Web Designer for FactoryCast HMI

User Manual

12/2011

Schneider Electric

Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE
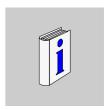
NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

At a Glance

Document Scope

This manual presents the Web Designer for FactoryCast HMI software and describes the installation and operation.

NOTE: In this manual, the term "Web Designer" will be used for "Web Designer for FactoryCast HMI".

Validity Note

This documentation applies to Web Designer software.

The characteristics presented in this manual should be the same as those that appear online. In line with our policy of constant improvement we may revise content over time to improve clarity and accuracy. In the event that you see a difference between the manual and online information, use the online information as your reference.

Related Documents

Title of Documentation	Reference Number
FactoryCast HMI 1.7 User Manual	35007632
Communications Setup Manual	TLX DS COMPL7 V4
Ethernet Network - Reference Manual	TSX DR ETH
Modbus - User Guide	TSX DG MDB

You can download these technical publications and other technical information from our website at www.schneider-electric.com.

Product Related Information

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Use only Schneider Electric software or approved software with our hardware products.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Anyone who has access to a configuration tool and to your embedded server can override your security settings and download new settings to the server.Unauthorized or incorrect changes to data may change the behavior of your application in ways that may be undesirable or even hazardous.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Password-protect access to the embedded server.
- Carefully select the symbols and direct addresses you authorize to be modified online.
- Do not authorize online modification of variables of critical nature.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

User Comments

We welcome your comments about this document. You can reach us by e-mail at techcomm@schneider-electric.com.

Introduction

1

Scope of this Chapter

This chapter introduces the Web Designer for FactoryCast HMI software. It shows you how to install it. It also provides you a description of the graphical interface.

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Presentation	14
Preparing for Web Designer installation	16
Interface Presentation	17

Presentation

Introduction

Web Designer for FactoryCast HMI is a state-of-the-art software application with which you can create Web based operator panels and configure operating parameters for Web human machine interface (Web HMI) devices. It provides all the tools needed to design an HMI project, from the data acquisition to the creation and display of animated Web drawings.

Web Designer handles the following for the device website:
● editing,
● configuration,
● modification.

Web Designer offers two levels of personalization:
● the creation of a variable base of devices that can be viewed and modified in Web pages,
● the addition of your own Web pages on the device site.

Web Designer provides an interface to configure Services:

Name	Description
Email	It sends notification periodically or when a specific event occurs.
Calculation	It performs arithmetic and logical operations on a combination of variables.
Database	It archives internal or processed data into a database.
Active Pages	It enables you to create your own HTML pages that can be used to view variables in real time.
Datalogging	It enables you to save information such as configuration, variable's values, log files into a file system.
Recipe	Used to change the values of a set of variables when a predefined event occurs.
Recipe Database	Used to update values of a set of variables with values contained in a database table when a predefined event occurs.

Devices

In the Schneider product range, Web Designer for FactoryCast HMI unites website configuration with services carried out in the coupling unit or device. A project can simultaneously manage several devices.

The following list indicates the devices managed by Web Designer for FactoryCast HMI. This list includes:
● TSX WMY 100
● 140 NWM 100 00

Simulation

Web Designer for FactoryCast HMI enables you to simulate devices in order to debug the application. This means you can verify the behavior of Web pages and services without being physically connected to the device or to the module.

Required configuration

To use this software at an optimal level, we recommend that your PC has the following configuration:

● CPU 1GHz,

● 512 Mb RAM,

● 80 Mb Hard disk,

● 800x600 screen,

● Windows 2000 SP2, Windows XP Professional or Windows Vista Business,

● Java Virtual Machine 1.4.2 minimum.

NOTE: For Windows XP or Windows Vista, you need administration privileges to install the Web Designer Software. You also need administration privileges to run the software under Windows Vista.

Preparing for Web Designer installation

Foreword

If a previous version of Web Designer is already installed, it must be uninstalled first (Web Designer offers to perform the uninstall for you if this is the case).

NOTE:

- Once installed, you can access Web Designer by clicking **Start** → **All programs** → **Schneider Electric** → **Vijeo Designer Suite** → **Web Designer**.
- For Windows XP or Windows Vista, you need administration privileges to install the Web Designer Software. You also need administration privileges to run the software under Windows Vista.

Installation

The installation procedure is as follows: insert the CD-ROM into the CD drive. The CD is Auto-run, therefore if your PC is set up for this feature you should see the Web Designer main window. If Auto-run is disabled or does not work:

Step	Action
1	Click **Start** → **Settings** → **Control panel**.
2	Click **Add/Remove Programs** in the Control Panel.
3	Click **Add New Programs** in the menu on the left, then **CD-ROM** and follow the instructions.
4	The Install Tool will automatically find the WebDesigner.exe program on the CD and will also display the path and file name then prompt you to perform the installation.
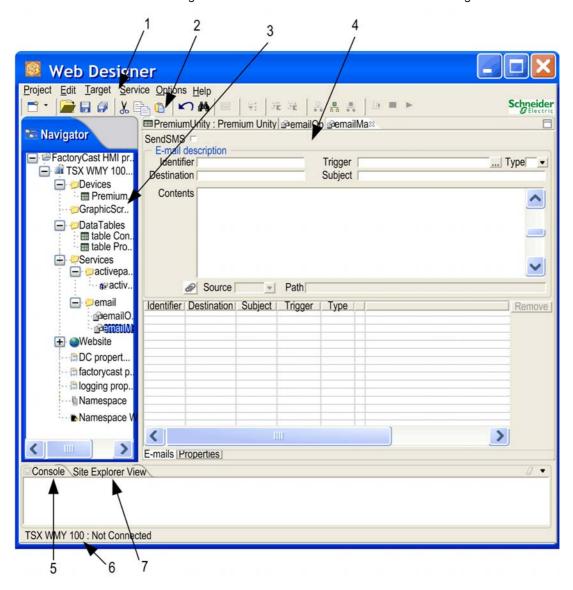
Importing Previous Projects

Previous projects are visible in the navigator once Web Designer is reinstalled.

Interface Presentation

Main Window Contents

The following illustration describes the elements of the Web Designer main window:
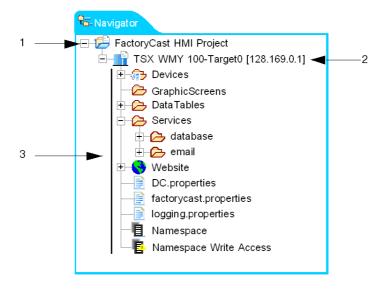
6 main zones compose this screen which are:

Zone	Description
1	Menu *(see page 298)*: list of options available.
2	Toolbar: shortcuts to frequently used functions.
3	Navigator *(see page 18)*: it displays all the files related to the projects.
4	Editing zone: Web Designer uses this zone to edit, create or configure services associated with the project.
5	Console zone: list of the last errors detected.
6	Information zone: it displays the connection status and the available memory of the selected module.
7	Site Explorer View: it displays all the target files.

Navigator

This zone displays all the files and folders associated with existing projects. It provides an overall view of the application displayed as a file tree.

The following figure describes the navigator:

3 main zones compose the navigator which are:

Zone	Description
1	This zone displays the name of the project as root directory. By clicking **+**, all the targets associated with the project appear.
2	This folder displays the name of the target associated with the project and its IP address. By clicking **+**, all the folders and files associated with the target appear.
3	5 main directories are visible for each target associated with the project: ● *Device*: it displays the devices (CPUs connected to the module) associated with the target. ● *GraphicScreens*: it contains pages created using the Graphic editor *(see page 156)*. ● *DataTables*: it contains tables created using the Data editor *(see page 146)*. ● *Service*: it displays the services created by the user (availability depending on the target). ● *Website*: it contains all the website files for the project. You can therefore customize the website *(see page 215)* by changing these files or by adding your own pages.

Toolbar

The toolbar enables you to access the main functions of the program directly by clicking its icons.

The figure below shows you the toolbar:

The following table describes the elements of the toolbar:

Icon	Function
	New: by clicking the down arrow, you can: ● create a new project, ● add a target to the project, ● add a device to the target, ● create a new service, ● create a folder, ● create a file.
	Open an existing project.
	Save: save the currently edited window.
	Save All: save all items modified in the project.

Icon	Function
	Cut: destruction of the selected object and putting it on the clipboard.
	Copy: copy the object to the clipboard.
	Paste: paste the clipboard.
	Undo: cancel last action.
	Find: open the **Search** window in which you can search for a text located in a file of the project.
	Lookup: open the **Lookup** window in which you can search a variable.
	Global Transfer: download all the project's modules (and all the files).
	Target -> PC: transfer a project from the target to the PC.
	PC -> Target: transfer a project from the PC to the target.
	Connection to the module: connect Web Designer to the target.
	Connection to the local simulator: connect Web Designer to the simulator.
	Disconnect: disconnect from the target or the simulator.
	Statistics: view statistics for the selected service (incoming messages, outgoing messages, etc.).

Icon	Function
■	Stop: shut down current service.
▶	Run: start current service.

Getting Started

2

Scope of this Chapter

The purpose of this document is to show you the procedure for creating a Web Designer for FactoryCast HMI application.

What's in this Chapter?

This chapter contains the following topics:

Presentation
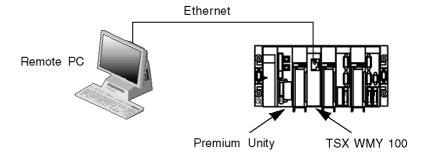
Introduction

This getting started covers from project creation to visualizing it on a PC with a browser. The project is made with a TSX WMY 100 module and a Premium Unity PLC connected on the same rack. The Web server will be hosted by the TSX WMY 100 module, which will periodically scan the values of variables located in the PLC. The IP address for the module will be a.b.c.d.

NOTE: If you use a 140 NWM 100 00 module instead of a TSX WMY 100, the procedures are identical.

Architecture
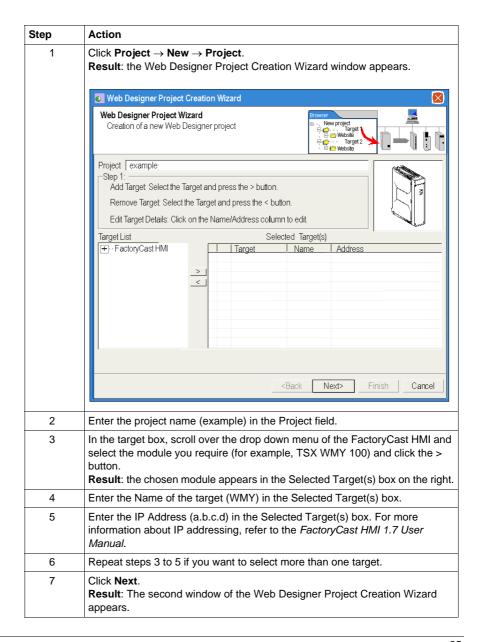
The following diagram shows the architecture of the getting started example:

The following table describes the elements of the example:

Reference	Type	Description
TSX WMY 100	Target	Ethernet module
Premium Unity	Device	PLC

Creating a New Project

Step	Action
1	Click **Project** → **New** → **Project**. **Result**: the Web Designer Project Creation Wizard window appears.
2	Enter the project name (example) in the Project field.
3	In the target box, scroll over the drop down menu of the FactoryCast HMI and select the module you require (for example, TSX WMY 100) and click the > button. **Result**: the chosen module appears in the Selected Target(s) box on the right.
4	Enter the Name of the target (WMY) in the Selected Target(s) box.
5	Enter the IP Address (a.b.c.d) in the Selected Target(s) box. For more information about IP addressing, refer to the *FactoryCast HMI 1.7 User Manual*.
6	Repeat steps 3 to 5 if you want to select more than one target.
7	Click **Next**. **Result**: The second window of the Web Designer Project Creation Wizard appears.

Device Selection

Introduction

For each target you can configure the devices that are connected to it.

Device creation

The following table shows how to attach devices to a target:

Step	Action
1	Select a device in the Device List box and click the > button. **Result**: the device appears in Selected Target(s) Device(s).
2	In the selected Target(s)/Device(s) zone, enter the device name in the Name column and its address in the Address column. For more information about addressing refer to the *FactoryCast HMI 1.7 User Manual*.
3	If the device supports several protocols, enter the desired protocol in the Protocol column.
4	If you want to attach more than one target, repeat steps 1 to 4 until you have selected all devices required.
5	Click **Finish**. **Result**: the project example appears in the browser.

Step	Action
6	Save your project by clicking:

Target Properties

Introduction

Target properties allow you to:
- change the name of the target and its address,
- change the different passwords *(see page 290)* to access the device.
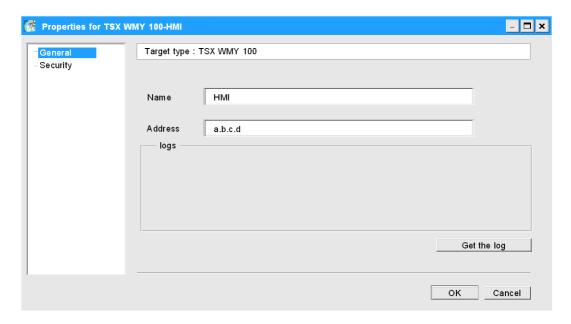
This example shows you how to manually configure the IP parameters for a TSX WMY 100.

Accessing the Target Properties Page

You can access the Target Properties page in one of the following ways:
- On the Web Designer browser, right-click the device name and click **Properties**.
- On the **Target** menu, click **Properties**.

Result: the Target Properties window appears.

Setting Up the IP Parameters

Use the **IP parameters** area to define the IP configuration of the module.

Having two devices with the same IP address can cause unpredictable operation of your network.

> # ⚠ **WARNING**
>
> **UNINTENDED OPERATION — DUPLICATE IP ADDRESS**
>
> - Make sure that this device will receive a unique IP address.
> - Always obtain your IP address from your system administrator to avoid the possibility of duplicate addresses.
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

NOTE: In this example, we manually assign the a.b.c.d address to the module. For details about managing IP address, refer to the *FactoryCast HMI 1.7 User Manual*.

The following table shows how to manually configure the TSX WMY 100 module:

Step	Action
1	Access the Target Properties page.
2	Enter the IP address for the TSX WMY 100 in the **IP Address** field.
3	Click **OK** to validate.
4	Save the new configuration by clicking: 💾

Variable Selection

Introduction

The Select Symbol window lets you configure the variables for various devices that can be used in website pages.
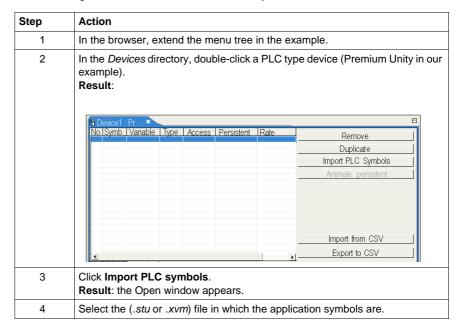
All device variables used in a project are grouped in a file called **Namespace**. The Data Editors and Graphic Editors as well as the Services in a project use variables in this **Namespace**.
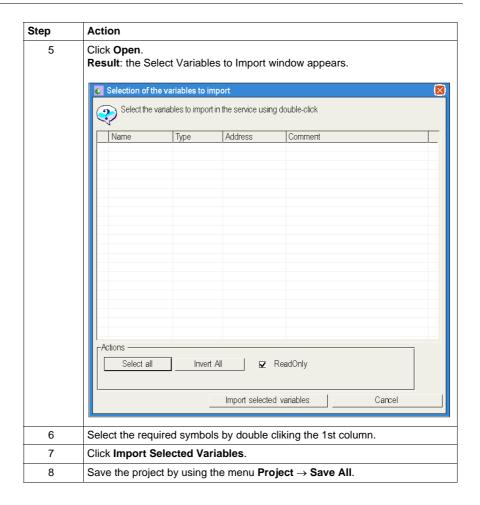
Types of Symbols

For Premium Unity PLCs, symbols that can be used come from the PLC application (*.stu* or *.xvm* file type).

Selecting PLC Symbols

The following table shows how to select PLC symbols:

Step	Action
1	In the browser, extend the menu tree in the example.
2	In the *Devices* directory, double-click a PLC type device (Premium Unity in our example). **Result**:
3	Click **Import PLC symbols**. **Result**: the Open window appears.
4	Select the (*.stu* or *.xvm*) file in which the application symbols are.

Step	Action
5	Click **Open**. **Result**: the Select Variables to Import window appears.
6	Select the required symbols by double cliking the 1st column.
7	Click **Import Selected Variables**.
8	Save the project by using the menu **Project → Save All**.

Namespace

By clicking the Namespace file of the project in the browser, a table that groups all symbols previously selected for targets or devices appears.

Email Service

Introduction

The email service is used to send an email when an alarm is triggered, for example, when there is a change in the status of a variable or a threshold is overrun.

NOTE:
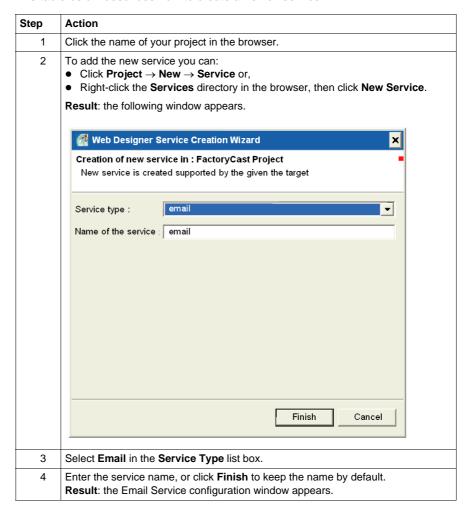
Web Designer for FactoryCast HMI enables you to configure other Web HMI services such as:
- Calculation
- Database
- Datalogging
- Active Pages
- Recipe
- Recipe Database

For more information on Services configuration refer to the Service chapter *(see page 91)*.
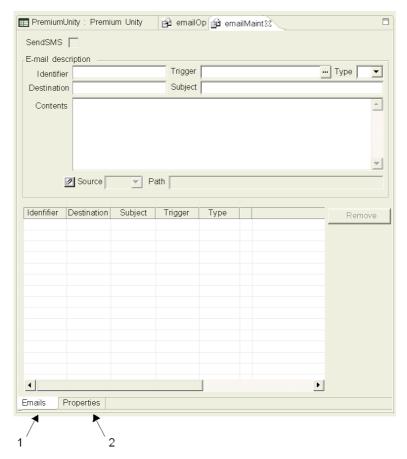
Creating an Email Service

The table below describes how to create an email service:

Step	Action
1	Click the name of your project in the browser.
2	To add the new service you can: ● Click **Project** → **New** → **Service** or, ● Right-click the **Services** directory in the browser, then click **New Service**. **Result**: the following window appears.
3	Select **Email** in the **Service Type** list box.
4	Enter the service name, or click **Finish** to keep the name by default. **Result**: the Email Service configuration window appears.

Email Configuration Window

The configuration properties screen for the email service is shown below:
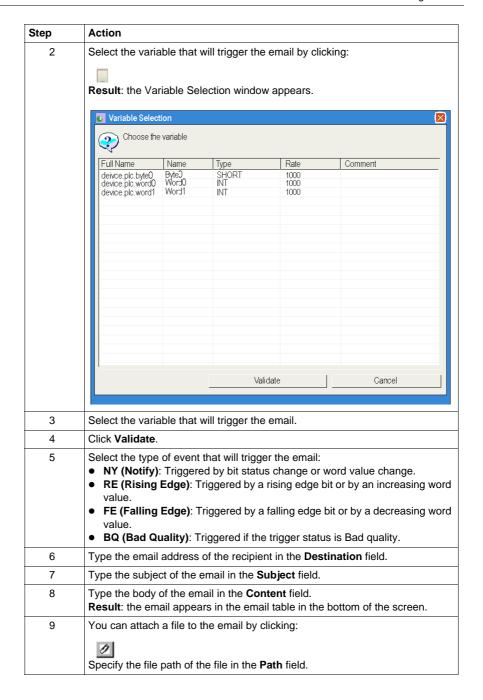
1 This button is used to configure emails sent by the email service.
2 This button is used to configure email properties.

Sending an Email

First of all, you must create the email to be sent. It is almost the same procedure as writing a normal email except that you need to define a trigger event. The procedure below shows you the steps needed to create such an email:

Step	Action
1	Type a name for the email in the **Identifier** field.

Step	Action
2	Select the variable that will trigger the email by clicking: **Result**: the Variable Selection window appears.
3	Select the variable that will trigger the email.
4	Click **Validate**.
5	Select the type of event that will trigger the email: ● **NY (Notify)**: Triggered by bit status change or word value change. ● **RE (Rising Edge)**: Triggered by a rising edge bit or by an increasing word value. ● **FE (Falling Edge)**: Triggered by a falling edge bit or by a decreasing word value. ● **BQ (Bad Quality)**: Triggered if the trigger status is Bad quality.
6	Type the email address of the recipient in the **Destination** field.
7	Type the subject of the email in the **Subject** field.
8	Type the body of the email in the **Content** field. **Result**: the email appears in the email table in the bottom of the screen.
9	You can attach a file to the email by clicking: Specify the file path of the file in the **Path** field.

Access Parameters

To configure the access parameters for the email service, follow the procedure below:

Step	Action
1	Click the **properties** tab. **Result**: the email properties window appears.
2	Type the address of the email (SMTP) server in the **SMTP Server Address** field. **Note**: the **SMTP Server Port** field is unavailable and thus cannot be modified.
3	Select the **Require Secure Authentication** box if access to the server is protected. In this case, fill in the **Login** and **Password** fields.
4	Type a **Sender Address** which will identify the module when the user receives the email.
5	Type a **Reply Address** to which a reply will be sent if the user clicks the **Reply** button.
6	Define the maximum number of emails that can be stored in the buffer memory before being sent by filling in the **Maximum Size of Send Queue** field: ● Default value = 100, ● Minimum value = 30, ● Maximum value= 200.
7	Specify the delay before emails stored in the buffer memory are re-sent after interruption in the **Time Before Retry to Send** field.

Step	Action
8	Finally, select a variable to determine the status of the email service in the **Service status variable** field.
9	Save the new email service by clicking:

Data Editor

Introduction

Data Editor enables you to create Web pages in which the values of variables are displayed in table format. In certain cases these values can be modified by the user.

Allowing write access can change system behavior.
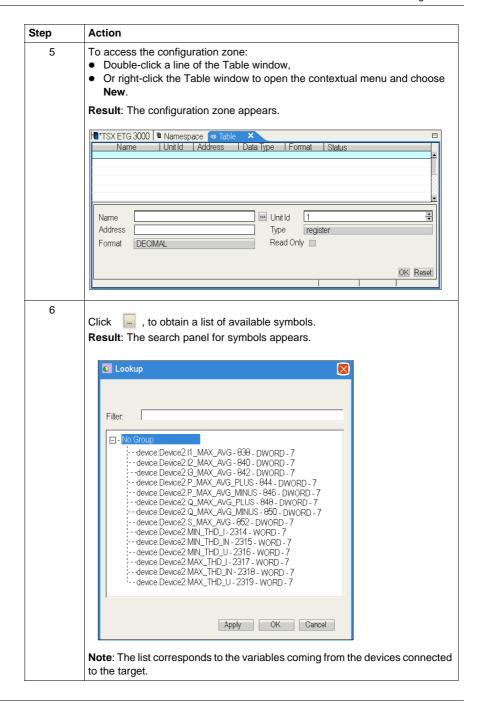
⚠ WARNING

UNINTENDED OPERATION

- Make sure variables that can be written are accessible by trained personnel only (password protect).
- Do not give write access to critical control variables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Selecting Editor Symbols

Step	Action
1	In the browser, extend the menu tree in the example.
2	Right-click the *DataTables* directory to open the contextual menu and choose **New Table**.
3	In the Table Name field, enter a name for the data table.
4	Click **OK**. **Result**: An empty data table appears.

Step	Action
5	To access the configuration zone: ● Double-click a line of the Table window, ● Or right-click the Table window to open the contextual menu and choose **New**. **Result**: The configuration zone appears.
6	Click , to obtain a list of available symbols. **Result**: The search panel for symbols appears. **Note**: The list corresponds to the variables coming from the devices connected to the target.

Step	Action
7	Select the symbols that you wish to monitor.
8	Click **OK**.
9	Save your table by clicking:

Graphic Editor

Introduction

The Graphic Editor enables you to create Web pages in which the values of variables are displayed as graphic objects, such as VU meters, indicators, etc.

Some graphic objects allow values to be entered. In this case, the variable must be write authorized and, in order to be able to use it, the user must have entered the write authorization password.

In the configuration phase, the Graphic Editor allows you to edit and view screens at the same time. In the operation phase, you can only visualize one screen at a time in order to optimize memory resources.

Selecting Graphic Objects

The following table shows how to open the Graphic Editor:

Step	Action
1	In the menu tree, select the target.
2	Right-click the *GraphicScreens* directory to open the contextual menu and choose **New Graphic Page**. **Result**: the Graphic Editor panel appears.
3	Click **Edit**.
4	Select graphic objects from the Graphic Editor toolbar on top of the screen.
5	Click the sub-window under the main window to place them.
6	Open the Properties window by double-clicking on the graphic object.
7	You can specify a name, a label, the data type and many other parameters. Click ▭ on the right of the Address field to associate a variable with the object. **Result**: the Lookup Variables window appears.
8	Select the variable that you want to associate with the object.
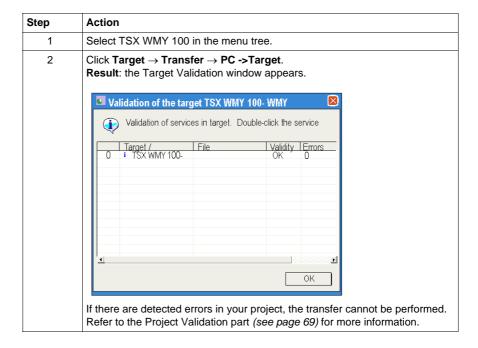
Step	Action
9	Repeat steps 4 to 8 to add other objects.
10	Once you have finished, click **Done**.
11	Click **Save** and enter a name for the graphic (graph).
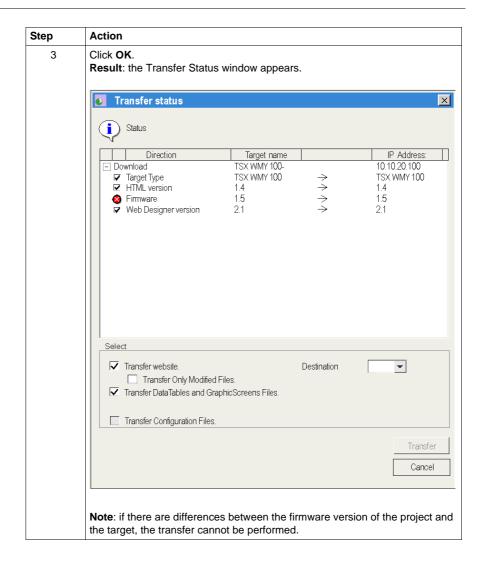
Transfer
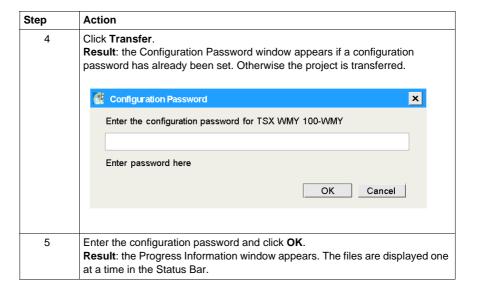
Introduction

Once you have completed the site construction on the configuration PC, you should transfer it to a target.

Transferring the Website to a Target

Step	Action
1	Select TSX WMY 100 in the menu tree.
2	Click **Target → Transfer → PC ->Target**. **Result**: the Target Validation window appears. If there are detected errors in your project, the transfer cannot be performed. Refer to the Project Validation part *(see page 69)* for more information.

Step	Action
3	Click **OK**. **Result**: the Transfer Status window appears. **Note**: if there are differences between the firmware version of the project and the target, the transfer cannot be performed.

Step	Action
4	Click **Transfer**. **Result**: the Configuration Password window appears if a configuration password has already been set. Otherwise the project is transferred. **Configuration Password** Enter the configuration password for TSX WMY 100-WMY Enter password here OK Cancel
5	Enter the configuration password and click **OK**. **Result**: the Progress Information window appears. The files are displayed one at a time in the Status Bar.

Accessing the Website

Introduction
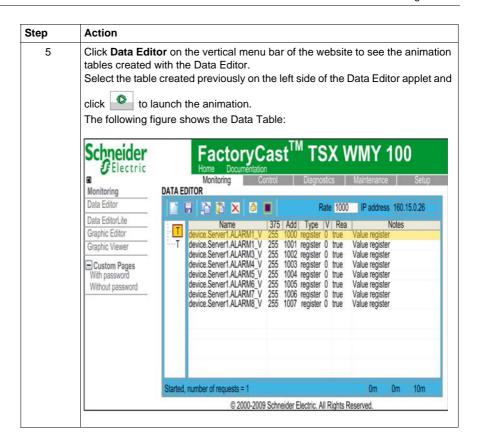
At this time, you have:
- created a project,
- selected the devices and the variables of your choice,
- created data and graphic table to monitor the installation,
- transferred your application from the PC to the target.
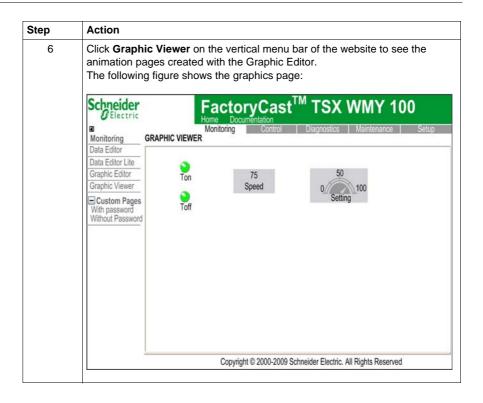
The last step consists of connecting to the website. The Data Editor and the Graphic Viewer are used to view graphic animation pages related to the device variables or internal module variables.

Accessing the Website

Step	Action
1	Open a Web browser.
2	Type the IP address of the module in the address bar. In this example, we set the IP address of the module to a.b.c.d *(see page 25)*. Therefore type a.b.c.d in the address bar.
3	Click **Go**. **Result**: the module website appears.
4	Click **Monitoring** on the horizontal menu bar of the website. **Result**: the monitoring home page appears.

Step	Action
5	Click **Data Editor** on the vertical menu bar of the website to see the animation tables created with the Data Editor. Select the table created previously on the left side of the Data Editor applet and click ![icon] to launch the animation. The following figure shows the Data Table:

Step	Action
6	Click **Graphic Viewer** on the vertical menu bar of the website to see the animation pages created with the Graphic Editor. The following figure shows the graphics page:

Project Management

3

Scope of this Chapter

This chapter explains how to manage a project. It concerns:

● Modifying a project,

● Opening and closing a project,

● Importing a project from a file.
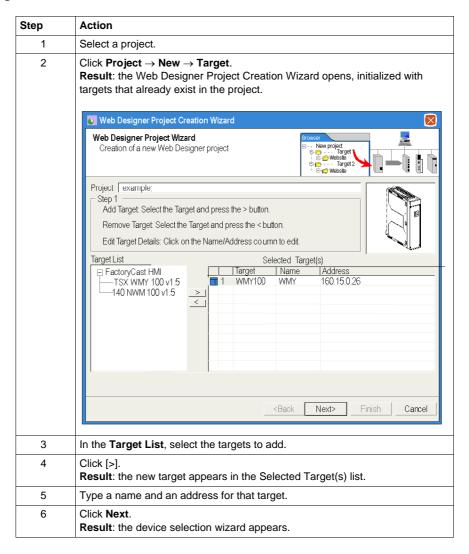
What's in this Chapter?

This chapter contains the following topics:

Adding/Removing Targets

Adding a New Target

Step	Action
1	Select a project.
2	Click **Project** → **New** → **Target**. **Result**: the Web Designer Project Creation Wizard opens, initialized with targets that already exist in the project.
3	In the **Target List**, select the targets to add.
4	Click [>]. **Result**: the new target appears in the Selected Target(s) list.
5	Type a name and an address for that target.
6	Click **Next**. **Result**: the device selection wizard appears.

Window Fields

The following table gives a description of the elements of the Web Designer Project Creation Wizard window:

Field	Function
Project	Project name.
Target List	List of available targets.
Target	Target types selected in the Module List.
Name	Target Name, to distinguish targets of the same type.
Address	IP address of the target.

The button **>** enables you to add one of the targets in the list. The button **<** enables you to remove a target in the list.

Deleting a Target

To remove a target from the project, right-click the target in the navigator to open the contextual menu and select **Delete**.
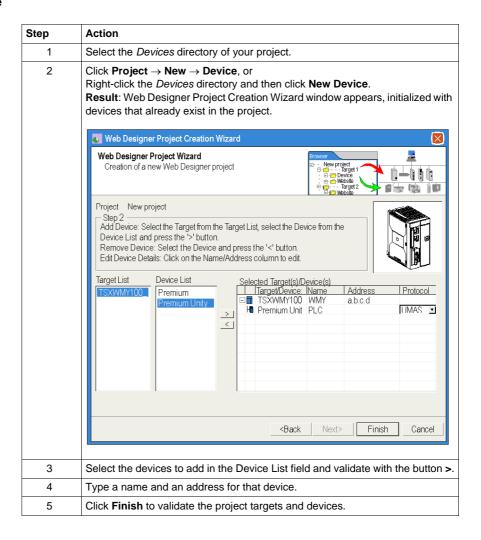
NOTE: If you delete a target of the project, all the files associated with that target (including devices) are also deleted.

Number of Targets

A project can contain up to 16 targets. It's possible to select the same type of target several times, on condition that you attribute a different name and IP Address for each target.

Adding/Removing a Device

Adding a Device

Step	Action
1	Select the *Devices* directory of your project.
2	Click **Project** → **New** → **Device**, or Right-click the *Devices* directory and then click **New Device**. **Result**: Web Designer Project Creation Wizard window appears, initialized with devices that already exist in the project.
3	Select the devices to add in the Device List field and validate with the button **>**.
4	Type a name and an address for that device.
5	Click **Finish** to validate the project targets and devices.

NOTE: If you have more than one target in your project, select the target in the Target List to which you want to attach the device before achieving step 3.

Window Fields

The following table shows the fields in the Web Designer Project Creation Wizard for the Device window.

Field	Function
Target List	List of targets created in the previous panel.
Device List	List of available devices.
Selected Target(s)/Device(s)	Device selected (from the Device List).
Name	Name given to the device to distinguish it from other devices of the same type.
Address	Address of the Target device.
Protocol	Protocol supported by the device (the Protocol List is determined by the type of device).

Removing a Device

To remove a device from the project, right-click the device in the navigator to open the contextual menu and select **Delete**.

NOTE: When you delete a device, all variables relating to the Namespace of the device are also deleted.

Device selection

The maximum number of selectable devices for a target depends on the type of target. Each target must have at least one device.

If your using a TSX WMY 100, you can select a maximum of 5 devices. Those devices must belong to the same family products (Premium or Premium Unity).

If your using a 140 NWM 100 00, you can select only 1 device.

Module Device

For a target in a rack, the default address is **localhost**.

Protocol

You can associate one or several protocols with each device. When a device supports several protocols, the protocol column is active and the user can choose one from the list. The address in the previous column depends on the protocol selected.

Adding/Removing Items

Presentation

The following pages show how to add elements of the following type to the project:

● Data Tables,

● Graphic Pages,

● Services,

● Folders,

● Files.

