages includes mainly the two parts: (1) Starting compile (2) Checking for errors after compile is complete. The introductions of these two parts are as follows.

15.3.2 Start compiling running packages

To start compiling, press the【Compile】switch in the【Project】section of the HMI toolbar.

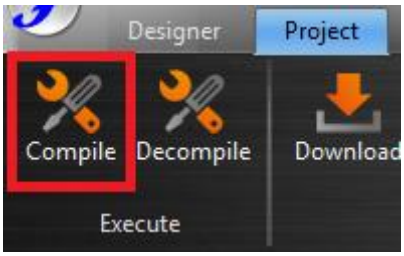


Figure 246 Perform compile from the toolbar above

15.3.3 Ending compile and error check

When the compilation ends, the compile process will be displayed in the【Information Window】below, and a running package (with file extension fcrp, which is short for fatek running package) to be used on the HMI will be generated. This running package can be placed in the HMI for use.

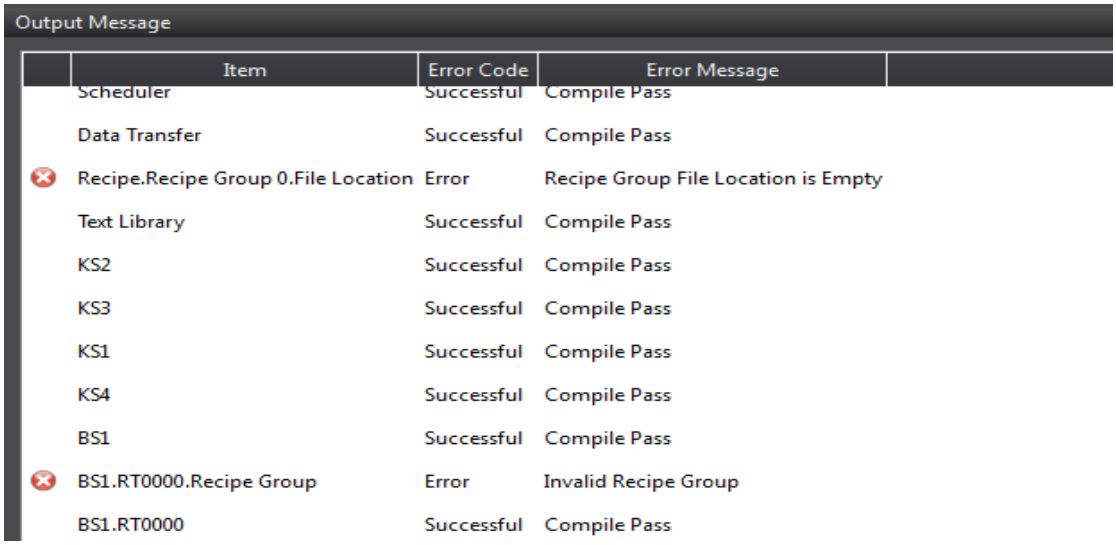


Figure 247 Compile process illustration

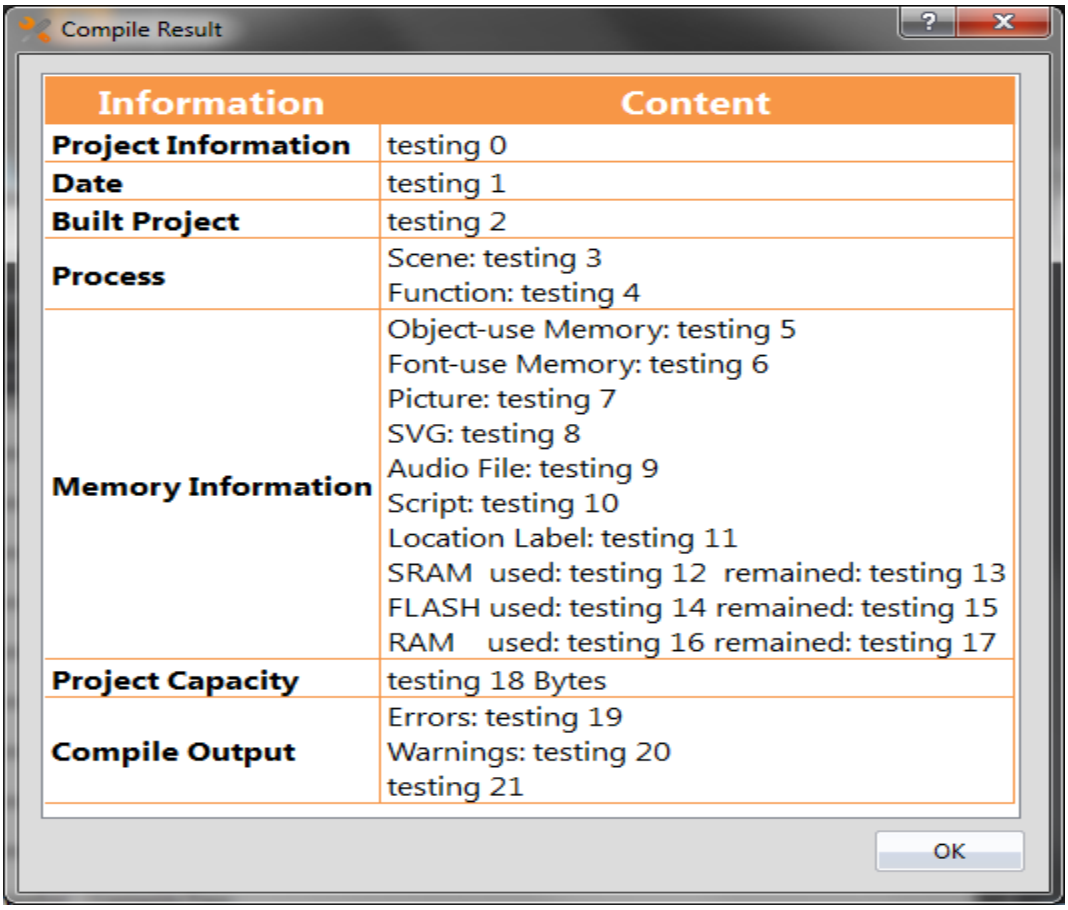


Figure 248 Compile results illustration

If any errors were generated during the compilation, it will be displayed in the 【Information Window】. The error information will include the (1) component, (2) success or error code and (3) compile message as shown in Figure 2 of the error. Users can click on the message once to move to the object or double-click on the message to open the error screen and focus on the component screen setting of the error allowing the user to quickly debug the error.

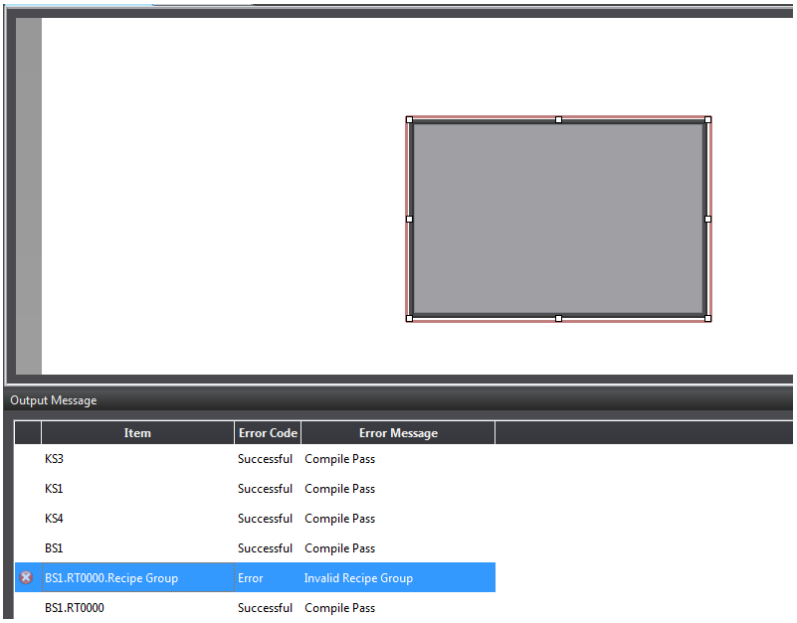


Figure 249 Single click on the compile failure message window to jump to the component

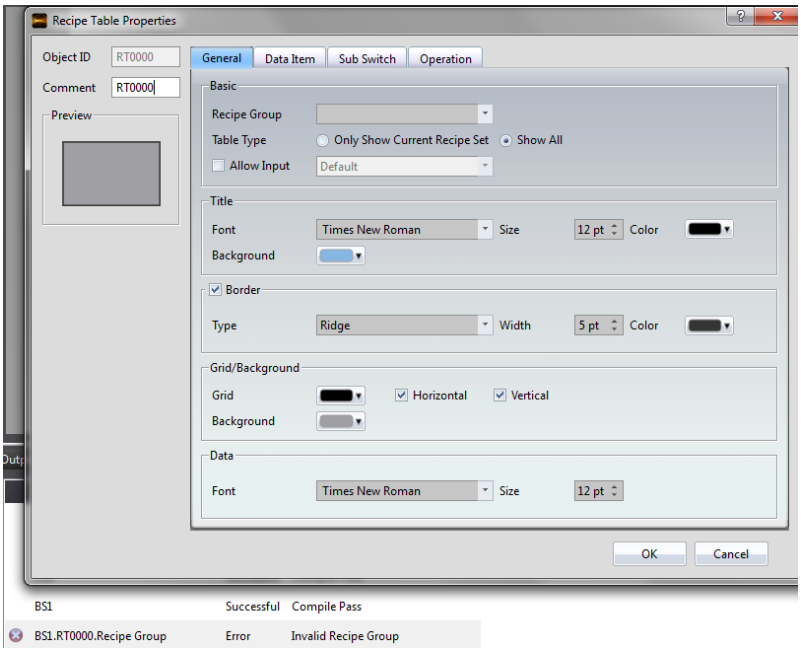


Figure 250 Double click on the compile failure message to open the screen setting

15.4 【Simulation】

15.4.1 Simulation Introduction

【Simulation】is used mainly to perform preliminary tests before actually downloading the running package to the HMI in order to prevent finding errors after being downloaded into the HMI; running simulations can verify the accuracy of the project plan. The simulation function can be run on the PC to simulate how the running package will run on the HMI. Simulations provided by Fatek are mainly

divided into【Offline Simulation】and【Online Simulation】. The simulation setting window can be used to determine whether to start the Offline or Online Simulation.

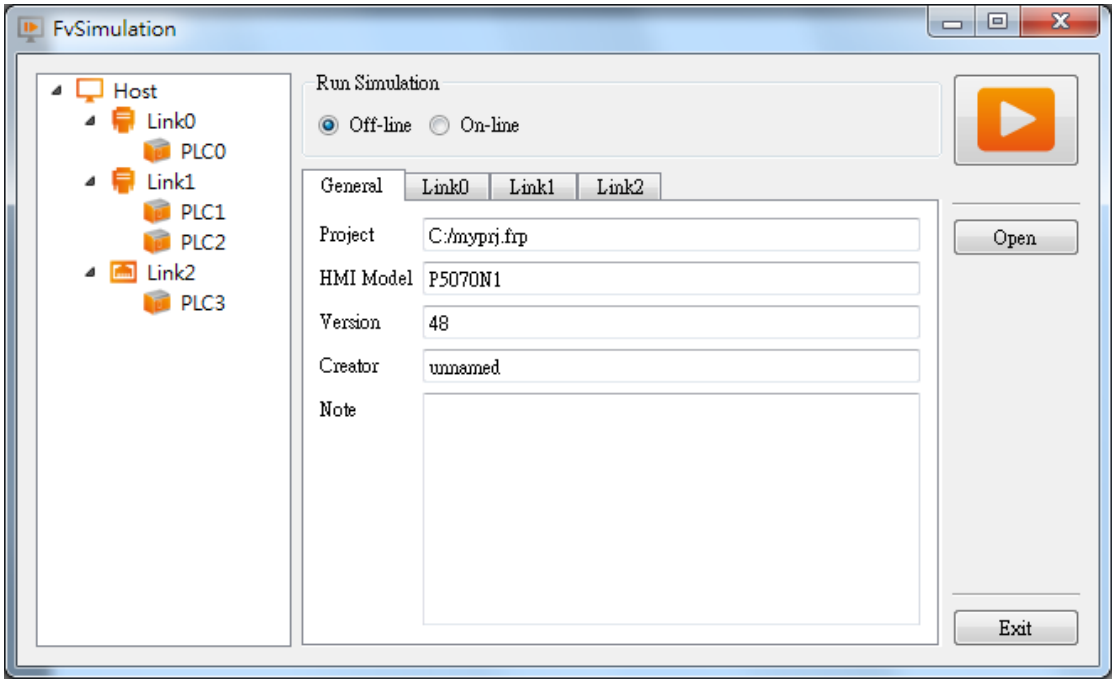


Figure 251 Simulation setting window

15.4.2 Starting Simulation

Users can start【Simulation】by opening the simulation setting window from【Project】, and then selecting whether to perform【Offline Simulation】or【Online Simulation】.

