Korenix JetLink 2108
Industrial 8FE Managed Ethernet Switch support
EtherNet/IP, -40~75℃
Korenix JetLink 2308
Industrial 8FE Managed Ethernet Switch support
PROFINET, -40~75℃
Korenix JetLink 2308M
Industrial 8FE Managed Ethernet Switch support
PROFINET MRP Master, -40~75℃

User Manual

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www.korenix.com

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User's Manual

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1. Collect all the information about the problem encountered. (For example, CPU speed, Korenix products used, other hardware and software used, etc.) Note anything abnormal and list any on screen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.

3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a fully completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Opera- tion of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

1. Visit the Korenix web site at www.korenix.com where you can find the latest information about the product.

2. Contact your distributor, sales representative, or Korenix's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

Safety Instructions

- Read these safety instructions carefully.
- Keep this User Manual for later reference.
- Disconnect this equipment from any DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
- Keep this equipment away from humidity.
- Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
- The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Position the power cord so that people cannot step on it. Do not place anything over the power cord.
- All cautions and warnings on the equipment should be noted.
- If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- Never pour any liquid into an opening. This may cause fire or electrical shock.
- Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
- If one of the following situations arises, get the equipment checked by service personnel:
- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work well, or you cannot get it to work according to the user's manual.
- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO -40°C (-40°F) ~ 85°C (185°F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

Conventions

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*

Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*

JetLink 1308/2308/2308M User Manual

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1.1 Overview

EtherNet/IP was introduced in 2001, it is the leading proven industrial automation communications technology based on standard Ethernet and Internet technology. Developed and managed by ODVA, EtherNet/IP is open and supported by hundreds of supplier companies.

EtherNet/IP switches provide Faceplate, Add-on Instruction (AOI), Electronic Data Sheet (EDS), so users can easily integrate with Rockwell systems or other EtherNet/IP systems to monitor and configure switches.

ODVA certificated, EtherNet/IP switches are quite simply reliable andrugged.

1.2 Supported Hardware

The following is a list of devices supported by the AOI program.

Model	Version
1756-L61	V19 and higher
1756-L62	V19 and higher
1756-L63	V19 and higher
1756-L64	V19 and higher
1756-L65	V19 and higher
1756-L71	V20 and higher
1756-L72	V19 and higher
1756-L73	V19 and higher
1756-L74	V19 and higher
1756-L75	V19 and higher
1769-L32E	V19 and higher
1769-L35E	V19 and higher
1769-L30ER	V20 and higher
1769-L30ERM	V20 and higher
1769-L30ER-NSE	V20 and higher
1769-L33ER	V20 and higher
1769-L33ERM	V20 and higher
1769-L36ERM	V20 and higher
1769-L24ER-QB1B	V20 and higher
1769-L24ER-QBFC1B	V20 and higher
1769-L24ERM-QBFC1B	V20 and higher
1769-L16ER-BB1B	V20 and higher
1769-L18ER-BB1B	V20 and higher
1769-L18ERM-BB1B	V20 and higher

1.3 Requirements

1.3.1 SCADA Requirements

- AB FactoryTalk® View v8.0

1.3.2 Hardware

- Personal computer with an Intel Pentium 4 processor (2 GHz or faster processor

recommended).

- Memory (RAM): 1 GB (or more) for 32-bit systems. A minimum of 2 GB required for 64-bit operating systems
- Hard disk space: Minimum 1.5 G
- Human Machine Interface (HMI) requirements:
  - Model: AB 2711P-XXXXXX
  - PanelView Plus 6 (700 or higher)
  - PanelView Plus 7 (700 or higher)
  - Version 8.0

1.3.3 Operating System

The host computer must be equipped with any of the following operating systems to support the AOI program operations.

- Windows XP 32/64bit Professional version or higher
- Window 7 32/64bit Professional version or higher
- Windows 8 64bit Professional version or higher
- Windows Server 2012 32/64bit Professional version or higher

1.4 Configuring the Controller Device

This section provides a path for configuring and programming the controller device. Once the device is configured, the settings are saved to an AOI file for exporting to PLC devices.

Note! *PLC device is required before you can fully configure the device. The included software and installation guide for the PLC device from the manufacturer are required to fully configure the controller device.*

Two possible methods for configuring and programming are available. The following outlines the use of the Logix application and FactoryTalk® View ME, the latter of the two options.

For further reference, FactoryTalk® View is the application to allow you to generate a user interface. Two possible UI types are available, Machine Edition and Site Edition. The ME UI is intended for HMI devices, while the SE UI is for a personal computer.

1.4.1 Configuring in Logix

The Logix application provides the functionality required to create an AOI file. The RSLogix5000 v19 or higher is required for this procedure.

1. Prior to getting started, locate the necessary example file(s) from the enclosed CD.
2. Locate the RSLogix5000 application and open it.

3. Once in the main menu, navigate to the File main menu and select **Open** to open an existing file or **New** to create a new file.
4. If you selected **New**, the **New Controller** window displays. Select the hardware architecture for your main board type. See the following image for further details.

– Click the **Vendor** drop-down menu to select the hardware vendor.
– Click the **Type** drop-down menu to select the type of hardware.
– Click the **Revision** drop-down menu to select the revisions variable.
– Tick the **Redundancy Enabled** field if required.
– In the **Name** field, enter the name to identify this controller.
– In the **Description** field, enter a brief description to better identify the new controller, include items such as location, settings type, etc.
– Click the **Chassis Type** drop-down menu to select the chassis type.
– Use the **Slot** numeric entry field to identify the slot number.
– In the **Create In** field, click Browse to select the directory to save the settings.
– Click the **Security Authority** drop-down menu to enable the security authority function.

If security authority is enabled, the **Use only the selected Security Authentication and Authorization** option is avail- able. Tick the option to set authorization and authentication to the selected security authority as configured in the **Security Authority** field.