Adding a Graphics Page

The following table shows how to add a graphics page:

Step	Action
1	Select the project.
2	Select the sub-directory *GraphicScreens* in the target directory.
3	Click **Project** → **New** → **Graphic**, or Right-click the *GraphicScreens* directory and click **New Graphic Page**. **Result**: The Graphic Editor opens with a blank page to edit.

Adding a Data Table

The following table shows how to add a Data table:

Step	Action
1	Select the project.
2	Select the sub-directory *DataTables* in the target directory.
3	Click **Project** → **New** → **Data**, or Right-click the *DataTables* directory and click **New Table**. **Result**: The Data Editor opens with a blank table.

Adding a Service

The following table shows how to add a service:

Step	
1	Select the target.
2	Click **Project** → **New** → **Service**, or Right-click the *Service* directory and click **New Service**. **Result**: A window opens with a list of services that can be created.

Step	
3	Select the desired service from the list.
4	Click **OK**. **Result**: The Service window opens.

Adding a Folder

The following table shows how to add a folder:

Step	Action
1	Select one of the *Website* folders or *Website* itself.
2	Click **Project** → **New** → **Folder**, or Right-click the *Website* directory and click **New** → **Folder**. **Result**: The Create a Folder window opens.

NOTE: you cannot create new folders outside of the *Website* menu tree.

Adding a File

The following table shows how to add a file:

Step	Action
1	Select one of the *Website* folders or *Website* itself.
2	Click **Project** → **New** → **File**, or Right-click the *Website* directory and click **New** → **File**. **Result**: The Create a File window opens.

NOTE: You cannot create new files outside the *Website* menu tree.

Removing Items

To remove an item from the project, right-click the item in the navigator to open the contextual menu and select **Delete**.

Opening/Closing a Project

Presentation

This section shows how to:

- open/close a project,
- save a project,
- close Web Designer for FactoryCast HMI.

Opening an Existing Project

Step	Action
1	Click **Project** → **Open Project**. **Result**: the Open Project window opens. This window displays the list of projects in the workspace.
2	Select a project.
3	Click **Open**. **Result**: the project appears in the menu tree.

Closing a Project

Step	Action
1	Select the project.
2	Click **Project** → **Close Project**. **Result**: the project disappears from the menu tree.

Saving all Modifications

To save all modifications made, select Save All in the project menu or click the save all icon in the tool bar. This operation saves all modifications made in open windows. These modifications cover all open projects.

Closing Web Designer

When you close Web Designer for FactoryCast HMI, it memorizes the open or close state of projects. Projects that are open when you close Web Designer for FactoryCast HMI will automatically reopen the next time you launch the software.

Import

List of sources
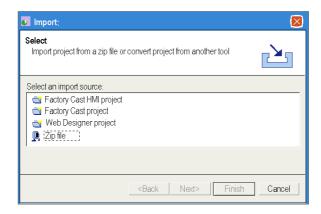
Web Designer for FactoryCast HMI can import a project from the following sources to recuperate previous developments:

- a *.zip* file exported by Web Designer for FactoryCast HMI,
- a Web Designer for FactoryCast HMI project outside the Workspace,
- a FactoryCast HMI project.

Import

To import a project, click **Project → Import**.

Import window:

After import, the project appears in the menu tree.

FactoryCast

The *.cfg* files used for importing a FactoryCast project do not describe the type of module used. Web Designer therefore gives you a list of available modules.

Export

To export a project as a *.zip* file, click **Project → Export**. This function is useful for saving a complete project before modifying it. The project stays open after being exported.

Importing a FactoryCast Project and Web Site into Web Designer

Introduction

You can use Web Designer to import a project—including its embedded web site—that was created with the FactoryCast Configurator tool. The import process consists of three parts:

- Using the FactoryCast Configurator tool:
  - save the project as a configurator (.cfg) file
  - back up the web site as a compressed (.zip) file

- Using Web Designer, import both the saved configurator file and the compressed web site

The steps to accomplish these tasks are described below.
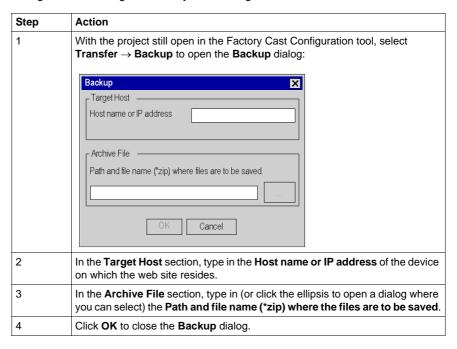
Saving the FactoryCast Configurator File using the FactoryCast Configurator Tool

Follow these steps to save a configurator (.cfg) file using the FactoryCast Configurator tool:

Step	Action
1	Open the project you want to save in the Factory Cast Configuration tool.
2	Select **File → Save As** to open the **Save As** dialog.
3	Use the **Save As** dialog to save the project to the desired location.
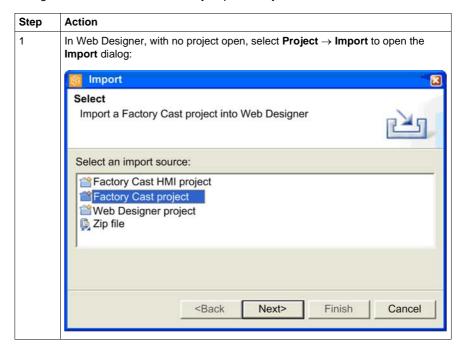
Backing Up the Web Site using the FactoryCast Configurator Tool
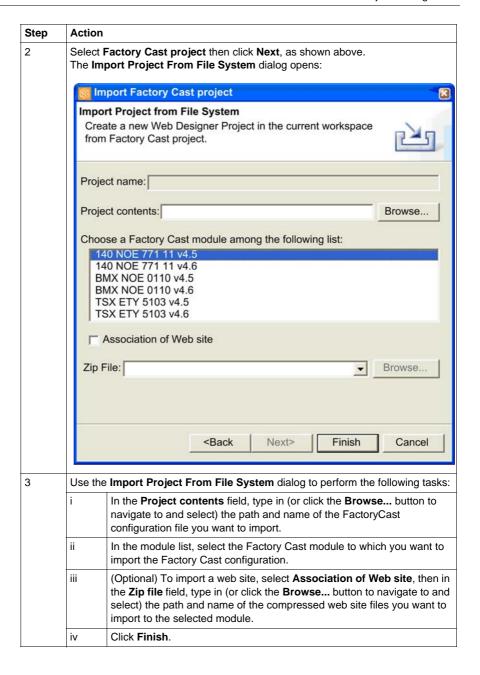
Follow these steps to back up the web site that is associated with the saved configurator file using the FactoryCast Configurator tool:

Step	Action
1	With the project still open in the Factory Cast Configuration tool, select **Transfer** → **Backup** to open the **Backup** dialog:
2	In the **Target Host** section, type in the **Host name or IP address** of the device on which the web site resides.
3	In the **Archive File** section, type in (or click the ellipsis to open a dialog where you can select) the **Path and file name (*zip) where the files are to be saved**.
4	Click **OK** to close the **Backup** dialog.

Importing the FactoryCast Configuration and Web Site Using Web Designer

Follow these steps to use Web Designer to import both the FactoryCast configuration file and the Web Site you previously saved:

Step	Action
1	In Web Designer, with no project open, select **Project** → **Import** to open the **Import** dialog:

Step	Action
2	Select **Factory Cast project** then click **Next**, as shown above. The **Import Project From File System** dialog opens:
3	Use the **Import Project From File System** dialog to perform the following tasks:

	i	In the **Project contents** field, type in (or click the **Browse...** button to navigate to and select) the path and name of the FactoryCast configuration file you want to import.
	ii	In the module list, select the Factory Cast module to which you want to import the Factory Cast configuration.
	iii	(Optional) To import a web site, select **Association of Web site**, then in the **Zip file** field, type in (or click the **Browse...** button to navigate to and select) the path and name of the compressed web site files you want to import to the selected module.
	iv	Click **Finish**.

Upgrading the Target Version of a Project

Presentation

The Upgrade Target Version function enables you to easily upgrade your target from its current version to the latest version available. It updates the website, services and monitoring features remain identical.

NOTE:

- The Upgrade Target Version is only available if a more recent version of your target exists.
- Once upgraded to the last version, the target cannot go back to a prior version

Upgrading Target Version

Step	Action
1	Select the target you want to upgrade in the navigator.
2	Click **Target** → **Upgrade Target Version**. **Result:** the Confirm Update dialog box appears.
3	Click **OK**. **Result:** the Progress Information window appears.
4	Once the upgrade is finished, the Progress Information window disappears and the Upgrading Successful dialog box appears. Click **OK**.

Transfer

4

Subject of this Chapter

This chapter describes how to transfer a website. You can transfer it from the configuration PC to the module or vice-versa. The transfer concerns the Web pages generated by Web Designer for FactoryCast HMI as well as those created by the user. The transfer can be more general and it can include files describing services.

What's in this Chapter?

This chapter contains the following topics:

Transfer

Introduction

These functions enable you to transfer the Data Editor tables, the Graphic Editor pages, the services, the website and its associated files, either from the configuration PC to the target, or from the target to the configuration PC. You must previously advise the target address. Web Designer for FactoryCast HMI carries out a validation on the structure of the project before transferring files to the target.

Setting Up the IP Address
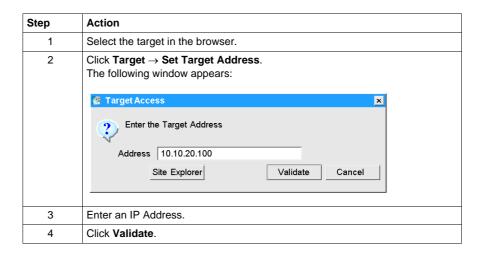
You must set the IP address of the module to perform a transfer. The following table shows how to advise the physical address of the module. Having two devices with the same IP address can cause unpredictable operation of your network.

⚠ WARNING

UNINTENDED OPERATION — DUPLICATE IP ADDRESS

- Make sure that this device will receive a unique IP address.
- Always obtain your IP addresses from your system administrator to avoid the possibility of duplicate addresses.
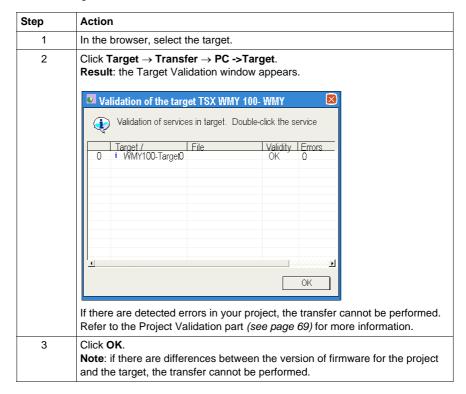
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Step	Action
1	Select the target in the browser.
2	Click **Target** → **Set Target Address**. The following window appears: Target Access Enter the Target Address Address 10.10.20.100 Site Explorer Validate Cancel
3	Enter an IP Address.
4	Click **Validate**.
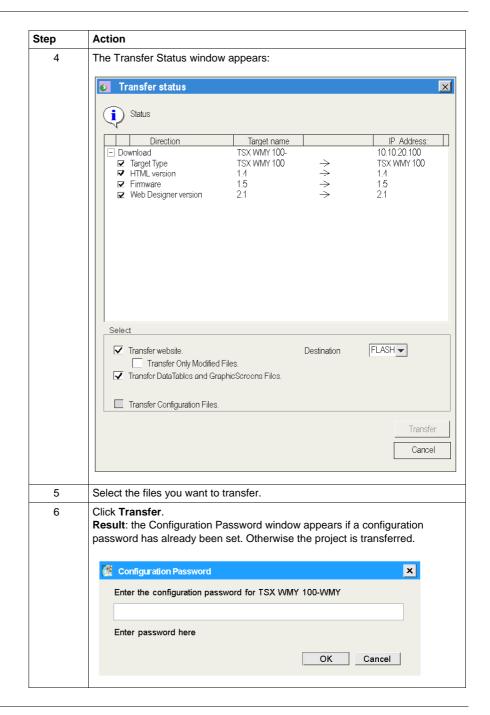
NOTE: You can also advise the address during the creation of the project with the Creation Wizard.

Transferring from the PC to the Target

The following table shows how to transfer data to the module:

Step	Action
1	In the browser, select the target.
2	Click **Target** → **Transfer** → **PC ->Target**. **Result**: the Target Validation window appears. **Validation of the target TSX WMY 100- WMY** Validation of services in target. Double-click the service |	Target /	File	Validity	Errors
0	i WMY100-Target0		OK	0	 OK If there are detected errors in your project, the transfer cannot be performed. Refer to the Project Validation part *(see page 69)* for more information.
3	Click **OK**. **Note**: if there are differences between the version of firmware for the project and the target, the transfer cannot be performed.

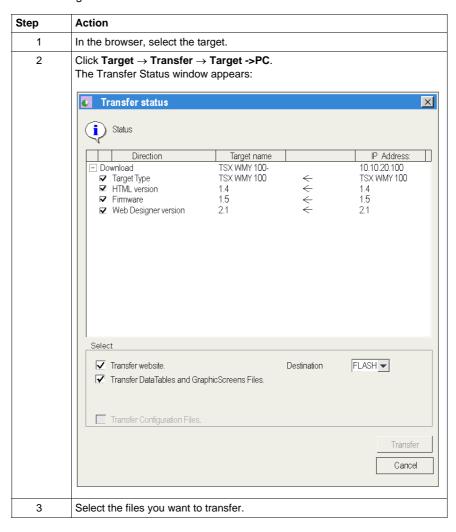| Step	Action
4	The Transfer Status window appears:
5	Select the files you want to transfer.
6	Click **Transfer**. **Result**: the Configuration Password window appears if a configuration password has already been set. Otherwise the project is transferred.

Step	Action
7	Enter the configuration password and click **OK**. **Result**: the Progress Information window appears. The files are displayed one at a time in the Status Bar.

Transferring from the Target to the PC

The following table shows how to transfer data from the module to a PC:

Step	Action
1	In the browser, select the target.
2	Click **Target** → **Transfer** → **Target ->PC**. The Transfer Status window appears: ![Transfer status window]
3	Select the files you want to transfer.

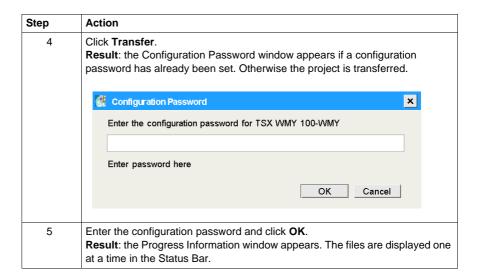| Step	Action
4	Click **Transfer**. **Result**: the Configuration Password window appears if a configuration password has already been set. Otherwise the project is transferred.
5	Enter the configuration password and click **OK**. **Result**: the Progress Information window appears. The files are displayed one at a time in the Status Bar.

Global Transfer

This function lets you transfer the entire project to all the targets associated with it. The transfer is done target by target. The global transfer only works in 1 way, you can transfer from the PC to the targets but not from the targets to the PC. In the last case, you have to manually transfer the files target by target.

To activate the transfer, click **Project** → **Global transfer**. The procedure is exactly the same than a transfer from the PC to the target *(see page 65)*.

Partial Transfer

To save time, it's possible to do only a partial transfer. In the *Website*, *gdt* (graphic pages), *rdt* (data tables) and *Service* directories, the contextual menu authorizes a partial transfer limited to files located in these directories. In this way, you don't have to transfer the entire project if you just modified a small part.

Documentation

To manage online documentation, the user can add Word (*.doc*) or Acrobat (*.pdf*) files to the website in the site directory. The Transfer function lets you copy these files to the target.

Site Explorer

The **Site Explorer View** tab displays all the target files in the lower window. This is especially useful before or after a data transfer, in order to analyze the contents of the target.
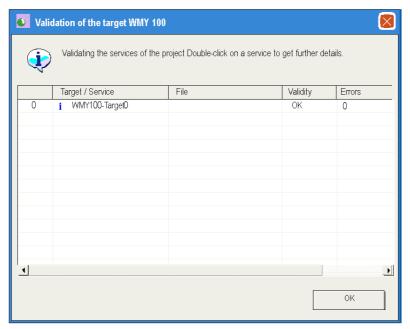
Project Validation

Introduction

Web Designer carries out a validation on the structure of the project before transferring files to the target. If the verification detects anomalies, the transfer is cancelled. Web Designer also performs a comparison between the PC configuration and the target configuration.

Validating a Project

When you start a transfer, Web Designer performs a project validation. You can also validate a project at any time by selecting **Project Validation** in the Project menu.

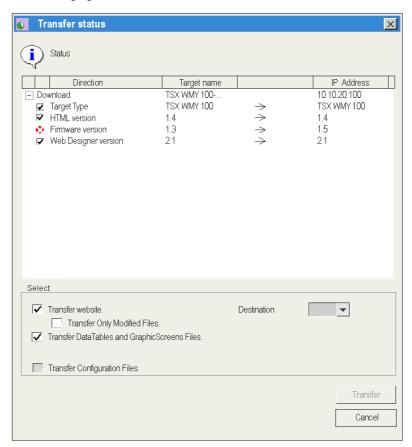The Project Validation window looks like this:

The validation process monitors the following points:
- the available space on the target is bigger than the size of the website,
- the use of a user page or a service, with variables that will not be in the Namespace (file *Namespace.dat*),
- the number of variables is less that the maximum number authorized for the target (1000 variables),
- the detected errors related to services.

Click a line with a message to display the details of detected errors encountered.

Transfer Status

The following figure shows the Transfer Status window:

? The information has not been found on the remote target.

⚠ Inconsistent, non-blocking information between the target and the PC.

✖ Inconsistent, blocking information between the target and the PC.

☑ Consistent information between the target and the PC.

Use the Select area to specify the files you want to transfer:

Parameter	Action
Transfer Website	Select this box to transfer files located in the *Website* directory.
Transfer only Modified Files	Select this box to transfer only files of the website that have been modified since the last transfer.
Transfer DataTables and GraphicScreens Files	Select this box to transfer data tables (*rdt* directory) and graphic pages (*gdt* directory).
Transfer Configuration Files	Select this box to transfer configuration files. This feature is not available for FactoryCast HMI modules.
Destination	Specify the media on which the files will be transferred. This feature is not available for FactoryCast HMI modules.

Connecting/Disconnecting to/from the Module

Introduction

The information below explains the procedure for executing an application once the services have been created.

Transferring a project to the module permanently erases the existing project. When a project is transferred, the old project is overwritten.

Anyone who has access to Web Designer for FactoryCast HMI can modify the value of PLC variables that have been write enabled and also modify your security settings. Unauthorized or incorrect changes to data change the behavior of your application or your process in ways that can be undesirable or even hazardous.

⚠ **WARNING**
UNAUTHORIZED SECURITY ACCESS
• Change or disable default passwords on all devices, since default settings are often easy to find in user manuals. • Change your passwords monthly. • Do not choose simple user names and passwords.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ **CAUTION**
LOSS OF DATA
Backup important information before transferring a new application.
Failure to follow these instructions can result in injury or equipment damage.

NOTE: if an application is in RUN mode, the new project will be taken into account after a module reboot.

Connecting to the Module and Recovering a Project from the Module

The following table shows the procedure for connecting to the module with a view to recovering its application:

Step	Procedure
1	Select the target in the browser.
2	Click **Target** → **Connect** → **Target**. Web Designer for FactoryCast HMI analyses the changes between your project and the module content. If you have modified the project, the software will ask you to transfer the project. Otherwise the application moves automatically to online mode. **Result**: the Configuration Password window appears if a configuration password has already been set. Otherwise Web Designer connects to the module. **Configuration Password** Enter the configuration password for TSX WMY 100-WMY Enter password here OK Cancel
3	Enter the configuration password and click **OK**. **Result**: Web Designer connects to the module.

Disconnecting from the Module

The following table shows the procedure for disconnecting from the module:

Step	Function	Procedure
1	Disconnecting from the module	Click **Target** → **Disconnect**. **Result**: Web Designer for FactoryCast HMI has just switched back to offline mode.

Simulation Mode

5

Scope of this Chapter

This chapter describes the simulation mode. It is a question of debugging the data tables, graphic pages and services without being connected to the target.

What's in this Chapter?

This chapter contains the following topics:

Simulation

Objective

You can simulate your website or your application without using actual devices. This allows you to verify your configuration and test the behavior of your application even if devices are not yet available.

Simulation Mode

Simulation Mode is available with protocols:

- UMAS,
- UNITE,
- Modbus.

Simulation Mode enables you to test the behavior of your application without running it in the module. In this case, the application runs in the configuration PC.

The user can enter pertinent values for variables (symbols). The default values are set to zero. The values are entered manually in the window associated with the device (double-click the device in the menu tree) or they can be automatically incremented.
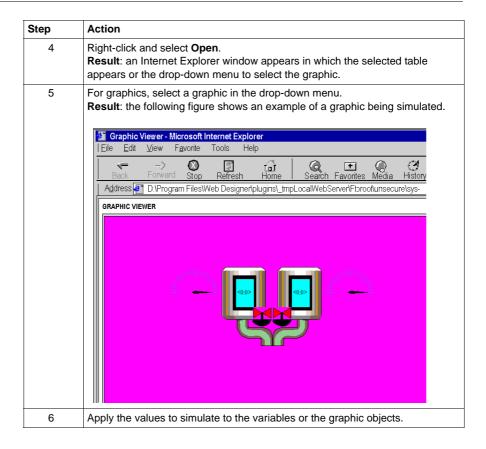
Using the Simulator Icon

The following table shows how to use the simulator icon:

Step	Action
1	In the task bar, right-click on the simulation icon ▶.
2	If you check **AutoIncrement** the variables will be automatically incremented. If you uncheck **AutoIncrement**, the variables will no longer be incremented and you can modify the value of R/W variables. If you check **StopServer**, the simulation stops.

Use of Simulator for Data Tables and Graphic Pages
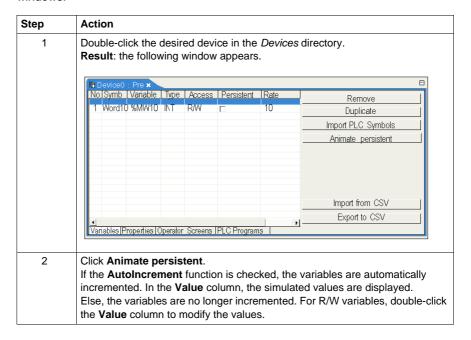
The following table describes how to use the simulator with Data Tables and Graphic Pages:

Step	Action
1	Select a target in a project.
2	Extend the target directory.
3	Select a table in the *DataTables* directory or a graphic in the *GraphicScreens* directory.

Step	Action
4	Right-click and select **Open**. **Result**: an Internet Explorer window appears in which the selected table appears or the drop-down menu to select the graphic.
5	For graphics, select a graphic in the drop-down menu. **Result**: the following figure shows an example of a graphic being simulated.
6	Apply the values to simulate to the variables or the graphic objects.

Use of Simulator for Device windows

The following table describes how to use the simulator with variable and device windows:

Step	Action
1	Double-click the desired device in the *Devices* directory. **Result**: the following window appears.
2	Click **Animate persistent**. If the **AutoIncrement** function is checked, the variables are automatically incremented. In the **Value** column, the simulated values are displayed. Else, the variables are no longer incremented. For R/W variables, double-click the **Value** column to modify the values.

Connecting/Disconnecting to/from the Simulator

Introduction

The following information describes the operating mode for launching an application through the simulator.

The simulator enables you to execute an application without having to connect to a module. It is therefore possible to test the application from a PC before transferring it to the module.

NOTE: The graphic and data editors *(see page 145)* are both active in simulation mode. You can therefore modify these pages in simulation mode.

Once the changes are made, carry out a part transfer in order to reduce transfer time.

Connecting to the Simulator

The following table shows the procedure for connecting to the simulator and transferring the application:

Step	Procedure
1	Select a target in a project.
2	Click **Target** → **Connect** → **Simulation**. You are now connected to the simulator, the application is in simulation mode.

NOTE: Simulation does not work if a FTP server is running on the system.

Disconnecting from the Simulator

The following table shows the procedure for disconnecting from a module:

Step	Procedure
1	Click **Target** → **Disconnect** → **Simulation**. You have just switched back to configuration mode.

Animations

In simulation mode, the variables are animated as follows (value update frequency depends on the update frequency setting):

- bit: value change, 0 or 1,
- word: increment step 1.

Managing Variables

6

Subject of this Chapter

This chapter explains how Web Designer for FactoryCast HMI handles variables. This concerns importing variables, either from a file describing a piece of equipment, or from a file exported by software from the automated program, listing variables from the automated program.

This chapter also presents the file called *Namespace* which groups all these variables. The data and graphics publishers as well as services use these variables.

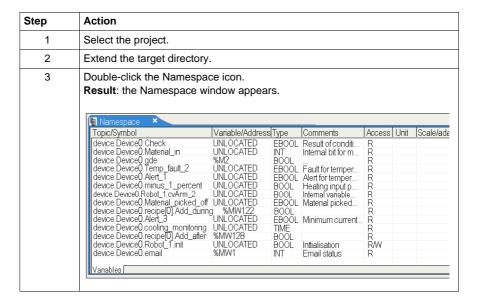**What's in this Chapter?**

This chapter contains the following topics:

Namespace

Introduction

Namespace groups all variables (symbols) previously selected for targets or devices. Data Editors, Graphic Editors, and services get symbols from *Namespace*.

Variables come from either connected devices or from PLC applications. If you connect a device type to the same target several times, compose the name as follows in order to have a unique name: *device.name, variable name*. If the device is a PLC, compose the names of variables declared in the PLC like this: *PLC device.name, PLC variable name.*

Accessing the Namespace

Step	Action
1	Select the project.
2	Extend the target directory.
3	Double-click the Namespace icon. **Result**: the Namespace window appears.

Importing from a Programmable PLC

Introduction

It is possible to access databases with the function Import Symbols:
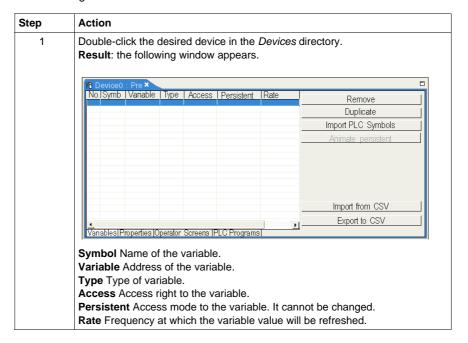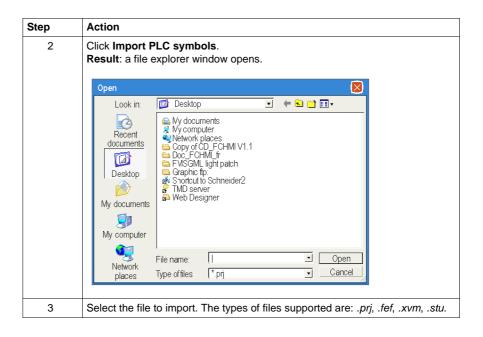
- PL7,
- Concept,
- Unity Pro.

NOTE:

- Depending on the devices that you connect to the target, the type of variables you can access through the target might be different. Refer to the *FactoryCast HMI 1.7 User Manual* for more information on supported variables.
- The number of variables stored in the namespace is limited to 1,000.
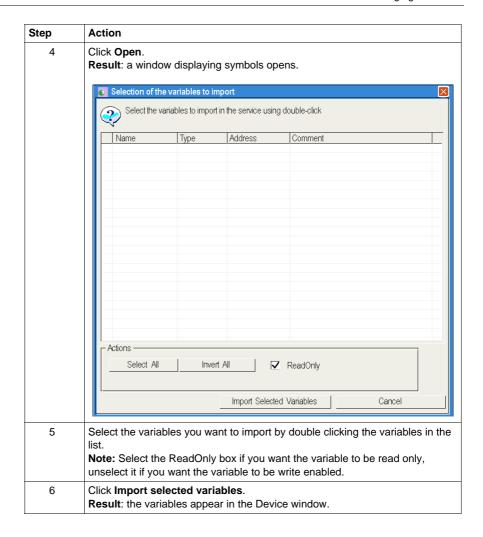
Accessing the Software Database

The following table shows how to access the software database:

Step	Action
1	Double-click the desired device in the *Devices* directory. **Result**: the following window appears. **Symbol** Name of the variable. **Variable** Address of the variable. **Type** Type of variable. **Access** Access right to the variable. **Persistent** Access mode to the variable. It cannot be changed. **Rate** Frequency at which the variable value will be refreshed.

Step	Action
2	Click **Import PLC symbols**. **Result**: a file explorer window opens.
3	Select the file to import. The types of files supported are: *.prj*, *.fef*, *.xvm*, *.stu*.

Step	Action
4	Click **Open**. **Result**: a window displaying symbols opens. ![Selection of the variables to import window showing a symbols table with columns Name, Type, Address, Comment, and Actions section with Select All, Invert All, ReadOnly checkbox, Import Selected Variables and Cancel buttons]
5	Select the variables you want to import by double clicking the variables in the list. **Note:** Select the ReadOnly box if you want the variable to be read only, unselect it if you want the variable to be write enabled.
6	Click **Import selected variables**. **Result**: the variables appear in the Device window.

Description of the Window

The following table shows the buttons in the preceding window:

Button	Function
Remove	Delete the variable.
Duplicate	Duplicate the variable.
Import PLC Symbols	Open a selection window of variables.
Animate persistent	This button is used to switch to animation mode. You must be connected to the module or in simulation mode.
Import from CSV	Import all the variables from a CSV file.
Export to CSV	Export the variables to a CSV file.

Accessing the Concept Base

In order to access a Concept database, you must install the Concept software on your computer. Concept database files have a *.prj* extension.

NOTE: You must set the ExportVariables parameter to 1 in order to be able to import Concept variables. This parameter is located in the *concept.ini* file. It has to be done before saving the project in Concept.

Accessing the PL7 Base

A PL7 database is accessible from any allocated drive. PL7 database files have a *.fef* extension.

Accessing the Unity Pro Base

In order to access a Unity Pro database, you must install the Unity Pro software on your computer. Unity Pro database files have *.stu* extension. It's also possible to use an Unity Pro export file (extension *.xvm*).

Manual Edit

Presentation

You can manually add variables by directly entering a symbol, an address, its type and define the access right in the Variables window of each device.

NOTE: Depending on the devices that you connect to the target, the type of variables you can access through the target might be different.

Automatic Input

Automatic Input is an option that makes easier the manual creation of variables by incrementing the value of the last record.

If you select this option, the value of the fields is automatically filled when you add a new variable. The values correspond to those of the previous line incremented by 1.

Activating / Desactivating Automatic Input:

Options → Automatic Input

Author Rights in Namespace

Presentation

This table enables you to specify which variables can be accessed in read/write mode.

NOTE: Write access is controlled by a password (Security) whose default value is USER.

Unauthorized or incorrect changes to data may change the behavior of your application in ways that may be undesirable or even hazardous.

⚠ WARNING

UNAUTHORIZED CHANGES TO VARIABLES OR DIRECT ADDRESSES.

Carefully select the variables (symbols) and the direct addresses you authorize to be modified online, and the people authorized to do so.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Managing Author Rights

Use the following procedure to manage author rights:

Step	Action
1	In the navigator: ● double-click the **NameSpace Write Access** file or, ● rigth-click the **NameSpace Write Access** file and select **Open**. **Result**: the Window manager for author rights in Namespace appears. <table><tr><td>Start Address</td><td>End Address</td><td></td></tr><tr><td>☑ %MW1</td><td>☑ %MW2</td><td></td></tr></table>
2	Define the intervals at which variables can be written. Outside these intervals, variables with direct access are only accessible to read.

Services

7

Scope of this Chapter

This chapter describes all the built-in FactoryCast services:
- Email,
- Calculation,
- Database,
- Active Pages,
- Datalogging,
- Recipe,
- Recipe Database.

NOTE:

The maximum number of services for
- a 140 NWM 100 00 module is 6.
- a TSX WMY 100 module is 7.

What's in this Chapter?

This chapter contains the following topics:
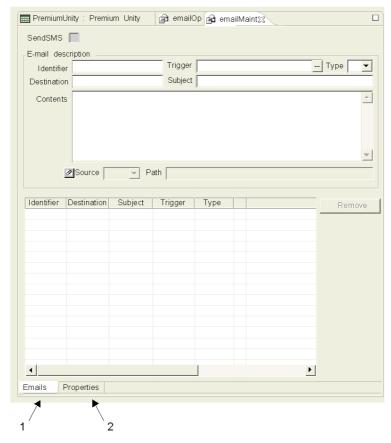
Email Service

General

Use the Email service to send an email if an alarm is triggered, if there is a change in the status of a variable, or if a threshold is overrun, for example.

You can associate Email service with variables coming from your Namespace or the calculation service.

NOTE: Schneider Electric does not guarantee:

- integrity of data sent by the module with the email or SMS service,
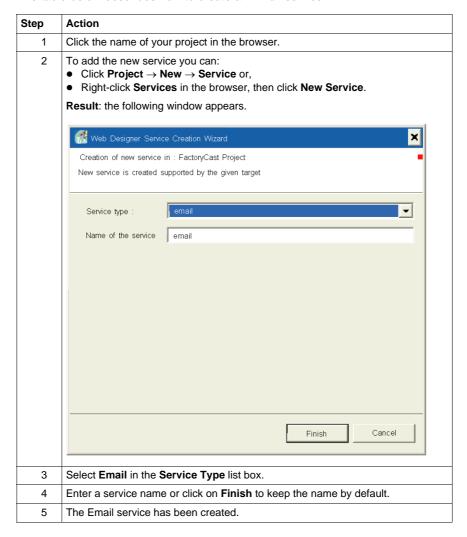- the exactness of the time at which the message has been sent.

Configuration properties screen for Email service:

1 Use this button to configure Emails sent by the email service.
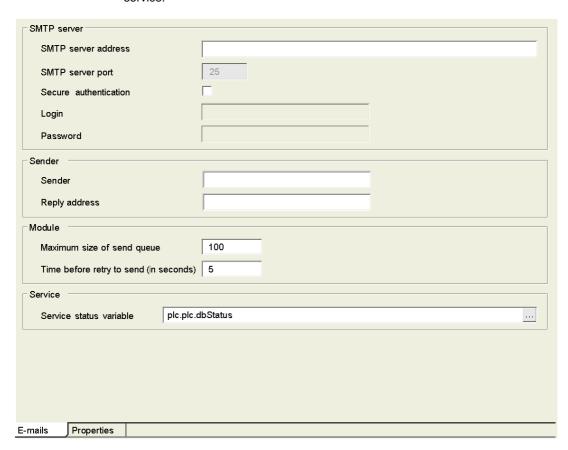**2** Use this button to configure Email properties.

Creating an Email Service

The table below describes how to create an Email service:

Step	Action
1	Click the name of your project in the browser.
2	To add the new service you can: ● Click **Project** → **New** → **Service** or, ● Right-click **Services** in the browser, then click **New Service**. **Result**: the following window appears. Web Designer Service Creation Wizard Creation of new service in : FactoryCast Project New service is created supported by the given target Service type : email Name of the service: email Finish Cancel
3	Select **Email** in the **Service Type** list box.
4	Enter a service name or click on **Finish** to keep the name by default.
5	The Email service has been created.