Figure 252 Starting simulation

15.4.3 Offline Simulation

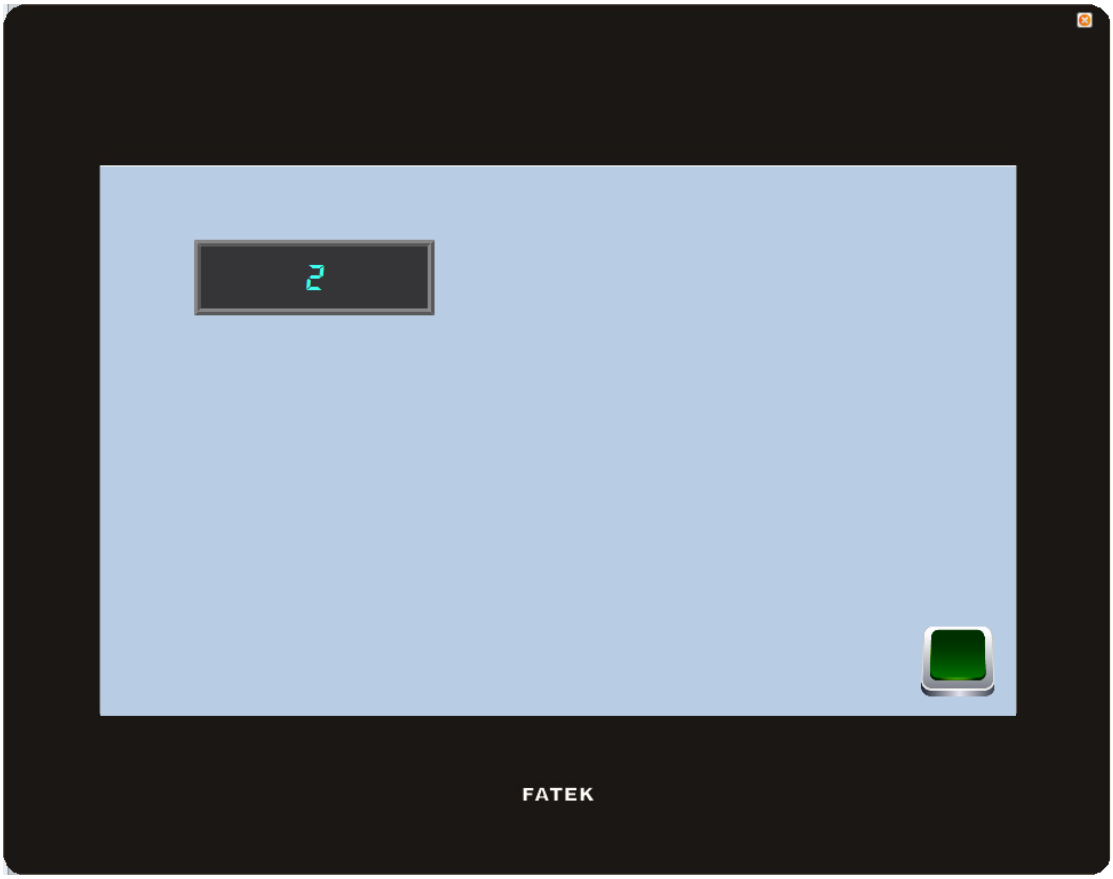


Figure 253 Offline Simulation

【Offline Simulation】is as shown in Figure 253. A simulator will open on the PC and create a virtualized PCL that's connected to the HMI in the memory of the PC, therefore no communication errors will be generated during the simulated connection. The simulated connection is mainly used to verify the accuracy of the screen and the accuracy of the logic.

15.4.4 Online Simulation

The difference between【Online Simulation】and【Offline Simulation】is that the PLC to connect (serial or network connection) can be set. As shown in Figure 254 below, Online Simulation can be started when the setting is complete.

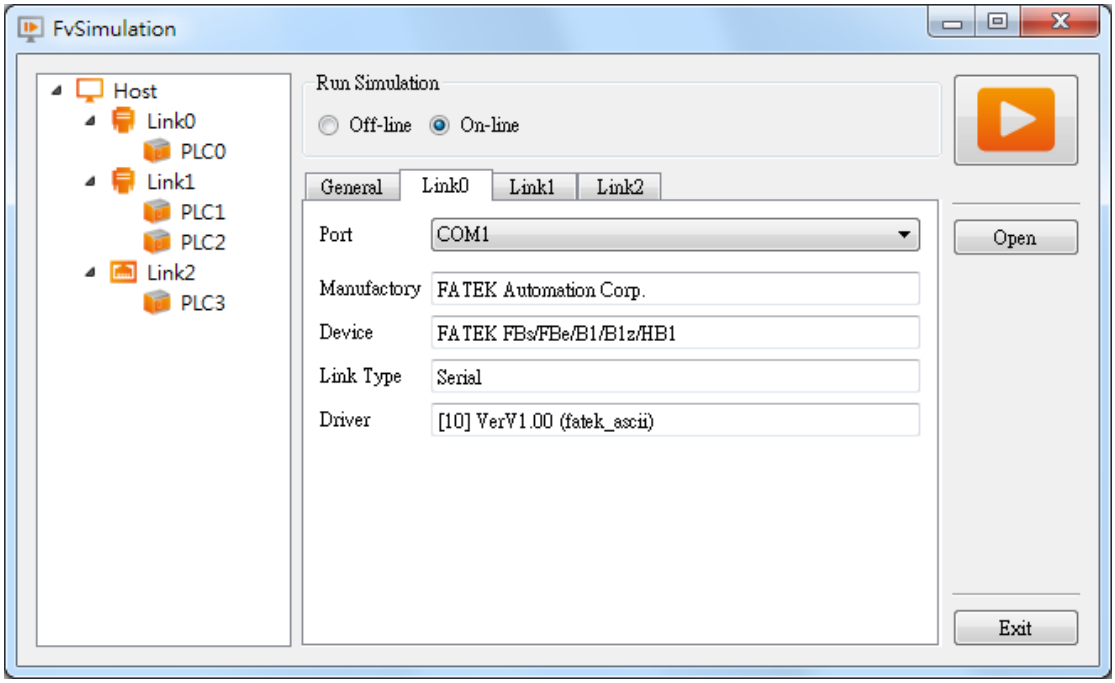


Figure 254 Online simulation connection setting

【Online Simulation】is as shown in Figure 255; similarly, a simulator is also opened on the PC, however, what's different from【Offline Simulation】is that now the PC will communicate the with PLC, therefore if there is no PLC connected to the PC/PLC not responding/PLC connection setting error, a communication error messages will be generated. Online Simulation not only can verify the accuracy of the screen/logic, but it can also verify the accuracy of the communication.

Note: Online Simulation

1) It can only be ran for 10 minutes.
2) If serial port configuration of project is different from PC, you can config the serial port number before run Online Simulation.

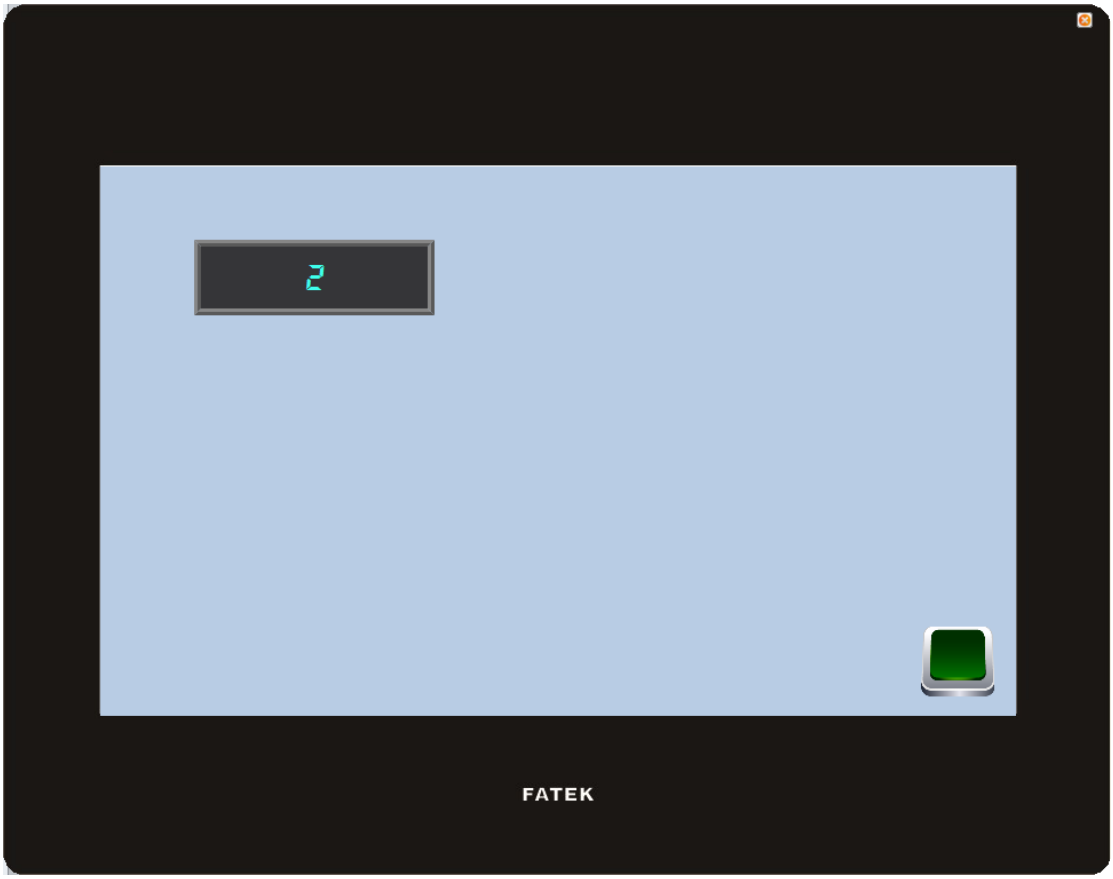


Figure 255 Online simulation illustration

16. Application Tool

16.1 【Pass Through】

Pass Through is a communication between PLC and PC through the HMI.

Generally, when the PC wants to perform serial communications with the PLC, related application programs such as WinProLadder, etc. is used on the PC and communicates directly with the PLC through the【Ethernet】or the COM port on the PC. However, under some circumstances, the PC cannot connect to the PLC directly or connection information with the PLC cannot be acquired directly. The【Pass Through Function】is provided just for such conditions so that the PC can perform serial communications with the PLC indirectly, and also acquire the register data of the device. The communication mode is as shown in Figure 256 Pass Through architecture.

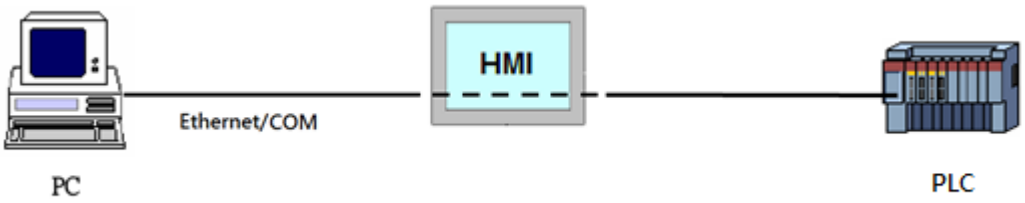


Figure 256 Pass Through architecture

16.2 Setting Pass Through

To use pass through, users must first use the FvDesigner to connect to the HMI that they want to pass through and switch it to【Pass Through Mode】. The goal of this action is to tell the HMI to change its operating mode in preparation to be used for【Pass Through】. After successfully setting the HMI to the pass through mode, the HMI will be able to transfer all data coming from the specific port of the PC to the specified PLC.

After the setps, users can use the WinProLadder or other related application programs to specify the same port to communicate with the HMI. Although at this time the PC is not directly connected to the PLC, but because the HMI will transfer all data received from the specified port to the specified PLC, therefore in terms of behavior, the response result will be the same as when connecting directly with the PLC and achieve the communication goal. When the task is complete, the FvDesigner can be used again to switch HMI back to the normal operation mode.

The following are detailed descriptions of the【Pass Through】operating process.

The Pass Through function can be launched by clicking on the【Pass Through】icon in the【Tools】function tab of the FvDesigner task bar to open the function window.

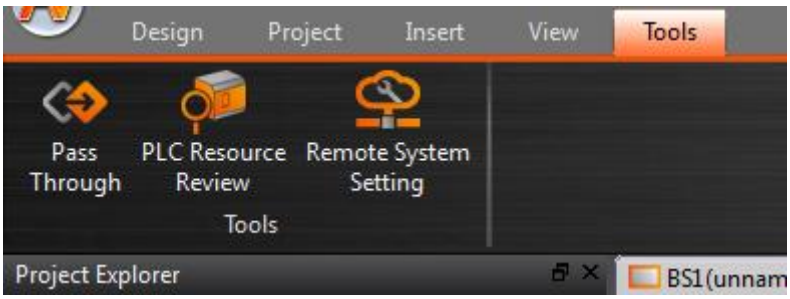


Figure 257 Pass Through icon

The dialog that appears after pressing【Pass Through】is the main operating inter-face of the【Pass Through】function. Parameters that can be set from left to right include three major categories that correspond to the individually related parameters of PC, HMI and PLC, respectively. For the PC side, the serial port to be used by the HMI can

be set (*can only be set when the serial port communication is selected). For the HMI side, its IP address, the input COM used to receive data from the PC side and the output COM used to send the data to the PLC side can be set; and for the PLC side, related parameters used can be set for the serial communication between the PLC and the HMI.