5. Click **OK** to continue.

Note! *If a matching file is already present, a prompt displays. Select Yes to replace the file or No to return to the previous menu.*

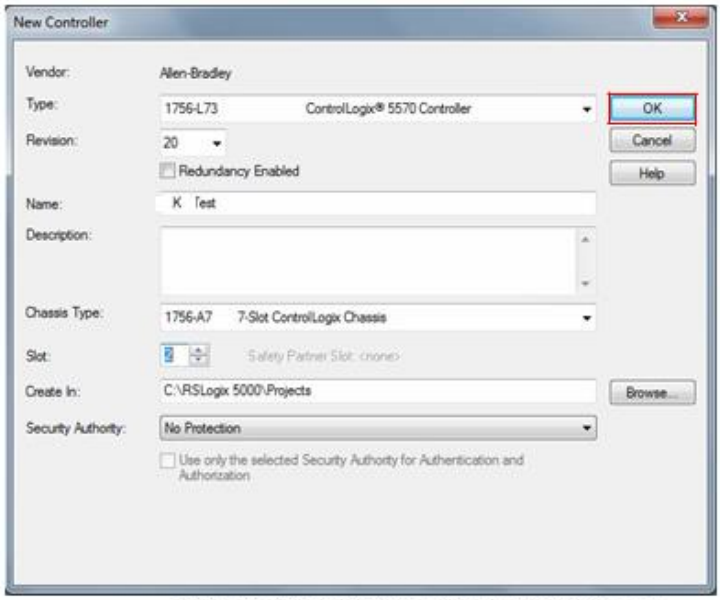


Figure 2.1 Creating a New Controller

For 1756 Series users see the following procedures, otherwise continue onto 6: The following procedure creates an Ethernet module.

- Under the I/O Configuration root, right-click on the available configuration and select New Module to create an Ethernet controller. See the following figure.

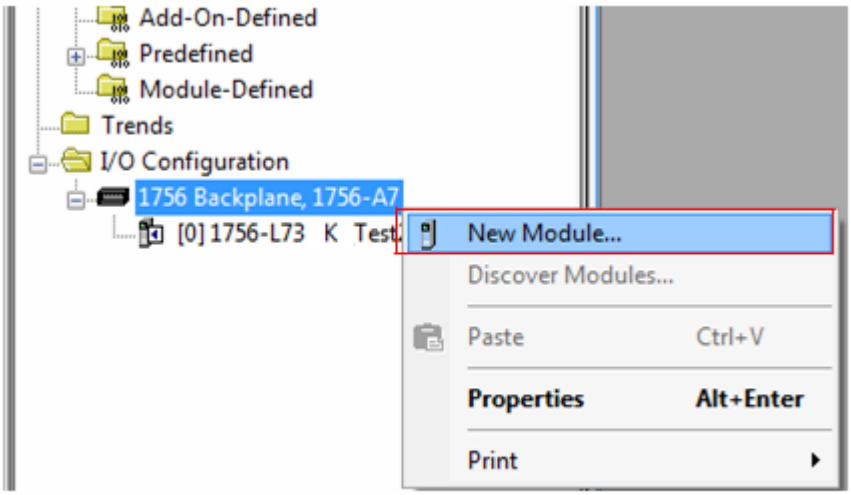


Figure 2.2 Creating a New Ethernet Module

- The Select Module Type screen displays. Scroll down to select the following:
  - 1756-ENBT (1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media
- Click **Create** to continue and create a new controller listing.

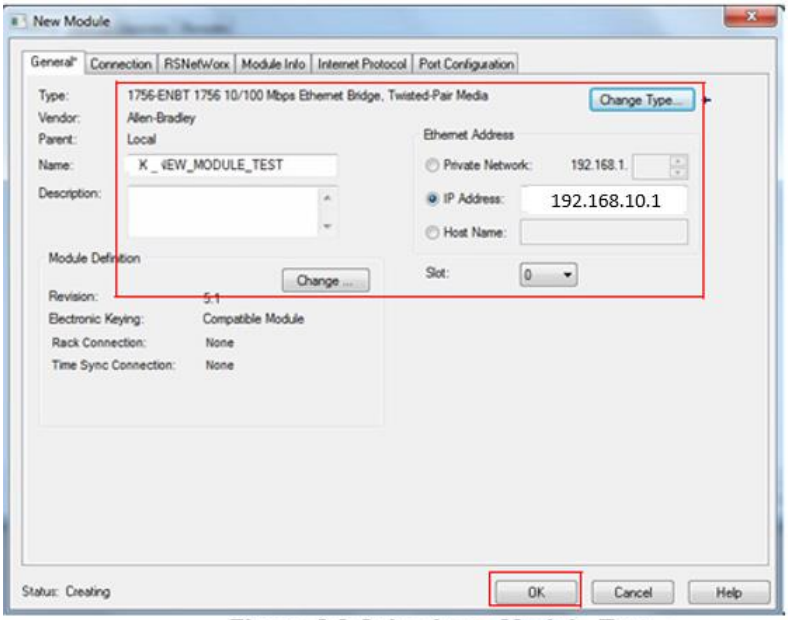


Figure 2.3 Selecting a Module Type

The newly created Module Properties listing displays, see the following figure.

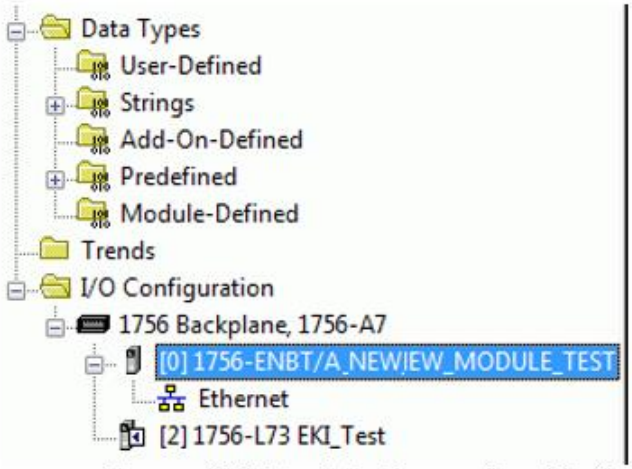


Figure 2.4 Module Properties Listing

This ends the procedures specific to the 1756 series.

Users other than the 1756 series can continue here with the configuration procedure.

6. Select the Ethernet entry and right click on it to open the menu bar.
7. Select **New Module** to define the module type, see the following figure.