Configuring the Server

The following table introduces you the properties configuration screen of the Email service:

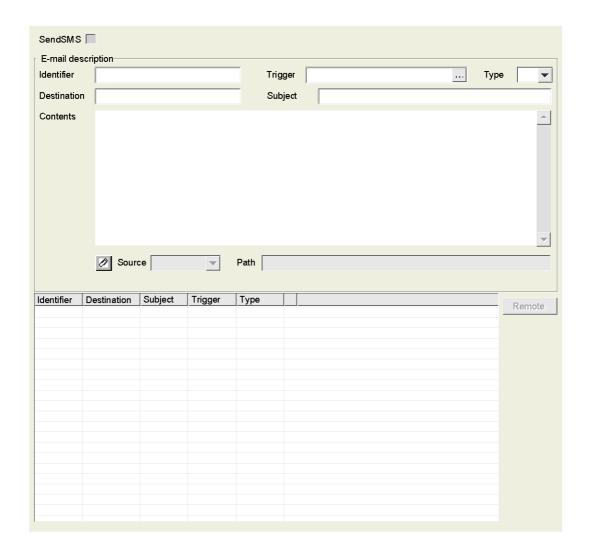The following table introduces you the properties configuration screen:

Fields	Function
SMTP server	
SMTP server address	Address of the SMTP server.
SMTP server port	TCP port used by the SMTP server (generally port 25).
Secure Authentication	Select this box if authentication is needed to access the SMTP server.
Login	Login to access the SMTP server.

Fields	Function
Password	Password to access the SMTP server.
Sender	
Sender	Email address of the sender of the message
Reply address	Email address to which a reply will be sent if the user clicks **Reply**.
Module	
Maximum size of the send queue	Maximum number of emails that can be stored in the buffer memory before being sent: ● Default value = 100, ● Minimum value = 30, ● Maximum value= 200.
Time before retry is sent (in seconds)	Delay before emails stored in the buffer memory are re-sent after failure: ● Default value = 15 s, ● Minimum value = 5 s, ● Maximum value= 3,600 s.
Service	
Service status variable	Used to determine the status of the Email service.

NOTE: When the maximum number of mails is reached (100), no further messages can be stored.

Configuring the Email Service

The Email configuration screen is shown below:

SendSMS ☐

E-mail description

Identifier [   ]   Trigger [   ] [...]   Type [▼]

Destination [   ]   Subject [   ]

Contents [▲]
         [   ]
         [   ]
         [   ]
         [   ]
         [   ]
         [▼]

         🖉 Source [▼]   Path [   ]

Identifier	Destination	Subject	Trigger	Type		

[Remote]

The fields in the Email screen are:

Fields	Function	
Send SMS	This function is not available for FactoryCast HMI products. Select this box to send a SMS instead of an email.	
Identifier	Email address or phone number (SMS) of the sender of the message.	
Trigger	Event that will trigger the Email.	
Type	**NY**: Notify	Triggered by bit status change or word value change.
	RE: Rising Edge	Triggered by a bit rising edge or by an increasing word value.
	FE: Falling Edge	Triggered by a bit falling edge or by a decreasing word value.
	BQ: Bad Quality	Triggered if the trigger status is Bad quality.
Destination	Email address(es) of the receiver(s) of the message.	
Subject	A brief summary of the contents of the message.	
Contents	Type the content of the message in this area.	
	Click this button to attach a file to the email.	
Source	Select the source from which the attached file comes from.	
Path	Specify the path of the file.	

NOTE:

- You can include dynamic data in the message. You can include dynamic data in 2 ways:
  - manually by placing brackets before and after the variable name. If, for instance, you want to know the value of the value1 variable created in the device service, type write {plc.plc1.value1}. You can also include comments before and after the brackets.
  - automatically by double clicking the location where you want to include dynamic data. The lookup table appears and you can select the variables that will appear in the email.
- The following fields are mandatory to record and save an Email: **Identifier**, **Trigger** and **Destination**.

Limitation

The number of message you can configure in the project is restricted to 100.
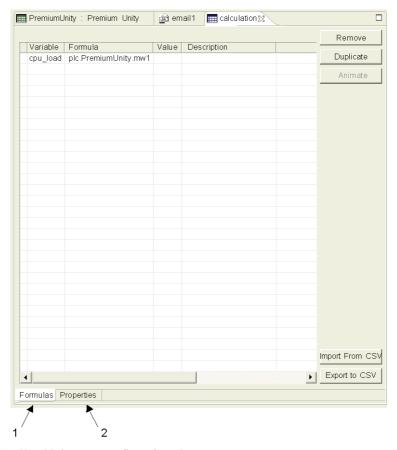
The maximum number of Email service is 2.

NOTE: The SMTP server must allow PLAIN or LOGIN authentication. Other authentication protocols are not supported.

Calculation Service

General

Use the Calculation service to perform operations on or to combine variables. You can also use it to view the result of operations in real time to facilitate application debugging.
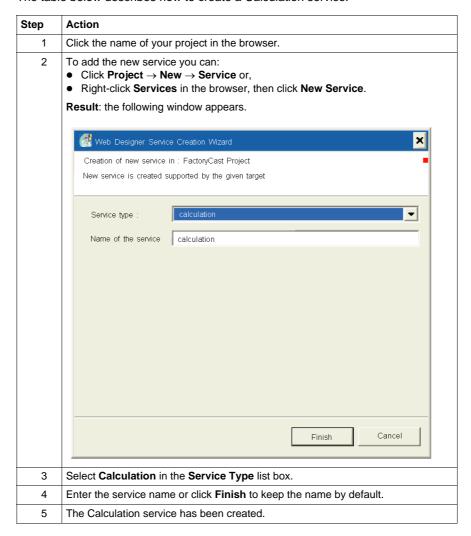
The configuration properties screen for the Calculation service is shown below:

1 Use this button to configure formula.
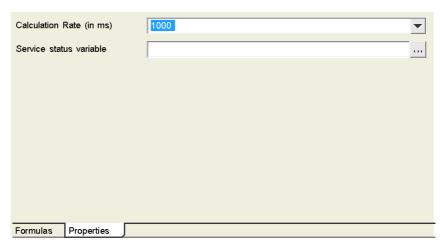**2** Use this button to configure properties common to all formula.

How to Create a Calculation Service

The table below describes how to create a Calculation service:

Step	Action
1	Click the name of your project in the browser.
2	To add the new service you can: ● Click **Project** → **New** → **Service** or, ● Right-click **Services** in the browser, then click **New Service**. **Result**: the following window appears.
3	Select **Calculation** in the **Service Type** list box.
4	Enter the service name or click **Finish** to keep the name by default.
5	The Calculation service has been created.

Configuring the Properties

The following table introduces you the properties configuration screen of the Calculation service:

| Calculation Rate (in ms) | 1000 | ▼ |
| Service status variable | | ... |

Formulas | Properties
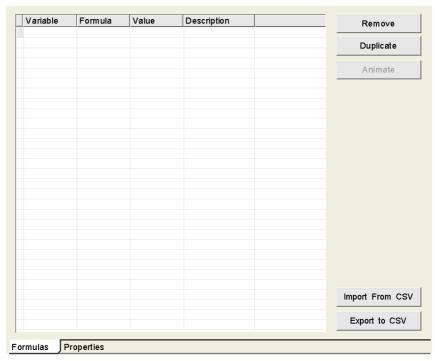
This table describes the fields of the Calculation configuration screen:

Fields	Function
Calculation rate (in ms)	Frequency of execution of formula using variables.
Service status variable	Used to determine the status of the calculation service.

Configuring Formulas

The formula configuration screen for the Calculation service is shown below:

This table describes the fields of the formula configuration screen:

Fields	Function
Variable	Name of the variable. It can be the name of a PLC variable that you set to the value of the calculation result.
Formula	Formula associated with the variables. The operators are limited.
Value	Gives the result of the formula (value of the variable) in real time if your are connected to the module and in animation mode.
Description	Comment on the variable.
Buttons	
Remove	Delete the selected variable from the table.
Duplicate	Duplicate the selected variable.
Animate	Use this button to switch to animation mode. You must be connected to the module or in simulation mode.

Fields	Function
Import from CSV	This button enables you to import symbols from a *.csv* file. You can create this file using Excel or a text editor (in this case, change the *.txt* file extension to *.csv*). You must use the following syntax: *variable;formula;description*.
Export to CSV	This button enables you to export the variable table to a *.csv* file.

List of Available Operators

The following list provides details of numeric binary, boolean and unary operators. The result of the operation is displayed in the Result type column:

Type	Operator	Description	Example
Binary numeric	+	addition	1+2 displays the result "3"
	-	subtraction	5-2 displays the result "3"
	*	multiplication	5*2 displays the result "10"
	/	division	15/3 displays the result "5"
	<	less than	1<2 displays the result "true"
	>	greater than	1>2 displays the result "false"
	<=	less than or equal to	1<=2 displays the result "true"
	>=	greater than or equal to	2>=2 displays the result "true"
	==	equal to	3==2 displays the result "false"
	!=	not equal to	1!=2 displays the result "true"
Boolean numeric	&	and	1+1 displays the result "1"
	|	or	1 | 0 displays the result "1"
Unary	!	inverse	!1 displays the result "0"
	-	sign inversion	-1 displays the result -1
	.<. ? . : .		a<b ? c:d returns c if a<b otherwise the result is d

Execution of Formula

The calculation service periodically executes formula, according to the frequency configured in the **Properties** screen. The formula cells are interpreted then executed one by one from top to bottom. The calculation service updates the associated variable configured in the variable field with the new value.

Limitation

The number of calculations you can configure in the project is restricted to 100.

The maximum number of calculation services is 2.

Database Service

Presentation

This connection enables all internal or process data to be archived so that it can be logged and traced. The data can be archived (written) periodically or for a specific event. These variables can be from PLCs (I/O bits, internal bits, internal words and registers) or local to the module.

Types of database supported:

- SQL server 6.5, 7, 2000, 2005
- MySQL 4.1 or above
- Oracle 8i, 9i, 10i

NOTE: Schneider Electric does not guarantee:

- integrity of data sent by the module with the database service,
- the exactness of the time at which data are logged.

The configuration screen for the Database service is shown below:
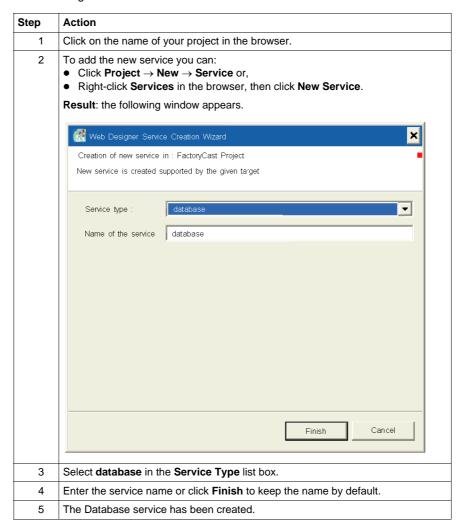
1 Use this button to configure the actions.
2 Use this button to configure the general properties of the database.
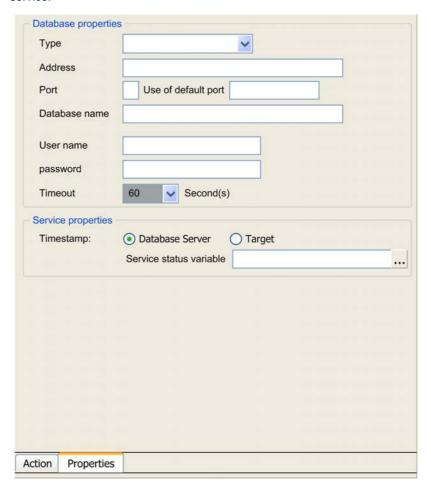
How to Create a Database Service

The following table describes how to create a Database service:

Step	Action
1	Click on the name of your project in the browser.
2	To add the new service you can: ● Click **Project** → **New** → **Service** or, ● Right-click **Services** in the browser, then click **New Service**. **Result**: the following window appears.
3	Select **database** in the **Service Type** list box.
4	Enter the service name or click **Finish** to keep the name by default.
5	The Database service has been created.

Configuring the Properties

The following table introduces the properties configuration window of the Database service:
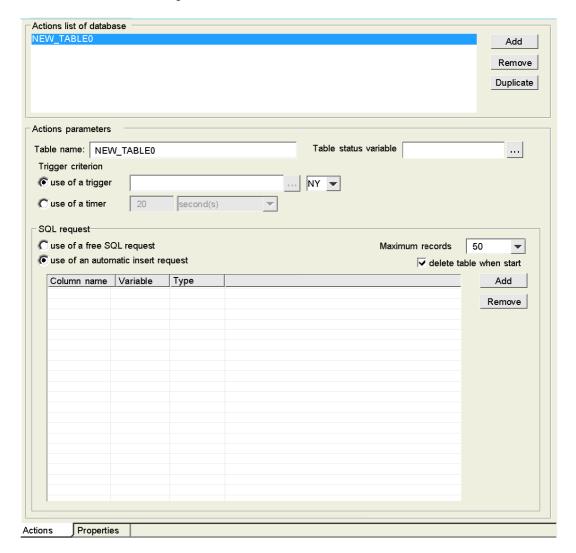
The following table describes the parameters of the database service:

Fields	Function
Type	- Oracle - MySql - SQL Server
Address	IP address of the database server.
Port	Used to validate a default address.
Use Default Port	Port used by the database to access the server.
Database Name	Name of the database that will contain all data configured by the user.
User Name & Password	Username and password for database access (database connection string).
Timeout	Period of time that will be allowed to elapse before the system kills the current process when it improperly operates.
Service status variable	Used to determine the status of the database service.
Timestamp server	The date is taken directly from the server for the dating values it receives.
Timestamp Target	The date is taken directly from the module for the dating values it receives.

Configuring the Log Files

The configuration screen for the Database service is shown below:

The following table describes the fields in the log file configuration screen:

Fields	Function
Actions list of database	List of all tables configured on the server. Use the **Add**, **Remove** and **Duplicate** buttons to create, delete or copy a table. When you duplicate an existing database, the new name will have the suffix _copy added to its original name.
Actions parameters	Name of the new archiving table. If the table does not exist in the database, the database service will create it on the first connection. To trigger variable logging, you must specify an event. This will either be a periodic event (use periodic log), in which case you need to set a time base, or it will be an event associated with a variable (use trigger), in which case you need to provide the name of the variable (for example, calculation.calculation1.Pressure1).
SQL Request	Two options are available: ● create SQL requests in the **Free Text SQL Request** window, or ● use the table provided to specify the name of the column and the variable type and name. In this case, the column name syntax must comply with the database syntax. As a general rule, avoid using punctuation marks, upper case letters and hyphens, (refer to your database documentation).

Database Properties

The table below shows the equivalents of Xopen types for other databases:

Xopen type	MySql	Oracle	SQL Server
BOOLEAN	SMALLINT	NUMBER(1)	SMALLINT
TINYINT	SMALLINT	SMALLINT	SMALLINT
SMALLINT	SMALLINT	NUMBER	SMALLINT
INTEGER	INTEGER	NUMBER	INTEGER
BIGINT	DECIMAL(200)	NUMBER	NUMERIC(38,0)
DOUBLE	DECIMAL(50,80)	NUMBER	FLOAT(32)
REAL	REAL	REAL	REAL
TIMESTAMP	TIMESTAMP	TIMESTAMP	TIMESTAMP
DATE	DATETIME	DATE	DATETIME
VARCHAR	VARCHAR(255)	VARCHAR(255)	VARCHAR(255)
All other types	VARCHAR(255)	VARCHAR(255)	VARCHAR(255)

Limitation

The maximum number of columns is 50 per table.

The maximum number of database connections that can be configured is 10 per service.

The maximum number of database services is 3.

NOTE: The service database contains a buffer that allows it to store a limited number of events in case of communication failure or network disruption. The number of events must not exceed 5000.

Datalogging Service

General

The Datalogging service enables you to backup information such as configuration parameters, variable's values, log files coming from the devices connected to the FactoryCast module into the internal memory of the module.

This can be achieved periodically, or when a specific event occurs (configured by the user).

The file system of the FactoryCast module is accessible from any FTP client. You can specify a URL for automatic sending of the information to a remote FTP server.

You can use the log file to animate a Datalogging history object *(see page 189)* in the Graphic Editor.

NOTE:

- To prolong the internal Flash life, rerun the log file at intervals greater than 30 minutes.
- Schneider Electric does not guarantee the exact time at which data have been logged.
- Back up any log files that are stored in the module's volatile memory so that you are able to restore any lost data.
- In case of loss of power during datalogging, the file that is being backed up is lost.
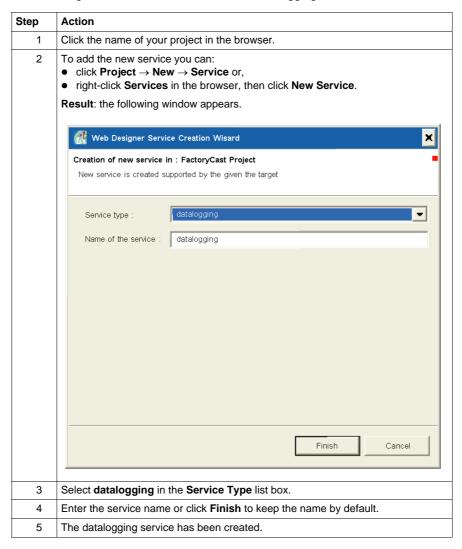
The properties configuration screen of the datalogging service is shown below:

1 Use this button to configure the parameters to be archived.
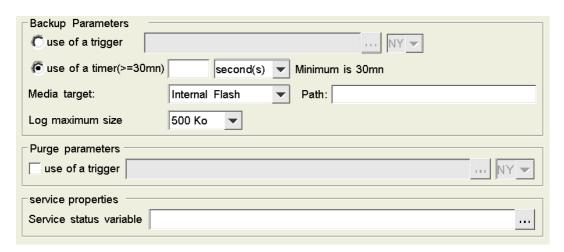**2** Use this button to configure the general properties of the database.

How to Create a Datalogging Service

The following table describes how to create a datalogging service:

Step	Action
1	Click the name of your project in the browser.
2	To add the new service you can: ● click **Project** → **New** → **Service** or, ● right-click **Services** in the browser, then click **New Service**. **Result**: the following window appears.
3	Select **datalogging** in the **Service Type** list box.
4	Enter the service name or click **Finish** to keep the name by default.
5	The datalogging service has been created.

Configuration of Properties

The properties configuration screen of the datalogging service is shown below:
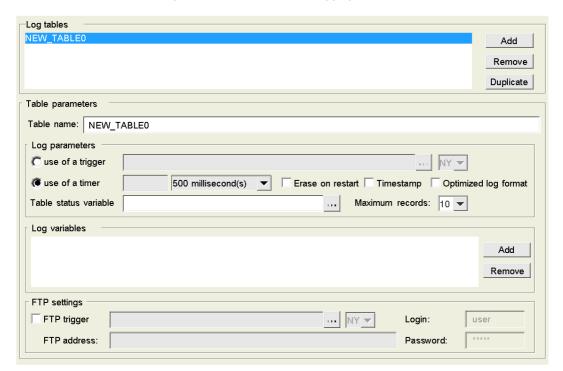
The following table describes the fields of the datalogging configuration screen:

Fields	Function
Backup parameters	
Action parameters	To trigger variable logging, an event must be configured. This will either be a periodic event (use periodic log), in which case you need to set a time base, or it will be an event associated with a variable (use trigger), in which case you need to provide the name of the variable (for example, calculation.calculation1.Pressure1).
Media target	Select the media on which the data will be backup: ● Select **Internal Flash** to store the information on the internal memory of the module. ● Select **Internal Saved RAM** to store the information on the internal RAM of the module (not available for FactoryCast HMI modules). ● Select **CF card** to store the information on the memory card of the module (not available for FactoryCast HMI modules). ● Select **USB Storage** to store the information on a USB memory key connected to the module (not available for FactoryCast HMI modules).
Path	Specify the path of the media selected in **Media target**. The default path is: *NAND\FLASH1\USERDATA*. You can create subdirectories in the *USERDATA* directory. If you want to attached a subdirectory (i.e. *NAND\FLASH1\USERDATA\SUBD1\SUBD2*) to the email, specify its path without typing the default path (i.e. SUBD1\SUBD2).

Fields	Function
Log maximum size	Specify the maximum size of the log file.
Purge parameters	
Use of a trigger	Define the event that will purge the current log file(s) and start new one(s) on service restart.
Service properties	
Service status variable	Used to determine the status of the database service.

Log File Configuration

The configuration screen of the datalogging service is shown below:

The following table describes the fields of the datalogging configuration screen:

Fields	Function
Log Tables	List the current log files stored on the module. It is possible to: ● Create a new log file using the **Add** button. ● Remove a log file using the **Remove** button. ● Duplicate a log file using the **Duplicate** button.
Table name	Name of the log file that will contain all data configured by the user.
Log parameters	
Trigger criteria	To trigger logging of variables, an event must be configured. This will either be a periodic event (**use of a timer**), in which case you need to set a timebase, or it will be an event associated with a FactoryCast variable (**use of a trigger**), in which case you need to provide the name of this variable (for example, calculation.calculation1.Pressure1). It is possible to use both criteria at the same time.
Erase on restart	If the box is checked, the log file will be deleted on restart of the module.
Timestamp	Check this box if you want to have the hour and the date of each event included in the log file. **Note:** Timestamps are mandatory if you want to use the log file for a Datalogging History *(see page 189)*.
Optimized log format	Check this box for optimizing the log file format *(see page 117)* of the *.csv* file. In this case, the variable name doesn't appear in each record.
Table status variable	Used to determine the status of the selected table.
Maximum Records	Configure the maximum of records that can be stored in a log file. If that number is reached, a new log file overwrites the old file.
Log variables	
Log variables	This section is used to configure the log files content. If the **Timestamp** checkbox has been checked, the hour and the date of each event is included in the log file. The **variable name** part lists the variables (PLC or Calculation variables) that will be stored in the log file.
FTP settings	
FTP trigger	Specify the event that will trigger logging of variables via FTP.
FTP address	Type the address of the FTP server.
Login and Password	Protection of FTP access by username and password (default: **userdata/userdata**).

File Format

The file format is fixed and cannot be modified by the user. The file is encoded in pure ASCII format in a text file with a *.csv* extension. Microsoft Excel is able to open these files.

Example of log file:

2003-10-01 02:44:55;plc.plc1.height;150;plc.plc1.length;200;plc.plc1.width;50;
2003-10-01 03:48:08; plc.plc1.height;140;plc.plc1.length;150;plc.plc1.width;30;

2003-10-01 04:55:10;
plc.plc1.height;220;plc.plc1.length;280;plc.plc1.width;80;2003-10-01 06:01:05;
plc.plc1.height;170;plc.plc1.length;220;plc.plc1.width;60;

Example of optimized log file:

Date;plc.plc1.height;plc.plc1.length;plc.plc1.width;

2003-10-01 02:44:55;150;200;50;2003-10-01 03:48:08;140;150;30;2003-10-01
04:55:10;220;280;80;2003-10-01 06:01:05;170;220;60;

Limitation

The memory space allocated to the datalogging service is limited to 500ko.

You must pay attention to the file size of your log file in order to do not reach the limit of 500ko. The estimation of the log file size table *(see page 295)* shows you an estimation of the log file size depending on number of variables and the number of logs.
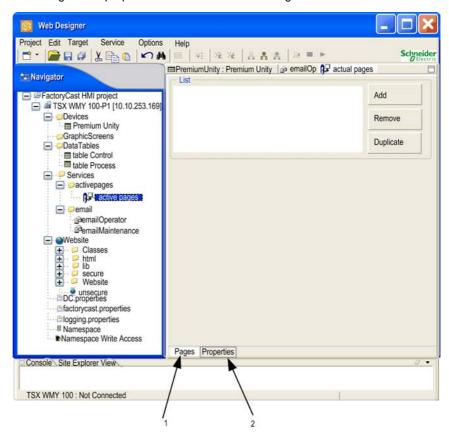
Active Pages Service

Presentation

The Active Pages service enables you to create your own HTML pages to view variables in real time.

This technology has two benefits:

● The Web page displayed only includes data useful for viewing, meaning data size is kept to a minimum (a few KBs).
● The only protocol used for communication with the browser is HTTP, so this technology can bridge all firewalls used in an internet infrastructure.
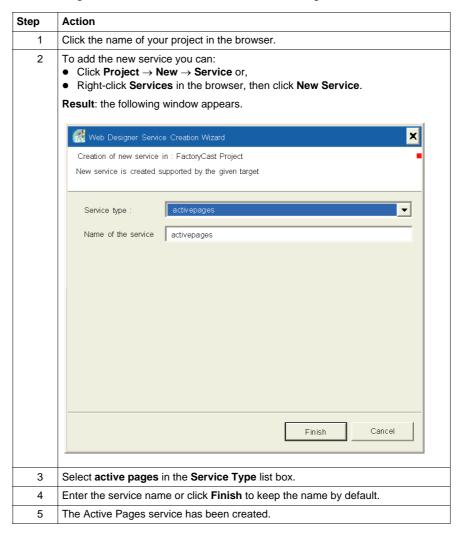
The configuration properties screen of the Active Pages service is shown below:

1 Use this button to configure the Active Pages service.
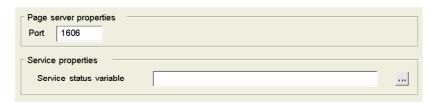**2** Use this button to configure properties of the pages.

How to Create an Active Pages Service

The following table describes how to create an Active Pages service:

Step	Action
1	Click the name of your project in the browser.
2	To add the new service you can: ● Click **Project** → **New** → **Service** or, ● Right-click **Services** in the browser, then click **New Service**. **Result**: the following window appears.
3	Select **active pages** in the **Service Type** list box.
4	Enter the service name or click **Finish** to keep the name by default.
5	The Active Pages service has been created.

Configuring the Properties

The properties configuration screen of the Active Pages service is shown below:

Page server properties
Port 1606

Service properties
Service status variable

The following table describes the fields of the properties configuration screen:
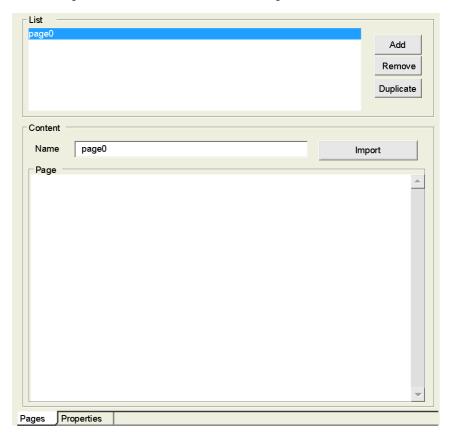
Fields	Function
Port	Active pages port number for the server IP address. The port numbers are between 1024 and 65535. By default, the first port declared will be assigned number 1606.
Service status variable	Used to determine the status of the Active Pages service.

NOTE: It is possible to create two Actives Pages services. In this case, you must configure the two services with different port numbers.

Configuring Pages

The configuration screen of the Active Pages service is shown below:

The following table describes the fields of the configuration screen:

Fields	Function
List	List of all the active HTML pages created with the calculation service on the server. Use the **Add**, **Remove** and **Duplicate** buttons to create, delete or copy a page. When you duplicate an existing page, the new name will have the suffix _copy added to its original name.
Import	Use this button to import complete HTML code from an *.htm* or *.txt* file. You can create the file with Frontpage or a text editor. It overwrites the code already written.
Name	Name of the page currently being created. You can rename the page using this field.
Page	Use this field to write HTML code of the current page or to view code which has been imported. Double-clicking in the field enables you to display the list of variables. If you select one of these variables, it is directly incorporated into the code. You can incorporate calls to applets, bitmaps or HTML tags into the page's HTML code.

Accessing the Pages

To access the pages, use the following syntax:
- http://IP address of module: Active Pages port or
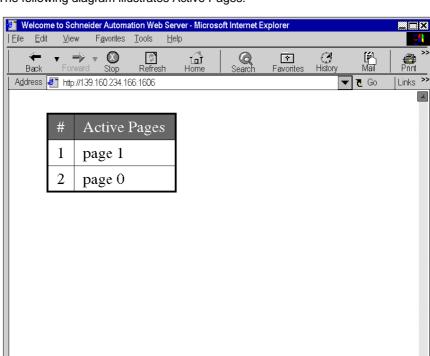- http://domain name of module: Active Pages port

Example:
- *http://139.160.234.166:1606*
- *http://hmi4:1606*

To access a specific page, you must use the following syntax:
- http://IP address of module: Active Pages port / name of page
- http://domain name of module: Active Pages port / name of page

Example:
- *http://139.160.234.166:1606/page0*
- *http://hmi4:1606/page0*

The following diagram illustrates Active Pages:

#	Active Pages
1	page 1
2	page 0

NOTE: Automatic refresh of the page called up is not available by default but you can include a refresh command in the HTML code of the page.

Example of HTML code you can use in a page to be refreshed:

```
<meta http-equiv="refresh" content="1";url=page1>
```

```
where content= "refresh time in seconds";url=name of page to
be reloaded
```

Limitation

The maximum number of active pages is 2 per project.

The active pages service may include up to a maximum of 64 pages in the project.

1,000 variables can be declared for the entire set of project pages.
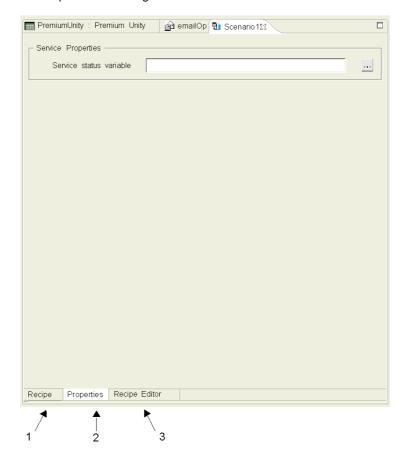
Recipe Service

General

The Recipe service is used following an event to initialize a group of variables set at predetermined values. The predetermined values are stored in an XML file.

For this particular event, the recipe service accesses the recipe file (in XML format) through an HTTP server, reads the values that correspond to the variables, then updates the PLC variables.

This XML file can be created either by using the Recipe Editor, or by using an external tool.

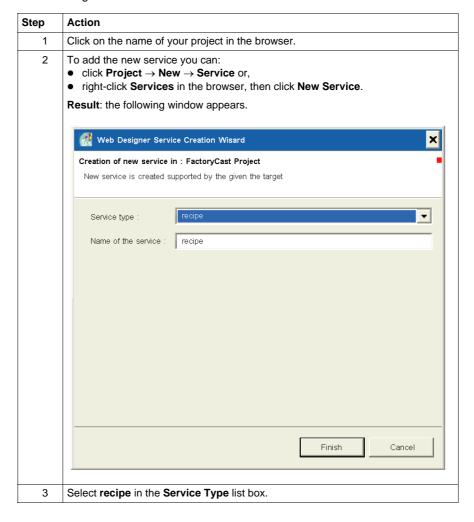The Recipe service configuration screen is shown below:

The numbered references are as follows:

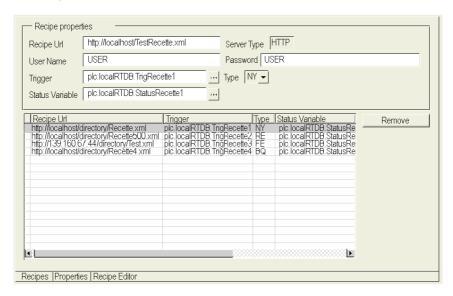| Reference	Function
1	View the Recipe service's status with this tab.
2	Configure recipes' properties with this tab.
3	Configure a recipe's values with this tab.

How to Create a Recipe Service

The following table describes how to create a Database connection service:

Step	Action
1	Click on the name of your project in the browser.
2	To add the new service you can: ● click **Project** → **New** → **Service** or, ● right-click **Services** in the browser, then click **New Service**. **Result**: the following window appears.
3	Select **recipe** in the **Service Type** list box.

Step	Action
4	Enter the service name or click **Finish** to keep the name by default.
5	The Recipe service has been created.

Configuring the Properties

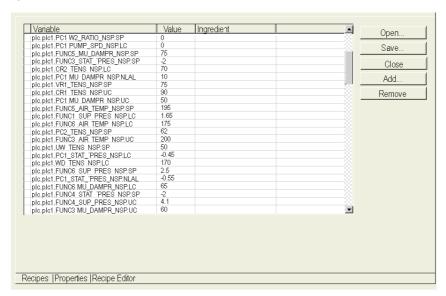The configuration screen of the Recipe service is shown below:

This table describes the various fields that make up the configuration screen:

Field	Function
Recipe URL	Location of the recipe file, with a *.xml* extension. If the file is stored in the module, the URL for accessing it is: *http://localhost/directory/filename.xml*, or *http://IP address of HTTP server/directory/filename.xml*.
Username	Username for connecting to the HTTP server.
Password	Password for connecting to the HTTP server.
Status Variable	Variable that describes the recipe's status: ● 0: no action ● 1: recipe writing in progress ● 60: detected error in recipe configuration ● 61: detected error when writing the value ● 62: communication interruption ● 63: detected error in recipe file
Trigger	Variable from which the event is triggered.

Field	Function	
Type	NY: Notify	Triggered on a bit or word value state change.
	RE: Rising Edge	Triggered on a rising edge for a bit, or a value increase for a word.
	FE: Falling Edge	Triggered on a falling edge for a bit, or a value decrease for a word.
	BQ: Bad Quality	Triggered if the trigger status is "Bad quality".
Remove	To remove a recipe from the list.	

Recipe Editor

The Recipe Editor screen is used to input a recipe's values in an XML-format recipe file:

The following table describes the fields of the recipe editor configuration screen.

Field	Function
Variable	Name of the variable to which a value is to be given.
Value	Value to attribute.
Ingredient	Optional comment to describe the variable's role.
Open	To open an XML-format recipe file.
Save	To save a recipe as an XML file.
Close	To close the Recipe Editor.

Field	Function
Add...	To add a variable.
Remove	To remove a variable.

Adding Variables

This table describes how to add variables:

Step	Action
1	Click **Add**. **Result:** the variable selection box is displayed.
2	Select the variables to insert into the recipe file. Multiple variables may be selected by holding down the Ctrl or Shift keys while left-clicking.
3	Close the window by clicking **Confirm**. **Result:** the selected variables are added to the recipe file.

Saving a Recipe File

This table describes how to save a recipe file:

Step	Action
1	Click **Save**. **Result:** the **Save as** dialog box is displayed.
2	The file must be saved on the disk in order to be transferred to an HTTP server later. If you would like the file to remain local to the FactoryCast HMI module, you must save it in a directory located in the website root of the project currently being configured. For example: *C:\Program Files\Schneider Electric\FactoryCast HMI\workspace\project_name\wwwroot\recipes\my recipe.xml*.
3	Close the window with the **Save** button. **Result:** the recipe file is saved.

Transferring a recipe file to a module

This table describes how to transfer a recipe file to a module

Step	Action
1	In the navigator, select the recipe file to transfer in the directory located under the website root (*wwwroot*).
2	Right-click on **Partial transfer -> :PC -> Module**.

Note

For a recipe file that is not local to the module, you must first transfer it to the target HTTP server without using the FactoryCast HMI configuration application.