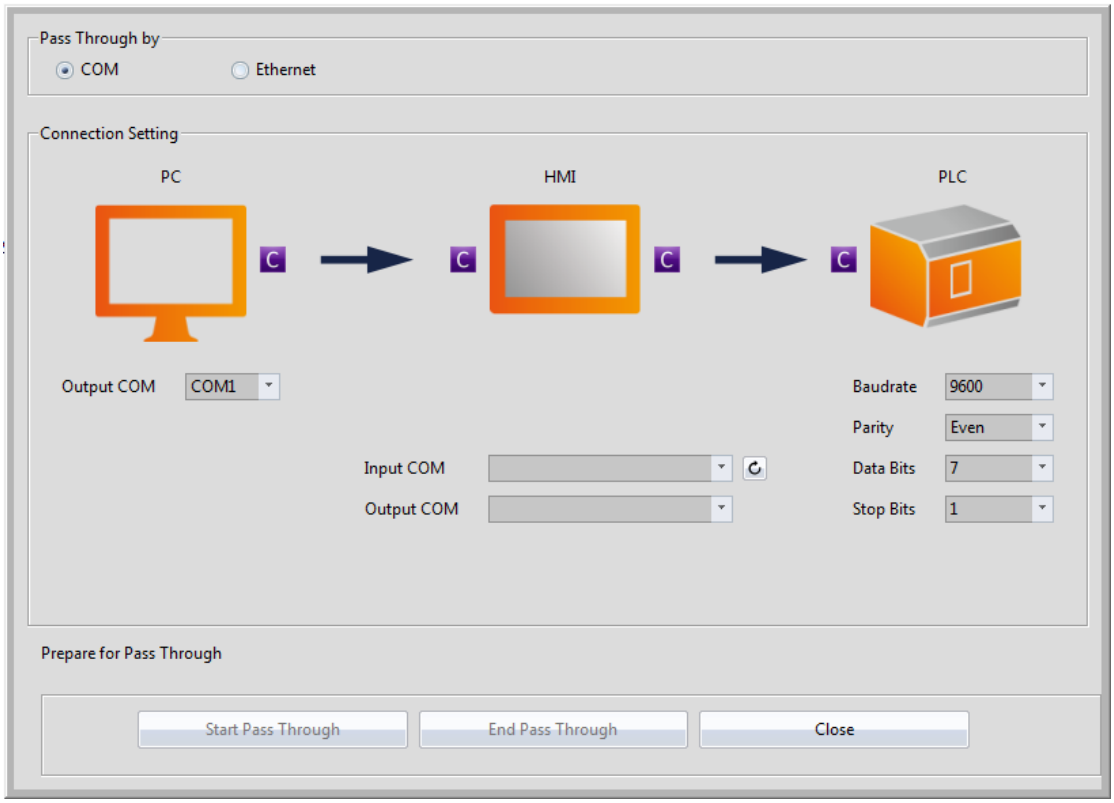


Figure 258 Pass Through parameter setting page

Detailed descriptions of each parameter are as follows:

Table 169 Pass Through related parameters

Property	Description
【Pass Through by】	【COM】 Use the serial port to communicate between the PC and the HMI. 【Ethernet】 Use Ethernet to communicate between the PC and the HMI.
【Connection Setting】	【PC】 1. 【Output COM】: When【COM】is selected for【Pass Through by】, this field will be enabled to specify the serial port to use for the PC output. On the other hand when the 【Ethernet】is selected, this field is disabled.

	【HMI】 1. 【IP Address】: Specifies the IP address of the target HMI to pass through; when the【Ethernet】is selected for【Pass Through by】, all IP addresses of HMIs in the local area network will automatically be scanned for the user to select the target HMI for pass through.User can press the 【  】button after this field to refresh IP address list or manually type into the combo box. 2. 【Ethernet Port】: When【Ethrenet】is seleced, this field shows the Ethernet port used between PC and HMI, this filed can be set by【System Setting】describe in Chapter.19. User can press the 【  】button after this field to get the set value from the specified HMI. 3. 【Input COM】: When【COM】is selected for【Pass Through by】, press the button【  】after this field can get all avaliable serial port on the target HMI; on the other hand, when the【Ethernet】is selected for【Pass Through by】, this field will be locked and unavailable for use. 4. 【Output COM】: press the button【  】after 【Input COM】can be used to get all available serial ports on the target HM ; the scan results will be displayed in this pull-down menu. 【PLC】 1. 【Baud Rate】: This field can be used to set the baud rate of the target device to pass through. 2. 【Stop Bits】: This field can be used to set the stop bits of the target device to pass through. 3. 【Parity Check Bits】: This field can be used to set the parity check bits of the target device to pass through. 4. 【Data Bits】: This field can be used to set the data bits of the target device to pass through. 5. 【Flow Control】: This field can be used to set the flow control of the target device to pass through.
	【Start Pass Through】 After setting the【Connection Setting】related parameters,

	press【Start Pass Through】to perform pass through. 【End Pass Through】 To end pass through, press 【End Pass Through】on the PC or the HMI. 【Close】 This function is the same as【End Pass Through】; it will also close the dialog window after ending pass through.

16.3 Example

The following show a simple example for performing pass through by the Ethernet using WinProLadder.

As described in the previous section of this chapter, FvDesigner must be used to connect to the HMI to pass through in order to use the HMI. Its operating mode must be switched to【Pass Through Mode】so that the HMI can transfer the data received from the specified port to the specified Output COM. In order to achieve this goal, first open the FvDesigner and click on the【Pass Through】function,

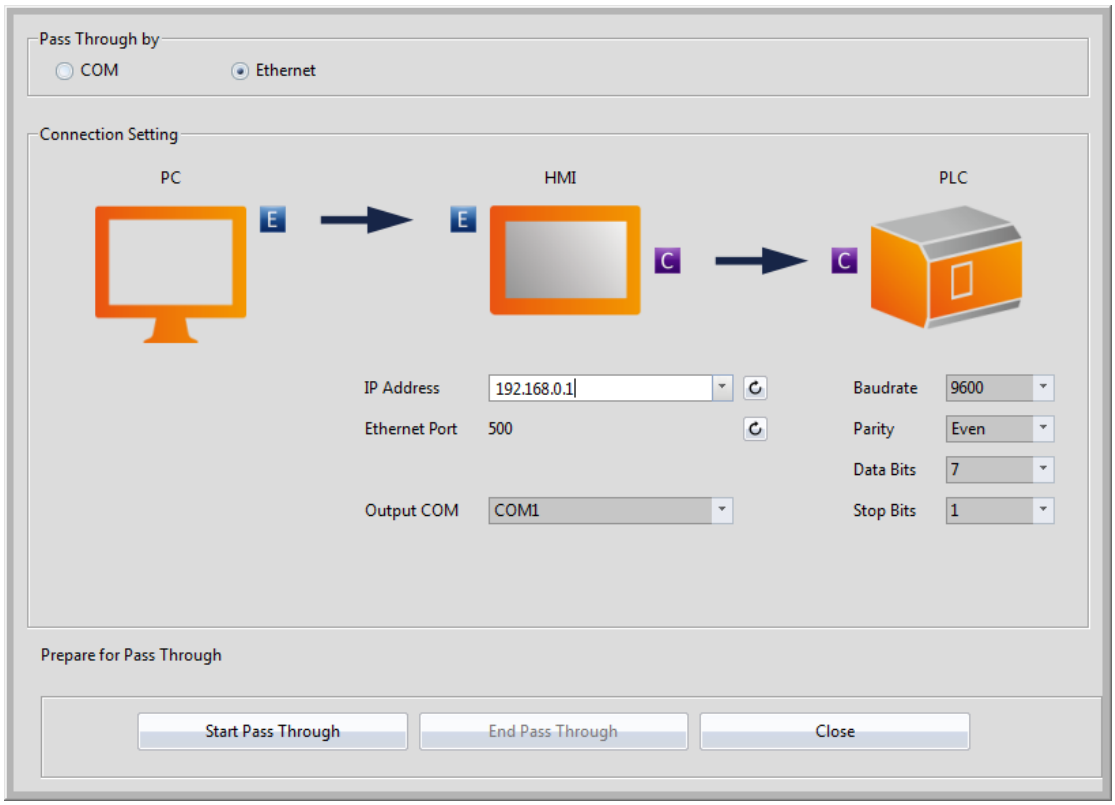


Figure 259 Pass Through parameter setting interface

then select the【Ethernet】as the connection method because the PC will not be connected to the HMI through the serial port, therefore the parameters of the PC【Output COM】to HMI【Input COM】do not need to be set. These two options will be disalbled, but the HMI【Output COM】must still be set.

The user must first press the【  】after the field 【IP Address】 to get all HMI IP address on the network those are available for pass through, or enter IP manually. After IP is selected, press【  】after the field 【Ethernet Port】 to list all available serial ports on the specified HMI. The user must clearly know which serial port is used by the HMI to connect to the PLC or else the pass through function will not be able to operate.

Next, the user must set the related parameters of the serial port used with the PLC. Please note that if the parameters set here are not correct for this PLC. It is very likely for unexpected communication failures to occur.

After setting all the parameters, press【Start Pass Through】to switch the target HMI to pass through mode to facilitate follow-up actions. If the HMI was successfully switched to pass through mode, the status of the operating inter-face will change as shown in the figure below. The status field will show a successfully changed HMI to pass through mode.

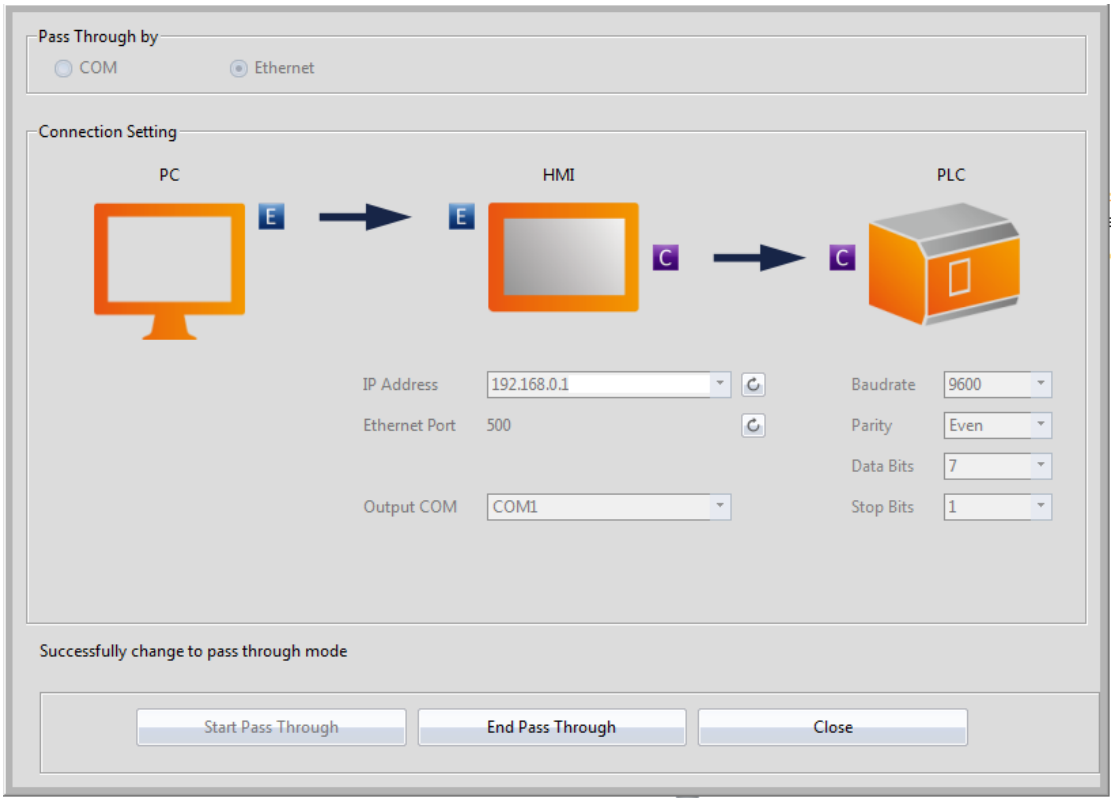


Figure 260 Successfully switched HMI to Pass Through mode

At this time all preprocedure are completed and the HMI is ready to transfer data between the PC and PLC at any time. User can open the WinProLadder and select 【PLC】→【Connect】

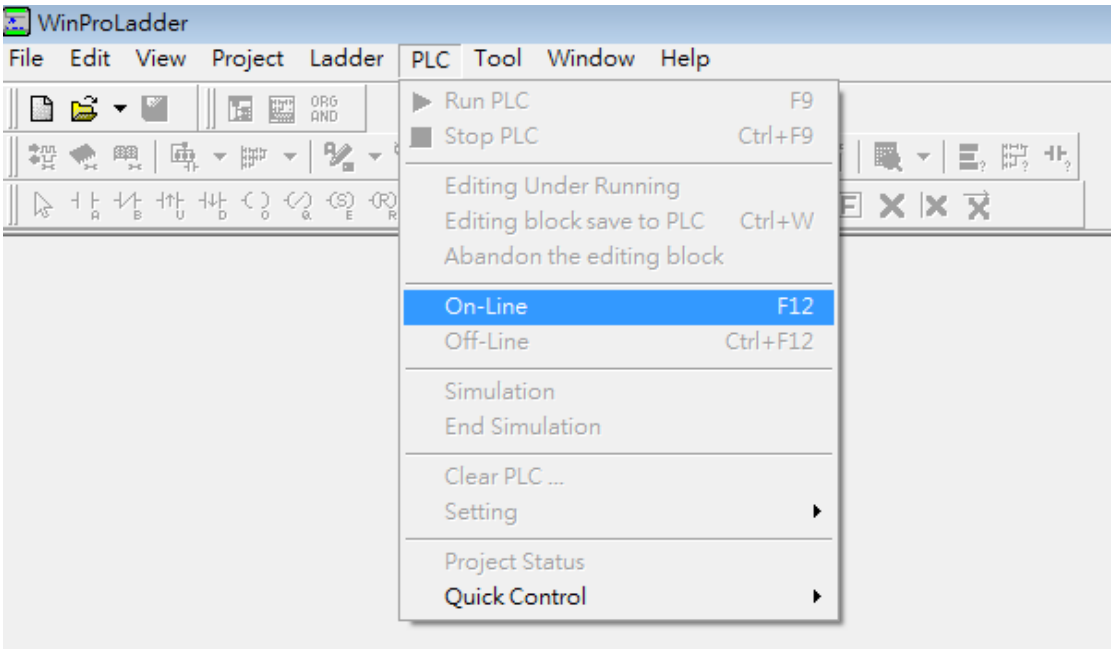


Figure 261 Open WinProLadder connection settings

Connection-related options will appear after clicking. The communication between the PC side and the HMI side in this pass through is through the 【Ethernet】, therefore please select FATEK-TCP for the connection name.