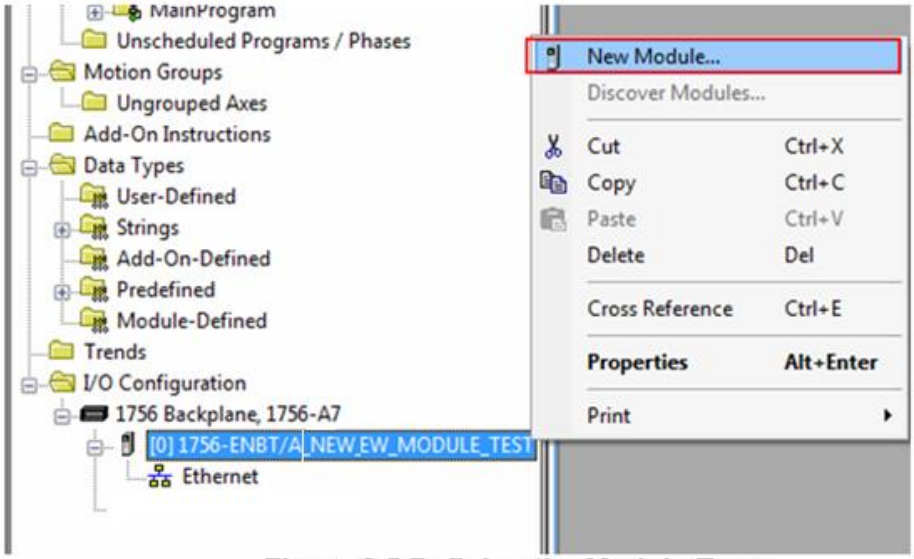


Figure 2.5 Defining the Module Type

The Select Module Type window displays.

8. Under the Catalog tab, scroll down to find ETHERNET-MODULE type and select it.
9. Click Close on Create to close the displayed window (optional).
10. Click Create to Continue

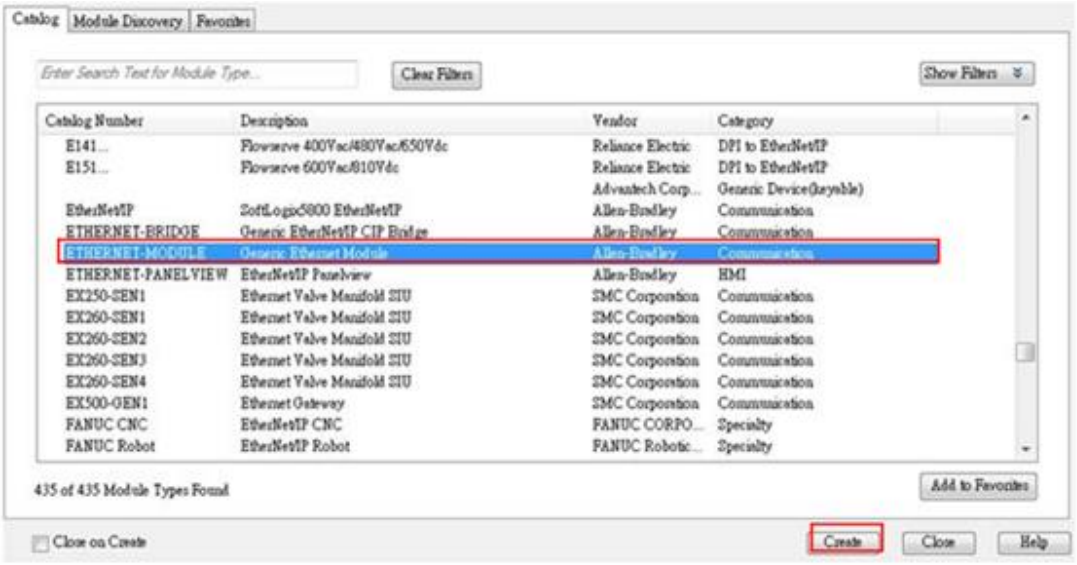


Figure 2.6 Creating an Ethernet Module Type

11. Select the General tab to modify the parameters. The Connection and Module Info parameters are fixed and aren't modifiable.

- In the **Name** field, enter the module name. In the following figure, K_Module1 is used.
- Under Connection Parameters, enter the values as shown in the following figure. The parameters must match the stated values or the parameters found in the EDS file.
- Under Address / Host Name, select IP Address and enter the designated IP address

value.

If a secondary I/O Configuration is available, make sure to use a different name for example K_Module2.

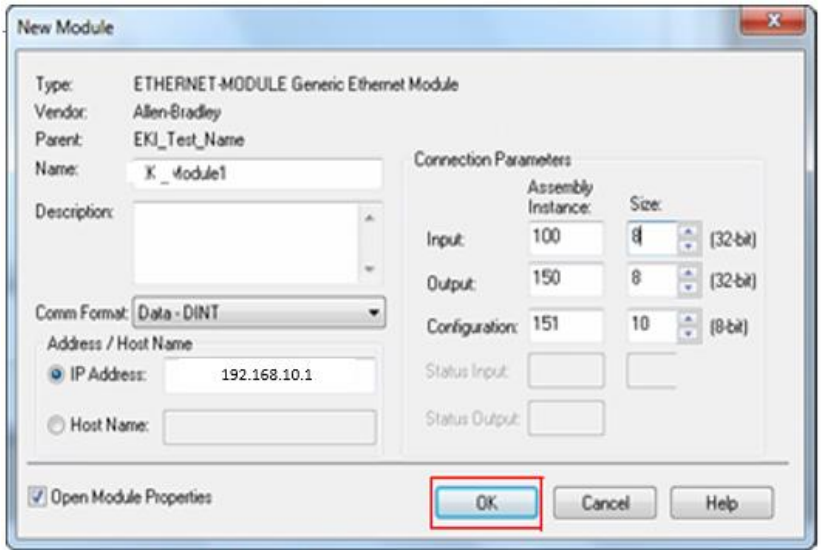


Figure 2.7 Modifying Ethernet General Parameters

12. Select the **Connection** tab and set the Requested Packet Interval (RPI) field (suggested: 1000.0 ms).
13. Click Ok to continue and return to the main screen.