Example of an XML File

```xml
<?xml version="1.0" encoding="utf-8" ?> -
<table>-
 <data>
  <name>plc.localRTDB.VarRecette403</name>
   <value>4</value>
   <ingredient>douwn part black</ingredient>
   </data>- <data>
  <name>plc.localRTDB.VarRecette402</name>
   <value>3</value>
   <ingredient>up part blue</ingredient>
   </data>- <data>
  <name>plc.localRTDB.VarRecette401</name>
   <value>2</value>
   <ingredient>left part red</ingredient>
   </data>- <data>
  <name>plc.localRTDB.VarRecette400</name>
   <value>1</value>
   </data>
</table>
```

Limitations

- Recipe files must be accessible by an HTTP server.
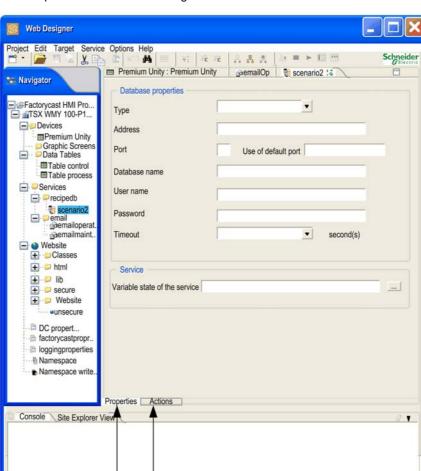- A HMI application can only manage a single recipe service.

Recipe Database Service

Presentation

The Recipe database service enables you to set the value of variables to predetermined values stored in database tables. You can create a scenario or initialize system variables of your system with values stored in a database (SQLServer, MySql and Oracle).

You can also save the state of your system by storing the value of your system variables in database tables.

This can be achieved periodically, or when a specific event occurs (configured by the user).
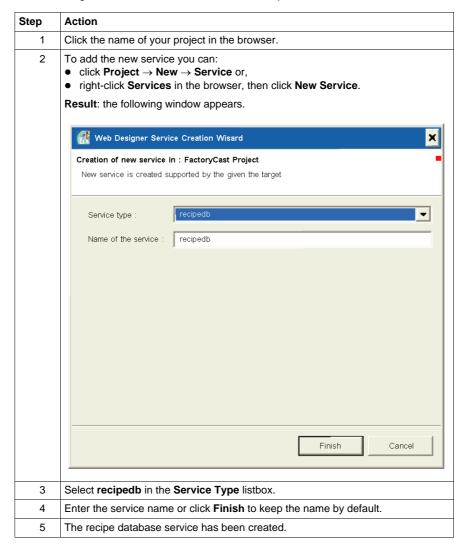
The Recipe database service configuration screen is shown below:

1 Configure the properties of the recipe database system with this tab.
2 Configure the actions to be undertaken with this tab.

How to Create a Recipe Database Service

The following table describes how to create a recipe database service:

Step	Action
1	Click the name of your project in the browser.
2	To add the new service you can: ● click **Project** → **New** → **Service** or, ● right-click **Services** in the browser, then click **New Service**. **Result**: the following window appears.
3	Select **recipedb** in the **Service Type** listbox.
4	Enter the service name or click **Finish** to keep the name by default.
5	The recipe database service has been created.

Configuration of Properties

The properties configuration window of the Database connection service is shown below:

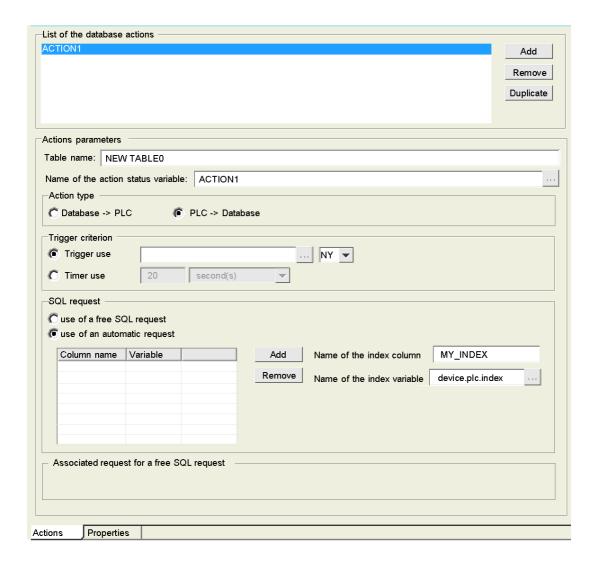The following table describes the fields of the database server configuration screen:

Fields	Function
Type	• Oracle 8i, 9i, 10i • MySql 4.1 or above • SQL Server 6.5, 7, 2000, 2005
Address	IP address of the database server.
Port	Used to validate a default address.
Use Of Default Port	Port used by the database to access the server.
Database Name	Name of the database that will contain all data configured by the user.
User Name & Password	Username and password (database connection string) to access the database server.
Timeout	Period of time that will be allowed to elapse before the system kills the current process when it improperly operates.
Service status variable	Used to determine the status of the recipe database service.

Configuring the Actions

The action screen of the recipe database service is shown below:

List of the database actions

ACTION1

[Add]
[Remove]
[Duplicate]

Actions parameters

Table name: NEW TABLE0

Name of the action status variable: ACTION1 [...]

Action type

○ Database -> PLC   ● PLC -> Database

Trigger criterion

● Trigger use [_____] [...] [NY ▼]

○ Timer use [20] [second(s) ▼]

SQL request

○ use of a free SQL request
● use of an automatic request

Column name	Variable	

[Add] Name of the index column [MY_INDEX]

[Remove] Name of the index variable [device.plc.index] [...]

Associated request for a free SQL request

Actions | Properties

This table describes the fields that make up the action screen:
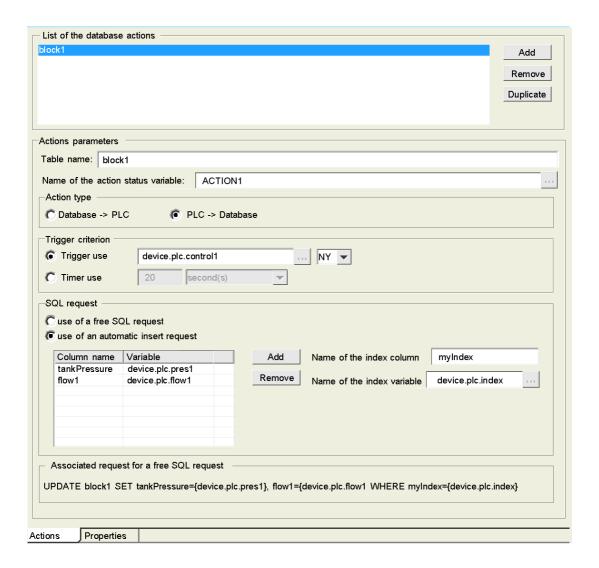
Field	Function	
Name of the status action variable	List the actions already configured.	
Action parameters		
Table name	Type a name to identify the action.	
Action status variable	Type the variable name that will represent the action status.	
Action type		
Database -> PLC	Initialization of your system variable with the value of the database.	
PLC -> Database	Save the current state of the system in the database.	
Trigger criterion		
Trigger use	Specify the variable that will trigger the action.	
	NY: Notify	Triggered on a bit or word value state change.
	RE: Rising Edge	Triggered on a rising edge for a bit, or a value increase for a word.
	FE: Falling Edge	Triggered on a falling edge for a bit, or a value decrease for a word.
	BQ: Bad Quality	Triggered if the trigger status is "Bad quality".
Timer use	Specify the period at which the action will be triggered.	
SQL request		
Use a free SQL request	Type your SQL request using the SQL syntax. In this case the screen looks like this: 	

Field	Function
Use of an automatic request	This function enables you to update tables without using a SQL syntax. Refer to the following paragraph for more information. Use the table provided for this purpose specifying the name of the column and the type of the variable. In this case, the column name syntax must comply with the database syntax. As a general rule, avoid using punctuation marks, upper case letters and hyphens (refer to your database documentation). **Note:** The name of the action and the name of the table are identical if you use Automatic Request therefore you cannot read and write to the same table in that case. Use the free SQL request to precise the name of the table.
Associated request for a free SQL request	This part displays the SQL request syntax corresponding to the automatic request you have entered.

Automatic Request Example

In this example, you will update the block1 table in the database with PLC values when the state of the device.plc.control1 variable changes.

The following figure shows you the window that corresponds to the example:

List of the database actions

block1

[Add] [Remove] [Duplicate]

Actions parameters

Table name: | block1

Name of the action status variable: | ACTION1 | ...

Action type

○ Database -> PLC   ◉ PLC -> Database

Trigger criterion

◉ Trigger use | device.plc.control1 | ... | NY ▼

○ Timer use | 20 | second(s) | ▼

SQL request

○ use of a free SQL request
◉ use of an automatic insert request

Column name	Variable
tankPressure	device.plc.pres1
flow1	device.plc.flow1

[Add] [Remove]

Name of the index column | myIndex

Name of the index variable | device.plc.index | ...

Associated request for a free SQL request

UPDATE block1 SET tankPressure={device.plc.pres1}, flow1={device.plc.flow1 WHERE myIndex={device.plc.index}

Actions | Properties

Step	Action
1	Create a recipe database service.
2	Click the **Actions** tab.
3	Type the name of the table you want to update (i.e. block1) in the **Table name** field.
4	Specify a variable that will represent the action status (i.e. ACTION1) in the **Name of the action status variable** field.
5	Select Database -> PLC in the **Action type** area.
6	Select use of a trigger in the **Trigger criterion** area and select the variable that will trigger the action by clicking . You also have to specify the type of event that will trigger the action (i.e. NY).
7	Select use of an automatic request.
8	Click **Add** and type tankPressure for the column name. The column name syntax must comply with the database syntax.
9	Select the corresponding variable (i.e. device.plc.pres1) by clicking on the left side of the **Variable** field.
10	Redo step 8 and 9 to add the values of device.plc.flow1 in the flow1 column.
11	Specify a name for the index of the table and select a variable to store the index value.

Limitations

Web Designer for FactoryCast HMI only manages a single recipe database service.

The maximum number of tables is 20 per service.

The maximum number of columns is 50 per table.

Service Status

The main purpose of the service status is to provide feedback on the services.

The status value of the service (email, plc, database, calculation...) is copied to a device variable using the Service properties screen. By default, each service has a FactoryCast HMI module internal status variable named as follows: "service type.service name.sstatus" (e.g. device.plc1.sstatus).

This status variable can be used to send out an email (alarm), to trigger archiving to a database, for management (sending alarm in supervision mode) or for any other action possible in the FactoryCast HMI application.

Example:

To send an email with the database service, you must:

● declare a dbStatus variable in the device and assign it to an address (integer, for example), then import this variable into the device service,
● define the dbStatus variable to trigger an email in the email service.

The service property configuration screens all have a 'service status variable' field. An illustration of what it looks like and how it is configured is shown below:

Service properties
Service status variable   device.plc.dbStatus   ...

Simply click on... to display a variable selection window which can be configured, by selecting from a list of INT, UINT, SHORT and USHORT type.

The status values are:

● 0 for a stopped service,
● 1 for a service that is running,
● ≥2 for a service on which an anomaly has occurred,

The codes are assigned in ascending order of severity.

In case of 2 events, the status value corresponds to the most important one.

When a new action is operational (log, creation of a table, etc.), the service is assigned the value 1 to inform you that the service is operating correctly.

Each service has its own codes.

Device Service Codes

Value	Comment
0	The service is stopped.
1	The service is running.
2	The PLC application's signature is different from the one contained in the FactoryCast HMI application for the device service.

NOTE: Value 2 will only be accessible from the service's internal status variable (i.e. device.plc.SSTATUS). This value will not be copied to the device variable (except if the variable belongs to another accessible device).

RecipeDB Services Codes

Value	Comment
0	The service is in stop mode.
1	The service is in run mode.
20	Log in table delayed.
21	No access to table.
22	Table no longer exists.
23	Database connection anomaly.
24	Incorrect service configuration.
25	Fatal detected error.

NOTE:

The value 20 should be considered to be a system message, not an alarm. It may occur when:
- the service is started (value not ready),
- the PLC has not had the time to send the data as part of the request,
- the signature of the PLC application is different to that of the FactoryCast HMI application.

The high values take priority. Code 23 has priority over code 21. When code 23 has been corrected, the value 21 can then be sent to the variable declared for the status of the service.

Database Services Codes

Value	Comment
0	The service is in stop mode.
1	The service is in run mode.
20	Log in table delayed.
21	Access to table.
22	Table no longer exists.
23	Database connection anomaly.
50	Buffer is full.
100	Anomaly database configuration.
200	Database undefined.
1000	Fatal detected error.

NOTE: Code 50 : buffer full - The database buffer is full, the new events are not stored anymore. A reconnection of the database or the ethernet cable is required to send the values to the database and store new coming values.

NOTE:

The value 20 should be considered to be a system message, not an alarm. It may occur when:
● the service is started (value not ready),
● the PLC has not had the time to send the data as part of the request,
● the signature of the PLC application is different to that of the FactoryCast HMI application.

The high values take priority. Code 23 has priority over code 21. When code 23 has been corrected, the value 21 can then be sent to the variable declared for the status of the service.

Email Service Codes

Value	Comment
0	The service is in stop mode.
1	The service is in run mode.
10	Email refused by SMTP server.
11	Email not sent, due to a connection interruption.
12	No more connections or queue saturated.

NOTE: The high values take priority. The value 12 has priority but becomes 11 subsequently. Code 11 disappears once the email has been sent correctly.

Datalogging Service Codes

Value	Comment
0	OK.
2	The current file '.csv' is renamed '.cs0'.
10	The module cannot reach a variable that should be logged because: ● the variable does not appear in the Web Designer namespace. ● the variable is not write enabled. ● the preceding value has not been updated yet.
11	FTP transfer interruption.
12	The URL specified for FTP cannot be accessed.
13	The internal flash is full
14	The internal RAM is full.
15	The module cannot write on the media specified.
16	The module cannot access the namespace.
17	The maximum number of tables has been reached (10 maximum) in your *.xml* file.
18	The maximum number of variables has been reached in a table.
19	The service is empty, no table defined.

NOTE:

- The value 2 should be considered as a warning, not an alarm.
- The high values take priority. For example: code 17 has priority over code 12. When code 17 has been corrected, the value 12 can then be sent to the variable declared for the status of the datalogging service
- If all tables status values are 0, the service status is set to 1 (for running state).
- The values of the table status variable are identical to the values of the datalogging service status variable.

Recipe Service Codes

Value	Comment
0	The service is in stop mode.
1	The service is in run mode.
60	Detected error in recipe configuration.
61	Detected error when writing the value.
62	Communication error.
63	Error in recipe file.

Codes for Other Services

The other services (calculation, active pages) do not have any specific values. The code only specifies whether the service is stopped (0) or running (1).

Value	Code	Comment
0	Stop	The service is in stop mode.
1	Run	The service is in run mode.

Monitoring

8

Subject of this Chapter

This chapter presents the different ways provided by Web Designer for FactoryCast HMI to monitor your system.

What's in this Chapter?

This chapter contains the following sections:

8.1 Data Editor

Overview

The Data Editor allows you to edit/create data monitoring tables or to display Data tables. Data tables provide read/write access to application data and devices registers. Write access is password protected.

Allowing write access can change system behavior.

⚠ **WARNING**

UNINTENDED OPERATION

● Make sure variables that can be written are accessible by trained personnel only (password protect).
● Do not give write access to critical control variables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This section shows how to use the Data Editor to display and modify the values of the symbol variables and direct addresses.

What's in this Section?

This section contains the following topics:

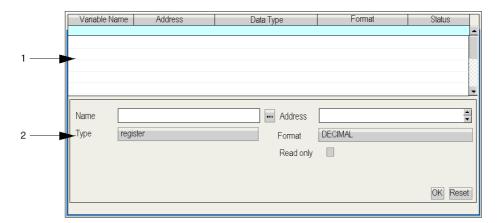| Topic	Page
Data Editor	147
Creating a Data Template	148
Data Editor Spreadsheet	149
Inserting a Symbol (Variable) in a Data Template	152
Inserting a Direct Address in a Data Template	154
Using an Existing Data Template	155

Data Editor

Overview

Data Editor is a Java applet that enables you to create dynamic data tables that can be updated with run-time data from the PLC.

Elements of Data Editor

The following illustration shows you the Data Editor:

Number	Description
1	List of the variables included in this table.
2	The configuration area makes it possible to: ● select and/or modify a symbol, ● select and/or modify an address, ● select the variable type, ● select the variable's display format, ● check the read-only option.
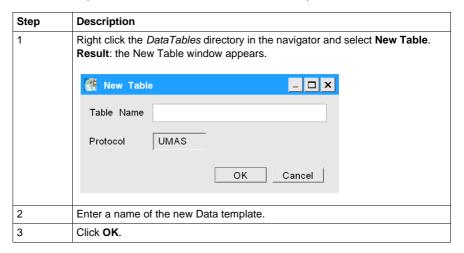
Creating a Data Template

Overview

To display some symbols (variables), you must create a new data template.

Creating a Data Template

Follow the steps in the table below to create a data template:

Step	Description
1	Right click the *DataTables* directory in the navigator and select **New Table**. **Result**: the New Table window appears.
2	Enter a name of the new Data template.
3	Click **OK**.

NOTE: Save the current spreadsheet before selecting a new spreadsheet. Selecting a new spreadsheet deletes the current spreadsheet.
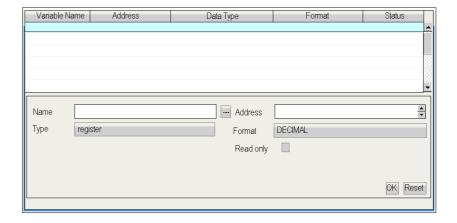
Data Editor Spreadsheet

Overview

Depending on the target, the Data Editor displays data in a spreadsheet with the following fields:

- name,
- address,
- type,
- read only,
- format,
- status.

This section describes the spreadsheet screen and gives an explanation of each field.

Spreadsheet

The following figure shows the Data Editor spreadsheet:

Field Name

The fields in the Data Editor screen are:

Fields	Function
Name	The Name column contains the names of symbolic variables from the Namespace. The symbolic variables which may be used in the Data Editor are those that have been predefined by the configuration tool. The symbolic variables are grouped in a file called *Namespace*.
Address	The Address column contains the addresses of the symbols. You can display any direct address by entering its reference in this field. This direct address does not need to be referenced in *Namespace*. However, a symbol must be associated with this direct address.
Type	Data type *(see page 150)*: input or output register, input or output bit.
Format	Format *(see page 151)* of the data value.
Read Only	If this box is selected the variable cannot be output directly.

Type Field

The Data Type field contains the data type of the symbol variable or direct address. The types of data of the symbolic variable appear automatically when the symbol variable is located. Direct address data types must be set by the user from a drop-down list.

The following data types are valid:

Abbreviation	Data type
INT	16-bit signed integer
UINT	16-bit unsigned integer
DINT	32-bit signed integer
UDINT	32-bit unsigned integer
REAL	32-bit IEEE floating point
TIME	32-bit unsigned integer (in ms)
DATE	Date (32-bit BCD)
TOD	Date/time (32-bit BCD)
BOOL	1 internal bit (boolean)

Format Field

The Format field contains the format type for displaying the value of the symbol variable or direct address. The following formats are accepted:

Abbreviation	Format Type
bool	Boolean
dec	Decimal
hex	Hexadecimal
binary	Binary
ASCII	Bytes displayed as ASCII characters
time	Day_hr_min_sec_ms
date	YYYY-MM-DD or HH:MM:SS

Status Field

The Status column contains messages about the status of communications with the symbol variable or direct address. If communications are normal, the status message is "OK".

If communication with a simple variable or a direct address is not operational, the Status column displays a message describing the event.

Inserting a Symbol (Variable) in a Data Template

Overview

If you want to view or modify the value of a symbol (variable) in the Namespace, you must insert that symbol (variable) in a data template.

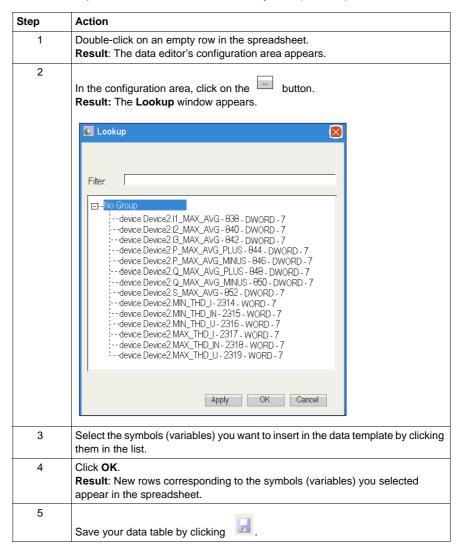| ⚠ WARNING |
| --- |
| **UNINTENDED EQUIPMENT OPERATION** |
| Password-protect access to the embedded server. Carefully select the symbols and direct addresses you authorize to be modified online. Do not authorize online modifications of critical process variables. |
| **Failure to follow these instructions can result in death, serious injury, or equipment damage.** |

Inserting a Symbol (Variable)

Follow the steps in the table below to insert a Symbol (variable):

Step	Action
1	Double-click on an empty row in the spreadsheet. **Result**: The data editor's configuration area appears.
2	In the configuration area, click on the [...] button. **Result:** The **Lookup** window appears.
3	Select the symbols (variables) you want to insert in the data template by clicking them in the list.
4	Click **OK**. **Result**: New rows corresponding to the symbols (variables) you selected appear in the spreadsheet.
5	Save your data table by clicking [save icon].

Inserting a Direct Address in a Data Template

Presentation

If you want to view or modify the value of a direct address, you must insert that direct address in a data template.

Allowing write access can change system behavior.

<table>
<tr><td colspan="2" align="center">⚠ WARNING</td></tr>
<tr><td colspan="2">UNINTENDED EQUIPMENT OPERATION

● Limit embedded server access to qualified personnel.
● Password-protect access to the embedded server.
● Carefully select the symbols and direct addresses you authorize to be modified online.
● Do not authorize online modifications of critical process variables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.</td></tr>
</table>

Inserting a Direct Address

Step	Action
1	Double-click on an empty row in the spreadsheet. **Result**: The data editor's configuration area appears.
2	In the **Address** field of the configuration area, enter the variable's Direct address.
3	In the configuration area, click on **Apply**. **Result:** A new row that corresponds to the variable address is displayed in the spreadsheet.

Using an Existing Data Template

Overview

Once you have created data templates, you may want to access or modify them.

Accessing a Data Template

The following procedure shows you how to access a existing data template.

Step	Action
1	Extend the *DataTables* directory in the navigator. **Result**: The existing tables appear in the navigator.
2	● Double click the table you want to modify in the list or, ● Right click the table you to modify and select **Edit**. **Result**: The selected table appears in the editing zone.

8.2   Graphic Editor

Subject of this Section

This section describes the functions and characteristics of the Graphic Editor. The Graphic Editor is a Web page that enables the user to create dynamic graphic displays with a browser and using a predefined set of graphic objects. The Graphic Editor is both a graphic editor that can be used to create and modify displays, and a Runtime environment that allows the user to view animated displays using data from the PLC.

What's in this Section?

This section contains the following topics:

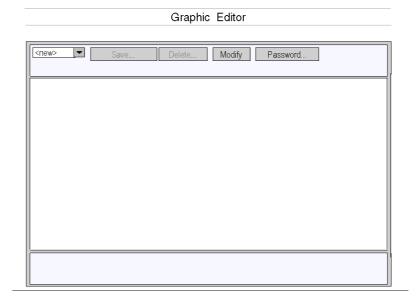## Overview of the Graphic Editor

Top Window

The Graphic Editor is made up of three windows. The top window features an area for presenting the user commands and dialog boxes for creating, saving, reading and editing a graphic display.

Display Window

The display window proposes a presentation area of the current graphic display. When you create a new graphic display, this window turns into a blank space into which you can add the graphic objects that will make up the required graphic display.

Message Window

This window proposes a scrolling message window used to display the messages generated by the Graphic Editor. The figure below shows the Graphic Editor with its initial top window and display window.

Graphic Editor

<new>	Save...	Delete...	Modify	Password...

Graphic Objects

All the graphic objects supplied with the Graphic Editor are able to communicate with the PLC. They are also designed as standalone objects, which means no connection is needed between the objects, and that each object is capable of operating on its own.

Allowing write access can change system behavior.

⚠ **WARNING**

UNINTENDED EQUIPMENT OPERATION

- Password-protect access to the embedded server.
- Carefully select the symbols and direct addresses you authorize to be modified online.
- Do not authorize online modifications of critical process variables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Write access is controlled by a password (Security) whose default value is USER.

Creating and Modifying Graphic Displays

If you wish to create and modify a graphic page, click **Modify...** which will give you access to the specific editing functions. Then, simply select the objects from the palette, place them in a space, move them and adjust their size, and define their properties. You can immediately test the graphic display updated with the PLC data by quitting edit mode (click **Done**). If you want to keep the graphic display you have created, you can save it in the PLC for future use by clicking **Save...**, on condition you have entered the correct password.

NOTE: Be careful when you modify and save a graphic page, the last modifications will be saved and will overwrite the existing page even if someone else has created it.

Toolbar

Overview

The Graphic Editor applet's top window consists of several "dialog panels," only one of which is shown at a time. Switching from one dialog to another is done by clicking buttons on the current dialog. This section describes the dialog panels that comprise the top window.

Top Dialog

The **Edit Dialog** allows you to select a graphic object for placement in the display window, and provides access to all graphic editing functions. The available graphic objects are presented in a set of palettes, with one palette visible at a time. There are two palettes.

The standard palette:

The extended palette:

The controls in the **top dialog box** provide the following functions.

- **Drop-down List**. The drop-down list box shows all the graphic pages that have been saved to the FactoyCast HMI module, and are available for retrieving. When you select a graphic page from this list, the graphic display currently visible in the window is replaced with the one selected. If the current graphic page has been modified since it was last saved, you will be asked for confirmation that the changes are to be discarded. If the special entry <new> is chosen from the list, then the display window is cleared, and a new graphic page can be created.
- **Save**. The **Save** button causes the **Save dialog box** to become visible. This button is disabled until you have entered a correct write-enable password.
- **Delete**. The **Delete...** button causes the **Delete dialog box** to become visible. This button is disabled until you have entered a correct password, or if the current graphic display has not yet been saved.
- **Edit**. The **Edit...** button causes the **Edit dialog box** to become visible.
- **Password**. The **Password...** button causes the **Password dialog box** to become visible.
- **Information display area**. The information display area shows the name and version of the Concept, PL7 or Unity Pro program that is running in the connected PLC.

Save Dialog

The **Save dialog box** allows you to save the current graphic display.

Save graphic display as: [_____]
OK | Cancel

When the **Save dialog box** is presented, the name of the current graphic page is shown in the dialog's text field. If the current graphic page has never been saved (i.e., a "new" graphic display), then the text field is blank. Once you have either accepted the current name (a "save" operation) or provided a new name (a "save as" operation), then you can click the **OK** button to save the contents of the current graphic display to the Web server module. The **Cancel** button will cause the **Top dialog box** to be shown again, with no action being taken.

Delete Dialog

The **Delete dialog box** allows you to delete the current graphic page.

Delete graphic display library?
Yes | No

If you click the **Yes** button, the existing graphic display window is cleared and the graphics file on the Web server module is deleted. Clicking the **No** button will cause the **Top dialog box** to be shown again, with no action being taken.

Password Dialog

The **Password dialog box** allows you to enter the password that enables those user functions that modify graphic display files or PLC run-time data values.

Password to allow write access: [_____]
OK | Cancel

If you enter the correct password and click the **OK** button, then you will be allowed to save and delete the current graphic display. Correct password entry also permits you to write new values to the PLC (via those graphic objects that support writing values to a PLC, if any). If you click the **OK** button when the text field is empty, then the current password permissions, if any, are cleared. The **Cancel** button will cause the **Top dialog box** to be shown again, with no changes made to current password permissions.

Edit Dialog

The **Edit dialog box** allows you to create or modify a graphic page, by selecting a graphic object for placement in the display window, and accessing all the graphic editing functions. The graphic objects available are presented in a single object palette.
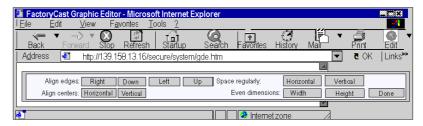

The controls of the **Edit dialog box** provide the following functions:
- The **Drop-down List Box** shows the set of palettes that are available. When you select the name of a palette from the list, the palette area of the dialog displays the selected one's graphic objects.
- The **Palette** shows the graphic objects that are in the current palette with an icon that depicts each graphic object's type (meter, button, etc.). When you click any of the icons in the palette, a graphic object of the corresponding type becomes selected for insertion. While the Graphic Editor is in "insert mode," if you click in an open area of the display window, an instance of the selected graphic object is inserted into the graphic display.
- The **Information Area** shows the name and size of the graphic object that is currently selected.
- The **Cut** button causes the currently selected graphic object(s) to be removed from the graphic display and saved to a buffer (i.e., an internal clipboard), replacing any existing contents of the buffer.
- The **Copy** button causes the currently selected graphic object(s) to be copied to the buffer, replacing any existing contents.
- The **Paste** button causes the content of the clipboard to be inserted into the upper left corner of the graphic display. The pasted graphic objects can then be moved to the desired location in the display.
- The **Properties** button causes the Properties Sheet for the currently selected graphic object to be shown.
- The **Customize** button causes the Customizer for the currently selected object to be shown, if the graphic object has been provided with one.
- The **Layout** button shows the **Layout dialog box**.
- The **Options** button shows the **Options dialog box**.
- The **Done** button causes the **Top dialog box** to be shown again.

Layout Dialog

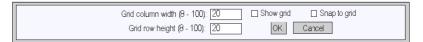The **Layout dialog box** allows you to change the position and size of a group of graphic objects.

The controls of the **Layout dialog box** provide the following functions.

- The **Right**, **Bottom**, **Left**, and **Top** buttons can be used to align the edges of the selected graphic objects so that their specified sides are at the same position. At least two graphic objects must be selected for these buttons to be enabled.
- The **Horizontal**, and **Vertical** buttons are used to align the centers of the graphic objects. At least two graphic objects must be selected for these buttons to be enabled.
- The **Horizontal** and **Vertical** buttons are used to space the selected graphic objects regularly, in order that the horizontal or vertical spacing between the objects is the same. At least three graphic objects must be selected for these buttons to be enabled.
- The **Width** and **Height** buttons are used to achieve parity in dimensions of the graphic objects, so the selected width or height corresponds. At least two graphic objects must be selected for these buttons to be enabled.
- The **Done** button causes the **Edit dialog box** to be shown again.

NOTE: For all layout operations (except **Space evenly**) one of the selected objects is considered the "reference object" to which all other selected objects refer in order to know their new position or dimension. For example, when the "Width" button is pressed, all of the selected objects will have their width changed to match the width of the reference object. The reference object is differentiated from the other selected objects by making its selection box a different color than the others.

Options Dialog

The **Options dialog box** is used to change the settings related to a grid drawn in the display window. The grid is solely for assistance in editing or creating a graphic display and is shown only when the Graphic Editor is in "edit mode."

Grid column width (8 - 100): 20	☐ Show grid	☐ Snap to grid
Grid row height (8 - 100): 20	OK	Cancel

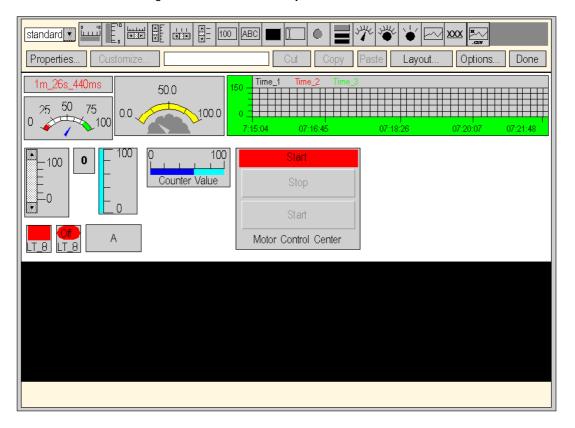The controls of the **Options dialog box** provide the following function.
- The cell size of the grid can be changed by the entering the grid's column width and row height into the dialog's text fields.
- If the **Show grid** check-box is checked, the grid will be drawn; otherwise, no grid will be shown.
- If the **Snap to grid** check-box is checked, then, when you change the size or position of a graphic object, the changed coordinate(s) or dimension(s) is automatically adjusted so that it coincides with a grid point.
- The **OK** button causes the current option settings to become active, and the **Edit dialog box** to be shown again.
- The **Cancel** button causes the **Edit dialog box** to be shown again, with no option settings being changed.

User Functions of the Display Window

Overview

The user functions available in the display window of the **Graphic Editor** are used to select and move objects, and redefine their size. All moving or size redefinition operations require the graphic object(s) to be selected before being modified. The object selected appears framed on the screen.

The figure below shows the **Graphic Editor** screen.

Selecting Graphic Objects

The selection status of a graphic object (selected/deselected) can be defined by the following user actions:

● You can select a single graphic object by simply clicking on it. If other objects are already selected, they are automatically deselected.

● You can select several graphic objects by creating a rectangle over them in the display window. Left-click with the mouse in an open area of the display window (not on a graphic object) and, holding down the button, drag the curser to draw a dotted frame. One of the corners of the rectangle will be where you first clicked, and the corner diagonally opposite will follow the path of the curser. When you release the button, all the objects within the box will be selected. All objects outside this box will be deselected.

● You can select or deselect a graphic object by holding down the CTRL key and clicking on an object. Here, the selection status of all other objects will remain unchanged. With this action, each graphic object can be added to the current group of selected or deleted objects.

● You can select a graphic object by holding down the SHIFT key and clicking on an object. Here, the selection status of all other objects will remain unchanged. With this method, when one object is selected it becomes the *reference object* (see the layout dialog box in section *Toolbar, page 159*) for the group of objects selected. The main aim of this action is to change the reference object in a group of selected objects. The **layout** operations come later.

● You can deselect all the graphic objects by clicking in an open area of the display window (and not on a graphic object).

Defining the Size of the Graphic Objects

You can modify the size of a graphic object by first selecting it then using the mouse to change the size of the object's selection box. As you move the curser on an object's selection box, this changes to reflect the type of operation to perform to redefine the size. If you press the left mouse button with the curser on an object's selection box, then hold down the button and move the object, a dotted frame appears. When you release the button, the size of the object is modified to correspond to the frame you have drawn. There are eight possible ways of redefining the size, according to the part of the object's selection box from which you drag the mouse. The corners of the frame will only move the adjacent sides, and each side of the frame can be moved on its own.

Moving Graphic Objects

The position of a graphic object in the display window can be modified using the mouse. If you press the left mouse button with the curser on an object, then hold down the button and move the object, a dotted frame appears. When you release the button, the position of the object is modified to correspond to the frame you have drawn.

You can move several graphic objects by first selecting the objects to move, then moving the whole group as you would a single object. When you move a group of objects, a box delimits each object of the group.

Defining the Properties of the Graphic Objects

You can define the properties of a graphic object using the **Property Sheet** (see property sheet in section *Property Sheet, page 167*). If the property sheet is displayed, the characteristics of the graphic object selected can be edited. You can display the property sheet by clicking **Properties...** or double-clicking anywhere on the selected object in the display window.

Customizing Complex Graphic Objects

Certain complex graphic objects have a large number of properties. The configuration process for graphic objects like these using the property sheet can be long. To simplify the configuration of complex graphic objects, you can use a customization module. This is a dialog window designed specially to configure associated graphic objects. . This button presents the customization module of the graphic object. When you double-click on a graphic object with a customization module, this is what is presented, not its properties sheet. If a graphic object has a customization module, the only characteristic to appear in its properties sheet is its name.
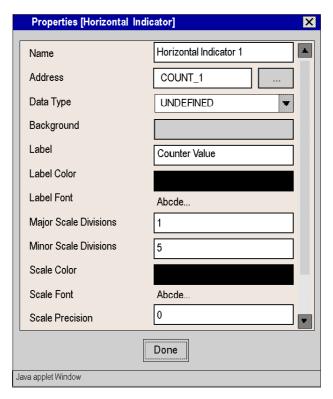
Displaying a Background Image

The Graphic Editor display has a **Background Image** characteristic which can be used to specify an image to appear in the background of the display. This image can be a GIF file or a JPEG file. All files are placed in the /wwwroot directory of the embedded server. For example, if the image "cool.gif" was placed in the /wwwroot/images directory of the embedded server, the background image property must be set to /wwwroot/images.