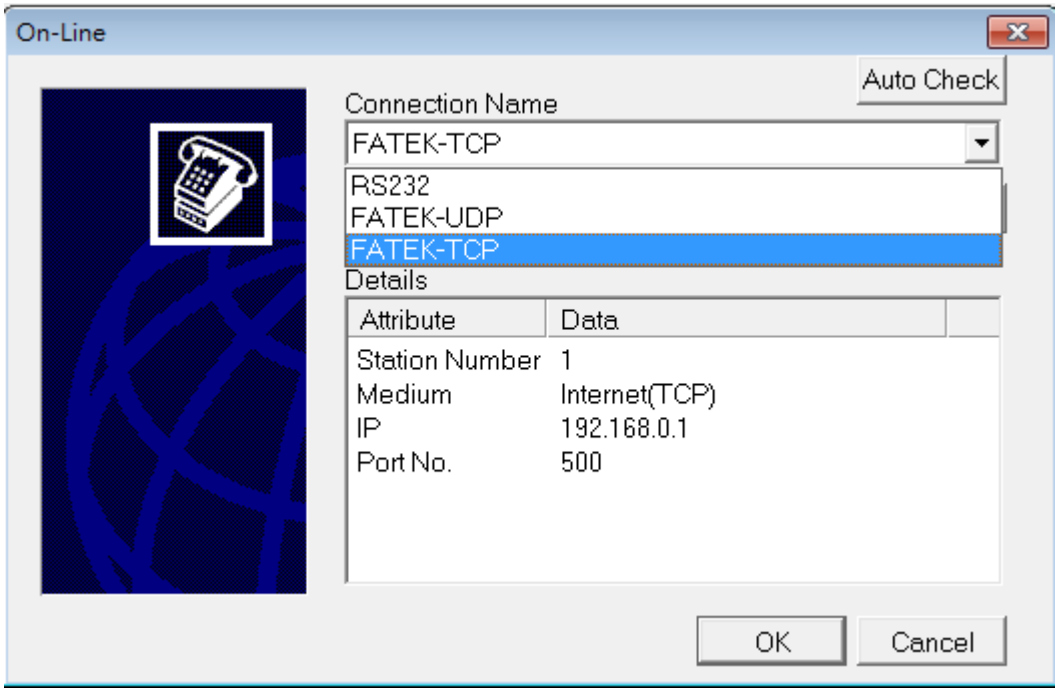


Figure 262 Selecting the communication protocol

The TCP connection-related parameters can be set after pressing Edit, as shown in the figure below:

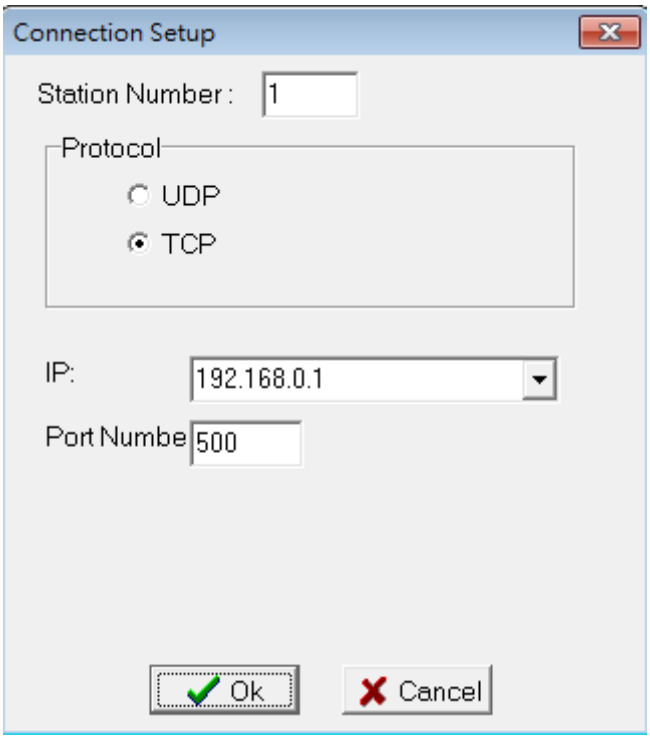


Figure 263 Setting the WinProLadder Ethernet communication parameters

User need to specify IP address and Ethernet port of the HMI, which is going to pass through to PLC. After setting completed, user can press button OK to perform pass through.

17. PLC Resource Review

The 【PLC Resource Review】function can be used when the user needs information on the PLC driver versions supported by FV Designer and internal PLC single point and register information. The【PLC Resource Review】function allows users to quickly find related information.

This chapter will explain【PLC Resource Review】related pages and the usage methods.

17.1 Usage Methods

Select【PLC Resource Review】in the【Tools】page of the【Ribbon】and the following window will appear.

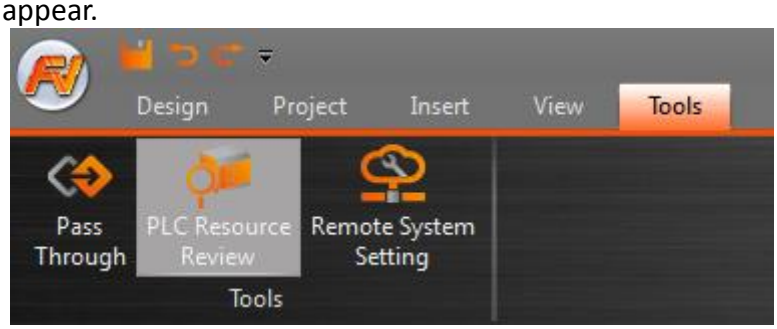
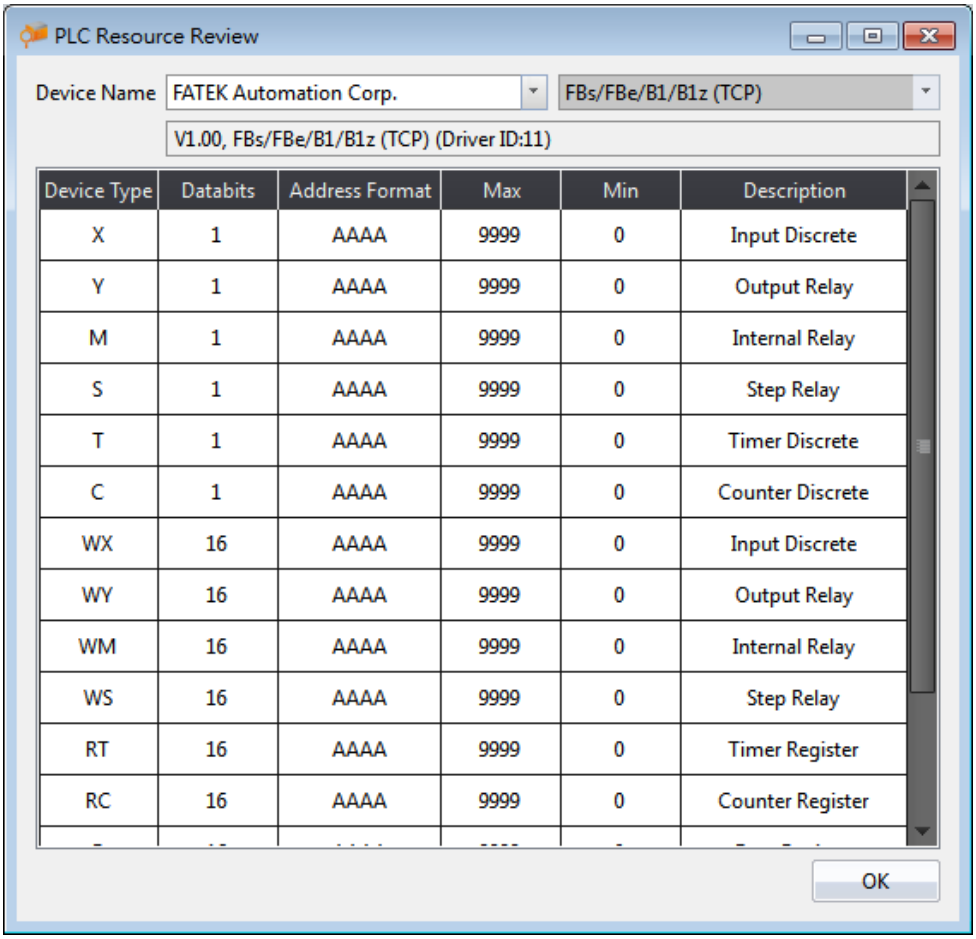


Figure 264 Tools page on the ribbon



Device Type	Databits	Address Format	Max	Min	Description
X	1	AAAA	9999	0	Input Discrete
Y	1	AAAA	9999	0	Output Relay
M	1	AAAA	9999	0	Internal Relay
S	1	AAAA	9999	0	Step Relay
T	1	AAAA	9999	0	Timer Discrete
C	1	AAAA	9999	0	Counter Discrete
WX	16	AAAA	9999	0	Input Discrete
WY	16	AAAA	9999	0	Output Relay
WM	16	AAAA	9999	0	Internal Relay
WS	16	AAAA	9999	0	Step Relay
RT	16	AAAA	9999	0	Timer Register
RC	16	AAAA	9999	0	Counter Register

Figure 265 PLC Resource Review

The PLC manufacturer and series model can be selected at the top half of the【PLC Resource Review】 as shown in the figure below.

Figure 266 PLC Resource Review–Select PLC manufacturer and series model

Information on the supported PLC driver versions and internal PLC single point and registers available for access will appear when the selection is complete; as shown in the figure below.

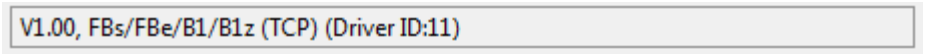


Figure 267 Information of supported PLC driver versions

Device Type	Databits	Address Format	Max	Min	Description
X	1	AAAA	9999	0	Input Discrete
Y	1	AAAA	9999	0	Output Relay
M	1	AAAA	9999	0	Internal Relay
S	1	AAAA	9999	0	Step Relay
T	1	AAAA	9999	0	Timer Discrete
C	1	AAAA	9999	0	Counter Discrete
WX	16	AAAA	9999	0	Input Discrete
WY	16	AAAA	9999	0	Output Relay
WM	16	AAAA	9999	0	Internal Relay
WS	16	AAAA	9999	0	Step Relay
RT	16	AAAA	9999	0	Timer Register
RC	16	AAAA	9999	0	Counter Register

Figure 268 Information on internal PLC single point and registers available for access

Introduction to the internal PLC single point and registers available for access is as shown in the table below.

Table 170 Introduction to internal single point and register information

Name	Description
【Device Type】	Represent the code of the single point or register in the PLC.
【Data Bits】	Represent the number of bits occupied by the data of this 【Device Type】.
【Address Format】	Represent the address format that must be used to access this 【Device Type】.
【Max】	Represent the maximum value of the address range available for access for this 【Device Type】.
【Min】	Represent the minimum value of the address range available for access for this 【Device Type】.
【Description】	Describe the function and usage of the 【Device Type】.

18. Address Registers

The FV Designer has three types of internal address registers for use during designing,

including Volatile Memory Registers $U:V, Non-volatile Memory Registers$U:NV and Non-realtime NV Memory $U:XNV. Internal ane external PLC address registers all support access using **characters or bits**, and also support **index register** function , making it more flexible and convenient when planning register location configurations.
In addition, special system tags are planned in some sections of the volatile registers and more may be added as functions are added. The function plans of each register are as shown in the chapters below:

18.1 Internal Address RegisterRange

【$U:V】 Volatile Memory Registers

The V memory will not be saved when the system power is cut; all the data on the V memory will be reset to 0 once power is reconnected.