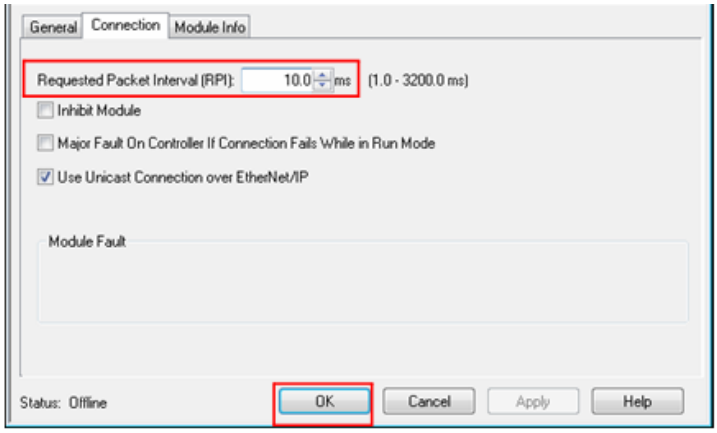


Figure 2.8 Modifying Ethernet Module Parameters

14. Click **Tasks** > **MainTask** > **MainProgram** to view **MainRoutine**.
15. Right click on **MainRoutine** submenu and elect Open to display the Rung Rou- tine window.

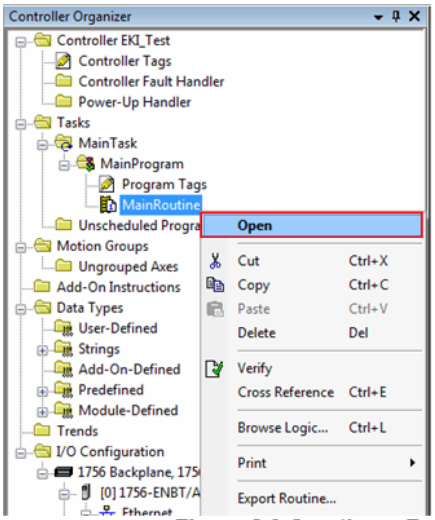


Figure 2.9 Creating a Routine

16. Select a Rung Ladder and right click on it to open the Properties menu.

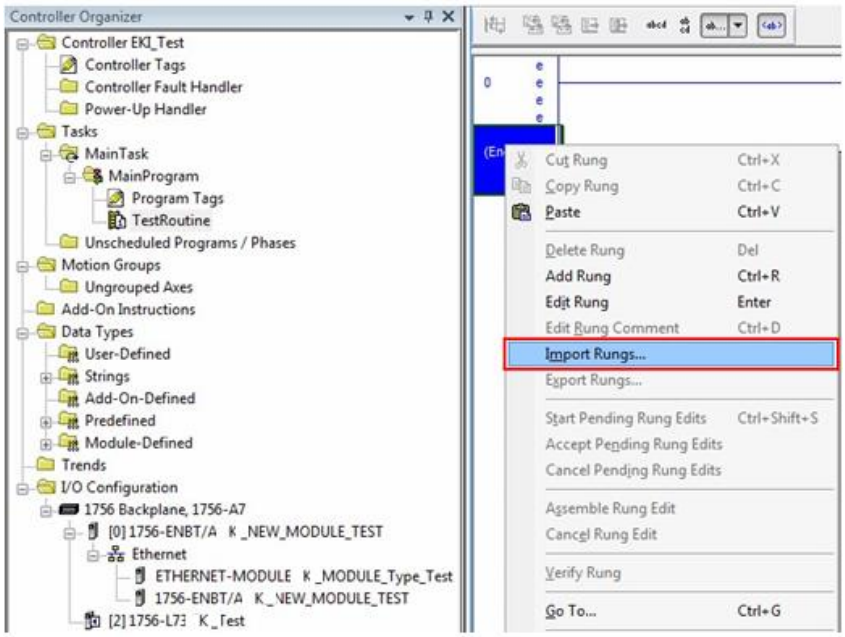


Figure 2.10 Selecting Import Rungs

The Import Rungs window displays.

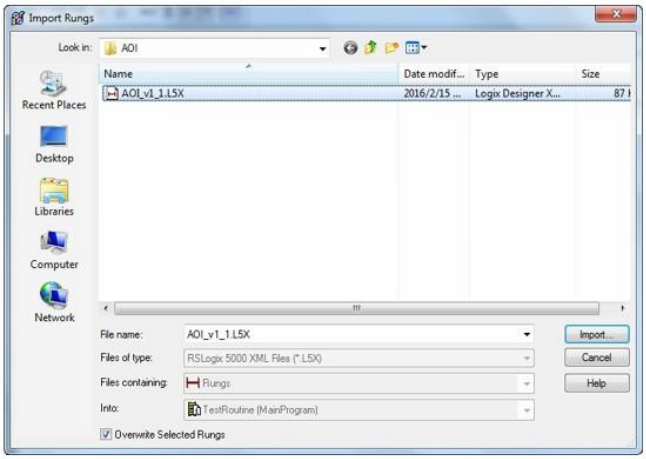


Figure 2.11 Importing a Rung File

17. Scroll down and select Import Rungs

Before you can overwrite any of the selected Rung files, select the **Overwrite Selected Rungs** option.