Property Sheet

Overview

The Property Sheet is a "floating" (non-modal) dialog that presents all the settable properties of the currently selected graphic object.
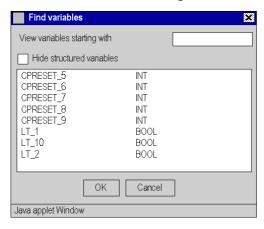
The properties of a graphic object are specific to an object's type. The properties are presented in a scrollable list, with the name and the value of each property listed. See *Graphic Objects, page 172* for a description of the graphic objects provided with the Graphic Editor.

Find variables dialog box

For each of the graphic objects provided with the Graphic Editor, a property editor is provided for its **Address** property. This property editor not only allows you to directly enter the address of a Quantum/Premium/Micro register (or Concept/PL7/Unity Pro variable name), but also provides access to the **Find variables dialog box**. The Lookup Dialog allows you to pick a Concept/PL7/Unity Pro symbol (variable) name from a list of symbol (variables) that have been "Web enabled" by Web Designer.

This is the **Find variables dialog box**.

Security

Security

Your API data is protected by three security measures.

- The HTML page containing the Graphic Editor applet has been placed in a "secure" directory on the Web module; the Web browser user is therefore asked to enter a password enabling him/her to download the HTML page.
- You must enter the correct password in the **Password** dialog box to be able to save/delete the files or send the data values to the connected PLC. For the transfer of data values to the PLC, the Graphic Editor reinforces the "read only" mode by deactivating the user commands of all the graphic objects.
- The FactoryCast configuration program lets you indicate that an element is in read only. The **Graphic Editor** reinforces the "read only" attribute of a symbol variable or address by rejecting all requests in order to define a new value for the data, and warning the user through the message window **Graphic Editor.**

Parameters of the Graphic Editor Applet

Overview

The **Graphic Editor** supports three applet parameters for customizing its behavior. The applet parameters are indicated by the <PARAM> labels in the <APPLET> label of the Graphic Editor HTML page. The parameters recognized by the **Graphic Editor** applet are:

- **LOAD**—This parameter asks the **Graphic Editor** to automatically load a graphic file when it is launched. If the specified file does not exist, a message is delivered. If the parameter does not appear in the <APPLET> label, no graphic file is automatically loaded on startup. In this case you must select the initial table file from the list provided by the **Graphic Editor**.
- **MODE**—This parameter tells the **Graphic Editor** whether it has to start normally in edit mode or in view mode. If it is launched in view mode, it will **only** display the display window. When this parameter is used with the LOAD parameter, a website can be designed using HTML pages that are reserved for specific graphic display. The user is not required to explicitly select any graphic files, which is typical HMI behavior. The possible values for this parameter are
  - **EDIT**—The **Graphic Editor** starts normally in edit mode (default value).
  - **VIEW_RO**—The **Graphic Editor** starts normally in read only. The Web browser user will not be authorized to send values to the PLC.
  - **VIEW_RW**—The **Graphic Editor** starts normally in read/write. The Web browser user will be authorized to send values to the PLC, having first entered the write access password.
- **AUTO_LOGIN**—This parameter tells the **Graphic Editor** to automatically enter the password required to write access the PLC. If the **MODE** parameter is set to **VIEW_RW** or **EDITI** and also set to **TRUE**, the **Graphic Editor** grants write access to the PLC without asking the user to enter the password. The possible values for this parameter are **FALSE** (by default) and **TRUE**.

Example

The following example shows an applet invocation marker that starts the **Graphic Editor** in view mode and automatically changes the graphic file called **UNIT_1**. The Web browser user will be authorized to send values to the PLC though graphic objects that take into account the sending of values if the password for write access in entered.

```
<APPLET codebase="/classes"
archive="SAComm.jar,GDE.jar,Widgets.jar"
code="com.schneiderautomation.gde.GdeApplet"
width="700" height="514">
<PARAM name="LOAD" value="UNIT_1">
<PARAM name="MODE" value="VIEW_RW">
<PARAM name="AUTO_LOGIN" value="FALSE">
</APPLET>
```

Graphic Objects

Presentation

The set of graphic objects provided in the **Graphic Editor** is intended to support building graphic displays that mimic conventional instrument panels. All of the data monitoring and control objects have built-in communication capabilities and are designed as stand-alone graphic objects.

Additionally, to support customers that want to put several simple applets on a single HTML page, each object in the **Graphic Editor** set is provided in an applet version. When used in conjunction with the `LiveBeanApplet`, the **Graphic Editor** graphic objects can be used in the same way as the `LiveLabelApplet`.

This section provides a description of the standard graphic objects and their properties.

Horizontal Indicator

A Horizontal Indicator provides an analog representation of the value of a symbol (variable) or direct address in a PLC by drawing a horizontal bar whose length is proportional to the value as a percentage of its range in engineering units. Optionally, a digital indication of the value can be shown in the center of the bar area.

The properties for the Horizontal Indicator are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Major Scale Divisions	The number of major (labeled) scale divisions	0 to 100
Minor Scale Divisions	The number of minor (unlabeled) scale divisions	0 to 100
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	

Property	Description	Limits
Scale Precision	The number of fractional digits to be shown for scale labels (Set to -1 to use a general exponential format.)	-1 to 6
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Value Visible	Indicates whether a digital display of the scaled value is to be shown	
Value Font	The font for the digital display of the value, if shown	
Bar Background	The background color for the bar indicator area	
Bar Color	The color for the indicator bar (when scaled value within High/Low limits)	
High High Limit Value	The value in engineering units for the 'High High' limit	
High High Limit Color	The color for the indicator bar when scaled value is greater than the 'High High' limit	
High Limit Value	The value in engineering units for the 'High' limit	
High Limit Color	The color for the indicator bar when scaled value is greater than the 'High' limit	
Low Limit Value	The value in engineering units for the 'Low' limit	
Low Limit Color	The color for the indicator bar when scaled value is less than the 'Low' limit	
Low Low Limit Value	The value in engineering units for the 'Low Low' limit	
Low Low Limit Color	The color for the indicator bar when scaled value is less than the 'Low Low' limit	
Limit Deadband	The deadband (as percentage of EU range) to apply to High/Low limit checking	0 to 10
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	
PLC Value	A simulated, raw (unscaled) input value for testing the graphic object	See Note 3, *Notes, page 192*

Vertical Indicator

A Vertical Indicator provides an analog representation of the value of a symbol (variable) or direct address in a PLC by drawing a vertical bar whose length is proportional to the value as a percentage of its range in engineering units.

The properties for the Vertical Indicator are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Major Scale Divisions	The number of major (labeled) scale divisions	0 to 100
Minor Scale Divisions	The number of minor (unlabeled) scale divisions	0 to 100
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	
Scale Precision	The number of fractional digits to be shown for scale labels (Set to -1 to use a general exponential format.)	-1 to 6
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Bar Background	The background color for the bar indicator area	
Bar Color	The color for the indicator bar (when scaled value within High/Low limits)	
High High Limit Value	The value in engineering units for the 'High High' limit	

Property	Description	Limits
High High Limit Color	The color for the indicator bar when scaled value is greater than the 'High High' limit	
High Limit Value	The value in engineering units for the 'High' limit	
High Limit Color	The color for the indicator bar when scaled value is greater than the 'High' limit	
Low Limit Value	The value in engineering units for the 'Low' limit	
Low Limit Color	The color for the indicator bar when scaled value is less than the 'Low' limit	
Low Low Limit Value	The value in engineering units for the 'Low Low' limit	
Low Low Limit Color	The color for the indicator bar when scaled value is less than the 'Low Low' limit	
Limit Deadband	The deadband (as percentage of EU range) to apply to High/Low limit checking	0 to 10
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	
PLC Value	A simulated, raw (unscaled) input value for testing the graphic object	See Note 3, *Notes, page 192*

Horizontal or Vertical Slider

A Horizontal or Vertical Slider provides an analog representation of the value of a symbol (variable) or direct address in a PLC by drawing a scroll bar whose "thumb" position is proportional to the value as a percentage of its range in engineering units. With a mouse, a user can change the value of the scroll bar and cause a new value to be sent to the PLC.

The properties for the Horizontal or Vertical Slider are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	

Property	Description	Limits
Major Scale Divisions	The number of major (labeled) scale divisions	0 to 100
Minor Scale Divisions	The number of minor (unlabeled) scale divisions	0 to 100
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	
Scale Precision	The number of fractional digits to be shown for scale labels (Set to -1 to use a general exponential format.)	-1 to 6
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Block Increment	The amount that the scaled value should change when the scroll bar's scroll area is clicked	
Unit Increment	The amount that the scaled value should change when the scrollbar's arrow buttons are clicked	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	

Horizontal or Vertical Selector

A Horizontal or Vertical Selector allows a user to make a selection from a set of choices. When a selection is made, the value corresponding to the choice is sent to the PLC. The choices are shown as labels of a "scale," with the current selection indicated by the position of the "thumb" of a scroll bar.

The properties for the Horizontal or Vertical Selector are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Choices	The choices for the selector. Each choice is given as a 'label=value' entry (when a user selects 'label,' 'value' is sent to PLC)	Minimum of two choices required
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Scale Visible	Indicates whether a "scale," labeled with the choices, is to be shown	
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	

Digital Indicator

A Digital Indicator provides a numeric representation of the value of a symbol (variable) or direct address in a PLC. The value can be shown in various formats, and can be made to change color when a preset high or low limit is exceeded.

The properties for the Digital Indicator are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	

Property	Description	Limits
Label Font	The font for the label	
Value Format	The format (decimal, hex, etc.) to use in displaying the scaled value	
Value Precision	The number of fractional digits to be shown for the scaled value (Set to -1 to use a general exponential format.)	-1 to 6
Value Background	The background color for the value display area	
Value Color	The text color for the digital display of the value	
Value Font	The font for the digital display of the value	
Units	The label for the engineering units of the value (appended to the numeric display of the value)	
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
High High Limit Value	The value in engineering units for the 'High High' limit	
High High Limit Color	The color for the indicator bar when scaled value is greater than the 'High High' limit	
High Limit Value	The value in engineering units for the 'High' limit	
High Limit Color	The color for the indicator bar when scaled value is greater than the 'High' limit	
Low Limit Value	The value in engineering units for the 'Low' limit	
Low Limit Color	The color for the indicator bar when scaled value is less than the 'Low' limit	
Low Low Limit Value	The value in engineering units for the 'Low Low' limit	
Low Low Limit Color	The color for the indicator bar when scaled value is less than the 'Low Low' limit	
Limit Deadband	The deadband (as percentage of EU range) to apply to High/Low limit checking	0 to 10
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	

Property	Description	Limits
PLC Value	A simulated, raw (unscaled) input value for testing the graphic object	See Note 3, *Notes, page 192*

Message Display

A Message Display shows a text message based on the value of a symbol (variable) or direct address in a PLC. For each specified message, a value is also specified that will trigger its display.

The properties for the Message Display are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Messages	The set of messages to display. Each message is given as a 'value=text' entry (when the PLC value equals 'value', 'text' is displayed as the message)	Minimum of one message required
Message Background	The background color for the message display area	
Message Color	The color for the message text	
Message Font	The font for the message text	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	
PLC Value	A simulated input value for testing the graphic object	See Note 3, *Notes, page 192*

Push Button

A Push Button allows a user to send preset value(s) to a PLC when clicked with the mouse.

The properties for the Push Button are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Values	The value(s) to send to the PLC	See Note 4, *Notes, page 192*
Reset Values	The value(s) to send to the PLC after the reset delay time has expired. If no reset values are provided, no reset action will occur.	
Reset Delay	The delay time (milliseconds) that the Push Button should wait after sending the value(s) to the PLC before sending the reset value(s).	0-2000
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Button Label	The text label for the button	
Button Background	The color for the knob	0 to 100
Button Label Color	The color for the button label	
Button Label Font	The font for the button label	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	

Direct Output Station

The Direct Output Station allows a user to enter a value into a text input field directly with their keyboard. When the entered text represents a numeric value that is within preset high and low limits, a **Set** button is enabled. While the **Set** button is enabled, the entered value will be sent to the PLC whenever the user presses either the **Set** button or the ENTER key (if the input field has keyboard input focus).

The properties for the Direct Output Station are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Maximum Input	The maximum value, in engineering units, that is valid for the entered input value	
Minimum Input	The minimum value, in engineering units, that is valid for the entered input value	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	

LED

The Indicator Light provides a dual-state indication of the value of a symbol (variable) or direct address in a PLC. Unless the **Input Inverted** property is set to **TRUE**, an input value of zero is deemed **OFF** and a non-zero value is deemed **ON**. If the **Flash Interval** property is set to greater than zero, the light will flash while the input value is on.

The properties for the Indicator Light are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Off Word	The text to show when the input value is off	
Off Word Background	The background color of the light when the **Off Word** is shown	
Off Word Color	The color for the **Off Word** text	
Off Word Font	The font for the **Off Word** text	
On Word	The text to show when the input value is on	
On Word Background	The background color of the light when the **On Word** is shown	
On Word Color	The color for the **On Word** font	
On Word Font	The font for the **On Word** text	
Flash Interval	The flashing time period (in milliseconds) of the light when the input value is on. Set to zero for no flashing.	200 to 2000
Shape	The shape (circle, rectangle, etc.) of the light	
Input Inverted	If **TRUE**, inverts the input value. (Light will show the **Off Word** when input value is on.)	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	
PLC Value	A simulated input value for testing the graphic object	See Note 3, *Notes, page 192*

Motor Control Station

The Motor Control Station is designed to mimic the typical start/stop push button station that is often used to control motors. This graphic object is essentially a composite of two Push Buttons and an Indicator Light. In order to make it easier to set this object's many properties, a Customizer is provided. All of the properties (except Name) are set with its Customizer, not with the **Graphic Editor's** Property Sheet.

The properties for the Motor Control Station are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	
LED	Same properties as the Indicator Light graphic object, excluding the common properties listed above	
Top Push Button	Same properties as the Push Button graphic object, excluding the common properties listed above	
Bottom Push Button	Same properties as the Push Button graphic object, excluding the common properties listed above	

Analog Meter

An Analog Meter provides an analog representation of the value of a symbol (variable) or direct address in a PLC by drawing a pointer on a circular dial whose position is proportional to the value as a percentage of its range in engineering units. The size of the meter's circular dial (degrees sweep of a circle), the colors for the dial, and the style of the pointer can all be set.

The properties for the Analog Meter are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Major Scale Divisions	The number of major (labeled) scale divisions	0 to 100
Minor Scale Divisions	The number of minor (unlabeled) scale divisions	0 to 100
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	
Scale Precision	The number of fractional digits to be shown for scale labels (Set to -1 to use a general exponential format.)	-1 to 6
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Dial Degrees Sweep	The amount of a circular arc to use for drawing the dial	60 to 300
Pointer Type	The type (needle, arrow head, etc.) of pointer to use	
Pointer Color	The color for the pointer	
Dial Color	The color for the dial (that part that is within the High/Low limits)	
High High Limit Value	The value in engineering units for the 'High' limit	
High High Limit Color	The color for the indicator bar when scaled value is greater than the 'High High' limit	

Property	Description	Limits
High Limit Value	The value in engineering units for the 'High' limit	
High Limit Color	The color for the indicator bar when scaled value is greater than the 'High' limit	
Low Limit Value	The value in engineering units for the 'Low' limit	
Low Limit Color	The color for the indicator bar when scaled value is less than the 'Low' limit	
Low Low Limit Value	The value in engineering units for the 'Low Low' limit	
Low Low Limit Color	The color for the indicator bar when scaled value is less than the 'Low Low' limit	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	
PLC Value	A simulated, raw (unscaled) input value for testing the graphic object	See Note 3, *Notes, page 192*

Rotary Slider

A Rotary Slider provides an analog representation of the value of a symbol (variable) or direct address in a PLC by drawing a knob on a circular dial whose position is proportional to the value as a percentage of its range in engineering units. The size of the circular dial (degrees sweep of a circle) and knob color can be set. With a mouse, a user can change the position of the knob and cause a new value to be sent to the PLC.

The properties for the Rotary Slider are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Major Scale Divisions	The number of major (labeled) scale divisions	0 to 100

Property	Description	Limits
Minor Scale Divisions	The number of minor (unlabeled) scale divisions	0 to 100
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	
Scale Precision	The number of fractional digits to be shown for scale labels (Set to -1 to use a general exponential format.)	-1 to 6
Dial Degrees Sweep	The amount of a circular arc to use for drawing the dial	60 to 300
Dial Color	The color for the dial	
Knob Color	The color for the knob	
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 192*
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	

Rotary Selector

A Rotary Selector allows a user to make a selection from a set of choices. When a selection is made, the value corresponding to the choice is sent to the PLC. The choices are shown as labels of a "scale," with the current selection indicated by the position of the knob. The size of the circular dial (degrees sweep of a circle) and knob color can be set.

The properties for the Rotary Selector are listed below:

Property	Description	Limits
Name	The name for the graphic object	
Address	The direct address (or the name of a symbol (variable)) to monitor	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 192*
Background	The background color for the graphic object	

Property	Description	Limits
Choices	The choices for the selector. Each choice is given as a 'label=value' entry (when a user selects 'label,' 'value' is sent to PLC)	Minimum of two choices required
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Scale Visible	Indicates whether a "scale," labeled with the choices, is to be shown	
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	
Dial Degrees Sweep	The amount of a circular arc to use for drawing the dial	60 to 300
Knob Color	The color for the knob	
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	

Trend Recorder

A Trend Recorder provides a continuous, time-based charting of the value of up to six symbol (variable)s or direct addresses in a PLC. A Trend Recorder emulates a strip-chart recorder, with the pens on the right, and the "paper" moving from right to left. A vertical scale can be shown on the left side of the chart for showing the range of the values being recorded, and a horizontal scale can be shown below the chart for showing the time span of the chart. The rate at which the chart is updated, and the appearance of the chart can be set.

In order to make it easier to set this object's many properties, a Customizer is provided. All properties (except Name) are set with its Customizer, not with the **Graphic Editor's** Property Sheet.

The following table describes properties for the Trend Recorder. Properties available for each pen are described in the next table:

Property	Description	Limits
Name	The name for the graphic object	
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	

Property	Description	Limits
Major Scale Divisions	The number of major (labeled) scale divisions	0 to 100
Minor Scale Divisions	The number of minor (unlabeled) scale divisions	0 to 100
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	
Scale Precision	The number of fractional digits to be shown for scale labels (Set to -1 to use a general exponential format.)	-1 to 6
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Update Period	The update interval (in seconds) for the chart	0.5 to 120
Time Scale Divisions	The number of horizontal scale divisions	0 to 6
Chart Background	The color for the chart area	
Grid Color	The color of the grid drawn in the chart area	
Vertical Grid Divisions	The number of vertical divisions for the grid	0 to 100
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	

These Trend Recorder properties are available for each pen:

Property	Description	Limits
Address	The direct address (or the name of a symbol (variable)) to monitor.	See Note 1, *Notes, page 192*
Data Type	The data type of the direct address or symbol (variable).	See Note 2, *Notes, page 192*
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC.	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC.	See Note 3, *Notes, page 192*
Pen Color	The color of the "pen" used to record the scaled value.	
Pen Label	The label used to identify the pen.	

Display Link

A Display Link is a special graphic object that allows the user to switch to another graphic display by clicking on it with a mouse. To indicate to the user that the object is a link to another display, the text label for the link is underlined and the mouse cursor changes to a hand icon when the mouse is moved over it. This object is especially useful when the **Graphic Editor** is used in its **view mode**, where no drop-down list of graphic displays is available for selecting a display.

A Display Link can also be used as a hyperlink to an HTML file. If a URL is entered as the **Link Display Name**, the URL can be opened in a new browser window if the user presses the SHIFT key while they click the link; otherwise, the existing browser window is replaced with the URL when the link is clicked.

If the **Link Display Name** is blank, then the **Label** will be shown as not underlined, and the displayed object becomes a simple text label.

The properties for the Display Link are listed below:.

Property	Description	Limits
Label	The label for the link	
Link Display Name	The name of the graphic display to be loaded when the link is clicked, or a URL of a Web page	
Label Color	The color for the label	
Label Font	The font for the label	

Datalogging History

A Datalogging History provides a continuous, time-based charting of the value of up to six symbols (variables) coming from the log file of the Datalogging service. A Datalogging History emulates a strip-chart recorder, with the pens on the right, and the "paper" moving from right to left. A vertical scale can be shown on the left side of the chart for showing the range of the values being recorded, and a horizontal scale can be shown below the chart for showing the time span of the chart.

NOTE: In order to plot the Datalogging History, you must select the Timestamp option in the Datalogging Service *(see page 111)* configuration window.

In order to make it easier to set this object's many properties, a Customizer is provided. All properties (except Name) are set with its Customizer, not with the **Graphic Editor's** Property Sheet.

3 buttons are available in edition and animation mode:
● Reload: the Datalogging History object is a static widget. This button enables to refresh the value used to build the chart.
● +: zoom on the trend. It decreases the time scale in order to have a better vision of a part of the trend.
● -: zoom out on the trend. It increases the time scale in order to have a larger vision of the trend.

If you place the mouse cursor on a point of the trend, a tooltip appears displaying the exact value at that point. Stay pressed and rollover several points to display the tooltips of all of those points.

Releasing the mouse button and rolling over any point will cleanup existing tooltips and display a new one.

Right click on it to make it disappear.

The following table describes properties for the Datalogging History. Properties available for each pen are described in the next table:

Property	Description	Limits
Name	The name for the graphic object	
Background	The background color for the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color for the label	
Label Font	The font for the label	
Major Scale Divisions	The number of major (labeled) scale divisions	0 to 100
Minor Scale Divisions	The number of minor (unlabeled) scale divisions	0 to 100
Scale Color	The color for the scale and its labels	
Scale Font	The font for scale labels	
Scale Precision	The number of fractional digits to be shown for scale labels (Set to -1 to use a general exponential format.)	-1 to 6
Maximum EU Value	The maximum value, in engineering units, of the symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the symbol (variable)	
Time Scale Divisions	The number of horizontal scale divisions	0 to 6
Chart Background	The color for the chart area	
Grid Color	The color of the grid drawn in the chart area	
Vertical Grid Divisions	The number of vertical divisions for the grid	0 to 100
Border Width	The width (in pixels) for the graphic object's border	0 to 32
Border Color	The color for the graphic object's border	
Zoom Coefficient	Set a coefficient for the zoom. In example, if the zoom coefficient is set to 2, the timescale will be divided by 2 by clicking **+** in animation mode.	

These Datalogging History properties are available for each pen:

Property	Description	Limits
Name of the CSV file	The name of the CSV file used to build the trend. **Note:** the log file must include timestamps *(see page 115)*.	
Address	The name of a symbol (variable) to monitor.	
Data Type	The data type of the symbol (variable). **Note:** the data type must be numerical.	
Maximum PLC Value	The maximum raw (unscaled) value of the symbol (variable) in the PLC.	See Note 3, *Notes, page 192*
Minimum PLC Value	The minimum raw (unscaled) value of the symbol (variable) in the PLC.	See Note 3, *Notes, page 192*
Pen Color	The color of the "pen" used to record the scaled value.	
Pen Label	The label used to identify the pen.	

Notes

These are the notes for the chapter.

1.	If the Address property of a graphic object is a direct address, the Data Type property is set to UNDEFINED, a default Data Type (BOOL, INT,DINT or REAL based on the implied size of the data value) is used. If the Address property is a symbol (variable) name, the Data Type property does not have to be specified and can be set to UNDEFINED. However, if the Data Type property is specified for a symbol (variable), it must exactly match the symbol (variable)'s actual data type.
	If the Address property is a direct address for a discrete PLC reference (Quantum 0x/1x reference), the Data Type property must be set to BOOL. The Data Type property may be set to BOOL only for a discrete PLC reference.

2.	The meaning of the possible values of the Data Type property are:	

Data Type	Meaning
UNDEFINED	no data type specified
BOOL	1-bit discrete (Boolean)
SHORT	8-bit signed integer
USHORT	8-bit unsigned integer
INT	16-bit signed integer
UINT	16-bit unsigned integer
DINT	32-bit signed integer
UDINT	32-bit unsigned integer
REAL	32-bit IEEE floating point
TIME	32-bit unsigned integer (in milliseconds)
DATE	Date (32-bit BCD)
TOD	Time of Day (32-bit BCD)
DT	Date and Time (64-bit BCD)

3.	The limits for the Maximum PLC Value and Minimum PLC Value properties are the natural limits of the Data Type property that is set. A Data Type setting of UNDEFINED is treated as a REAL with respect to its limit values.
4.	For a Push Button, a minimum of one value must be provided. If the Address property is a symbol (variable) name, then only one value will ever be sent to the PLC, and any additional values are ignored. If the Address property is a direct address, then all of the values provided will be sent to the PLC as an array of values starting at the specified direct address.

Extended Graphic Objects

Overview

The set of extended graphic objects provided in Graphic Editor is intended to support building graphic displays that mimic advanced graphic panels. All of the data monitoring and control objects have built-in communication capabilities and are designed as standalone graphic objects.

Additionally, to support customers who want to put several simple applets on a single HTML page, each object in the Graphic Editor set is provided in an applet version. When used in conjunction with the `LiveBeanApplet`, Graphic Editor graphic objects can be used in the same way as the `LiveLabelApplet`.

Be aware, however, that if communication to the device linked to the graphic object is lost, the object becomes inoperative without the end device's knowledge.

⚠ **WARNING**
UNINTENDED EQUIPMENT OPERATION
Do not use graphic objects in situations where loss of communication to the module can affect human or material integrity.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

For example, say you have programmed a pushbutton object to jog a motor when the button is depressed and to stop jogging when the button is released. If communications are lost while the button is depressed, the motor will continue to jog even when the button is released. Graphic objects should not be used to control situations such as this unless other srike interlock methods are installed in the system.

Extended Analog Meter

An extended analog meter provides an analog representation of the value of a symbol (variable) or direct address in a PLC. It draws a pointer on a circular dial whose position is proportional to the value as a percentage of its range in engineering units. The size of the meter's circular dial (measured in degrees of a circle), the dial colors, and the pointer style can all be set.

The properties of the extended analog meter are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 204*
Background	The background color of the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The label color	
Label Font	The label font	
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 204*
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 204*
Bitmap Choices	The bitmap to display	
Dial Degrees Sweep	The range in which degrees vary	
Pointer Type	The graphic display of the pointer	
Pointer Color	The color of the pointer	
Border Width	The width (in pixels) of the graphic object's border	0 to 32
Border Color	The color of the graphic object's border	
PLC Value	The default value of the PLC	

ASCII Text Writer

The ASCII Text Writer is based on the message display widget. It allows you to input new text.

The properties of the ASCII Text Writer are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Max. Text Length	The maximum length of the text	
Text Color	The color of the text	
Text Font	The font used for the text	
Swap Bytes	False if target order of bytes is same as PC	
Value	The text itself	

Bar Graph

A bar graph provides an analog representation of the value of a symbol (variable) or direct address in a PLC. It draws a vertical bar whose length is proportional to the value as a percentage of its range in engineering units.

The properties of the bar graph are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 204*
Background	The background color of the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color of the label	
Label Font	The font used on the label	
Maximum EU Value	The maximum value, in engineering units, of the direct address or symbol (variable)	
Minimum EU Value	The minimum value, in engineering units, of the direct address or symbol (variable)	
Maximum PLC Value	The maximum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 204*

Property	Description	Limits
Minimum PLC Value	The minimum raw (unscaled) value of the direct address or symbol (variable) in the PLC	See Note 3, *Notes, page 204*
Bar Background	The background color of the bar indicator area	
Bar Color	The color of the indicator bar (when scaled value is within High/Low limits)	
High High Limit Value	The value of the High High limit in engineering units	
High High Limit Color	The color of the indicator bar when the scaled value is greater than the High High limit	
High Limit Value	The value of the High limit in engineering units	
High Limit Color	The color of the indicator bar when scaled value is greater than the High limit	
Low Limit Value	The value of the Low limit in engineering units	
Low Limit Color	The color of the indicator bar when the scaled value is less than the Low limit	
Low Low Limit Value	The value of the Low Low limit in engineering units	
Low Low Limit Color	The color of the indicator bar when the scaled value is less than the Low Low limit	
Limit Deadband	The deadband (as percentage of EU range) to apply to High/Low limit checking	0 to 10
Border Width	The width (in pixels) of the graphic object's border	0 to 32
Border Color	The color of the graphic object's border	
PLC Value	A simulated, raw (unscaled) input value for testing the graphic object	See Note 3, *Notes, page 204*

Bitmap

The bitmap widget displays a static bitmap on the screen.

The properties of the bitmap widget are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Background	The background color of the graphic object	See Note 1, *Notes, page 204*
Label	The label to be displayed as part of the graphic object	
Label Color	The color of the label	
Label Font	The font used for the label	

Property	Description	Limits
Border Width	The width (in pixels) of the graphic object's border	
Border Color	The color of the graphic object's border	
Bitmap Choices	File names of custom bitmaps to display. Refer to the next paragrah for information on adding images into the module.	

Adding Images

You can add images into the module in one of the following way:
- Add your images into the images.zip file (path: *FLASH1/wwwroot*).
- Create a directory into the module (i.e. *FLASH1/wwwroot/bitmaps*). Copy your images into this directory. In this case, you need to specify the path of the images you want to use (i.e. *FLASH1/wwwroot/bitmaps/key.gif*).

Step	Action
1	Create an *images* folder on your PC.
2	Copy the images you want to use in this folder.
3	Import the user.jar file from the module to the PC (path: *NAND/FLASH1/wwwroot/classes*) using a FTP client.
4	Open the *user.jar* file using a file archiver.
5	Drag and drop the images folder in the *user.jar* file. Make sure the relative path of the image files is 'images/'.
6	Transfer the *user.jar* file back to the module using a FTP client.

Generic Bitmap

The generic bitmap widget lets you display one static bitmap for each distinct value of a PLC variable. It can be used to display dynamic animations, for instance the changing level in a tank.

The properties of the Generic Bitmap widget are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 204*
Background	The background color of the graphic object	See Note 1, *Notes, page 204*
Label	The label to be displayed as part of the graphic object	

Property	Description	Limits
Label Color	The color of the label	
Label Font	The font used for the label	
Bitmap Choices	File names of custom bitmaps to display. Refer to the next paragrah for information on adding images into the module.	
Border Width	The width (in pixels) of the graphic object's border	
Border Color	The color of the graphic object's border	
PLC Value	A simulated input value for testing the graphic object behavior	

Graphic Link

A graphic link is a special graphic object that lets you switch to another graphic display by clicking on it. Graphic links can also be recognized by their underlined labels, and the mouse cursor changes to a hand icon when the mouse moves over them. This object is especially useful when Graphic Editor is used in view mode, where no drop-down list of graphic displays is available.

A graphic link can also be used as a hyperlink to an HTML file. If a URL is entered as the **Link Display Name**, the URL can be opened in a new browser window by simultaneously pressing the SHIFT key and clicking the link. Otherwise, the URL opens in the existing browser window when the link is clicked.

If the **Link Display Name** is blank, then the label is not underlined, and the displayed object becomes a simple text label.

The properties of the display link are listed below:

Property	Description	Limits
Label	The link label	
Link Display Name	The name of the graphic display to be loaded when the link is clicked, or the URL of a Web page	
Label Color	The color of the label	
Label Font	The font used for the label	
Bitmap Choices	The filename of the bitmap on which to click	

Indicator Light

The indicator light displays the value of a symbol (variable) or direct address in a PLC with two possible states. An input value of 0 is considered off and a non-zero value is considered on. If the **Flash Interval** property is set to a value greater than 0, the light flashes while the input value is on. There is a bitmap for the on state and a different one for the off state.

The properties of the indicator light are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 204*
Background	The background color of the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color of the label	
Label Font	The font used for the label	
OFF Word	The text to display when the input value is off	
OFF Bitmap Choice	The light bitmap when the OFF word is displayed	
OFF Word Color	The color of the OFF word font	
OFF Word Font	The font used for the OFF word text	
ON Word	The text to display when the input value is on	
ON Bitmap Choice	The light bitmap when the ON word is displayed	
ON Word Color	The color of the ON word font	
ON Word Font	The font used for the ON word text	
Flash Interval	The flashing time period (in ms) of the light when the input value is on. Set to 0 for no flashing.	200 to 2000
Input Inverted	If true, inverts the input value. (Light will show the OFF word when input value is on.)	
Border Width	The width (in pixels) of the graphic object's border	0 to 32
Border Color	The color of the graphic object's border	
PLC Value	A simulated input value for testing the graphic object	See Note 3, *Notes, page 204*

Motor

The motor widget displays the value of a symbol (variable) or direct address in a PLC with three possible states. An input value of 0 is considered off, a value of 1 is considered on, and other values are considered default. The three states are represented by different bitmaps.

The properties of the motor widget are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 204*
Background	The background color of the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color of the label	
Label Font	The font used for the label	
OFF Word	The text to display when the input value is off	
OFF Bitmap Choice	The motor bitmap when the OFF word is displayed	
OFF Word Color	The color of the OFF word font	
OFF Word Font	The font used for the OFF word text	
ON Word	The text to display when the input value is ON	
ON Bitmap Choice	The motor bitmap when the ON word is displayed	
ON Word Color	The color of the ON word font	
ON Word Font	The font used for the ON word text	
DEFAULT Word	The text to display when the input value is ON	
DEFAULT Bitmap Choice	The motor bitmap when the DEFAULT word is displayed	
DEFAULT Word Color	The color of the DEFAULT word font	
DEFAULT Word Font	The font used for the DEFAULT word text	
Border Width	The width (in pixels) of the graphic object's border	0 to 32
Border Color	The color of the graphic object's border	
PLC Value	A simulated input value for testing the graphic object	See Note 3, *Notes, page 204*

Pipe

The pipe displays the value of a symbol (variable) or direct address in a PLC with two possible states. An input value of 0 is considered off and a non-zero value is considered on. There is a bitmap for the on-state and a different one for the off-state.

The properties of the pipe are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 204*
Background	The background color of the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color of the label	
Label Font	The font used for the label	
OFF Word	The text to display when the input value is off	
OFF Bitmap Choice	The pipe bitmap when the OFF word is displayed	
OFF Word Color	The color of the OFF word font	
OFF Word Font	The font used for the OFF word text	
ON Word	The text to display when the input value is on	
ON Bitmap Choice	The pipe bitmap when the ON word is displayed	
ON Word Color	The color of the ON word font	
ON Word Font	The font used for the ON word text	
Border Width	The width (in pixels) of the graphic object's border	0 to 32
Border Color	The color of the graphic object's border	
PLC Value	A simulated input value for testing the graphic object	See Note 3, *Notes, page 204*

Push Button

A push button sends preset value(s) to a PLC when the user clicks it with the mouse.