【$U:NV】 Non-volatile Memory Registers

All of the data on the NV memory will be saved in time and will not be cleared when the system power is cut. The total size of the NV memory is 120KB, in which the size that can be used as the internal register $U:NV can be configured according to the requirement plan of the user; the default is set to 2K. The rest of the memory capacity is used as the section for the data backup function.

【$U:XNV】 Non-realtime NV Memory Registers

The total capacity of XNV is 12MB; in which the size used as the internal register $U:XNV is 1MB; the remaining 11MB memory capacity is used as the section for the data backup function. The data in the XNV memory are automatically backed up into a file every minute in order to prolong the lifespan of the flash memory; the data saved in the file will be read into the XNV memory every time the system boots up. Users can set the special system tag【SS_FORCE_BACKUP_XNV】in addition to the scheduled backup mechanism to back up the XNV memory into the file in real-time.

Register	Maximum Capacity	Address Range (Characters)	Format
Volatile Memory Registers 【$U:V】	512KB	0 ~ 262143	Character $U:Vaaaaaa Bit $U:Vaaaaaa.bb
Non-volatile Memory Registers 【$U:NV】	120KB (default 2KB)	0 ~ 61439 (default 0~2048)	Character $U:NVaaaaa Bit $U:NVaaaaa.bb
Non-realtime NV Memory Registers	1MB	0 ~ 524287	Character $U:XNVaaaaaa

【$U:XNV】			Bit $U:XNVaaaaaa.bb

18.2 Index Register

Index Register is used to change address register in run-time. When operating on HMI, the address register configuration of object does not be changed, user could access register value of object according to different address convenienttly. And it makes it easy and flexible to transfer data between different regions.

18.2.1 Using Method

The following example explains how to use Index Register.

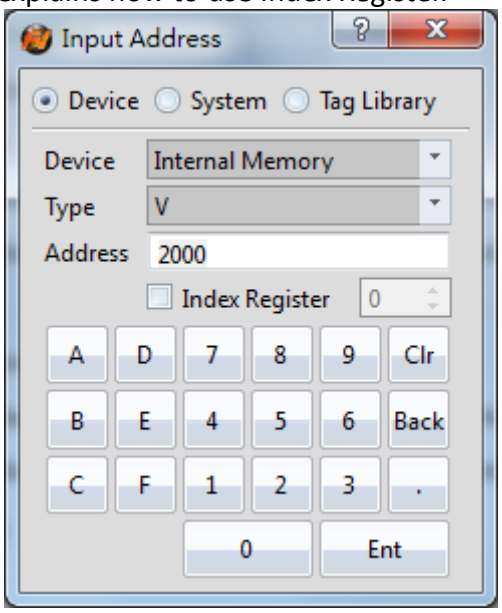


Figure 269 Inpute Address Dialog-Device Register

Click the checkbox Index Register. And select number 0. It means that the device register use the Index Register 0.

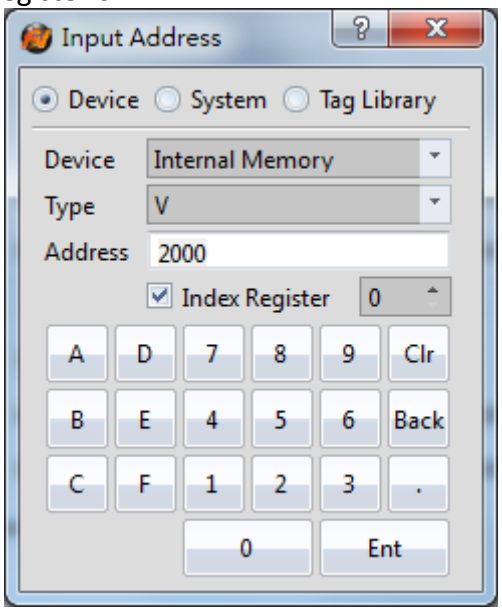


Figure 270 Inpute Address Dialog-Use Index Register 0

If user would like to setup Index Register to change its value. Index Register can be

choosen in System Tags.

Figure 271 Inpute Address Dialog-System Tags-Index Register

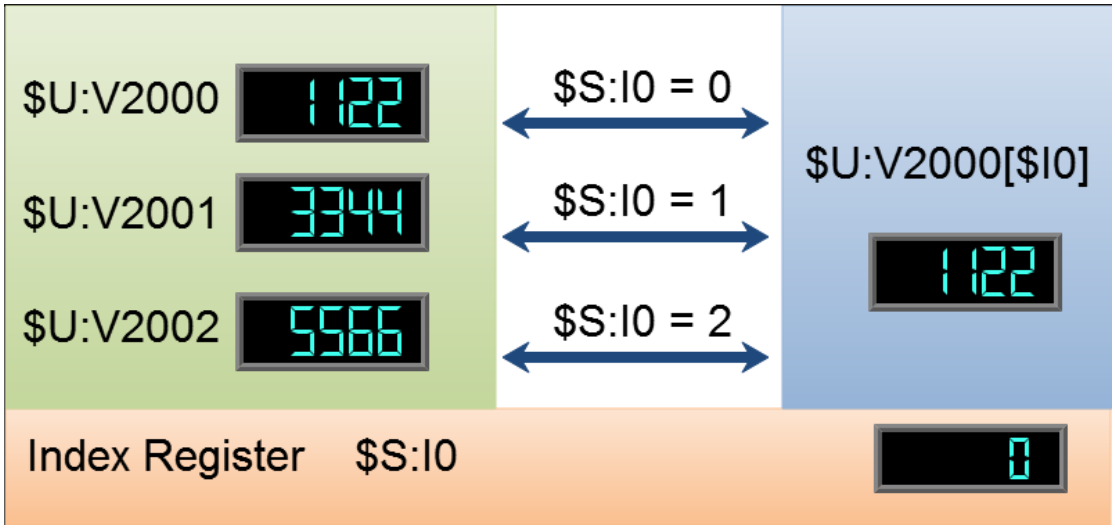


Figure 272 Index Register Example

$U:V2000
Value of internal volitle-memory register V2000, example value: 1122.
$U:V2001
Value of internal volitle-memory register V2001, example value: 3344.
$U:V2002
Value of internal volitle-memory register V2002, example value: 5566.
$U:V2000[$I0]
Value of internal volitle-memory register
V(2000+value of index register 0)
$S:I0
Value of index register 0

By modifying the value of index register 0, the value of **$U:V2000[$I0]** also changes.
Value of index register-0 is 0

$U:V2000[$I0] = $U:V2000

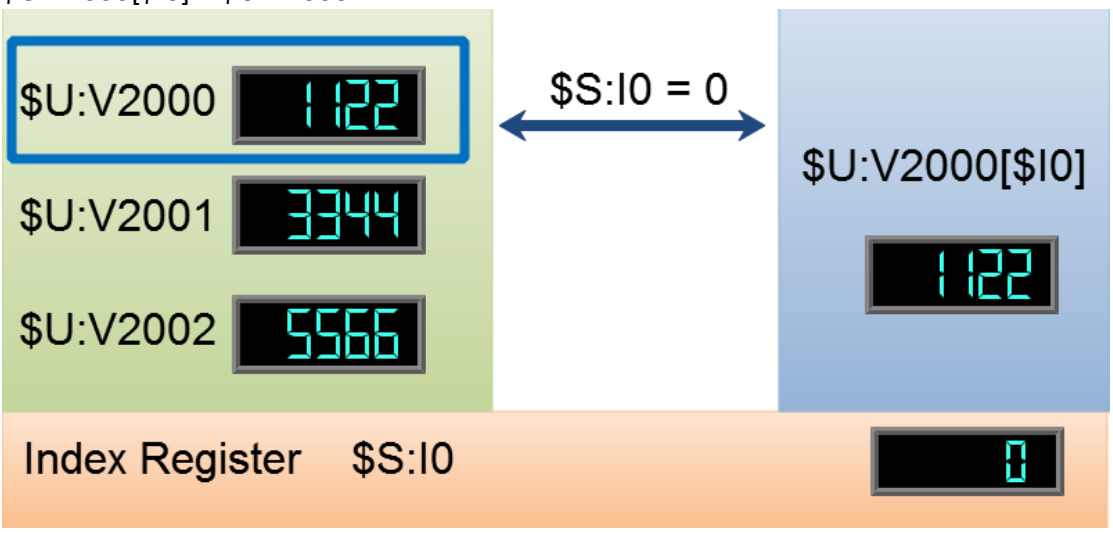


Figure 273 Index Register Example $S:I0 = 0

Value of index register-0 is 1

$U:V2000[$I0] = $U:V2001

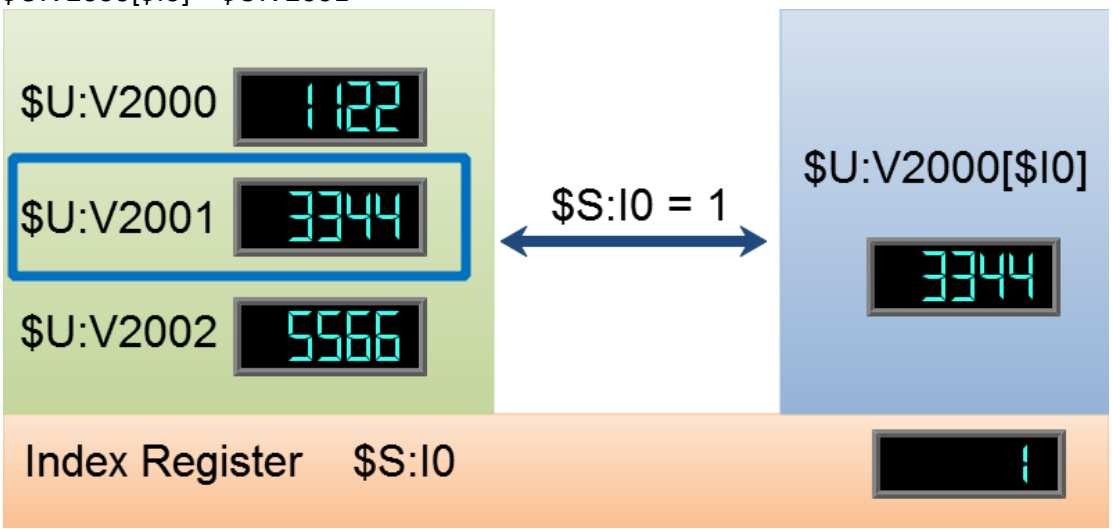


Figure 274 Index Register Example $S:I0 = 1

Value of index register-0 is 2

$U:V2000[$I0] = $U:V2002

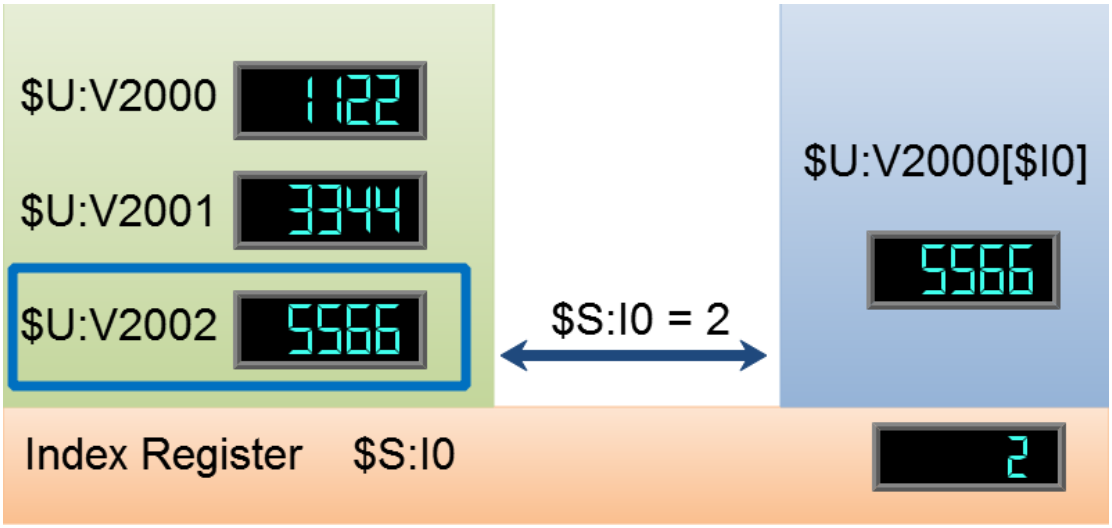


Figure 275 Index Register Example $S:I0 = 2

18.3 Special System Tags

18.3.1 Operations

Name	Address ($U:V)	Description	Read/Write
OP_REBOOT	250010.0	(1b)Reboot HMI device.	Read/Write
OP_BUZZER	250011.0	(1b)Open (1)/ Close (0) buzzer output.	Read/Write
OP_AUDIO	250011.1	(1b)Open (1) / Close (0) audio output.	Read/Write
OP_DIMMER_EN	250030.0	(1b)Open (1) / Close (0) backlight energy-saving function.	Read/Write
OP_SCREEN_SAVER_EN	250030.1	(1b)Open (1) / Close (0) screen saver function.	Read/Write
OP_FW_VER_MAJOR	250101	(16b)Firmware major version information.	Read Only
OP_FW_VER_MINOR	250102	(16b)Firmware minor version information.	Read Only
OP_FW_VER_REVISION	250103	(16b)Firmware revision information.	Read Only
OP_BATTERY_LEVEL	250110	(16b) Battery Level (Low1~High5).	Read Only
OP_BASE_SCREEN_ID	250500	(16b) Current Base Screen ID.	Read Only
OP_BACKLIGHT_LEVEL	251002	(16b)Current brightness level of the backlight.	Read/Write
OP_DIMMER_TIME	251003	(16b)Backlight power saving time.	Read/Write
OP_SCREEN_SAVER_TIME	251004	(16b)Screen saver time.	Read/Write