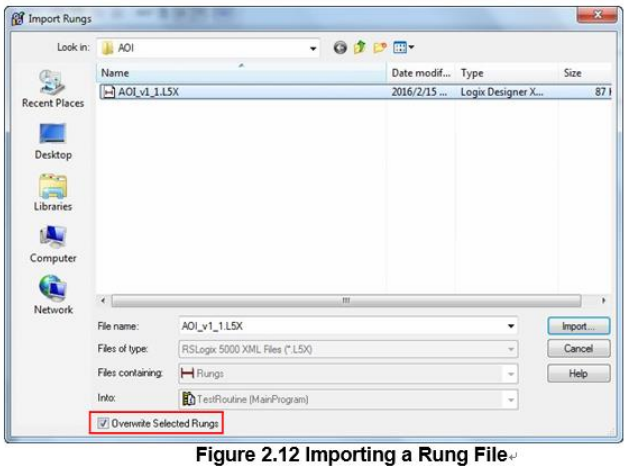


Figure 2.12 Importing a Rung File

18. Locate the target file and click **Import** to import the file and continue the pro- cess, see the following figure.

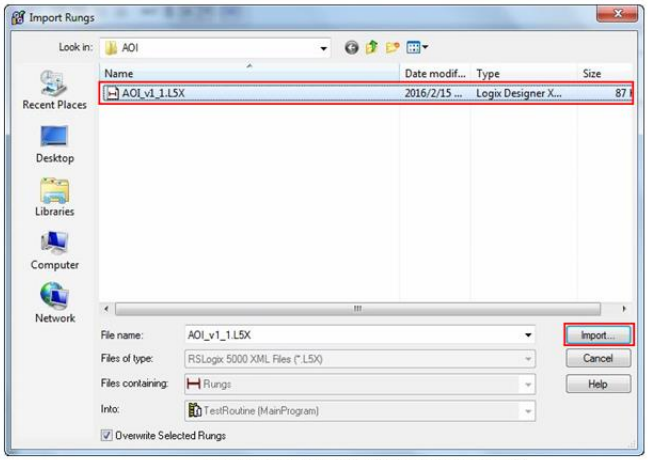
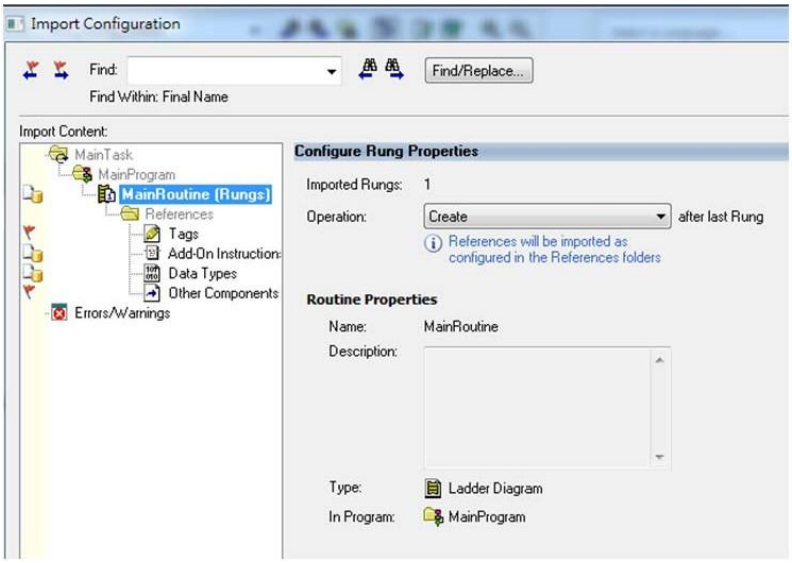


Figure 2.13 Importing a Rung File

The Configure Rung Properties window displays.



To configure a single JetLink switch setup, go to “Setting Message Configuration Parameters” on page 40.

For a multiple JetLink switch configuration, see the following:

– Import a second AOI file.
– Under **TestRoutine (Rungs)** > **References**, locate **Tags**.
– Locate and change all tags marked K_Switch1 to K_Switch2, see the following figure.
– Click OK to complete the process.

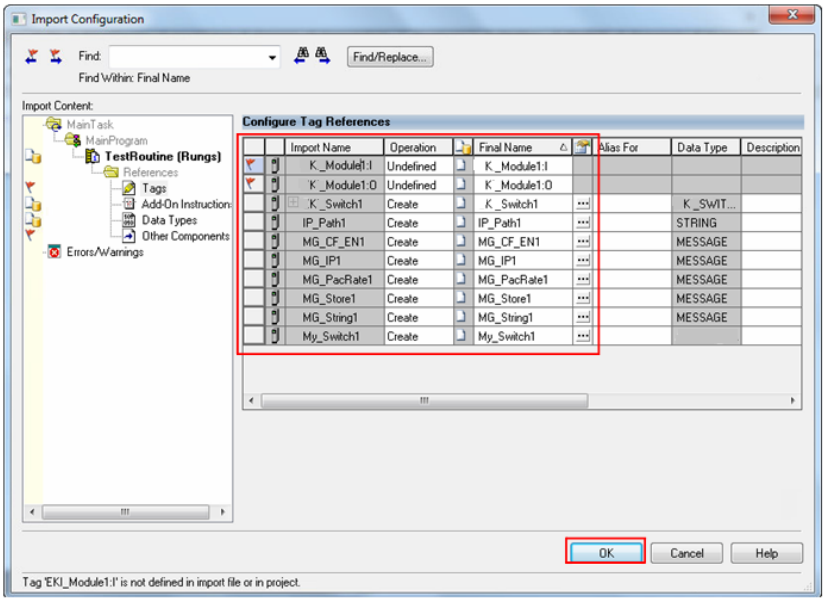


Figure 2.14 Configuring Tag References

Users with a single JetLink switch, it is not necessary to alter the Tag references. The default values define the single JetLink switch.

Once the AOI is created and displays as seen in the following figure.

19. Locate the property value MSG_IP_Address and click the message configuration option (MG_IP1).

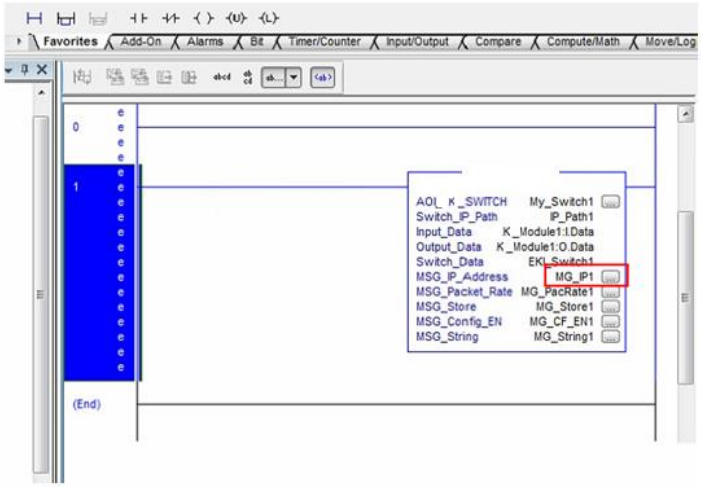


Figure 2.15 Setting Message Configuration Parameters

20. The Message Configuration window displays. Locate the Communication tab and click on it.

The following step is required to set the communication path for the target switch.

21. Locate the Path field and click Browse to open the Message Path Browser.
22. The Message Path Browser window displays. Select the target switch and click OK to continue.