The properties of the Push Button are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 204*
Background	The background color of the graphic object	
Values	The value(s) to send to the PLC	See Note 4, *Notes, page 204*
Reset Values	The value(s) to send to the PLC after the reset delay time has expired. If no reset values are provided, no reset action will occur.	
Reset Delay	The delay time (in milliseconds) that the Push Button should use after sending the value(s) to the PLC before sending the reset value(s).	0-2000
Label	The label to be displayed as part of the graphic object	
Label Color	The color of the label	
Label Font	The font used for the label	
Button Label	The text label for the button	
Button Label Color	The color of the button label	
Button Label Font	The font used for the button label	
OFF Bitmap Choice	The button bitmap when the OFF state is displayed	
ON Bitmap Choice	The button bitmap when the ON state is displayed	
Border Width	The width (in pixels) of the graphic object's border	0 to 32
Border Color	The color of the graphic object's border	

Valve

The valve displays the value of a symbol (variable) or direct address in a PLC with two possible states. An input value of 0 is considered off and a non-zero value is considered on. There is a bitmap for the on state and a different one for the off state.

The properties of the valve are listed below:

Property	Description	Limits
Name	The name of the graphic object	
Address	The direct address or the name of a symbol (variable) to monitor	See Note 1, *Notes, page 204*
Data Type	The data type of the direct address or symbol (variable)	See Note 2, *Notes, page 204*
Background	The background color of the graphic object	
Label	The label to be displayed as part of the graphic object	
Label Color	The color of the label	
Label Font	The font used for the label	
OFF Word	The text to display when the input value is off	
OFF Bitmap Choice	The valve bitmap when the OFF word is displayed	
OFF Word Color	The color of the OFF word font	
OFF Word Font	The font used for the OFF word text	
ON Word	The text to display when the input value is ON	
ON Bitmap Choice	The valve bitmap when the ON word is displayed	
ON Word Color	The color of the ON word font	
ON Word Font	The font used for the ON word text	
Flash Interval	The flashing time period (in ms) of the light when the input value is on. Set to 0 for no flashing.	200 to 2000
Border Width	The width (in pixels) of the graphic object's border	0 to 32
Border Color	The color of the graphic object's border	
PLC Value	A simulated input value for testing the graphic object	See Note 3, *Notes, page 204*

Notes

These are the notes for the chapter.

1.	If the address property of a graphic object is a direct address and the data type property is set to **UNDEFINED**, a default data type (**BOOL**, **INT**, **DINT**, or **REAL** based on the implied size of the data value) is used. If the address property is a symbol (variable) name, the data type property does not have to be specified and can be set to **UNDEFINED**. However, if the data type property is specified for a symbol (variable), it must match the symbol's (variable's) actual data type exactly. If the address property is a direct address for a discrete PLC reference (Quantum 0x/1x reference), the data type property must be set to **BOOL**. The data type property may be set to **BOOL** only for a discrete PLC reference.
2.	The meaning of the possible values of the Data Type property are:

Data Type	Meaning
UNDEFINED	no data type specified
BOOL	1-bit discrete (Boolean)
SHORT	8-bit signed integer
USHORT	8-bit unsigned integer
INT	16-bit signed integer
UINT	16-bit unsigned integer
DINT	32-bit signed integer
UDINT	32-bit unsigned integer
REAL	32-bit IEEE floating point
TIME	32-bit unsigned integer (in milliseconds)
DATE	Date (32-bit BCD)
TOD	Time of Day (32-bit BCD)
DT	Date and Time (64-bit BCD)

3.	The limits for the Maximum PLC Value and Minimum PLC Value properties are the natural limits of the Data Type property that is set. A Data Type setting of UNDEFINED is treated as REAL with respect to its limit values.
4	For a Push Button, a minimum of one value must be provided. If the Address property is a symbol (variable) name, then only one value will ever be sent to the PLC, and any additional values will be ignored. If the Address property is a direct address, then all of the values provided will be sent to the PLC as an array, starting at the specified direct address.

8.3   Operator Screens

Scope of this Section

You can import and display operator screens created with UnityPro in the website. This feature enables you to visualize and access operator screens during run time using a simple Web browser. This section shows you how to import operator screens as well as the method of access.

What's in this Section?

This section contains the following topics:

Topic	Page
Importing Operator Screens	206
How to Access the Operator Screens	207

Importing Operator Screens

Introduction

FactoryCast HMI enables you to see operator screens created with UnityPro or PL7 in a Web browser. The following part shows you how to import operator screen with Web Designer for FactoryCast HMI.

NOTE:

- You can use hyperlinks to link operator screen together. In this case, carefully select the screens you import. If you only import screen1 that is linked to screen2, the link is lost and a message appears. Schneider-Electric recommends you to import all the operator screens that are linked together.
- Explicit exchange graphic objects are not supported.

Importing Screens

This procedure shows you how to import operator screen:

Step	Action
1	Launch Web Designer for FactoryCast HMI and open or create a project.
2	Double-click the device with which the screen is linked in the **Devices** directory.
3	Click the **operator screen** tab. **Result**: The operator screen window appears. It displays a list of the already imported screens or an empty list.
4	Click **Import operator screen**. Result: The following dialog box appears.
5	Select the operator screen (.xcr file) you want to import and click **Open**. **Result**: The operator screen appears in the operator screen list.
6	Click the operator screen that you want to display in the list.

How to Access the Operator Screens

Introduction

An operator screen is a window just as any other editor (configuration, language, data editor). You can access these pages using a Web browser.
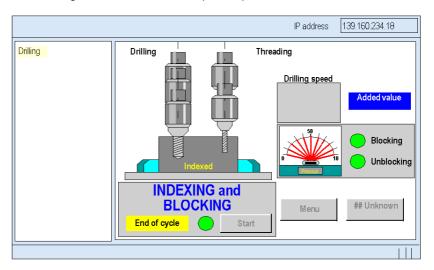
Methodology

The following table lists the operations to perform in order to access operator screens.

Step	Action
1	Launch your Web browser.
2	Connect to the embedded website of the module.
3	Click **Monitoring** in the horizontal menu.
4	Click **Operator Screens** in the vertical menu. **Result**: A list of the imported screen(s) appears.
5	Select a screen in the list by clicking it. **Result**: The selected operator screen appears.

Example of Screen

The following screen shows an example of operator screens.

8.4 PLC Program Viewer

PLC Program Viewer

Presentation

The PLC program viewer feature enables you to visualize and monitor UnityPro programs in run mode using a Web Designer. The PLC programs are displayed and animated as they are in UnityPro

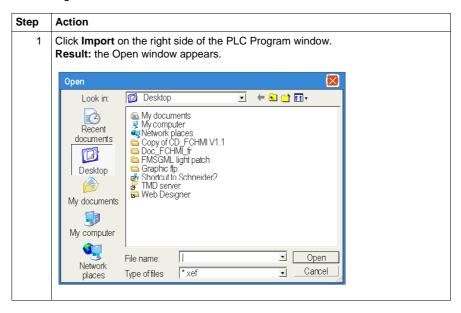PLC programs developed in any languages supported by UnityPro can be visualized:

- Ladder (LD)
- Instruction List (IL)
- Function Block Diagram (FBD)
- Structured Text (ST)
- Sequential Function Chart (SFC)
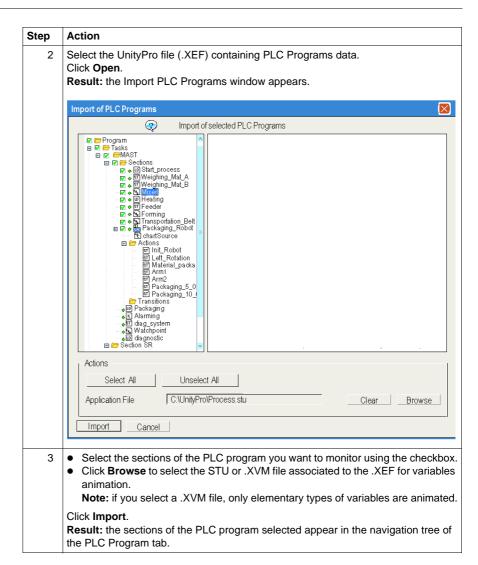
Accessing the PLC Program Viewer

Step	Action
1	Double click the PLC (*Devices* directory) you want to monitor in the Web Designer navigator.
2	Click the **PLC Programs** tab.

Importing PLC Programs

The following procedure shows you how to import PLC programs from UnityPro to Web Designer.

Step	Action
1	Click **Import** on the right side of the PLC Program window. **Result:** the Open window appears.

Step	Action
2	Select the UnityPro file (.XEF) containing PLC Programs data. Click **Open**. **Result:** the Import PLC Programs window appears.
3	• Select the sections of the PLC program you want to monitor using the checkbox. • Click **Browse** to select the STU or .XVM file associated to the .XEF for variables animation. **Note:** if you select a .XVM file, only elementary types of variables are animated. Click **Import**. **Result:** the sections of the PLC program selected appear in the navigation tree of the PLC Program tab.

Accessing an Animated PLC Program

Step	Action
1	Select a target in a project.
2	● Click **Target** → **Connect** → **Simulation** (Alt + S) to switch to simulation mode or, ● click **Target** → **Connect** → **Target** (Alt + C) to switch to run mode.
3	Extend the target directory.
4	Select a device in the Devices directory.
5	Right-click and select Open. **Result:** an Internet Explorer window in which the PLC program viewer window associated with the selected device appears.
5	Select the PLC program section you want to visualize in the navigation tree. **Result:** the PLC program appears in the Display window.

Representation and Color Convention

The following figure shows you the PLC Program Viewer window:

1 Navigation tree: select the section of the PLC program you want to visualize
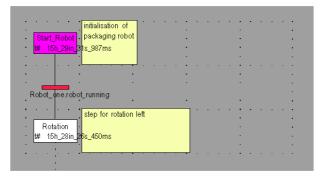**2** Display window: this zone display the animated PLC program

Variables animation:

- Boolean are displayed in:
  - green if its value is true
  - red if its value is false
- Other types display the name or the value of the variable in yellow. Use the tool tip to see more information as the name of the variable, its type, its address and its comment.

Links animation:

- Links connected to boolean variables are displayed in green or red depending on the value of the variable they are connected to (green if true red if false).
- Other links are displayed in black.

SFC animation:

The colors used for the different elements are:

- for steps:
  - green if the step is active,
  - white if the step is inactive,
  - yellow if the activity time of the step is less than the minimum programmed time,
  - pink if the activity time of the step is greater than the minimum programmed time.

- for macro-steps:
  - when a macro-step becomes active the upper half is shown in green,
  - when the OUT step of the macro-step is active the whole of the macro-step is shown in green,
  - when the macro-step becomes inactive it is then shown in white.

- for transitions associated with a Boolean element or a simple Boolean expression:
  - green if the element or the expression is TRUE,
  - red if the element or the expression is FALSE.

- for transitions associated with a section:
  - black as long as the previous step remains inactive,
  - green if the conditions in the section are TRUE,
  - red if the conditions in the section are FALSE.

Tool Tip

The tool tip function is a help bubble which is displayed when you move the cursor over a variable.

It displays information about the value of the variable only if its name is visible in the viewer.

Click on the variable to display the bubble permanently. Right click on it to make it disappear.

Limitations

- Only PLC programs created using UnityPro 4.0 or later can be viewed.
- You can only monitor PLC programs, edition is not allowed.
- The following objects are not animated, they appear in black:
  - Objects for which the result depends on an expression
  - Function blocks without instance for which there is no information on input/output variables
  - Standard DFB (i.e. ALARM_DIA)
  - Multiple dimension tables

Adding Custom Pages to the Site

9

Overview

You may choose to add your own Web pages to the site on the embedded Server. Web Designer allows you to protect these pages with the same passwords as the default pages. You can also put them in an unprotected area where anyone can view them without a password.

FactoryCast provides you animated graphical objects. These objects are written in HTML so you can use them in your own Web pages. They enable you to monitor and control PLC variables by associating PLC variables with objects.

This section discusses how to create you own HTML web pages and how to use the real time animated objects provided with FactoryCast.

NOTE:

When planning custom Web pages, be sure to keep them within the limits of the memory available for customization:
- If you are using a third party software to transfer a website and if you reach the limits of the memory, some pages of the website will not appear.
- If you are using Web Designer to transfer a website, it will prompt you if your website exceeds the memory capacity.

What's in this Chapter?

This chapter contains the following sections:

9.1 Using FactoryCast's Java Applets Using HTML Code

Overview

This section describes how to use the animated objects (also called Java applets) that come with FactoryCast. Use these applets to create custom Web pages. To create custom pages, you can use any plain text editor, such as Microsoft Notepad or a dedicated HTML editor, such as Microsoft FrontPage.

Creating custom Web pages with HTML makes it possible to view live PLC data in your browser.

What's in this Section?

This section contains the following topics:

Topic	Page
Inserting Applets on a Web Page	217
Inserting LiveBeanApplet	218
Inserting LiveBeanApplet using HTML Code	220
Inserting LiveLabelApplet using HTML Code	223
Inserting LiveTableApplet using HTML Code	228

Inserting Applets on a Web Page

Overview

FactoryCast software includes several graphic objects (or JavaBeans) that are used to visualize live PLC data on a graphic display. Generally, an end-user builds a graphic display using the **Graphic Editor** tool that comes with FactoryCast. However, you can also build a graphic display using graphic objects inserted into a Web page via the LiveBeanApplet. Any of the graphic objects, such as an Analog Meter or a Push Button, can be inserted into a Web page so that dynamic data may be visualized outside the context of the Graphic Editor.

To view live PLC data with a browser, you may opt for one of two methods to insert a FactoryCast applet on a Web page.

- (1) Enter the HTML code found in these sections:
  - Inserting a `LiveBeanApplet` using HTML code
  - Inserting a `LiveLabelApplet` using HTML code
  - Inserting a `LiveTableApplet` using HTML code

- (2) Insert a Java applet and then fill in the dialog boxes using the FactoryCast extension for Microsoft FrontPage or Expression Web.

Inserting LiveBeanApplet

Overview

This topic discusses general concepts about inserting a `LiveBeanApplet`.

NOTE:
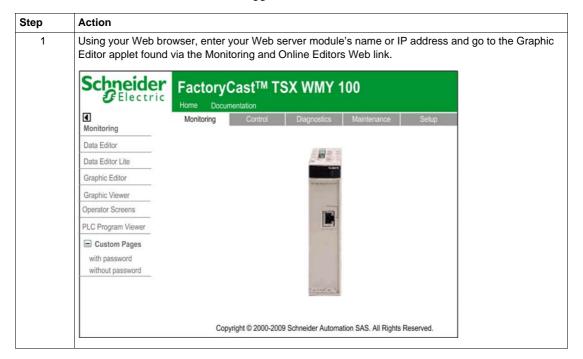
Elsewhere in this guide is information for inserting a `LiveBeanApplet` using:
● HTML *(see page 220)*
● Microsoft's FrontPage or Expression Web Extension *(see page 241)*
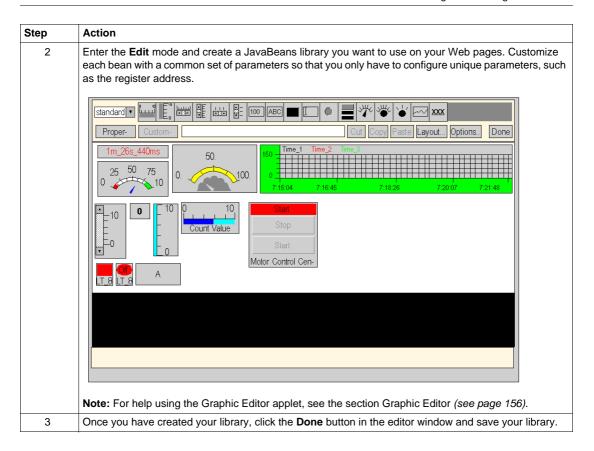
NOTE: Prior to inserting a `LiveBeanApplet` into a Web page, you must create a JavaBeans library using the Graphic Editor that comes with the FactoryCast software. Generally a user will create a JavaBeans library that has one instance of every object that they would like to use in a Web page. Think of this library as a set of templates that are copied to and customized for your Web pages. For example a library may have one analog meter, one rotary selector, and one push button. Multiple instances of each bean can then be added to a Web page, each with a set of unique parameters such as an address.

Inserting a LiveBeanApplet

To insert a `LiveBeanApplet`:

Step	Action
1	Using your Web browser, enter your Web server module's name or IP address and go to the Graphic Editor applet found via the Monitoring and Online Editors Web link.

Step	Action
2	Enter the **Edit** mode and create a JavaBeans library you want to use on your Web pages. Customize each bean with a common set of parameters so that you only have to configure unique parameters, such as the register address.
	Note: For help using the Graphic Editor applet, see the section Graphic Editor *(see page 156)*.
3	Once you have created your library, click the **Done** button in the editor window and save your library.

Inserting LiveBeanApplet using HTML Code

Overview

To graphically visualize data, use graphic objects such as Analog Meter or Push Button. Before any beans are inserted into a Web page, the special applet called `LiveBeanMgrApplet` must be inserted into the server.

LiveBeanMgrApplet

The `LiveBeanMgrApplet` allows the Web page to display dynamic data from the controller. This applet **must** be included **once** on the page if any instances of `LiveBeanApplet` are included in the page.

The `LiveBeanMgrApplet` can be included on a Web page in two possible forms.

- Invisible applet—if the Web page is used only to monitor PLC values, then no input is needed from the user
- Icon of a key—if the Web page is used both to send new values and to monitor values to the PLC, then input is needed from the user in order to send new values.

NOTE: If the applet is used as an icon of a key, the user enters a password in order to send values to the PLC. From the Web browser click on the applet (icon of a key), a dialog box appears requesting the user to enter a password; entering the password enables the user to write to the PLC.

Here is the HTML code that you use to include the applet on a Web page that is used only for monitoring:

```
<APPLET codebase="/classes"
archive="SAComm.jar,GDE.jar,Widgets.jar"
code="com.schneiderautomation.gde.LiveBeanMgrApplet"
width=0 height=0>
</APPLET>
```

Here is the HTML code that you use to include the applet on a Web page that is used for sending values to a PLC as well as monitoring:

```
<APPLET codebase="classes"
archive="SAComm.jar,GDE.jar,Widgets.jar"
code="com.schneiderautomation.gde.LiveBeanMgrApplet"
width=32 height=32>
<PARAM name=MODE value="READWRITE">
<PARAM name=AUTO_LOGIN value="FALSE">
</APPLET>
```

In the above example, if the value of the **AUTO_LOGIN** parameter is set to **TRUE**, instead of **FALSE**, then the password is automatically entered and the user is not required to enter the password.

LiveBeanApplet

The `LiveBeanApplet` is included one time for each symbol (variable) or direct address monitored/controlled on the Web page. For instance, if you are monitoring three symbols (variables), you would include the applet three times. `LiveBeanApplet` allows any graphic object/Java Bean that was created with the Graphic Editor *(see page 156)* to be included on a Web page as a separate applet. Any graphic object that has been saved as part of a Graphic Editor graphic display can be retrieved from the graphic file and presented by the applet.

LiveBeanApplet Parameters

The `LiveBeanApplet` uses parameters that allow you to specify the graphic object to be presented by the applet and to set the applet's background color.

The applet's parameters and their meanings are shown below.

Parameter...	Defines...
LIBRARY	The name of the graphic display which contains the graphic object that is to be presented by the applet. (This will be the same name that was used when the graphic display was saved with the **Graphic Editor**.) **This parameter is required.**
BEAN	The name of the graphic object that is to be retrieved from the graphic display specified by the LIBRARY parameter. (This will be the name that appears as the 'Name' property of the graphic object.) **This parameter is required.**
BACKGRND	The background color for the applet. Acceptable values are WHITE, LT_GRAY, GRAY, DK_GRAY, BLACK, RED, PINK, ORANGE, YELLOW, GREEN, MAGENTA, CYAN, and BLUE. Also, a RGB color value can be entered using the format "0xRRGGBB" where RR, GG, and BB are the hexadecimal values for the red, green, and blue components, respectively. This parameter is optional but is normally set to match the color of the HTML page.

In addition to the above parameters, the <APPLET> tag for a `LiveBeanApplet` must include **width** and **height** attributes. Normally, the size of a `LiveBeanApplet` is set to match the size of the graphic object that it is presenting. To get the size of a graphic object, select the object while the **Graphic Editor** is in editing mode. The selected object's name and size are shown in the **Information Area** at the top of the **Graphic Editor** applet.

LiveBeanApplet Example

All instances of `LiveBeanApplet` that are included in a Web page follow the same pattern, with only the applet's parameters and size varying for each instance.

Here is the HTML code for including a `LiveBeanApplet` that will present the graphic object named **MyMeter** which was saved by the **Graphic Editor** as part of the graphic display, **Library1**.

```
<APPLET codebase="/classes"
archive="SAComm.jar,GDE.jar,Widgets.jar"
code="com.schneiderautomation.gde.LiveBeanApplet"
width=180 height=160>
<PARAM name=LIBRARY value="Library1">
<PARAM name=BEAN value="MyMeter">
<PARAM name=BACKGRND value="0xDDEEFF">
</APPLET>
```

More Information

For more information about creating Java applets and graphic objects to obtain runtime data from a PLC, refer to the Software Developer's Kit included in the FactoryCast installation.

Inserting LiveLabelApplet using HTML Code

Overview

Before any live labels are inserted into a Web page, the special applet called `LiveLabelMgrApplet` must be inserted into the page.

NOTE: However, if a Web page contains both `LiveLabelApplet` and `LiveBeanApplet`, then that page must contain a single instance of `LiveBean-MgrApplet`, not `LiveLabelMgrApplet`.

(`LiveBeanMgrApplet` supports both `LiveLabelApplet` and `LiveBeanApplet`, while `LiveLabelMgrApplet` supports only `LiveLabelApplet`.)

LiveLabelMgrApplet

The `LiveLabelMgrApplet` allows the Web page to display dynamic data from the controller. This applet **must** be included **once** on the page if any instances of `LiveLabelApplet` are included on the page.

Here is the HTML code that you use to include the applet on a page.

```
<APPLET>
codebase="/classes" archive="SAComm.jar"
code="com.schneiderautomation.factorycast.LiveLabelMgrApple"
width=0 height=0>
</APPLET>
```

LiveLabelApplet

Use one `LiveLabelApplet` for every symbol (variable) or direct-address monitored on the Web page used. For example, if you are monitoring three symbols (variables), you would include the applet three times.

This applet displays the following three fields.

Field	Description
Label	Your label for the symbol (variable) or direct address
Value	Run-time value of the symbol (variable) or direct address
Units	The units you specify for the value

Data Parameters

The applet's parameters, their meaning, and the default values are shown below.

Parameter...	Defines...		With Default Value of...
LABEL	A text label to identify the data item		No label
UNITS	A text label to identify the value's engineering units		No units displayed
ADDRESS	The name of Concept/PL7/Unity Pro symbol (variable) or Quantum/Premium direct address		None
DATATYPE	The data type of the symbol (variable) or direct address. Acceptable values for this parameter are		UNDEFINED
	SHORT	8-bit signed integer	
	USHORT	8-bit unsigned integer	
	INT	16-bit signed integer	
	UINT	16-bit unsigned integer	
	DINT	32-bit signed integer	
	UDINT	32-bit unsigned integer	
	REAL	32-bit IEEE floating point	
	TIME	32-bit unsigned integer (in ms)	
	DATE	Date (32-bit BCD)	
	TOD	Time of Day (32-bit BCD)	
	DT	Date and Time 64-bit BCD	
	BOOL	1-bit discrete (boolean)	

NOTES: If the ADDRESS parameter is a direct address, and the DATATYPE parameter is not specified, a default DATATYPE (BOOL ,INT,DINT or REAL based on the implied size of the data value) is used.
If ADDRESS is a direct address for a discrete PLC reference (Quantum 0x/1x reference), DATATYPE must be set to BOOL. DATATYPE may be set to BOOL only for discrete PLC references.
If the ADDRESS parameter is the name of a Concept, PL7 or Unity Pro symbol (variable), the DATATYPE parameter is optional. If the DATATYPE is specified for a symbol (variable), it must exactly match its actual data type,TIME is not a valid data type for PL7 Premium.

Parameter...	Defines...		With Default Value of...
FORMAT	The display format for the value. Acceptable values for this parameter are		DEC for most data types TIME for data type TIME BOOL for data type BOOL DATE for data types DATE, TOD and DT.
	DEC	decimal	
	HEX	hexadecimal	
	BIN	binary	
	ASCII	bytes displayed as ASCII characters	
	TIME	'day_hr_min_sec_ms'	
	DATE	'yyyy-mm-dd-hh and /or hh:mm:ss	
	BOOL	ON_WORD or OFF_WORD (see below)	
NOTE: If DATA TYPE is REAL, a FORMAT other than DEC will give unpredictable results if the value cannot be converted to an integer.			
GAIN	The gain (multiplier) used for scaling the retrieved value to engineering units.		1.0
NOTE: Scaling is to be performed only if GAIN or BIAS is set and FORMAT is DEC. Linear scaling is performed by the formula: SCALED_VALUE=GAINxRAW_VALUE+BIAS			
BIAS	The bias (offset) used for scaling the retrieved value to engineering units. See NOTE for GAIN.		0.0
ON_WORD	A text value to be shown when value is non-zero (Use only if the FORMAT is BOOL).		ON
OFF_WORD	A text value to be shown when value is zero (Use only if the FORMAT is BOOL).		OFF
FOREGRND	Foreground color of the applet. Acceptable values are: WHITE, LT_GRAY, DK_GRAY, BLACK, RED, PINK, ORANGE, YELLOW, GREEN, MAGENTA, CYAN, and BLUE Also, a RGB color value can be entered using the format "0xRRGGBB" where RR, GG, and BB are the hexadecimal values for the red, green, and blue components, respectively.		BLACK
BACKGRND	Background color for the applet. For acceptable values, see FOREGRND.		LT_GRAY
ERROR_ COLOR	Foreground color of the VALUE field when unable to retrieve the value from the PLC. For acceptable values, see FOREGRND.		MAGENTA
LABEL_ ALIGN	Alignment of the text in the LABEL field, if the width of the field is greater than the length of the text. Acceptable values are: LEFT, CENTER, and RIGHT.		LEFT

Parameter...	Defines...	With Default Value of...
VALUE_ ALIGN	Alignment of the text in the VALUE field, if the width of the field is greater than the length of the text. Acceptable values are: LEFT, CENTER, and RIGHT.	LEFT
UNITS_ ALIGN	Alignment of the text in the UNITS field, if the width of the field is greater than the length of the text. Acceptable values are: LEFT, CENTER, and RIGHT.	LEFT
FONT_ NAME	Name of the font used by the applet. Acceptable values are: SERIF, SANSSERIF, and MONOSPACE.	SANSSERIF
FONT_ BOLD	If set, displays all text in the applet as bold. Acceptable values are: TRUE and FALSE.	FALSE
FONT_ ITALIC	If set, displays all text in the applet in italics. Acceptable values are: TRUE and FALSE.	FALSE
FONT_SIZE	Sets the point size of the font used by the applet.	12
LABEL_ WIDTH	The width of the LABEL field.	
UNITS_ WIDTH	The width of the UNITS field.	

Size Parameters

The size of a `LiveLabelApplet` is specified in the width and height attributes of its <APPLET> tag. Unless the width of Label or Units field is set with the LABEL_WIDTH or UNITS_WIDTH parameters, the LABEL and UNITS fields of the applet will always take the width required to display the text values of their associated applet parameters. The remaining width of the applet is given to its VALUE field.

LiveLabelapplet Example #1

The applet example in this section contains almost every applet parameter. Here is the HTML code for this example.

```
<APPLET codebase="/classes" archive="SAComm.jar"
code="com.schneiderautomation.factorycast.LiveLabelApplet"
width=300 height=30>
<PARAM name=LABEL value="Reactor 1 Temperature">
<PARAM name=UNITS value="F">
<PARAM name=ADDRESS value="40101">(ForPremium value="%MW100")
<PARAM name=DATATYPE value="UINT">
<PARAM name=FORMAT value="DEC">
<PARAM name=GAIN value="2.0">
<PARAM name=BIAS value="100.0">
<PARAM name=FOREGRND value="WHITE">
<PARAM name=BACKGRND value="BLACK">
<PARAM name=ERROR_COLOR value="RED">
<PARAM name=FONT_NAME value="SERIF">
<PARAM name=FONT_BOLD value="TRUE">
<PARAM name=FONT_ITALIC value="FALSE">
<PARAM name=FONT_SIZE value="10">
</APPLET>
```

LiveLabelApplet Example #2

This is an example of a minimal applet, using default values for most parameters. Here is the HTML code for this example.

```
<APPLET codebase="/classes" archive="SAComm.jar"
code="com.schneiderautomation.factorycast.LiveLabelApplet"
width=300 height=30>
<PARAM name=LABEL value="Reactor 1 Pressure">
<PARAM name=UNITS value="PSI">
<PARAM name=ADDRESS value="PT_101">
</APPLET>
```

Inserting LiveTableApplet using HTML Code

Overview

LiveTableApplet is used to display dynamic, runtime PLC data on a Web page, and LiveTableApplet operates in a manner similar to LiveLabelApplet. However, there is a difference: LiveTableApplet can show multiple input values using a tabular format. Only a single input value can be shown with LiveLabelApplet.

LiveTableApplet

LiveTableApplet supports applet parameters for

● Setting the number of rows in its table (N_ROWS)
● Default settings for a row's properties
● Unique settings for each row's properties

The properties (default or unique) that can be set for a row of LiveTableApplet are the same properties that can be set for LiveLabelApplet. (The parameter names are the same as those for LiveLabelApplet, except that **Rx_** prefixes them, where **x** equals the applicable row number. A default setting is specified by not including the **Rx_** prefix.

LiveTableApplet Example

This is an example of LiveTableApplet that has two rows and an overall width of 200. The common row properties set the width of the **Label** field to 100 and the width of the **Units** field to 40 (leaving a width of 60 for the **Value** field). Also, every row has a black background with white text of size-10 font. The **Label** text is centered; the **Value** text is right-aligned; and the **Units** text is left-aligned. The address, data type, and the text for the **Label** and **Units** fields are set individually for each of the two rows.

Here is the HTML code for this example.

```
<APPLET codebase="/classes" archive="SAComm.jar"
code="com.schneiderautomation.factorycast.LiveTableApplet"
width="200" height="40">
<PARAM name=N_ROWS value="2">
<PARAM name=LABEL_WIDTH value="100">
<PARAM name=UNITS_WIDTH value="40">
<PARAM name=BACKGRND value="BLACK">
<PARAM name=FOREGRND value="WHITE">
<PARAM name=FONT_SIZE value="10">
<PARAM name=LABEL_ALIGN value="CENTER">
<PARAM name=VALUE_ALIGN value="RIGHT">
<PARAM name=UNITS_ALIGN value="LEFT">

<PARAM name=R1_LABEL value="Reactor Pressure">
<PARAM name=R1_UNITS value="PSIG">
<PARAM name=R1_ADDRESS value="400101">
» (for Premium value="%MW101")
<PARAM name=R1_DATATYPE value="INT">

<PARAM name=R2_LABEL value="Reactor Temperature">
<PARAM name=R2_UNITS value="F">
<PARAM name=R2_ADDRESS value="400102">
» (for Premium value="%MW102")
<PARAM name=R2_DATATYPE value="INT">
</APPLET>
```

9.2   Using FactoryCast Extension for Microsoft FrontPage or Expression Web

Overview

The *Using FactoryCast's Java Applets* section described how to add FactoryCast's Java applets to a HTML document using any text editor. This section describes using an extension for Microsoft's FrontPage or Expression Web application. The extension allows a user of FrontPage or Expression Web to easily insert FactoryCast applets to view real-time PLC data on a Web page.

What's in this Section?

This section contains the following topics:

Installing FactoryCast's Microsoft Expression Web Extension

Overview

This section describes how to install/remove the FactoryCast extension for Microsoft Expression Web (MS Expression Web).

Installing FactoryCast

MS Expression Web installed before Web Designer for FactoryCast HMI 1.7:

During the installation of Web Designer for FactoryCast HMI 1.7, the FactoryCast Extension for MS Expression Web is automatically installed as a MS Expression Web "Macro File." If this is the case, then proceed to the next section, which provides instructions for adding the extension to MS Expression Web's menu.

MS Expression Web installed after Web Designer for FactoryCast HMI 1.7:

The extension can be installed by either re-installing Web Designer for FactoryCast HMI 1.7 or manually copying the macro file to MS Expression Web's macro folder. For manual installation, after installing MS Expression Web, the following will install the extension:

Copy the file "Microsoft Expression Web.wdmacro" from CD-ROM to the following folder (create the final 'Macros' folder, if it does not already exist):
C:\Documents and Settings\<username>\Application Data\Microsoft\Expression\Macros
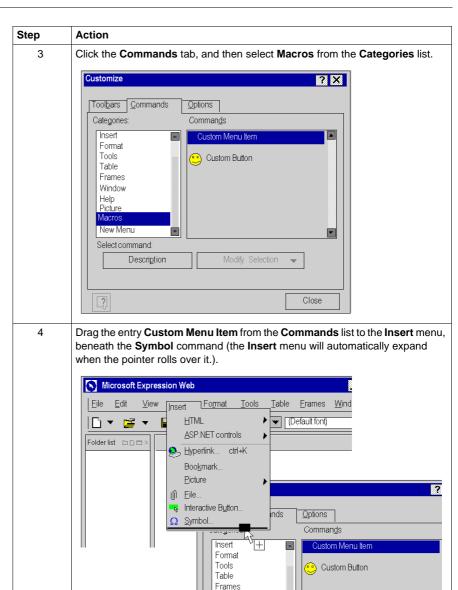
NOTE: MS Expression Web uses this address by default. For a custom installation, you can determine this address by typing SET from a Command Prompt.

Adding FactoryCast Extension

To add the FactoryCast Extension to the MS Expression Web **Insert** menu, do the following.
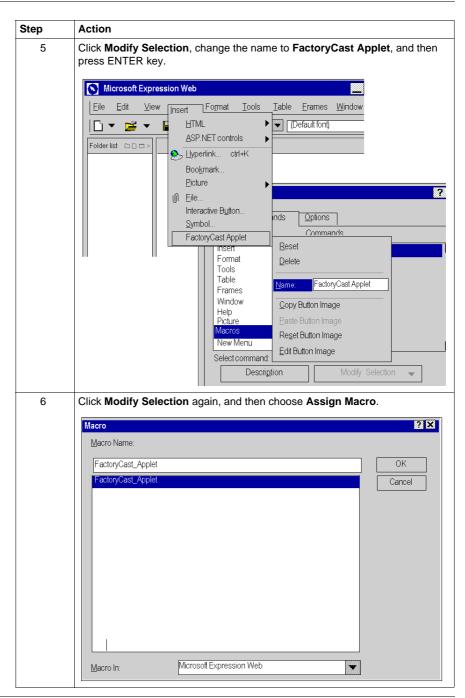
Step	Action
1	Start MS Expression Web.
2	Click **Customize** on the **Tools** menu.
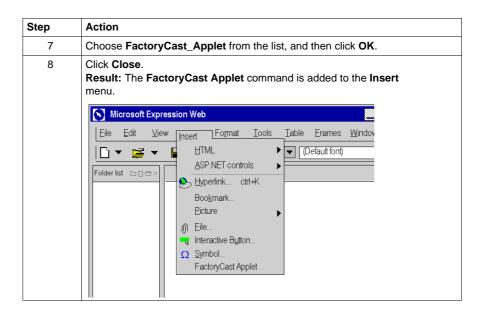
Step	Action
3	Click the **Commands** tab, and then select **Macros** from the **Categories** list.
4	Drag the entry **Custom Menu Item** from the **Commands** list to the **Insert** menu, beneath the **Symbol** command (the **Insert** menu will automatically expand when the pointer rolls over it.).