18.3.2 Save File

Name	Address	Description	Read/Write

($U:V)			
SS_HMI_WARNING	250021.0	(1b)HMI internal user storage free space insufficiency warning.	Read/Write
SS_FORCE_BACKUP_XNV	250021.0	(1b)Force the data in the XNV memory to be backed up in the HMI using a file format.	Read/Write
SS_RESET_XNV	250022.0	(1b)ClearXNV memory data and clear allXNV files.	Read/Write
SS_HMI_FREE_SPACE	251300	(32b)Current free space on HMI.	Read

18.3.3 Time

Name	Address ($U:V)	Description	Read/Write
TIME_SYSTEM_TIME	251100	(32b)System time (0.1sec).	Read/Write
TIME_SYSTEM_AMPM	251102	(16b)Time information AM:0, PM:1.	Read/Write
TIME_LOCAL_HOUR12	251103	(16b)Local time (12-hour format)	Read/Write
TIME_LOCAL_SECOND	251104	(16b)Local time (Second)	Read/Write
TIME_LOCAL_MINUTE	251105	(16b)Local time (Minute)	Read/Write
TIME_LOCAL_HOUR	251106	(16b)Local time (Hour)	Read/Write
TIME_LOCAL_DAY	251107	(16b)Local time (Day)	Read/Write
TIME_LOCAL_MONTH	251108	(16b)Local time (Month)	Read/Write
TIME_LOCAL_YEAR	251109	(16b)Local time (Year)	Read/Write
TIME_LOCAL_WEEK	251110	(16b)Local time (Day of week)	Read/Write

18.3.4 Touch Control Positions

Name	Address ($U:V)	Description	Read/Write
TOUCH_DOWN_X	251008	(16b)Position of X for touch control	Read Only
TOUCH_DOWN_Y	251009	(16b)Position of Y for touch control	Read Only
TOUCH_UP_X	251010	(16b)Position of X when exiting	Read Only
TOUCH_UP_Y	251011	(16b)Position of Y when exiting	Read Only

18.3.5 Network Information

Name	Address ($U:V)	Description	Read/Write
NET_IP0	251201	(16b) HMI IP0 address.	Read Only
NET_IP1	251202	(16b) HMI IP1 address.	Read Only
NET_IP2	251203	(16b) HMI IP2 address.	Read Only
NET_IP3	251204	(16b) HMI IP3 address.	Read Only
NET_GATEWAY0	251205	(16b) HMI Default gateway GATEWAY0 address.	Read Only
NET_GATEWAY1	251206	(16b) HMI Default gateway GATEWAY1 address.	Read Only
NET_GATEWAY2	251207	(16b) HMI Default gateway GATEWAY2 address.	Read Only
NET_GATEWAY3	251208	(16b) HMI Default gateway GATEWAY3 address.	Read Only
NET_MASK0	251209	(16b) HMI Subnet mask MASK0 address.	Read Only
NET_MASK1	251210	(16b) HMI Subnet mask MASK1 address.	Read Only
NET_MASK2	251211	(16b) HMI Subnet mask MASK2 address.	Read Only
NET_MASK3	251212	(16b) HMI Subnet mask MASK3 address.	Read Only
NET_MAC0	251213	(16b) HMI Physical address MAC0.	Read Only
NET_MAC1	251214	(16b) HMI Physical address MAC1.	Read Only
NET_MAC2	251215	(16b) HMI Physical address MAC2.	Read Only
NET_MAC3	251216	(16b) HMI Physical address MAC3.	Read Only
NET_MAC4	251217	(16b) HMI Physical address MAC4.	Read Only
NET_MAC5	251218	(16b) HMI Physical address MAC5.	Read Only

18.3.6 Index Registers (16Bit)

Name	Address ($U:V)	Description	Read/Write
I0	251400	(16b) Address index register 0	Read/Write
I1	251401	(16b) Address index register 1	Read/Write
I2	251402	(16b) Address index register 2	Read/Write
I3	251403	(16b) Address index register 3	Read/Write
I4	251404	(16b) Address index register 4	Read/Write
I5	251405	(16b) Address index register 5	Read/Write
I6	251406	(16b) Address index register 6	Read/Write

I7	251407	(16b) Address index register 7	Read/Write
I8	251408	(16b) Address index register 8	Read/Write
I9	251409	(16b) Address index register 9	Read/Write
I10	251410	(16b) Address index register 10	Read/Write
I11	251411	(16b) Address index register 11	Read/Write
I12	251412	(16b) Address index register 12	Read/Write
I13	251413	(16b) Address index register 13	Read/Write
I14	251414	(16b) Address index register 14	Read/Write
I15	251415	(16b) Address index register 15	Read/Write
I16	251416	(16b) Address index register 16	Read/Write
I17	251417	(16b) Address index register 17	Read/Write
I18	251418	(16b) Address index register 18	Read/Write
I19	251419	(16b) Address index register 19	Read/Write
I20	251420	(16b) Address index register 20	Read/Write
I21	251421	(16b) Address index register 21	Read/Write
I22	251422	(16b) Address index register 22	Read/Write
I23	251423	(16b) Address index register 23	Read/Write
I24	251424	(16b) Address index register 24	Read/Write
I25	251425	(16b) Address index register 25	Read/Write
I26	251426	(16b) Address index register 26	Read/Write
I27	251427	(16b) Address index register 27	Read/Write
I28	251428	(16b) Address index register 28	Read/Write
I29	251429	(16b) Address index register 29	Read/Write
I30	251430	(16b) Address index register 30	Read/Write
I31	251431	(16b) Address index register 31	Read/Write
I32	251432	(16b) Address index register 32	Read/Write
I33	251433	(16b) Address index register 33	Read/Write
I34	251434	(16b) Address index register 34	Read/Write
I35	251435	(16b) Address index register 35	Read/Write
I36	251436	(16b) Address index register 36	Read/Write
I37	251437	(16b) Address index register 37	Read/Write

I38	251438	(16b) Address index register 38	Read/Write
I39	251439	(16b) Address index register 39	Read/Write
I40	251440	(16b) Address index register 40	Read/Write
I41	251441	(16b) Address index register 41	Read/Write
I42	251442	(16b) Address index register 42	Read/Write
I43	251443	(16b) Address index register 43	Read/Write
I44	251444	(16b) Address index register 44	Read/Write
I45	251445	(16b) Address index register 45	Read/Write
I46	251446	(16b) Address index register 46	Read/Write
I47	251447	(16b) Address index register 47	Read/Write
I48	251448	(16b) Address index register 48	Read/Write
I49	251449	(16b) Address index register 49	Read/Write
I50	251450	(16b) Address index register 50	Read/Write
I51	251451	(16b) Address index register 51	Read/Write
I52	251452	(16b) Address index register 52	Read/Write
I53	251453	(16b) Address index register 53	Read/Write
I54	251454	(16b) Address index register 54	Read/Write
I55	251455	(16b) Address index register 55	Read/Write
I56	251456	(16b) Address index register 56	Read/Write
I57	251457	(16b) Address index register 57	Read/Write
I58	251458	(16b) Address index register 58	Read/Write
I59	251459	(16b) Address index register 59	Read/Write
I60	251460	(16b) Address index register 60	Read/Write
I61	251461	(16b) Address index register 61	Read/Write
I62	251462	(16b) Address index register 62	Read/Write
I63	251463	(16b) Address index register 63	Read/Write

18.3.7 Index Registers (32Bit)

Name	Address ($U:V)	Description	Read/Write
I64	251464	(32b) Address index register 64	Read/Write

I65	251466	(32b) Address index register 65	Read/Write
I66	251468	(32b) Address index register 66	Read/Write
I67	251470	(32b) Address index register 67	Read/Write
I68	251472	(32b) Address index register 68	Read/Write
I69	251474	(32b) Address index register 69	Read/Write
I70	251476	(32b) Address index register 70	Read/Write
I71	251478	(32b) Address index register 71	Read/Write
I71	251480	(32b) Address index register 72	Read/Write
I73	251482	(32b) Address index register 73	Read/Write
I74	251484	(32b) Address index register 74	Read/Write
I75	251486	(32b) Address index register 75	Read/Write
I76	251488	(32b) Address index register 76	Read/Write
I77	251490	(32b) Address index register 77	Read/Write
I78	251492	(32b) Address index register 78	Read/Write
I79	251494	(32b) Address index register 79	Read/Write
I80	251496	(32b) Address index register 80	Read/Write
I81	251498	(32b) Address index register 81	Read/Write
I82	251500	(32b) Address index register 82	Read/Write
I83	251502	(32b) Address index register 83	Read/Write
I84	251504	(32b) Address index register 84	Read/Write
I85	251506	(32b) Address index register 85	Read/Write
I86	251508	(32b) Address index register 86	Read/Write
I87	251510	(32b) Address index register 87	Read/Write
I88	251512	(32b) Address index register 88	Read/Write
I89	251514	(32b) Address index register 89	Read/Write
I90	251516	(32b) Address index register 90	Read/Write
I91	251518	(32b) Address index register 91	Read/Write
I92	251520	(32b) Address index register 92	Read/Write
I93	251522	(32b) Address index register 93	Read/Write
I94	251524	(32b) Address index register 94	Read/Write
I95	251526	(32b) Address index register 95	Read/Write

I96	251528	(32b) Address index register 96	Read/Write
I97	251530	(32b) Address index register 97	Read/Write
I98	251532	(32b) Address index register 98	Read/Write
I99	251534	(32b) Address index register 99	Read/Write
I100	251536	(32b) Address index register 100	Read/Write
I101	251538	(32b) Address index register 101	Read/Write
I102	251540	(32b) Address index register 102	Read/Write
I103	251542	(32b) Address index register 103	Read/Write
I104	251544	(32b) Address index register 104	Read/Write
I105	251546	(32b) Address index register 105	Read/Write
I106	251548	(32b) Address index register 106	Read/Write
I107	251550	(32b) Address index register 107	Read/Write
I108	251552	(32b) Address index register 108	Read/Write
I109	251554	(32b) Address index register 109	Read/Write
I110	251556	(32b) Address index register 110	Read/Write
I111	251558	(32b) Address index register 111	Read/Write
I112	251560	(32b) Address index register 112	Read/Write
I113	251562	(32b) Address index register 113	Read/Write
I114	251564	(32b) Address index register 114	Read/Write
I115	251566	(32b) Address index register 115	Read/Write
I116	251568	(32b) Address index register 116	Read/Write
I117	251570	(32b) Address index register 117	Read/Write
I118	251572	(32b) Address index register 118	Read/Write
I119	251574	(32b) Address index register 119	Read/Write
I120	251576	(32b) Address index register 120	Read/Write
I121	251578	(32b) Address index register 121	Read/Write
I122	251580	(32b) Address index register 122	Read/Write
I123	251582	(32b) Address index register 123	Read/Write
I124	251584	(32b) Address index register 124	Read/Write
I125	251586	(32b) Address index register 125	Read/Write
I126	251588	(32b) Address index register 126	Read/Write

I127	251590	(32b) Address index register 127	Read/Write

19. System Setting

The 【System Setting】function can be used when the user needs to change the system settings of the HMI. The【System Setting】function can change the system setting of the HMI according to the settings established by the user. There are two ways to use the【System Setting】function:【Local Setting】and【Remote Setting】. 【Local Setting】is when the user operates the【System Setting】function by pressing the control panel in front of the HMI. A【Remote Setting】is when the user operates the【System Setting】function from a remote host using the Ethernet connection with the HMI.

This chapter will explain the【System Setting】related pages and their setting methods for【Local Setting】and【Remote Setting】.

19.1 Local Setting

Press and hold down the right side of the screen during the HMI start-up process to enter the【System Setting】function in order to change the system settings of the HMI. If a system password is set for this HMI and is enabled, this password must first be entered for authorization before entering the【System Setting】function. Whether to enable/disable, the content of the system password can be set in【System Info】 and the default setting is disabled.