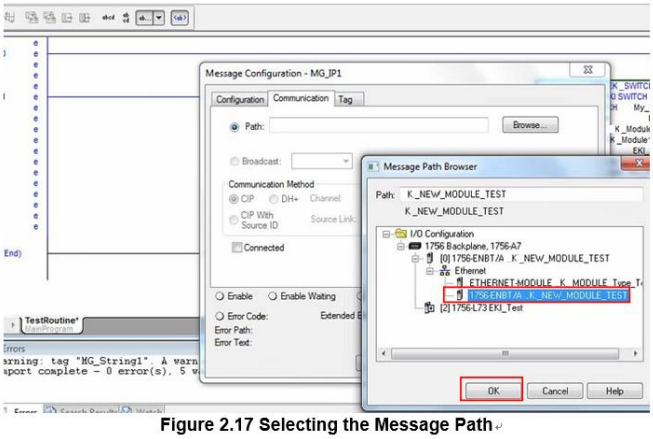


Figure 2.17 Selecting the Message Path

The Packet Rate Message windows displays. In this event if the MG_IP1 MSG set- ting is the only setting to change, other MSG settings do not require further configura tion.

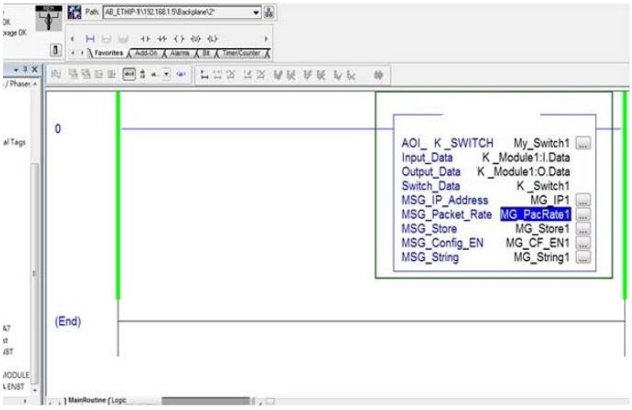


Figure 2.18 Configuring Packet Rate Message C

23. Once the parameter is configured, download the program to the controller and set it to run mode.

1.4.2 Configuring in FactoryTalk® View Machine Edition

1. Open FactoryTalk® View Studio editor software (v7.0 or higher).
2. The Application Type Selection window displays. Select **View Machine Edition**, and click **Continue**.

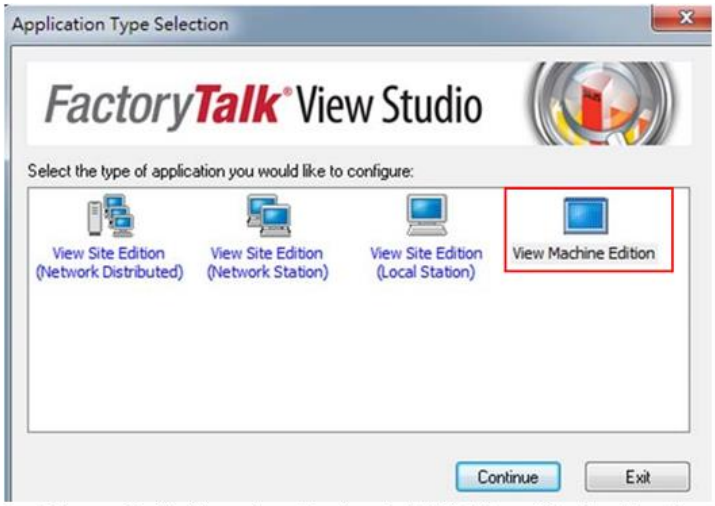


Figure 2.19 Opening FactoryTalk® View Studio Applications

The New/Open Machine Edition Application screen displays.

3. Select the New tab to create a new file; see the following:
   - In the **Application** name field, enter the name of the file.
   - In the **Description** field, type a brief description of the file (optional).
   - Click the **Language** drop-down menu and select en-US to designate the language tag for the file.
   - Enter an application name and click **Create** to create the new application file.

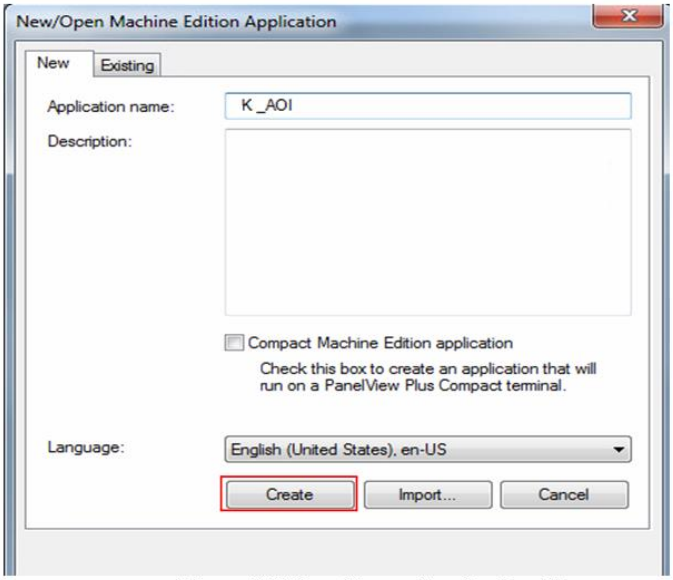


Figure 2.20 Creating an Application File

Or

4. You can open an existing application file, see the following:
   - Click on the **Existing** tab to view a list of available files.

- Select an option from the list in the open panel.
- Click **Open** to open the existing file.