Step	Action
5	Click **Modify Selection**, change the name to **FactoryCast Applet**, and then press ENTER key.
6	Click **Modify Selection** again, and then choose **Assign Macro**.

Step	Action
7	Choose **FactoryCast_Applet** from the list, and then click **OK**.
8	Click **Close**. **Result:** The **FactoryCast Applet** command is added to the **Insert** menu.

Removing FactoryCast Extension

To remove the FactoryCast Extension from the MS Expression Web menu, proceed as follow:

Step	Action
1	In MS Expression Web, click **Customize** on the **Tools** menu.
2	Click the **Insert** menu, and then select **FactoryCast Applet**.
3	Right click, and then select **Delete** from the popup menu.

Editing Applets

There are two ways to edit an applet that has been inserted into your Web page:

● You can double-click on the object and make changes via dialog boxes.
● You can switch to the HTML editor in MS Expression Web and do your editing in this environment.

NOTE: It is suggested you edit via the first approach unless you are comfortable programming in the HTML language used to build Web pages.

Installing FactoryCast Extension for Microsoft FrontPage

Overview

This section describes how to install/remove the FactoryCast Extension for Microsoft FrontPage 2000.

Installing FactoryCast

During the installation of Web Designer, if FrontPage 2000 has been installed on the same PC, then the FactoryCast Extension for FrontPage 2000 is automatically installed as a FrontPage "Macro File". If this is the case, then proceed to the next section, which provides instructions for adding the Extension to FrontPage's menu.
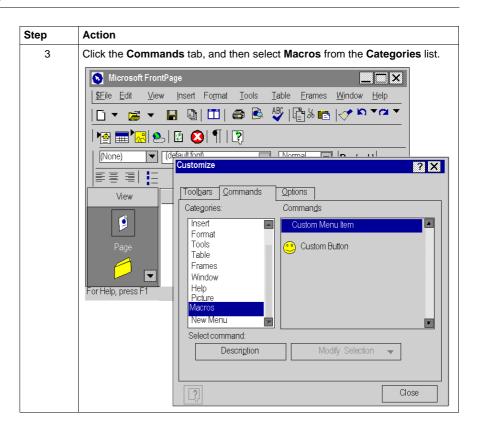
However, if FrontPage 2000 is installed after Web Designer has been installed, then the Extension can be installed by either re-installing Web Designer or manually copying the macro file to FrontPage's macro folder. For manual installation, after installing FrontPage 2000, the following will install the Extension:

Copy the file *Microsoft FrontPage.fpm* from CD-ROM to the folder *%USERPROFILE%\Application Data\Microsoft\FrontPage\Macros* (create the final *'Macros'* folder, if it does not already exist).

Adding FactoryCast Extension
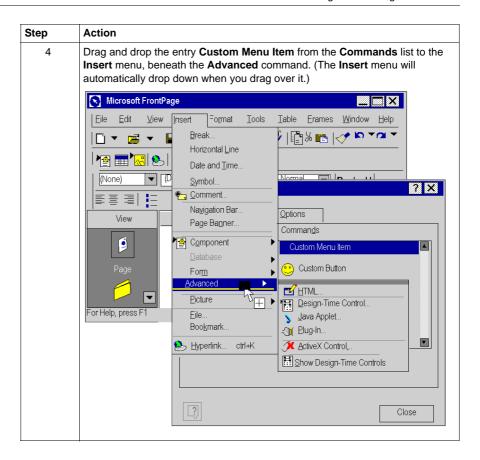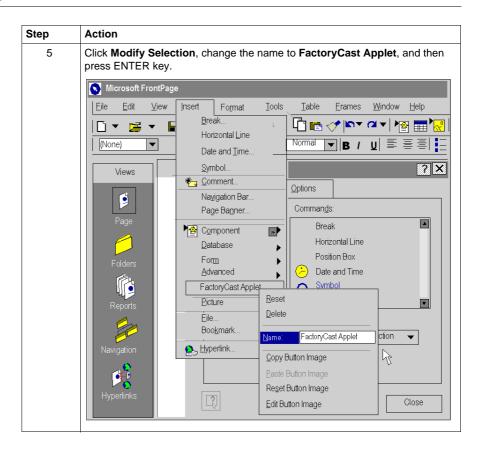
To add the FactoryCast Extension to the FrontPage **Insert** menu, do the following.

Step	Action
1	Start FrontPage 2000.
2	Click **Customize** on the **Tools** menu.

Step	Action
3	Click the **Commands** tab, and then select **Macros** from the **Categories** list.

Step	Action
4	Drag and drop the entry **Custom Menu Item** from the **Commands** list to the **Insert** menu, beneath the **Advanced** command. (The **Insert** menu will automatically drop down when you drag over it.)

Step	Action
5	Click **Modify Selection**, change the name to **FactoryCast Applet**, and then press ENTER key.

Step	Action
6	Click **Modify Selection** again, and then choose **Assign Macro**.
7	Choose **FactoryCast_Applet** from the list, and then click **OK**.

Step	Action
8	Click **Close**. The **FactoryCast Applet** command is added to the **Insert** menu.

Removing FactoryCast Extension

To remove the FactoryCast Extension from the FrontPage menu, do the following.

Step	Action
1	In FrontPage, click **Customize** on the **Tools** menu.
2	Click the **Insert** menu, and then select **FactoryCast Applet**.
3	Right click, and then select **Delete** from the popup menu.

Editing Applets
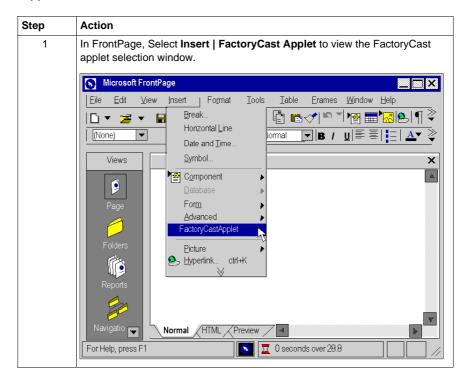
There are two ways to edit an applet that has been inserted into your Web page. First, you can double-click on the object and make changes via dialog boxes. Or you can switch to the HTML editor in FrontPage and do your editing in this environment. It is suggested you edit via the first approach unless you are comfortable programming in the HTML language used to build Web pages.

Inserting LiveBeanApplet Using FrontPage or Expression Web

Overview

NOTE: The following procedure shows you how inserting **LiveBeanApplet** using Frontpage. Use the same procedure if you use Expression Web.

Inserting a LiveBeanApplet

Step	Action
1	In FrontPage, Select **Insert	FactoryCast Applet** to view the FactoryCast applet selection window.

Step	Action
2	**Note:** The **LiveBeanMgrApplet** is a special applet that is inserted one time only into your Web page. Select the applet **LiveBeanMgrApplet** and then click the OK button.

Step	Action
3	Configure the **Mode** and **Auto Login** parameters and then click the **OK** button.

Step	Action
4	A window will appear showing the Java code that will be inserted into your HTML document.

```
<APPLET
codebase="/classes"
archive="SAComm.jar,GDE.jar,Widgets.jar"
code="com.schneiderautomation.gde.LiveBeanMgrApplet"
width="32"   height="32">
<PARAM name=MODE           value="READWRITE">
<PARAM name="AUTO_LOGIN     value="TRUE">
</APPLET>
```

Select the Insert button to finish inserting this applet.

Note: Though a gray box with a blue letter "J" will appear on your Web page during editing, this applet will only be visible on your loaded Web page if you configured the Mode parameter as **ReadWrite** (it will appear as a Key when viewed via your browser). Otherwise, if **Mode** *(see page 223)* is set as **ReadOnly** then the width and height of the applet will be set to zero and you will not see it in your browser.

Step	Action
5	Select the **LiveBeanApplet** from the FactoryCast applet selection window and then click the **OK** button.
6	Enter the library name and the name of a particular bean in this library that you want to show. If none of the bean's properties, such as address, need to be customized, then click the **OK** button.

Step	Action
7	Usually at a minimum the address property will need to be customized for your beans. Thus after entering the library name and bean name, select the object type from the **Object Type** box.
	Click the **Edit** button when finished.
8	In the properties edit window, change only those parameters, such as address, that are unique to this bean. All other parameters will be set to that of the saved bean in your library. Click the **OK** button when finished.

Step	Action
9	Click the **OK** button. A window will appear showing the Java code that will be inserted into your HTML document. Select the **Insert** button to finish inserting this bean.
10	Continue to add instances of `LiveBeanApplet` to your Web page. Once you have inserted your last applet, click the **Cancel** button on the FactoryCast applet selection window to return to editing your Web page.

Step	Action
11	Save the customized Web page.
12	Transfer the customized Web page to the NOE Web server.
13	Test the application.

Inserting LiveLabelApplet Using FrontPage

Overview

This section describes inserting LiveLabelApplet into a Web page.

NOTE: The following procedure shows you how inserting LiveTableApplet using Frontpage. Use the same procedure if you use Expression Web.
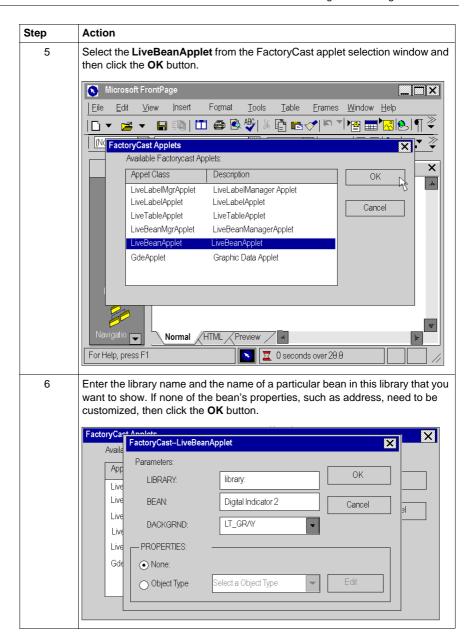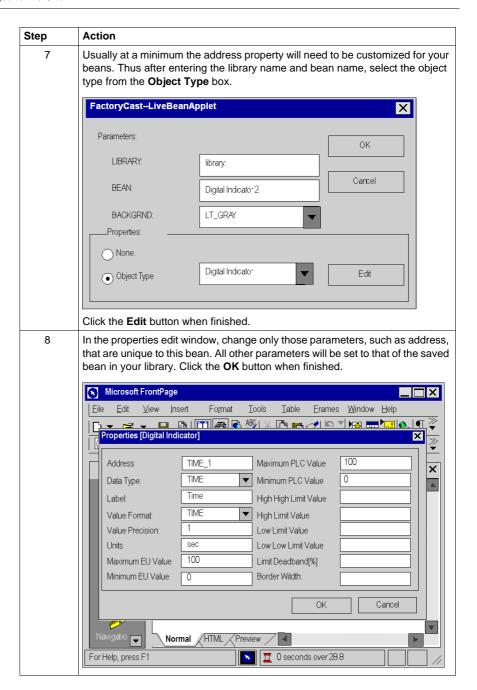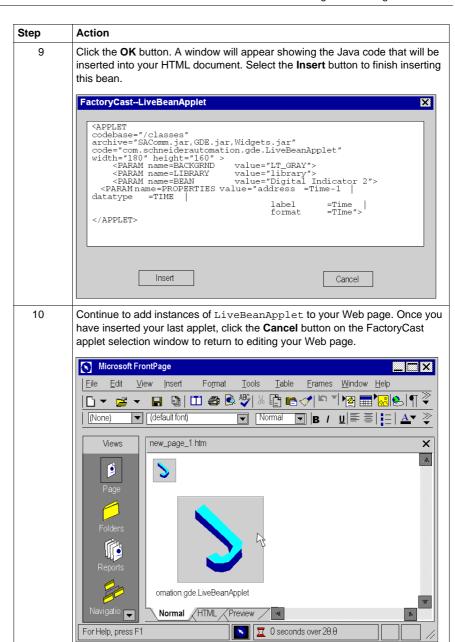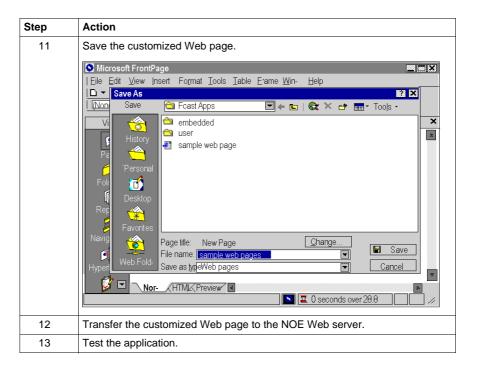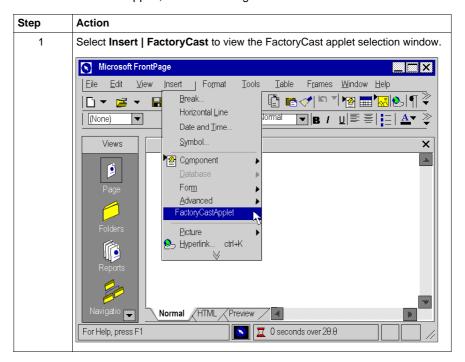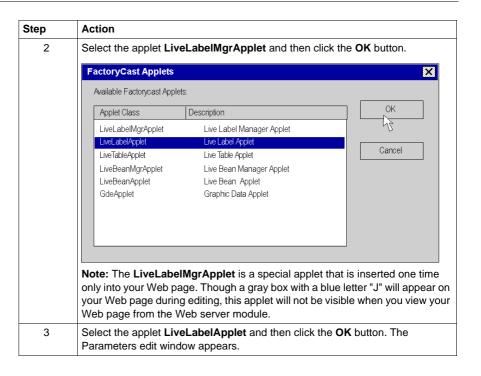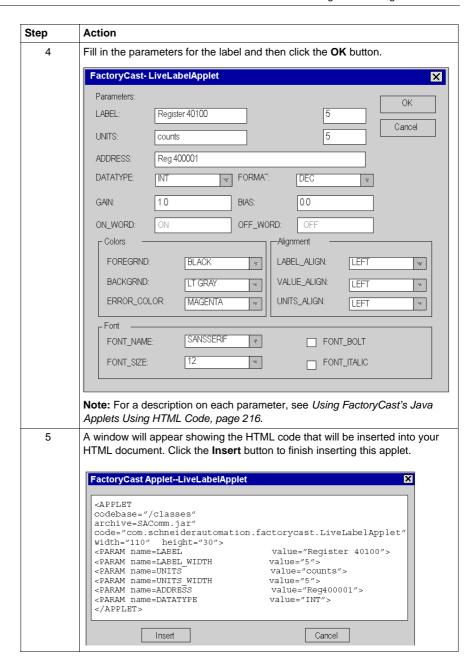
Inserting LiveLabelApplet

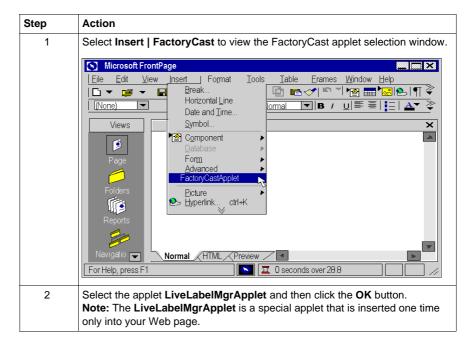To insert a LiveLabelApplet, do the following.

Step	Action
1	Select **Insert	FactoryCast** to view the FactoryCast applet selection window.

Step	Action
2	Select the applet **LiveLabelMgrApplet** and then click the **OK** button. ![FactoryCast Applets dialog] FactoryCast Applets Available Factorycast Applets: Applet Class / Description LiveLabelMgrApplet — Live Label Manager Applet LiveLabelApplet — Live Label Applet LiveTableApplet — Live Table Applet LiveBeanMgrApplet — Live Bean Manager Applet LiveBeanApplet — Live Bean Applet GdeApplet — Graphic Data Applet OK Cancel **Note:** The **LiveLabelMgrApplet** is a special applet that is inserted one time only into your Web page. Though a gray box with a blue letter "J" will appear on your Web page during editing, this applet will not be visible when you view your Web page from the Web server module.
3	Select the applet **LiveLabelApplet** and then click the **OK** button. The Parameters edit window appears.

Step	Action
4	Fill in the parameters for the label and then click the **OK** button.

FactoryCast- LiveLabelApplet

Parameters:

				OK
LABEL:	Register 40100		5	Cancel
UNITS:	counts		5	
ADDRESS:	Reg 400001			
DATATYPE:	INT	FORMAT:	DEC	
GAIN:	1.0	BIAS:	0.0	
ON_WORD:	ON	OFF_WORD:	OFF	

Colors
FOREGRND:	BLACK	
BACKGRND:	LT GRAY	
ERROR_COLOR:	MAGENTA	

Alignment
LABEL_ALIGN:	LEFT	
VALUE_ALIGN:	LEFT	
UNITS_ALIGN:	LEFT	

Font
FONT_NAME:	SANSSERIF	☐ FONT_BOLT
FONT_SIZE:	12	☐ FONT_ITALIC

Note: For a description on each parameter, see *Using FactoryCast's Java Applets Using HTML Code, page 216.*

Step	Action
5	A window will appear showing the HTML code that will be inserted into your HTML document. Click the **Insert** button to finish inserting this applet.

FactoryCast Applet--LiveLabelApplet

```
<APPLET
codebase="/classes"
archive="SAComm.jar"
code="com.schneiderautomation.factorycast.LiveLabelApplet"
width="110"  height="30">
<PARAM name=LABEL              value="Register 40100">
<PARAM name=LABEL_WIDTH        value="5">
<PARAM name=UNITS              value="counts">
<PARAM name=UNITS_WIDTH        value="5">
<PARAM name=ADDRESS            value="Reg400001">
<PARAM name=DATATYPE           value="INT">
</APPLET>
```

Insert   Cancel

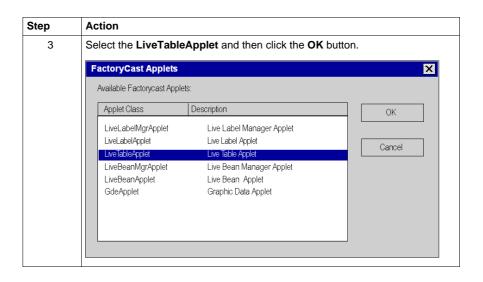| Step	Action
6	Continue to add additional instances of `LiveLabelApplet` to your Web page. Once you have inserted your last applet, click the **Cancel** button on the FactoryCast applet selection window to return to editing your Web page.

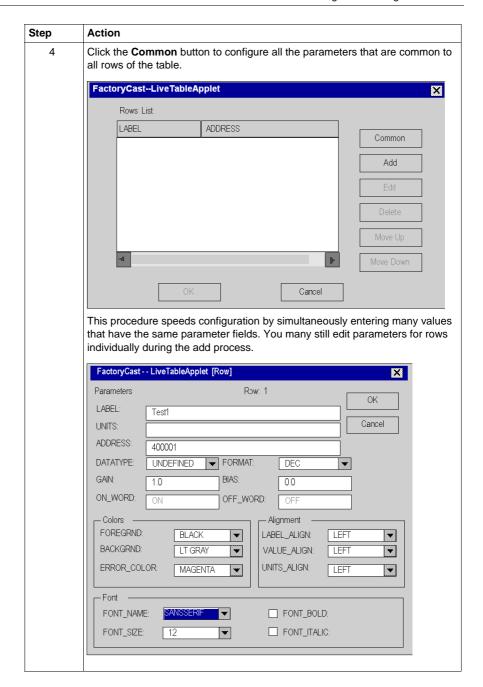# Inserting LiveTableApplet Using FrontPage or Expression Web
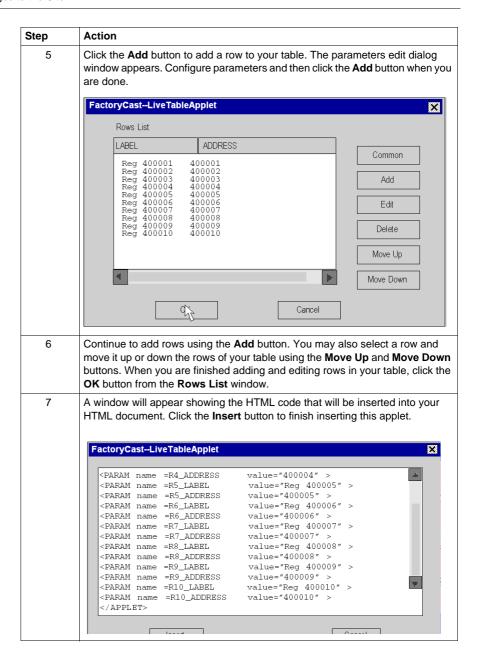
Overview

NOTE: The following procedure shows you how inserting **LiveTableApplet** using Frontpage. Use the same procedure if you use Expression Web.

Inserting LiveTableApplet

Step	Action
1	Select **Insert	FactoryCast** to view the FactoryCast applet selection window.
2	Select the applet **LiveLabelMgrApplet** and then click the **OK** button. **Note:** The **LiveLabelMgrApplet** is a special applet that is inserted one time only into your Web page.

Step	Action
3	Select the **LiveTableApplet** and then click the **OK** button.

Step	Action
4	Click the **Common** button to configure all the parameters that are common to all rows of the table.

This procedure speeds configuration by simultaneously entering many values that have the same parameter fields. You many still edit parameters for rows individually during the add process.

Step	Action
5	Click the **Add** button to add a row to your table. The parameters edit dialog window appears. Configure parameters and then click the **Add** button when you are done.
6	Continue to add rows using the **Add** button. You may also select a row and move it up or down the rows of your table using the **Move Up** and **Move Down** buttons. When you are finished adding and editing rows in your table, click the **OK** button from the **Rows List** window.
7	A window will appear showing the HTML code that will be inserted into your HTML document. Click the **Insert** button to finish inserting this applet.

9.3   Using Graphic Objects Lite

Overview

This section describes how to use the Graphic Objects Lite library. This library uses a modem and allows faster download of the graphical interface by the user. This is a lighter version of the standard graphical library.

What's in this Section?

This section contains the following topics:

Topic	Page
Downloading the Graphic Objects Lite Library	258
Description of Graphic Objects Lite	259

Downloading the Graphic Objects Lite Library

Overview

You must download the Graphic Objects Lite library before you use it. Use the Transfer Web File utility provided with Web Designer, and transfer the file **widgetslite.jar** to the module's Web site.

NOTE: The **widgetslite.jar** file is located in the installation folder, in the subdirectory **/addons/jar**.
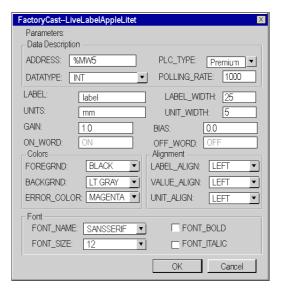
Description of Graphic Objects Lite

Presentation

The set of graphic objects provided in the FactoryCast_Applet can help you create graphic displays similar to the human-machine interface (HMI) screens. All the data control and monitoring objects have integrated communication functions and are designed as standalone graphic objects.

LiveLabel AppletLite Setup

The **LiveLabel AppletLite** window displays the direct address value of a Modbus slave in a text field.

The properties of this widget are as follows:

Property	Description	Limits
Address	Address of the PLC variable	Note 1 *(see page 275)*
Data type	PLC address data type	Note 2 *(see page 275)*
PLC Type	Type of PLC	Premium or Quantum
Label	Label displayed as part of the graphic object	Note 5 *(see page 275)*
Label Width	Width of label	
Unit Width	Width of unit	
Polling rate [ms]	Scanning value	
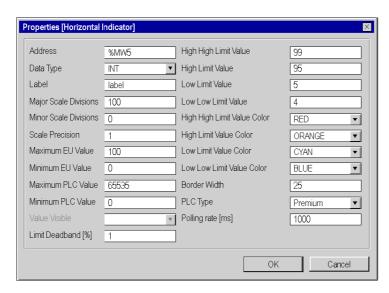
Property	Description	Limits
Gain	The gain (multiplier) is used for the scale of the value retrieved in physical units	1.0
Bias	The bias (multiplier) is used for the scale of the value retrieved in physical units	0.0
ON_Word	Text value displayed when the value is not zero (use if the data type is binary)	ON
OFF_Word	Text value displayed when the value is not zero (use if the data type is binary)	OFF
Foregrnd	Color of the applet foreground	BLACK
Backgrnd	Color of the applet background	LT_GRAY
Error_Color	Color of the applet foreground if the address value cannot be retrieved	MAGENTA
Label_Align	Alignment of text in the Label field if the size is greater than the text length	LEFT
Value_Align	Alignment of text in the Value field if the size is greater than the text length	LEFT
Units_Align	Alignment of text in the Units field if the size is greater than the text length	LEFT
Font_Name	Font name for the applet text	SANSSERIF
Font_Bold	Applet text is bold if configured as TRUE	FALSE
Font_Italic	Applet text is italic if configured as TRUE	FALSE
Font_Size	Applet text size	12

The HTML code with the parameters of the widget above is as follows:

```
<APPLET
codebase="/classes"
archive="mbclient.jar,widgetslite.jar"
code="com.schneiderautomation.factorycast.gateway.widgetsl
ite.LiveLabelApplet"
width="130" height="30">
    <PARAM name="progressbar"    value="true">
    <PARAM name="progresscolor"    value="#000000">
    <PARAM name="ADDRESS"    value="1">
    <PARAM name="UNITID"    value="0">
    <PARAM name="RATE"    value="1000">
    <PARAM name="DATATYPE"    value="REGISTER">
    <PARAM name="LABEL"    value="label">
    <PARAM name="LABEL_WIDTH"    value="25">
    <PARAM name="UNITS"    value="mm">
    <PARAM name="UNITS_WIDTH"    value="5">
</APPLET>
```

Horizontal or Vertical Indicator Setup

The horizontal or vertical indicator gives an analog representation of the value of a direct address of a Modbus slave. It is a horizontal or vertical bar whose length is proportional to the value. It represents a percentage of its range in physical units.

The properties of the indicator are as follows:

Property	Description	Limits
Address	Address of the PLC variable	Note 1 *(see page 275)*
Data type	PLC address data type	Note 2 *(see page 275)*
Label	Label displayed as part of the graphic object	Note 5 *(see page 275)*
Major scale gradation	Number of major gradations (marked) in the scale	0 to 100
Minor scale gradation	Number of minor gradations (not marked) in the scale	0 to 100
Scale precision	Number of decimal places shown for the scale gradations (set to -1 to use a general exponential format)	-1 to 6
Maximum EU Value	Maximum value of the direct address for scaling, in physical units	
Minimum EU Value	Minimum value, in physical units, of the direct address for scaling	

Property	Description	Limits
Maximum PLC Value	Gross maximum value (without scale) of the direct address in the PLC	Note 3 *(see page 275)*
Minimum PLC Value	Gross minimum value (without scale) of the direct address in the PLC	Note 3 *(see page 275)*
Limit Deadband[%]	Neutral range (as a percentage of the UP range) to apply to verification of the High/Low limit	0 to 10
High High Limit Value	Value expressed in physical units of the "High High" limit	
High Limit Value	Value expressed in physical units of the "High" limit	
Low Limit Value	Value expressed in physical units of the "Low" limit	
Low Low Limit Value	Value expressed in physical units of the "Low Low" limit	
High High Limit Value Color	Color of the indicator bar if the scale value is greater than the "High High" limit	
High Limit Value Color	Color of the indicator bar if the scale value is greater than the "High" limit	
Low Limit Value Color	Color of the indicator bar if the scale value is less than the "Low" limit	
Low Low Limit Value Color	Color of the indicator bar if the scale value is less than the "Low Low" limit	
Border Width	Width of border	
PLC Type	Type of PLC	Quantum or Premium
Polling rate [ms]	Scanning value	
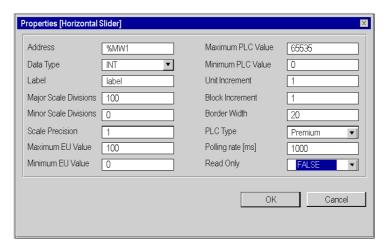
The HTML code with the parameters of the widget above is as follows:

```
<APPLET
codebase="/classes"
archive="mbclient.jar,widgetslite.jar"
code="com.schneiderautomation.factorycast.gateway.
indicators.LiveHorizontalIndicatorApplet"
width="180" height="160">
    <PARAM name="progressbar"    value="true">
    <PARAM name="progresscolor"    value="#000000">
    <PARAM name="debug"    value="0">
    <PARAM name="BACKGRND"    value="LT_GRAY">
    <PARAM name="address"    value="1">
    <PARAM name="datatype"    value="REGISTER">
    <PARAM name="label"    value="label">
    <PARAM name="majorTics"    value="100">
    <PARAM name="minorTics"    value="0">
    <PARAM name="precision"    value="1">
    <PARAM name="maximum"    value="100">
    <PARAM name="minimum"    value="0">
    <PARAM name="maxValue"    value="65535">
    <PARAM name="minValue"    value="0">
    <PARAM name="borderWidth"    value="25">
    <PARAM name="limitHiHi"    value="99">
    <PARAM name="limitHi"    value="95">
    <PARAM name="limitLo"    value="5">
    <PARAM name="limitLoLo"    value="4">
    <PARAM name="deadband"    value="1">
    <PARAM name="rate"    value="1000">
    <PARAM name="unitId"    value="0">
    <PARAM name="colorHiHi"    value="RED">
    <PARAM name="colorHi"    value="ORANGE">
    <PARAM name="colorLoLo"    value="BLUE">
    <PARAM name="colorLo"    value="CYAN">
</APPLET>
```

Horizontal or Vertical Slider Setup

A horizontal or vertical slider gives an analog representation of the direct address of a Modbus device. It is a cursor that is proportional to the value, and it represents a percentage of its range in physical units. Using the mouse, you can change the value of the slider and trigger, and you can send a new value to the Modbus slave.

The properties of the slider are as follows:

Property	Description	Limits
Address	Address of the PLC variable	Note 1 *(see page 275)*
Data type	Data type of the PLC address	Note 2 *(see page 275)*
Label	Label displayed as part of the graphic object	Note 5 *(see page 275)*
Major Scale Division	Number of major gradations (marked) in the scale	0 to 100
Minor Scale Division	Number of minor gradations (not marked) in the scale	0 to 100
Scale Precision	Number of decimal places shown for the scale gradations (set to -1 to use a general exponential format)	-1 to 6
Maximum EU value	Maximum value, in physical units, of the direct address for scaling	
Minimum EU Value	Minimum value of the direct address for scaling, in physical units	
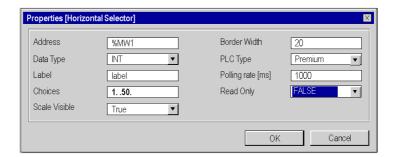
| Property	Description	Limits
Maximum PLC Value	Gross maximum value (without scale) of the direct address in the PLC	Note 3 *(see page 275)*
Minimum PLC Value	Gross minimum value (without scale) of the direct address in the PLC	Note 3 *(see page 275)*
Unit Increment	Amount by which the scale value is modified when you click on the slider arrows	
Block Increment	Amount by which the scale value is modified when you click on the slide area of the bar	
Border Width	Width (in pixels) of the border of the graphic object	
PLC Type	Type of PLC	Premium or Quantum
Polling rate [ms]	Scanning value	
Read Only	TRUE = read value, FALSE = read/write value	

The HTML code with the parameters of the widget above is as follows:

```
<APPLET
codebase="/classes"
archive="mbclient.jar,widgetslite.jar"
code="com.schneiderautomation.factorycast.gateway.sliders.
LiveHorizontalSliderApplet"
width="180" height="160">
    <PARAM name="progressbar"    value="true">
    <PARAM name="progresscolor"    value="#000000">
    <PARAM name="debug"    value="0">
    <PARAM name="BACKGRND"    value="LT_GRAY">
    <PARAM name="address"    value="1">
    <PARAM name="datatype"    value="REGISTER">
    <PARAM name="label"    value="label">
    <PARAM name="majorTics"    value="100">
    <PARAM name="minorTics"    value="0">
    <PARAM name="precision"    value="1">
    <PARAM name="maximum"    value="100">
    <PARAM name="minimum"    value="0">
    <PARAM name="maxValue"    value="65535">
    <PARAM name="minValue"    value="0">
    <PARAM name="unitIncrement"    value="1">
    <PARAM name="blockIncrement"    value="1">
    <PARAM name="rate"    value="1000">
    <PARAM name="unitId"    value="0">
    <PARAM name="borderWidth"    value="20">
    <PARAM name="readOnly"    value="False">
</APPLET>
```

Horizontal or Vertical Selector

A horizontal or vertical selector allows the user to choose from a number of options. Once the selection has been made, the value corresponding to the choice is sent to the PLC. The choices are represented by marks on a "scale", the current selection being indicated by the position of the cursor on a slider.

The properties of the slider are as follows:

| Property	Description	Limits
Address	Address of the PLC variable	Note 1 *(see page 275)*
Data type	PLC address data type	Note 2 *(see page 275)*
Label	Label displayed as part of the graphic object	Note 5 *(see page 275)*
Choices	Setpoints to apply to the address value	
Border Width	Width (in pixels) of the border of the graphic object	
PLC Type	Type of PLC	Premium or Quantum
Polling rate [ms]	Scanning value	
Read Only	True = read value, False = read/write value	

The HTML code with the parameters of the widget above is as follows:
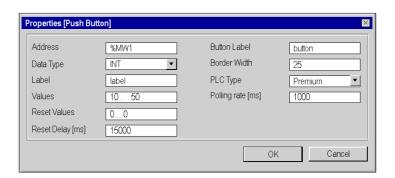
```
<APPLET
codebase="/classes"
archive="mbclient.jar,widgetslite.jar"
code="com.schneiderautomation.factorycast.gateway.selectors
.LiveHorizontalSelectorApplet"
width="180" height="160">
    <PARAM name="progressbar"    value="true">
    <PARAM name="progresscolor"    value="#000000">
    <PARAM name="debug"    value="0">
    <PARAM name="BACKGRND"    value="LT_GRAY">
    <PARAM name="address"    value="1">
    <PARAM name="datatype"    value="REGISTER">
    <PARAM name="label"    value="label">
    <PARAM name="scaleVisible"    value="True">
    <PARAM name="choices"    value="1=1000,9=9000,50=50000">
    <PARAM name="rate"    value="1000">
    <PARAM name="unitId"    value="0">
    <PARAM name="borderWidth"    value="20">
    <PARAM name="readOnly"    value="False">
</APPLET>
```

Push Button Setup

You can send a preset value to one or more Modbus slaves with a push button. A push button is activated with the mouse.

The properties of the push button are as follows:

Property	Description	Limits
Address	Address of the PLC variable	Note 1 *(see page 275)*
Data type	PLC address data type	Note 2 *(see page 275)*
Label	Label displayed as part of the graphic object	Note 5 *(see page 275)*
Values	Setpoints to apply to the address value when the button is pressed	Note 4 *(see page 275)*
Reset Values	Value to apply when the Reset Delay ends	
Reset Delay [ms]	Time in ms counted down after the button is pressed	
Button Label	Label to display on the button	
Border Width	Width (in pixels) of the border of the graphic object	
PLC Type	Type of PLC	Premium or Quantum
Polling rate [ms]	Scanning value	

The HTML code with the parameters of the widget above is as follows:
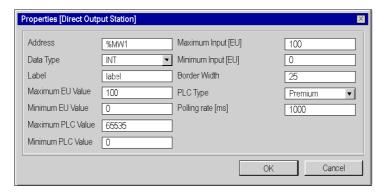
```
<APPLET
codebase="/classes"
archive="mbclient.jar,widgetslite.jar"
code="com.schneiderautomation.factorycast.gateway.pushButton
.LivePushButtonApplet"
width="180" height="160">
    <PARAM name="progressbar"    value="true">
    <PARAM name="progresscolor"    value="#000000">
    <PARAM name="debug"    value="0">
    <PARAM name="BACKGRND"     value="LT_GRAY">
    <PARAM name="address"     value="1">
    <PARAM name="datatype"     value="REGISTER">
    <PARAM name="label"    value="label">
    <PARAM name="values"    value="10,50">
    <PARAM name="resetValues"    value="0">
    <PARAM name="resetDelay"    value="15000">
    <PARAM name="borderWidth"    value="25">
    <PARAM name="buttonLabel"    value="button">
    <PARAM name="rate"    value="1000">
    <PARAM name="unitID"     value="0">
</APPLET>
```

NOTE: In this example, when you press the button, the value 10 is applied to address 1 and the value 50 is applied to address 2 for 15,000 ms. After 15,000 ms, the two addresses are reset to 0.