Figure 276 System Setting home page for touch control

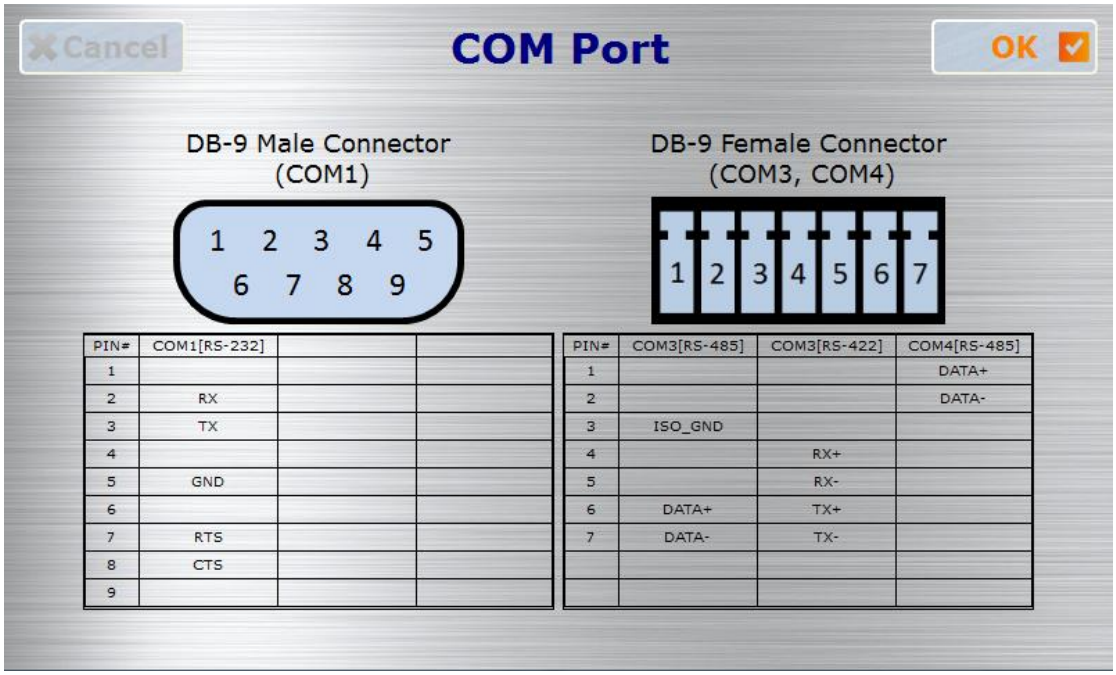
The【System Setting】home page is divided into two parts: the left part is【Run Project】which will exit from the setting interface and execute the project in the HMI directly once it is pressed. The right part is【Setting】and is divided into nine categories: 【COM Port】, 【Ethernet】, 【Servers】, 【Backlight】, 【Display】, 【Calibration】, 【Time】, 【System Info】and【MISC】.

19.1.1 Run Project

The system will automatically detect the current firmware and the integrity and compatibility of the project on the HMI when entering the【System Setting】.If the system determined that the firmware and project versions are compatible and the file is complete with no corruptions, it will enable the【Run Project】and the user can execute the project on the HMI immediately. On the other hand, if the system determined that the version is incompatible or that the file is corrupted, 【Run Project】will be locked and cannot be started. This is when the download function of the FvDesigner can be used to update to the latest version of firmware and project.

19.1.2 【COM Port】

The【COM Port】data page will appear after pressing the【COM Port】block, as shown in the figure below. This is where the COM Port details for the DB-9 male/female adapter of the HMI can be found. Pressing【OK】on the top-right corner or【Cancel】on the top-left corner will exit this page.



PIN#	COM1[RS-232]		
1			
2	RX		
3	TX		
4			
5	GND		
6			
7	RTS		
8	CTS		
9			

PIN#	COM3[RS-485]	COM3[RS-422]	COM4[RS-485]
1			DATA+
2			DATA-
3	ISO_GND		
4		RX+	
5		RX-	
6	DATA+	TX+	
7	DATA-	TX-	

Figure 277 COM Port data page

19.1.3 【Ethernet】

The【Ethernet】setting page will appear after pressing the【Ethernet】block, as shown in the figure below. Introductions to the setting page options are as listed in the table blow. When the setting is complete, press the【OK】button on the top-right corner to save the settings and exit this page or the 【Cancel】 button on the top-left corner to discard the changes and exit this page.

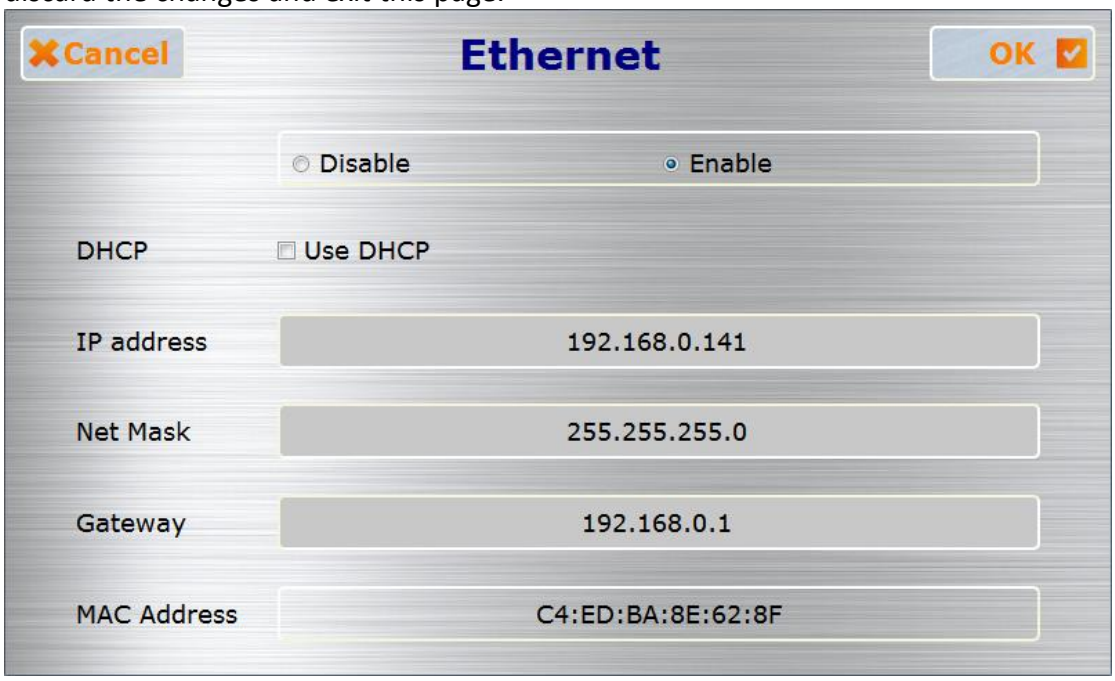


Figure 278 Ethernet setting page

Table 171 Ethernet setting page options

Option	Description

【Enable Ethernet】	Select whether to enable【Ethernet】: Selecting【Enable】will allow users to continue setting the follow-up options; selecting【Close】will close the follow-up options and they cannot be set.
【DHCP】	Select whether to enable【Enable DHCP】: Selecting【Enable DHCP】will close the three options【IP Address】,【Net Mask】and【Gateway】as they will be assigned and set by the system. If the 【Enable DHCP】was not selected, then the user must continue setting the three options【IP Address】,【Net Mask】and【Gateway】.
【IP Address】	Please set the IP address of the HMI here.
【Net Mask】	Please set the sub-net mask of the HMI here.
【Gateway】	Please set the gateway of the HMI here.
【MAC Address】	The MAC address of the HMI is displayed here.

19.1.4 【Servers】

The【Server】setting page will appear after pressing the【Server】block as shown in the figure below. The setting page options can be divided into three parts:【Enable FTP Server】,【Enable VNC Server】and【Pass Through】. The introductions for the【Enable FTP Server】,【Enable VNC Server】and【Pass Through】options are as listed in the table below. When setting is complete, press the【OK】button on the top-right corner to save the settings and exit this page or the【Cancel】button on the top-left corner to discard the changes and exit this page.

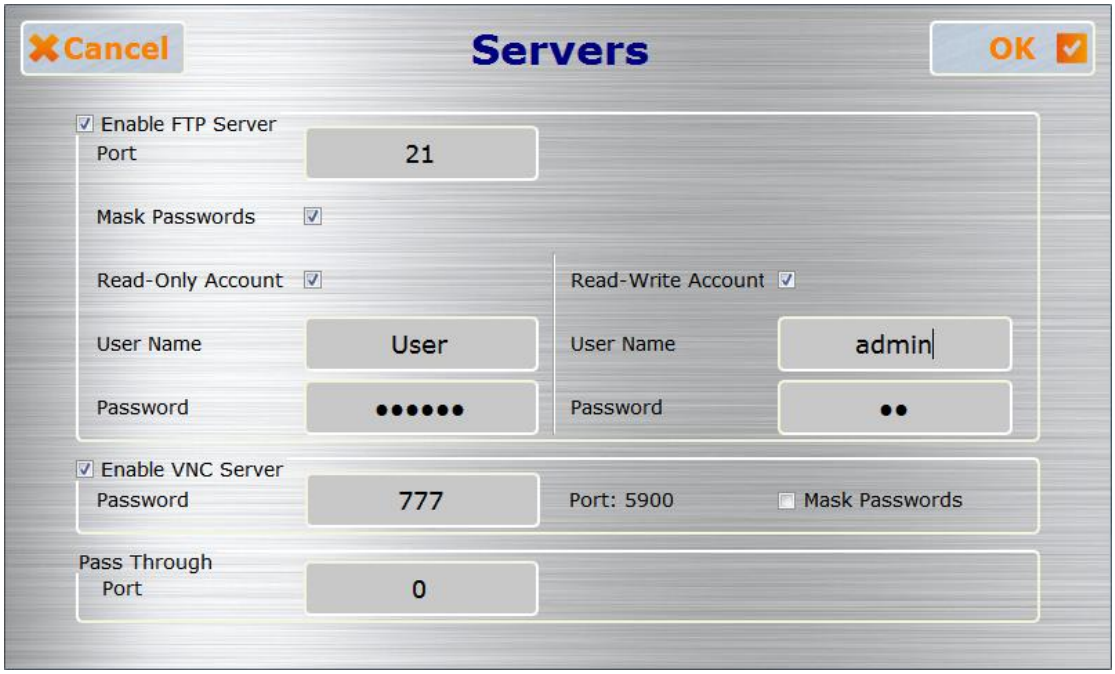


Figure 279 Server setting page

Table 172 Options to Enable FTP Server in the Server page

Option	Description
【Enable FTP Server】	Select whether to【Enable FTP Server】. Selecting this option will allow users to continue setting the follow-up options. If this option is not selected, the follow-up options will be closed and cannot be set. Note: If the Enable FTP Server is selected, please remember to set【Read-Only Account】or【Read-Write Account】, or else the setting cannot be completed.
【Port】	Select the port used by FTP Server.
【Mask Password】	The password will be masked once this option is selected.
【Read-Only Account】	Select whether to enable the read-only account. The user account and password can be set below once this option is selected.
【Read-Write Account】	Select whether to enable the read-write account. The user account and password can be set below once this option is selected.
【Pass Through Port】	Set the port used for pass through.

Table 173 Options to Enable VNC Server in the Server page

Option	Description
【Enable VNC Server】	Select whether to【Enable VNC Server】. Selecting this option will allow users to continue setting the follow-up options. If this option is not selected, the follow-up options will be closed and cannot be set.

【Password】	Enter the password for the VNC server.
【Mask Password】	The password will be masked once this option is selected.

19.1.5 【Backlight】

The【Backlight】setting page will appear after pressing the【Backlight】block, as shown in the figure below. Introductions to the setting page options are as listed in the table below. When setting is complete, press the 【OK】button on the top-right corner to save the settings and exit this page or the【Cancel】button on the top-left corner to discard the changes and exit this page.

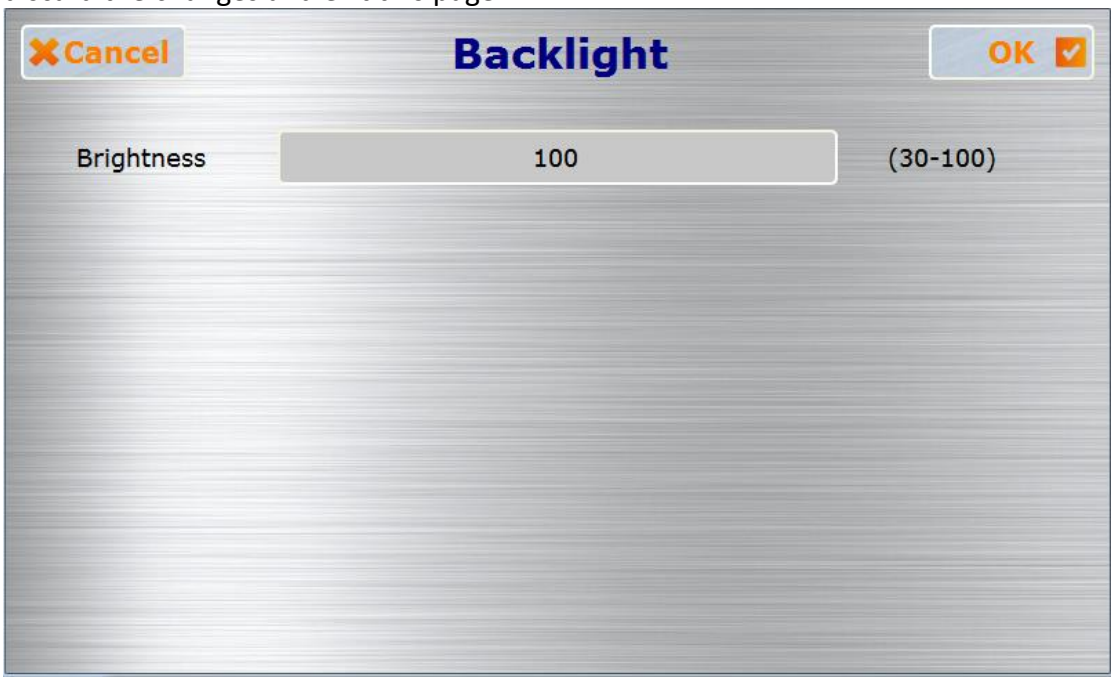


Figure 280 Backlight setting page

Table 174 Backlight setting page options

Option	Description
【Backlight】	Select the backlight required. The available range is between 30-100 and the default value is 90.