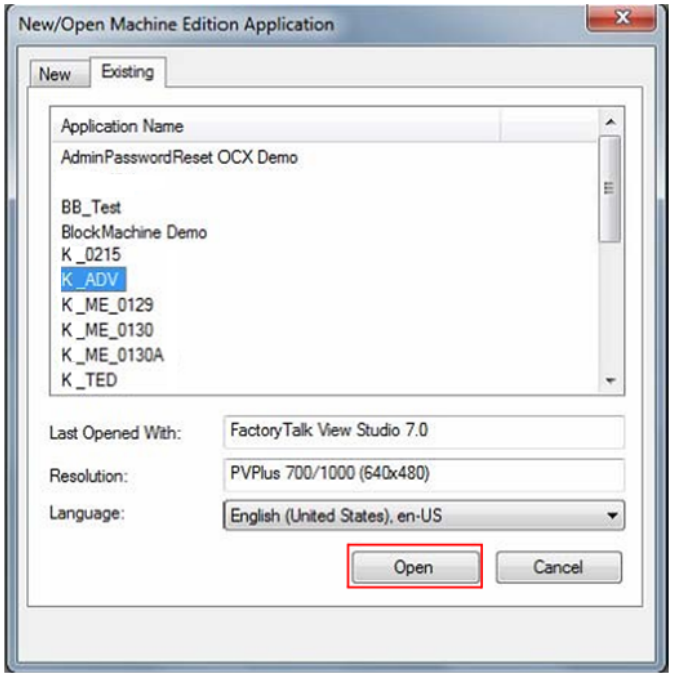


Figure 2.21 Opening an Application File

5. Once the application file is open, you can add components to the configuration. If the explorer window is not open, locate the main tool bar and click View > Explorer Window to open the menu tree for the application file.
6. Under the **Graphics** folder, locate **Images** and right-click to open an options menu.
7. Click Add **Components Into Applications.**

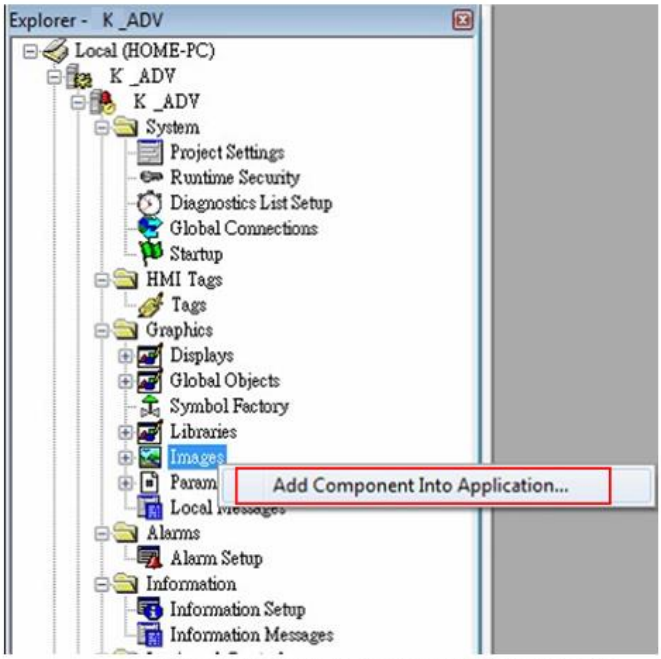


Figure 2.22 Importing an Image File

8. The **Add Components Into Project** window displays. Navigate to the location of the source folder located in the included CD or download the required files from the web site.
9. Select all images in the Images folder (.png and .bmp), and click **Open** to import them.

To view specific supported formats, click the Format drop-down menu and select a specific format to display in the body pane.

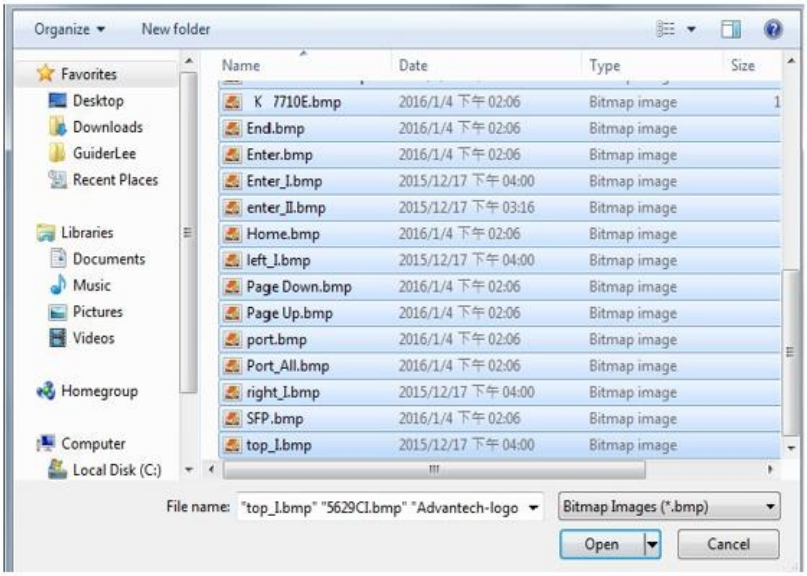


Figure 2.23 Importing Images

The images are imported and the main menu displays.

10. From the menu tree, navigate to **Graphics > Global Objects**.
11. Right-click to open the options menu and select **Add Component Into Application**....

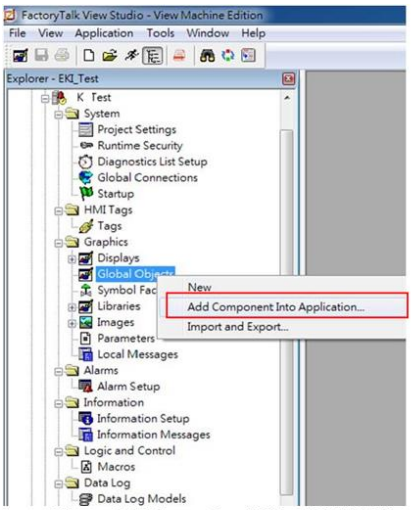
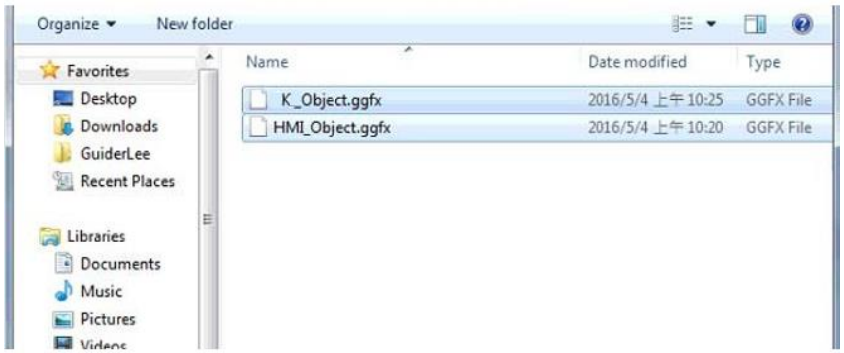


Figure 2.24 Importing EKI and HMI Objects

12. The **Add Components Into Project** window displays. Navigate to the location of the global objects source folder.



13. Select the K_Object and HMI_Object files and click Open to import them. To view specific supported formats, click the Format drop-down menu and select a specific format to display in the body pane.
14. From the menu tree, navigate to **Graphics** > **Displays**.
15. Right-click to open the options menu and select **Add Component Into Application...**.
16. The Add Components Into Project window displays. Navigate to the location of the GFX Objects source folder.
17. Select the five files in the GFX folder and click **Open** to import them.