Direct Output Window

With the Direct Output Window applet, you can enter a value in a text input field directly from the keyboard. If you enter a numerical value between the upper and lower preset limits, an OK button is activated. The value is sent to the Modbus slave each time you click OK or press the ENTER key (if the input field is active for keyboard input).

The direct output properties are as follows:

| Property	Description	Limits
Address	Address of the PLC variable	Note 1 *(see page 275)*
Data type	PLC address data type	Note 2 *(see page 275)*
Label	Label displayed as part of the graphic object	Note 5 *(see page 275)*
Maximum EU Value	Maximum value, in physical units, of the direct address for scaling	
Minimum EU Value	Minimum value, in physical units, of the direct address for scaling	
Maximum PLC Value	Gross maximum value (without scale) of the direct address in the PLC	Note 3 *(see page 275)*
Minimum PLC Value	Gross minimum value (without scale) of the direct address in the PLC	Note 3 *(see page 275)*
Maximum Input [EU]	Maximum setpoint for the input	
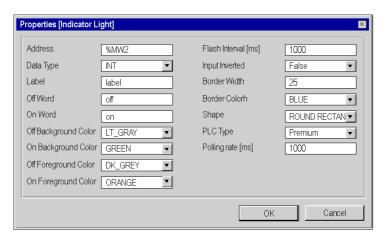
Property	Description	Limits
Minimum Input [EU]	Minimum setpoint for the input	
Border Width	Width (in pixels) of the border of the graphic object	
PLC Type	Type of PLC	Premium or Quantum
Polling rate [ms]	Scanning value	

The HTML code with the parameters of the widget above is as follows:

```
<APPLET
codebase="/classes"
archive="mbclient.jar,widgetslite.jar"
code="com.schneiderautomation.factorycast.gateway.direct
Output.LiveDirectOutputApplet"
width="180" height="160">
    <PARAM name="progressbar"    value="true">
    <PARAM name="progresscolor"    value="#000000">
    <PARAM name="debug"    value="0">
    <PARAM name="BACKGRND"    value="LT_GRAY">
    <PARAM name="address"    value="1">
    <PARAM name="datatype"    value="REGISTER">
    <PARAM name="label"    value="label">
    <PARAM name="maximum"    value="100">
    <PARAM name="minimum"    value="0">
    <PARAM name="maxValue"    value="65535">
    <PARAM name="minValue"    value="0">
    <PARAM name="maxInputValue"    value="100">
    <PARAM name="minInputValue"    value="0">
    <PARAM name="rate"    value="1000">
    <PARAM name="unitId"    value="0">
    <PARAM name="borderWidth"    value="25">
</APPLET>
```

Indicator Light Setup

The indicator light provides a dual indication of the value of a direct address in a PLC. If the Input inverted property is not set to TRUE, a 0 input value is declared OFF, and a non-zero value is declared ON. If the Flash Interval property is set to a positive value, the indicator light flashes when the input value is equivalent to ON.

The properties of the indicator light are as follows:

| Property	Description	Limits
Address	Address of the PLC variable	Note 1 *(see page 275)*
Data type	PLC address data type	Note 2 *(see page 275)*
Label	Label displayed as part of the graphic object	Note 5 *(see page 275)*
OFF Word	Text displayed when the input value is OFF	
ON Word	Text displayed when the input value is ON	
OFF Background Color	Background color of the indicator light when OFF Word is displayed	
ON Background Color	Background color of the indicator light when ON Word is displayed	
OFF Foreground Color	OFF Word text color	
ON Foreground Color	ON Word text color	
Flash Interval	The flashing time for the indicator light (expressed in ms) when the input value is ON. Set to zero for no flashing	200 to 2000
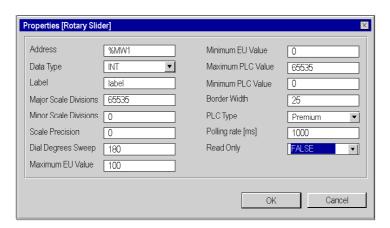
Property	Description	Limits
Input inverted	On TRUE, inverts the input value (the indicator light displays the OFF Word when the input value is ON)	
Border Width	Width (in pixels) of the border of the graphic object	
Border Color	Color of the border	
Shape	Shape (circular, rectangular, etc.) of the indicator light	
PLC Type	Type of PLC	Premium or Quantum
Polling rate [ms]	Scanning value	

The HTML code with the parameters of the widget above is as follows:

```
<p><APPLET
codebase="/classes"
archive="mbclient.jar,widgetslite.jar"
code="com.schneiderautomation.factorycast.gateway.indica-
torLight.LiveIndicatorLightApplet"
width="180" height="160">
    <PARAM name="progressbar"    value="true">
    <PARAM name="progresscolor"    value="#000000">
    <PARAM name="debug"    value="0">
    <PARAM name="BACKGRND"    value="LT_GRAY">
    <PARAM name="address"    value="2">
    <PARAM name="datatype"    value="REGISTER">
    <PARAM name="label"    value="label">
    <PARAM name="offWord"    value="off">
    <PARAM name="onWord"    value="on">
    <PARAM name="offWordBackground"    value="LT_GRAY">
    <PARAM name="onWordBackground"    value="GREEN">
    <PARAM name="offWordForeground"    value="DK_GRAY">
    <PARAM name="onWordForeground"    value="ORANGE">
    <PARAM name="flashInterval"    value="1000">
    <PARAM name="inputInverted"    value="False">
    <PARAM name="borderWidth"    value="25">
    <PARAM name="borderColor"    value="BLUE">
    <PARAM name="shape"    value="ROUND RECTANGLE">
    <PARAM name="rate"    value="1000">
    <PARAM name="unitId"    value="0">
</APPLET>
```

Rotary Slider Setup

A rotary slider gives an analog representation of the direct address of a Modbus device. It draws a position proportional to the value of the address and represents a percentage of its range in physical units on a circular dial. The size of the circular dial (cycle in degrees of a circle) and the button color can be configured. Using the mouse, the user can change the value of the rotary slider and trigger sending a new value to the PLC.

The properties of the slider are as follows:

Property	Description	Limits
Address	Address of the PLC variable	Note 1 *(see page 275)*
Data type	PLC address data type	Note 2 *(see page 275)*
Label	Label displayed as part of the graphic object	Note 5 *(see page 275)*
Major scale gradation	Number of major gradations (marked) in the scale	0 to 100
Minor scale gradation	Number of minor gradations (not marked) in the scale	0 to 100
Scale precision	Number of decimal places in the scale gradations (set to -1 to use a general exponential format)	-1 to 6
Dial Degrees Sweep	Portion of circular dial used to draw the scale	60 to 300
Maximum EU Value	Maximum value of the direct address for scaling, in physical units	
Minimum EU Value	Minimum value of the direct address for scaling, in physical units	

Property	Description	Limits
Maximum PLC Value	Gross maximum value (without scale) of the direct address in the PLC	Note 3 *(see page 275)*
Minimum PLC Value	Gross minimum value (without scale) of the direct address in the PLC	Note 3 *(see page 275)*
Border Width	Width (in pixels) of the border of the graphic object	
PLC Type	Type of PLC	Premium or Quantum
Polling rate [ms]	Scanning value	
Read Only	True = read value, False = read/write value	

The HTML code with the parameters of the widget above is as follows:

```
<APPLET
codebase="/classes"
archive="mbclient.jar,widgetslite.jar"
code="com.schneiderautomation.factorycast.gateway.sliders.
LiveRotosliderApplet"
width="180" height="160">
    <PARAM name="progressbar"    value="true">
    <PARAM name="progresscolor"    value="#000000">
    <PARAM name="debug"    value="0">
    <PARAM name="BACKGRND"    value="LT_GRAY">
    <PARAM name="address"    value="1">
    <PARAM name="datatype"    value="REGISTER">
    <PARAM name="label"    value="label">
    <PARAM name="majorTics"    value="65535">
    <PARAM name="minorTics"    value="0">
    <PARAM name="precision"    value="0">
    <PARAM name="degSweep"    value="180">
    <PARAM name="maximum"    value="100">
    <PARAM name="minimum"    value="0">
    <PARAM name="maxValue"    value="65535">
    <PARAM name="minValue"    value="0">
    <PARAM name="borderWidth"    value="25">
    <PARAM name="rate"    value="1000">
    <PARAM name="readOnly"    value="False">
    <PARAM name="unitID"    value="0">
```

Notes

1.	The address can be:	
	%MW	IEC internal word
	%MD	IEC double word
	%M	IEC internal bit
	400000	Concept integer
	100000	Concept boolean
2.	The various values of the Data type property have the following meaning:	
	Data type	Meaning
	`INT`	`integer`
	`DINT`	`double integer`
	`BOOL`	`boolean`
3.	The limits of the Maximum PLC Value and Minimum PLC Value properties are the natural limits of the configured Data type property.	
4.	Specify at least one value for a push button. If several values are entered, they will be assigned to an address table starting with the direct address indicated.	
5.	If you specify `param name="label" value="$data$'` in the HTML code, the applet displays the numerical value of the data in place of a label.	

Setting Up an External Tool

<div style="text-align: right; font-size: 2em; font-weight: bold;">10</div>
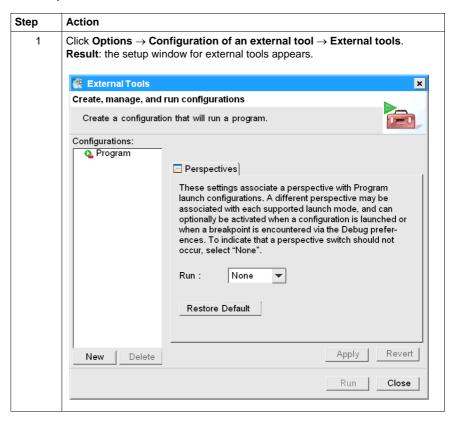
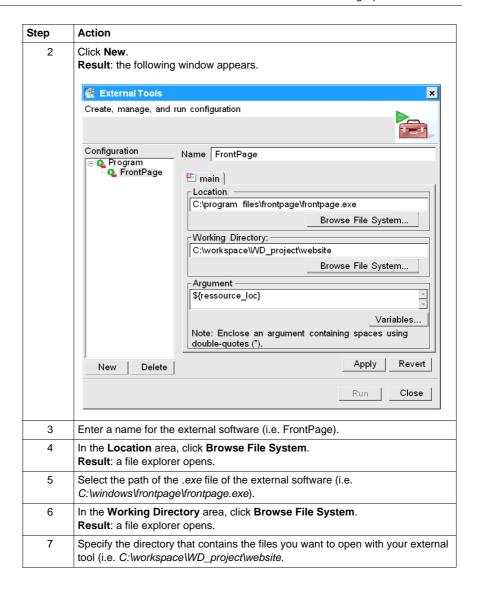## Setting Up an External Tool

Overview

This function enables you to setup an external tool that will be used by Web Designer. For example, you can setup FrontPage to edit the files of your website.
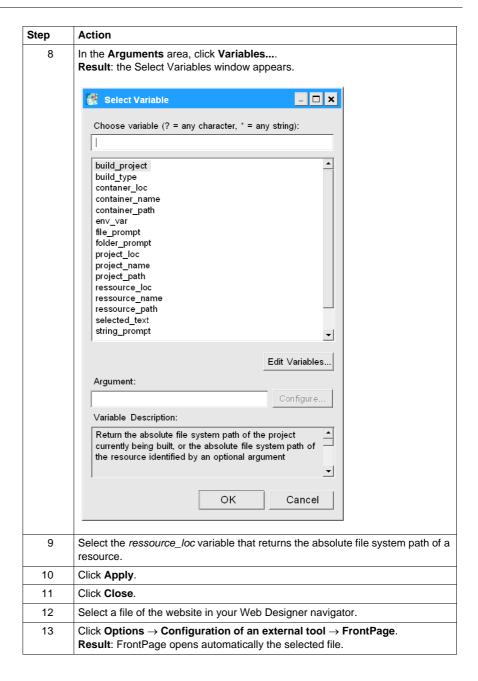
The following part shows you how setup FrontPage to open the files of the website, however the procedure is the same if you use another software.

Example

The following table shows how to set up a HTML editor. Here, hostname is used as an example:

Step	Action
1	Click **Options** → **Configuration of an external tool** → **External tools**. **Result**: the setup window for external tools appears.

Step	Action
2	Click **New**. **Result**: the following window appears.
3	Enter a name for the external software (i.e. FrontPage).
4	In the **Location** area, click **Browse File System**. **Result**: a file explorer opens.
5	Select the path of the *.exe* file of the external software (i.e. *C:\windows\frontpage\frontpage.exe*).
6	In the **Working Directory** area, click **Browse File System**. **Result**: a file explorer opens.
7	Specify the directory that contains the files you want to open with your external tool (i.e. *C:\workspace\WD_project\website.*

Step	Action
8	In the **Arguments** area, click **Variables...**. **Result**: the Select Variables window appears.
9	Select the *ressource_loc* variable that returns the absolute file system path of a resource.
10	Click **Apply**.
11	Click **Close**.
12	Select a file of the website in your Web Designer navigator.
13	Click **Options** → **Configuration of an external tool** → **FrontPage**. **Result**: FrontPage opens automatically the selected file.

Changing the Workspace Directory

11

Changing the workspace directory.

Presentation

The workspace is the space where projects are stored. Only those located in the current workspace are accessible when open. Projects are automatically created in the current workspace. It's possible to have several workspaces and to pass from one to another.

This function enables you to change the path to the workspace.

To do this, select **Change Workspace...** in the **Options** menu.

Formatting and Re-Starting a Module

12

Re-start/Format a Module

Introduction

Re-starting is necessary to take into account the modifications made to the application.

Formatting deletes the website on the module and restores the default website *(Website*, *GraphicScreens* and *DataTables* directories). Formatting allows you to delete all the modifications made to the website of a module, in order to start a fresh one from a defined status. It does not modify the system configuration.
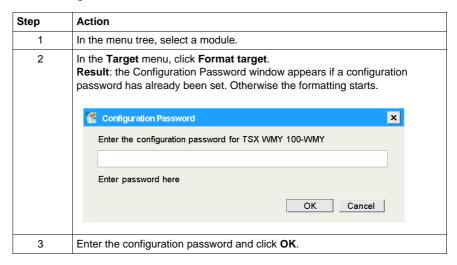
Re-start the Module

The following table shows how to re-start a module:

Step	Action
1	In the menu tree, select a module.
2	In the **Target** menu, click **Reboot target**.

Format the Module

The following table shows how to format a module:

Step	Action
1	In the menu tree, select a module.
2	In the **Target** menu, click **Format target**. **Result**: the Configuration Password window appears if a configuration password has already been set. Otherwise the formatting starts. **Configuration Password** ☒ Enter the configuration password for TSX WMY 100-WMY Enter password here OK Cancel
3	Enter the configuration password and click **OK**.

Security

13

Subject of this Chapter

This chapter explains how to manage the security for a website using firewall, access rights and password protection.

What's in this Chapter?

This chapter contains the following topics:

Internal Security

Overview

Web Designer provides 2 mechanisms to allow that only authorized users view and modify your data:
- password entry,
- write restrictions.

Anyone who has access to a configuration tool and to your embedded server can override your security settings and download new settings to the server. Unauthorized or incorrect changes to data may change the behavior of your application in ways that may be undesirable or even hazardous.

⚠ WARNING

UNINTENDED OPERATION

Keep strict control of access to the embedded server:

- Change passwords monthly,
- Do not use simple user names and passwords,
- Disable default passwords before commissioning the module.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Password Entry

Although you may add unprotected Web pages to the site, the default Web pages and any other pages you choose to protect can only be viewed by users who supply the correct user name and password.

Restrictions

Restrictions are applied overall.

When you create a website and you want to protect it, you must place it in the folder called *secure*.

External Security
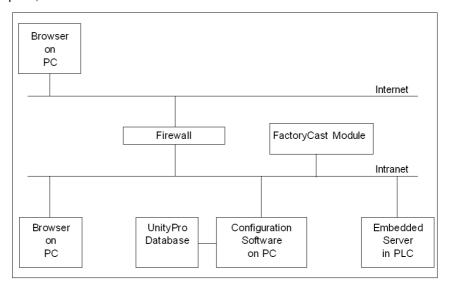
Overview

If your network has been configured to enable users to consult your Internet site, your security system is the same as that of an intranet site, only you have an additional security measure: a firewall.

Architecture of a Firewall

A firewall forms a gateway between Internet and your embedded server. You can use a firewall to restrict or forbid access to your website.

A firewall can be configured to authorize network connections to a limited range of ports, or to authorize traffic to or from certain IP addresses.

Types of Firewalls

There are two types of firewalls:
- Network firewalls
- Application firewalls

Network Firewalls

Network firewalls are often installed between the Internet and a single entry point to an intranet or internal protected network.

Application-Level Firewalls

An application firewall works for an application, for example FTP. It intercepts all traffic sent to this application, and decides whether or not to transmit this traffic to the application. Application firewalls are located on individual host computers.

Firewall Configuration

Web Designer uses HTTP, FTP and Schneider Electric Modbus application protocol (MBAP) to access embedded server pages and files. If you want viewers to be able to access your site from the Internet and your embedded server is protected by a firewall, you must configure the firewall to authorize HTTP, FTP and MBAP traffic.

Port	Protocol	Access to...
21	FTP	Protected embedded server files
Higher than 1024		
80	HTTP	Web pages
502	MBAP	Operational data

NOTE:

● The default FTP name and password are USER/USER.
● The FactoryCast client follows the "Firewall Friendly FTP" standard, RFC 1579. It issues an FTP PASV command to the FactoryCast server before any attempt to establish an FTP data connection.
● The online mode of the configuration tool is not operational if the module is protected by a firewall. The ports in this mode are dynamically assigned.

Variable Access Security, Symbol, Direct Address

Presentation

Users who enter the write password can only modify variables (symbols) and direct addresses which are write-enabled. When you create a Web-enabled database of variables and direct addresses, you can designate each element as read-only or write-enabled.

Unauthorized or incorrect modifications made to symbols and direct addresses may have undesirable or even dangerous effects on the behavior of your application.

⚠ **WARNING**

UNINTENDED EQUIPMENT OPERATION

- Carefully select the symbols and direct addresses you authorize to be modified online.
- Do not authorize online modifications of critical process variables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.
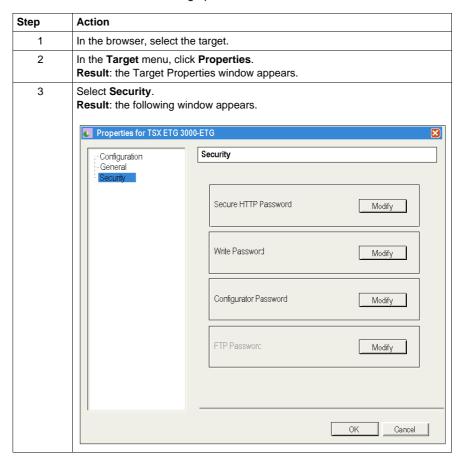
Changing Passwords
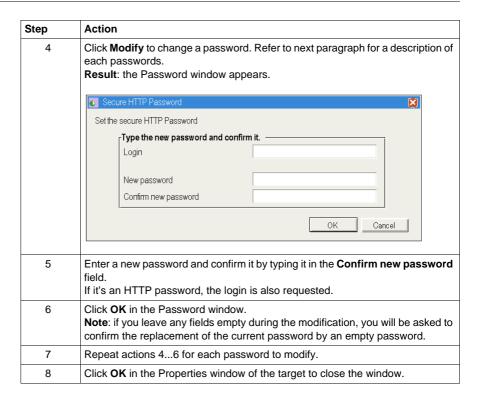
Introduction

This page enables you to modify the different user names and passwords that are used for identification.

Modify Passwords

This table describes how to change passwords:

Step	Action
1	In the browser, select the target.
2	In the **Target** menu, click **Properties**. **Result**: the Target Properties window appears.
3	Select **Security**. **Result**: the following window appears.

Step	Action
4	Click **Modify** to change a password. Refer to next paragraph for a description of each passwords. **Result**: the Password window appears. ![Secure HTTP Password window: Set the secure HTTP Password. Type the new password and confirm it. Login, New password, Confirm new password fields with OK and Cancel buttons.]
5	Enter a new password and confirm it by typing it in the **Confirm new password** field. If it's an HTTP password, the login is also requested.
6	Click **OK** in the Password window. **Note**: if you leave any fields empty during the modification, you will be asked to confirm the replacement of the current password by an empty password.
7	Repeat actions 4...6 for each password to modify.
8	Click **OK** in the Properties window of the target to close the window.

Function

This table shows the fields in the various windows used to modify passwords:

Window	Function
Secure HTTP Password	Required for connecting to the secure pages of the module website via a browser.
Write Password	Required to write variables in animation mode.
Configurator Password	Required to access the configuration parameters of the module.
FTP Password	Not available.

Appendices

Scope of this Appendix

This appendix shows the menus of the high application and the contextual menus. It also gives you recommandations on datalogging service.

What's in this Appendix?

The appendix contains the following chapters:

Chapter	Chapter Name	Page
A	Flash Recommendation	295
B	Menu	297

Flash Recommendation

A

Recommendation on Datalogging Service

Size of the Log File

The following table shows you an estimation of the log file size in bytes depending on the number of variables logged and the number of logs:

Number of logs	Number of variables						
	1	2	5	10	20	50	100
1	65	110	245	470	920	2270	4520
2	130	220	490	940	1840	4540	9040
5	325	550	1225	2350	4600	11350	22600
10	650	1100	2450	4700	9200	22700	45200
20	1300	2200	4900	9400	18400	45400	90400
50	3250	5500	12250	23500	46000	113500	226000
100	6500	11000	24500	47000	92000	227000	452000

NOTE: To prolong the internal Flash life, rerun the log file at intervals greater than 30 minutes.

Menu

B

Subject of this Chapter

This chapter describes the menus for Web Designer functions.

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Menu	298
Contextual Menu	300

Menu

Overview

The following table shows the complete menu system when all functions are supported:

Menu	Sub-menu	Overview
Project	New	Create a new project: Creating a new module/device/data table/graphic page. Creating a service. Creating files and folders.
	Open project	Open an existing project.
	Close project	Close current project.
	Save all	Save all items modified in the project.
	Import	Importing an existing (*.zip*) project or converting a FactoryCast or FactoryCast HMI project.
	Export	Exporting the current project to a *.zip* file.
	Global transfer	Downloading all the project's modules (and all the files).
	Project Validation	Verifying the project before transfer.
	Refresh	Updating the window and menu tree.
	Properties	View/modify the project's properties (passwords, comments, etc.).
	Exit	Exit application
Edit	Undo	Cancel last action.
	Cut	Destruction of the selected object and putting it on the clipboard (the object can be a project, a module, a device, a graphic object, a file, a variable etc.).
	Copy	Copy the object to the clipboard.
	Paste	Paste the clipboard.
	Delete	Delete the selected object.
	Find...	Search for text in the project.

Menu	Sub-menu	Overview
Target	Transfer	Transfer all files, either from your PC to the destination, or from the destination to your PC.
	Connect	Connecting to the module (if the module authorizes the connection) or to the simulator.
	Disconnect	Disconnecting from the module or from the simulator
	Stop all services	Shutting down all the services (for targets using services).
	Start all services	Starting all the services (for targets using services).
	Site Explorer	Display a view of the website in the window on the bottom.
	Reboot target	Rebooting the connected module (for modules that authorize).
	Format target	Formatting the connected module (for modules that authorize).
	Set target address	Display/modify the IP Address, user name and password of the target.
	Synchronize with PLC database	Synchronize the namespace of your project with a PLC database. Not available for FactoryCast HMI targets.
	Properties	View/modify the target's properties.
Service	Stop	Shut down current service.
	Run	Start current service.
	Print	Print current service.
	Statistics	View statistics for the selected service (incoming messages, outgoing messages, etc.).
Options	Set up an external tool	Set up an external tool (for example FrontPage).
	Change workspace...	Changing a workspace directory.
	Default display	Restoring the three-dimensional view of the work window by default.
	Automatic input	Fill in automatically the values of a new variable by incrementing the values of the last record.
Help	Help	Access to Web Designer for FactoryCast HMI Help file.
	About	Information about the version, copyright etc. of Web Designer for FactoryCast HMI.

Contextual Menu

Table

The following table shows the contextual menu of the file tree.

File tree item	Menu (right-click)	Sub-menu	Comment
Project name	New	Project Target	Launch the wizard. 1st window.
	Edit		
	Paste		Paste project.
	Delete		Destroy project.
	Rename		Rename project.
	Global transfer		Transfer project.
	Properties		View the project properties.
Module name	New	Device Service	Launch the wizard. 2nd window.
	Edit		
	Cut		Cut module.
	Copy		Copy module.
	Paste		Paste module.
	Delete		Delete module.
	Rename		Rename module.
	Transfer	PC->Target Target->PC	Transfer web site.
	Connect	Target Simulation	Connect module.
	Disconnect		Disconnect module.
	Properties		View the module's properties.
Devices folder	New device		View the selection window of symbols.
	Paste		Paste device.

File tree item	Menu (right-click)	Sub-menu	Comment
Device element	Edit		Launch the device display window.
	Cut		Cut device.
	Copy		Copy device.
	Delete		Delete device.
	Rename		Rename device.
	Run		Start the service.
	Stop		Stop the service.
	Partial transfer	Target>PC	Transfer only the folder.
GraphicScreens folder	New Graphic Page		Launch Graphic Editor.
	Paste		Paste the graphic.
	Partial transfer	Target>PC PC->Target	Transfer only the folder. See note.
GraphicScreens item	Edit		Graphic Editor.
	Open		View graphic.
	Cut		Cut the graphic.
	Copy		Copy the graphic.
	Delete		Delete graphic.
	Rename		Rename gaphic.
	Partial transfer	Target>PC PC->Target	Transfer only the folder. See note.
DataTables folder	New data		Launch the data editor.
	Paste		Paste the data table.
	Partial transfer	Target>PC PC->Target	Transfer only the folder. See note.
DataTables item	Edit		Data Editor.
	Open		Data Viewer.
	Cut		Cut the data table.
	Copy		Copy the data table.
	Delete		Delete the data table.
	Rename		Rename the data table.
	Partial transfer	Target>PC PC->Target	Transfer only the folder. See note.

File tree item	Menu (right-click)	Sub-menu	Comment
Services folder	New service		Create a new service.
	Paste		Paste a service.
	Partial transfer	Target>PC PC->Target	Transfer only the folder. See note.
A *Services* folder calculation, email, database, data logging, active pages	New		Launch the service wizard with the selected service.
	Cut		Cut a service.
	Copy		Copy a service.
	Paste		Paste a service.
	Delete		Delete a service.
	Partial transfer	Target>PC PC->Target	Transfer only the folder. See note.
Services item	Edit		Launch the edit window of the service.
	Cut		Cut the service.
	Copy		Copy the service.
	Delete		Delete the service.
	Rename		Rename the service.
	Run		Start the service.
	Stop		Stop the service.
	Partial transfer	PC->Target	Transfer only the folder. See note.
Website folder	New	Folder File	Create a new file or folder.
	Paste		Paste a new file or folder.
	Import File		Importing an existing website.
	Partial transfer	Target>PC PC->Target	Transfer only the website. See note.

File tree item	Menu (right-click)	Sub-menu	Comment
Folder in *Website*	New	Folder File	Create a new file or folder.
	Cut		Cut the folder.
	Copy		Copy the folder.
	Paste		Paste a new file or folder.
	Delete		Delete the folder.
	Rename		Rename the folder.
	Import File		Importing an existing file.
	Partial transfer	Target>PC PC->Target	Transfer only the folder. See note.
File in *WebSite*	Open		Open the file.
	Open with System Editor		Launch another window with System Editor.
	Edit with	Notepad	Launch the HTML page in Edit mode with notepad.
		FrontPage	Launch the HTML page in Edit mode with FrontPage.
	Cut		Cut the file.
	Copy		Copy the file.
	Delete		Delete the file.
	Rename		Rename the file.
	Partial transfer	Target>PC PC->Target	Transfer only the file.
Namespace	Open		Launch the Namespace window.
Namespace Write Access	Edit		Launch the author rights Namespace window.

Glossary

A

applet

Software component that runs in the context of another program, for example a Web browser.

ASCII

American Standard Code for Information Interchange.

Pronounced "aski". This is an American code (but now an international standard) which allows alphanumerical characters used in English, punctuation marks, some graphics characters and various commands to be defined with 7 bits.

AT commands

Also called **Hayes Commands**: Set of commands for various phone-line manipulations, dialing and hanging up for instance.

B

bit

Contraction of Binary Digit.

This is the binary unit of information content, which can represent two separate values (or states): 0 or 1.

A field of 8 bits constitutes 1 **byte**.

BOOTP

Bootstrap Protocol: Protocol for booting diskless terminals or stations by centralized management of network parameters.

C

CF card

CompactFlash card: Type of data storage device, used in portable electronic devices.

communication interruption

Communication error detected by the module when the periodic exchanges with the PLC stop.

configuration

The configuration comprises the data that defines the device (invariable) and that is necessary to the operation of the module.

CPU

Central Processing Unit: The microprocessor. This comprises the entire control unit and the arithmetic unit. The purpose of the control unit is to extract the execution instruction from the central memory along with the data needed to execute this instruction, to establish electrical connections in the arithmetic and logic unit and to start the processing of this data in the unit. **ROM** or **RAM** memories are sometimes included on the same chip, and sometimes I/O interfaces or buffers.

CRC

Cyclic Redundancy Check: Type of hash function used to produce a checksum – a small, fixed number of bits – against a block of data, such as a packet of network traffic or a block of a computer file.

D

DHCP

Dynamic Host Configuration Protocol: Protocol allowing a station connected to the network to obtain its configuration dynamically.

DNS

Domain Name System: It stores and associates many types of information with domain names and it translates domain names (computer hostnames) to IP addresses.

driver

Program which informs the operating system of the presence and characteristics of a peripheral.

F

FactoryCast HMI

Active Web server that executes HMI functions integrated in a PLC module. When you use the active Web server, you do not need to communicate via polling to update the HMI/SCADA database.

FDR

Faulty Device Replacement: Automatic configuration recovery service provided by the module.

firewall

Information technology (IT) security device which is configured to permit, deny or proxy data connections set and configured by the organization's security policy.

Flash memory

Form of non-volatile computer memory that can be electrically erased and reprogrammed.

FTP/TFTP

File Transfer Protocol/Trivial File Transfer Protocol: Network file transfer protocol.

G

GPRS

General Packet Radio Service: A radio technology for GSM networks that adds packet-switching protocols and shorter set-up time for ISP connections.

H

HMI

Human Machine Interface: The aggregate of means by which people (the users) interact with a particular machine, device, computer program or other complex tool (the system).

HTML

HyperText Markup Language: the predominant markup language for the creation of web pages. It provides a means to describe the structure of text-based information in a document and to supplement that text with interactive forms, embedded images, and other objects.

HTTP

HyperText Transfer Protocol: Network transfer protocol for documents written in hypertext (links).

I

IP

Internet Protocol: Data-oriented protocol used for communicating data across a packet-switched internetwork (i.e. the Internet).

IP Address

Unique address that devices use in order to identify and communicate with each other on a computer network utilizing the Internet Protocol standard (IP)—in simpler terms, a computer address.

ISO

International Standards Organization. Formats, symbols, transmission rules are covered by ISO standards. AFNOR is a member of ISO.

ISP

Internet Service Provider: Business or organization that sells to consumers access to the Internet and related services.

M

MIB

Management Information Base: Database used by the SNMP protocol for network management and containing information on data transmission, station or router components, etc.

- MIB II: standard MIB
- Schneider Automation MIB: private MIB

N

NAT

Network Address Translation: is the translation of an Internet Protocol address (IP address) used within one network to a different IP address known within another network.

NTP

Network Time Protocol: Protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks.

O

operating mode

The rules governing the behavior of the module when it is running.

P

PAP

Password Authentication Protocol: Password identification protocol used for remote modem connections.

PL7

Schneider Automation PLC programming software.

PLC

Programmable Logic Controller: It is a small computer used for automation of industrial processes, such as control of machinery on factory assembly lines.

PPP

Point-to-Point Protocol: Point-to-point communication protocol used for modem connections.

Premium

Family of Schneider Automation PLCs.

PSTN/RTC

Public Switched Telephone Network: The network of the world's public circuit-switched telephone networks.

Q

Quantum

Family of Schneider Automation PLCs.

R

RGB

Additive model in which red, green, and blue (often used in additive light models) are combined in various ways to reproduce other colors.

RS232

Serial communication standard that in particular defines the following operating voltage:

- A signal of +3 to +25V indicates a logic 0

- A signal of -3V to -25V indicates a logic 1

Between +3V and -3V the signal is regarded as invalid.

RS 232 connections are relatively sensitive to interference. The standard recommends not exceeding a distance of 15 meters and a speed of 20,000 baud (bps) maximum.

RS485

Serial connection standard operates at +/-5V differential. The connection uses separate wires for transmission and receipt. Their "3-status" outputs allow them to switch to listening mode when transmission is completed.

RTU

Remote Terminal Unit.

RUN

Function used to start execution of the application program in the PLC.

S

SCADA

Supervisory Control And Data Acquisition: Software that, interfacing with a programmable logic controller, gathers and analyzes information used to monitor and control commercial equipment.

SMTP

Simple Mail Transfer Protocol: Application protocol used to transmit messages via the Internet and direct them to a mailbox.

SNMP

Simple Network Management Protocol: Network management protocol for controlling a network remotely by polling the stations for their status and modifying their configuration, performing security tests and viewing information relating to data transmission. It can also be used to manage software and databases remotely.

SQL

Structured Query Language: Used to query (request data from) a relational database.

T

TCP

Transmission Control Protocol: Virtual circuit protocol that is one of the core protocols of the Internet protocol suite, often simply referred to as TCP/IP.

TCP/IP

The set of communications protocols that implement the protocol stack on which the Internet and many commercial networks run.

Time Out

Expiry of a waiting time. Stops the application or disconnects after a lengthy period of non-use.

U

UDP

User Datagram Protocol: One of the core protocols of the Internet protocol suite. Using UDP, programs on networked computers can send short messages sometimes known as datagrams to one another.

URL

Uniform Resource Locator: The global address of documents and other resources on the World Wide Web.

V

VPN

Virtual Private Network: A private network that is configured within a public network. It uses encryption and other security mechanisms so that only authorized users can access the network and that the data cannot be intercepted.

X

XML

Extensible Markup Language: it is aimed to facilitate the sharing of data across different information system. It is a simplified subset of the SGML and is designed to be relatively human-legible.

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