19.1.6 【Display】

The【Display】setting page will appear after pressing the【Display】block, as shown in the figure below. Introductions to the setting page options are as listed in the table below. When setting is complete, press the【OK】button on the top-right corner to save the settings and exit this page or the【Cancel】button on the top-left corner to discard the changes and exit this page.

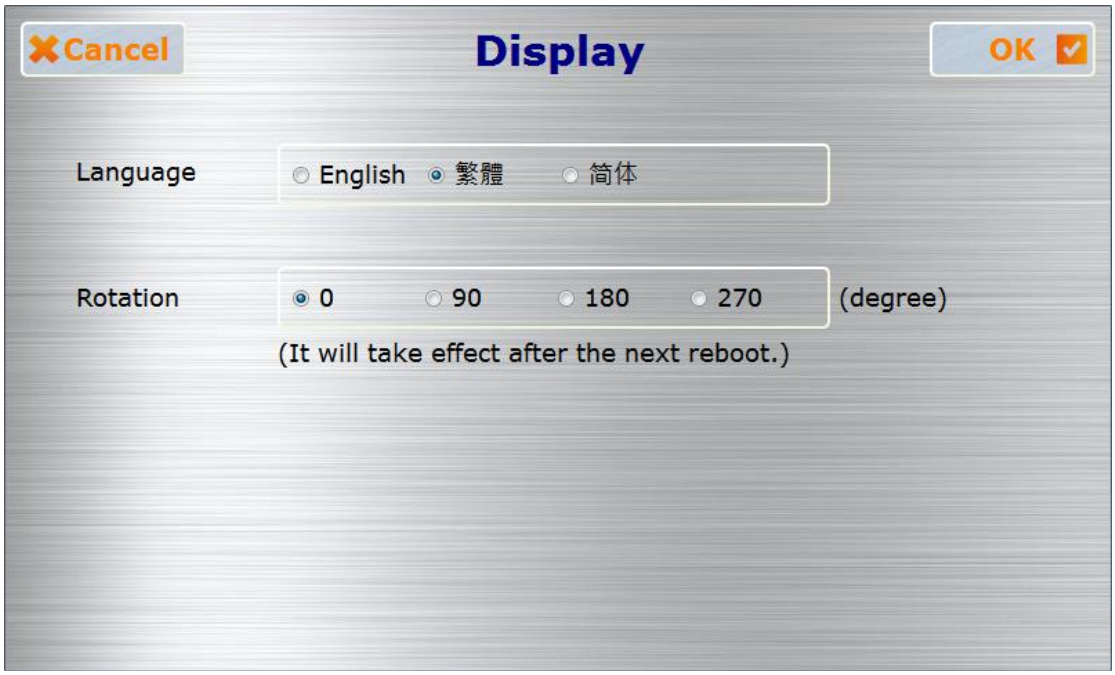


Figure 281 Display setting page

Table 175 Display setting page options

Option	Description
【Language】	Select the language displayed in【System Setting】. The available language selections include English, Traditional Chinese and Simplified Chinese.
【Rotation】	Select the rotation of the HMI display screen.

19.1.7 【Calibration】

The 【Calibration】setting page will appear after pressing the【Calibration】block. If the error detected for the touch panel is too great resulting in users unable to properly click this【Calibration】block, users can then press and hold any point on the screen for ten seconds to enter the calibration mode.

19.1.8 【Time】

The【Time】setting page will appear after pressing the【Time】block, as shown in the figure below. Introductions to the setting page options are as listed in the table below. When setting is complete, press the【OK】button on the top-right corner to save the settings and exit this page or the【Cancel】button on the top-left corner to discard the changes and exit this page.

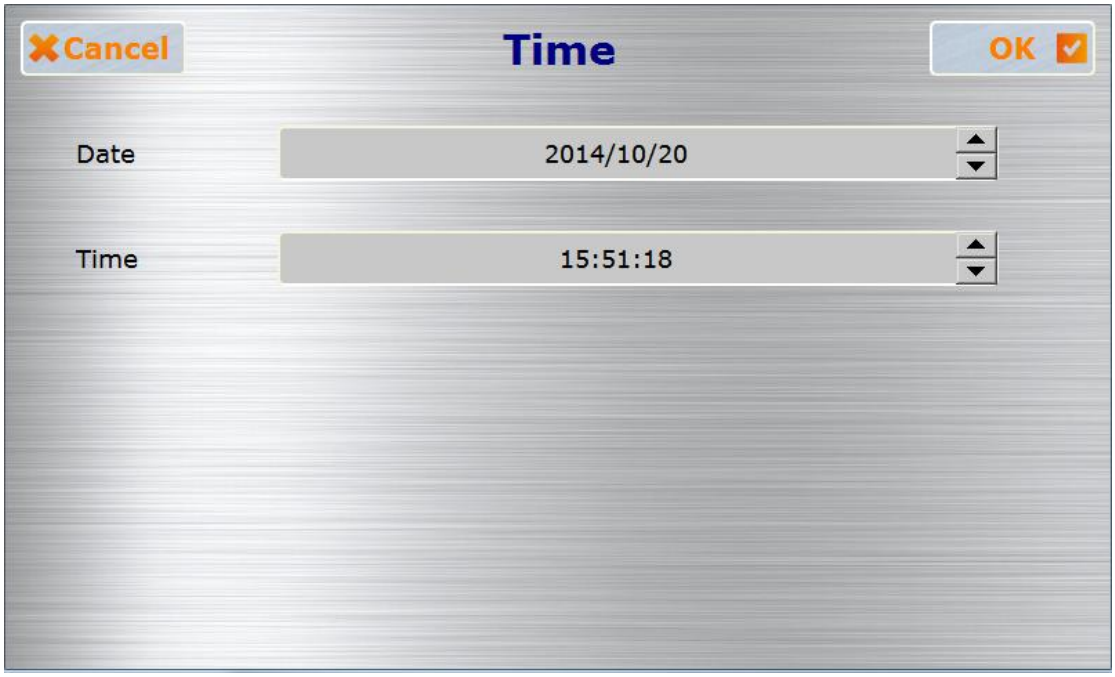


Figure 282 Time setting page

Table 176 Time setting page options

Option	Description
【Date】	The system date of the HMI can be set here.
【Time】	The system time of the HMI can be set here.

19.1.9 【System Info】

The【System Info】setting page will appear after pressing the【System Info】block, as shown in the figure below. Introductions to the setting page options are as listed in the table below. When setting is complete, press the【OK】button on the top-right corner to save the settings and exit this page or the【Cancel】button on the top-left corner to discard the changes and exit this page.

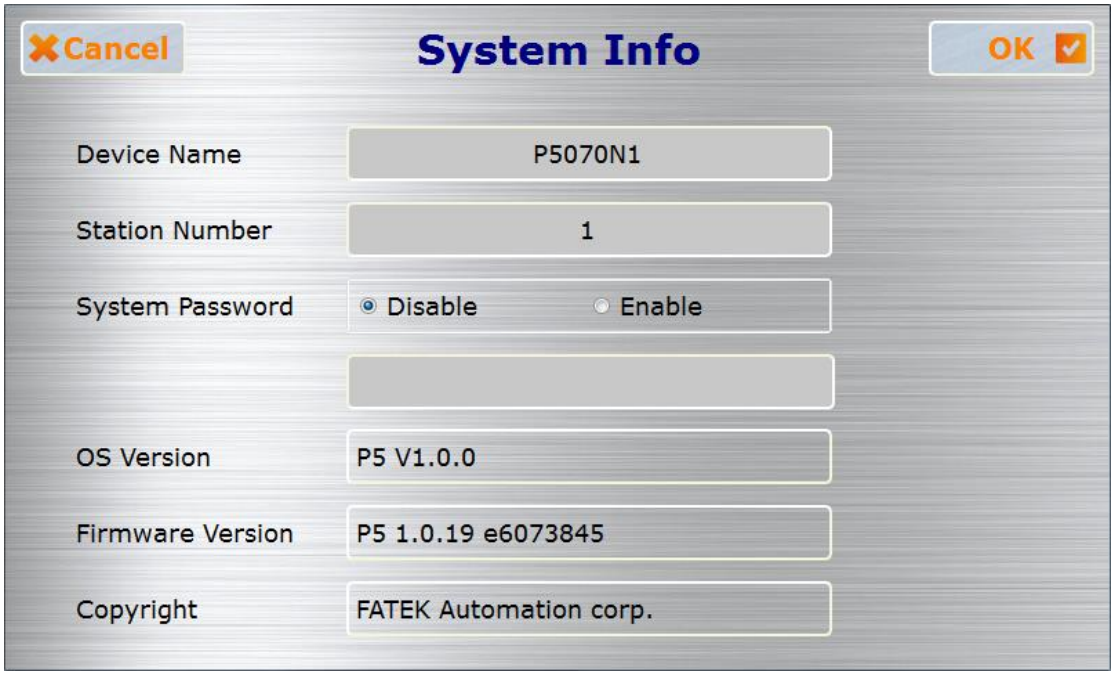
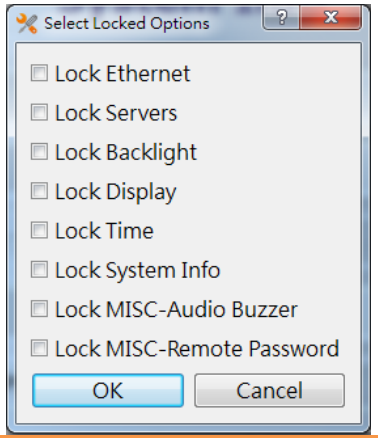


Figure 283 System Info setting page

Table 177 System Info setting page options

Option	Description
【Device Name】	The device name of the HMI can be set here.
【Station Number】	The station number of the HMI can be set here.
【System Password】	Select whether to enable【System Password】here. If【System Password】is enabled, the password must be set below. This password must be entered in order to set the locked option once【System Password】is enabled. Select the locked option, select the options which need enter【System Password】 

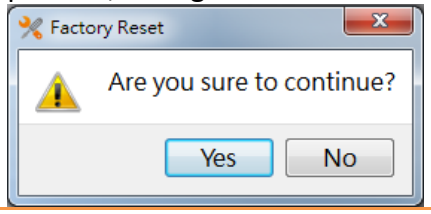
【OS Version】	Information on the operating system version can be viewed here.
【Firmware Version】	Information on the firmware version can be viewed here.
【Copyright】	Information related to the copyright can be viewed here.

19.1.10 【MISC】

The【MISC】setting page will appear after pressing the【MISC】block, as shown in the figure below. Introductions to the setting page options are as listed in the table below. When setting is complete, press the【OK】button on the top-right corner to save the settings and exit this page or the【Cancel】button on the top-left corner to discard the changes and exit this page.

Figure 284 MISC setting page

Table 178 MISC settingpage options

Option	Description
【Factory Reset】	The system setting of the HMI can be re-set to the factory settings here. The following window will appear after this option is pressed, asking whether to continue. 

	Selecting【OK】will restore the HMI to factory settings and selecting【Cancel】will cancel this operation.
【Buzzer】	This option selects whether to enable the buzzer. Close will turn the buzzer off.
【Audio】	Audio can be played back if this option is enabled, otherwise it will be closed.
【Remote Password】	Select whether to enable【Remote Password】here. If【Remote Password】is enabled, the password must be set below. This password must be entered in order to log in 【System Setting】

19.2 Remote Settings

The operating inter-face of the 【Remote Setting】is basically the same as【Local Setting】, only that the【Run Project】on the left is changed to【Connection Setting】. Users must specify the IP address of the target HMI to change settings and the setting inter-face on the right will only be enabled once the HMI is successfully connected.

Figure 285 Remote Settings operation interface

19.3 System Booting Sequence

The system will automatically detect the current firm ware and the integrity and compatibility of the project on the HMI when starting up. If the system detected that the version is incompatible or that the file is corrupted resulting in the HMI being unable to start up properly, the system will automatically enter the【System Setting】

and lock the【Run Project】switch. This is when users can use the download function of the FV Designer to sequentially download the firmware and project.

If the firmware and project were both enabled normally, the system will skip the【System Setting】during start-up and run the project immediately. In this case, the user must press and hold the right side of the HMI screen during the start-up until it enters the System Setting screen if the user wants to adjust the system settings.