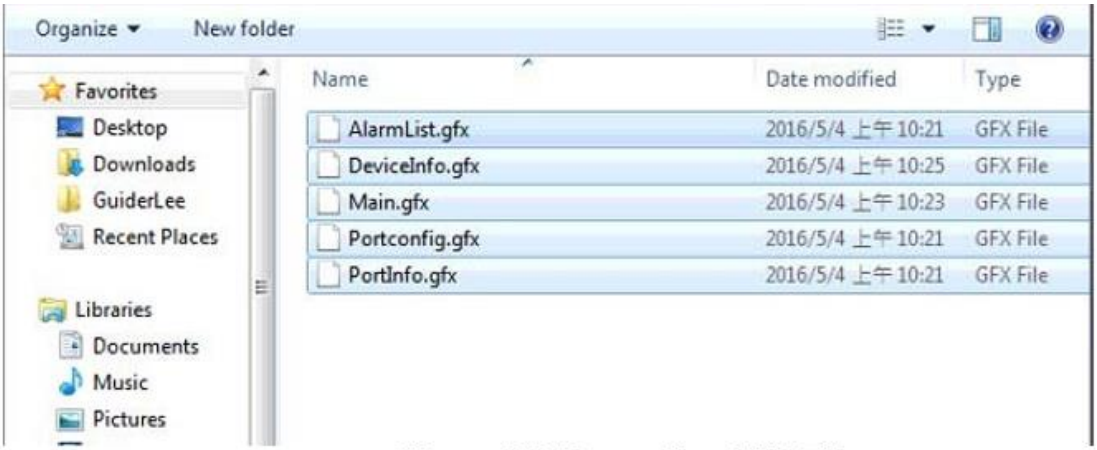


Figure 2.26 Importing GFX Files

The GFX files are imported and the main menu displays.

18. From the menu tree, navigate to **Graphics** > **Parameters**.
19. Right-click to open the options menu and select **Add Component Into Application...**.

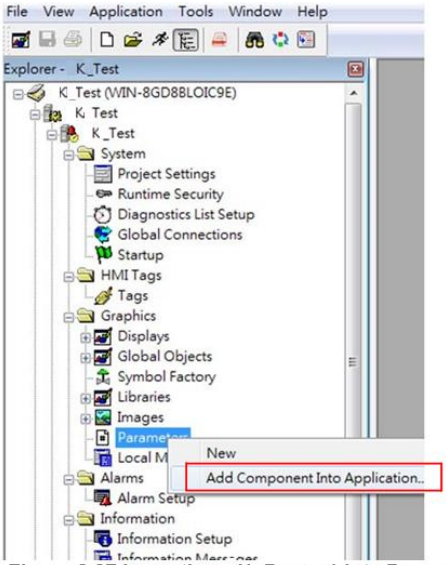


Figure 2.27 Importing K_Param1 into Parameters

20. The **Add Components Into Project** window displays. Navigate to the location of the parameter source folder.
21. Select K_PARAM1 and click **Open** to import the files. To view specific supported formats, click the Format drop-down menu and select a specific format to display in the body pane.

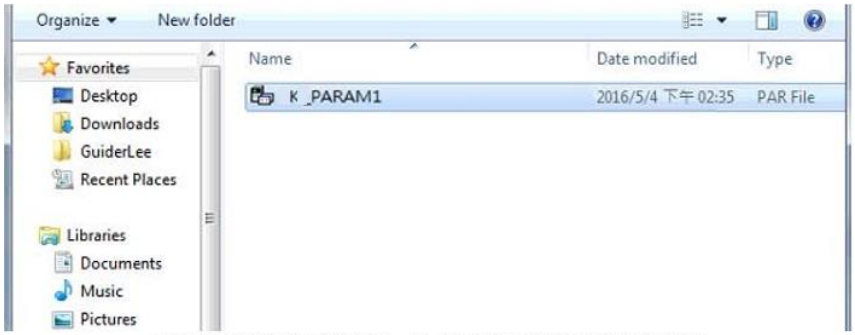


Figure 2.28 Importing K_Param1 into Parameters

22. Click **Open** to import the files.
23. From the menu tree, locate the Communications tab at the bottom of the screen.
24. Navigate to **RSLinx Enterprise** > **Communication Setup** and double click to open the options menu.

Figure 2.29 Locating RSLinx Enterprise List

25. Select **Create a new configuration** to create a new runtime configuration.
26. Click **OK** to continue.

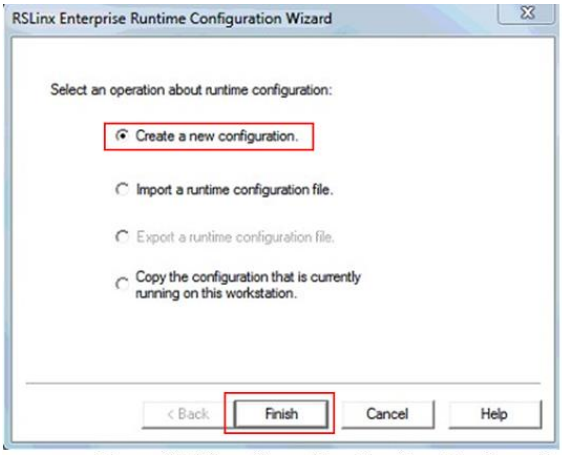


Figure 2.30 Creating a New Runtime Configuration

27. Open RSLinx Enterprise, add a new Device Shortcut. For this example, name the device shortcut CLX and select your PLC controller.
28. Click **Apply and Copy** from Design to Runtime.
29. Click **OK** to continue.

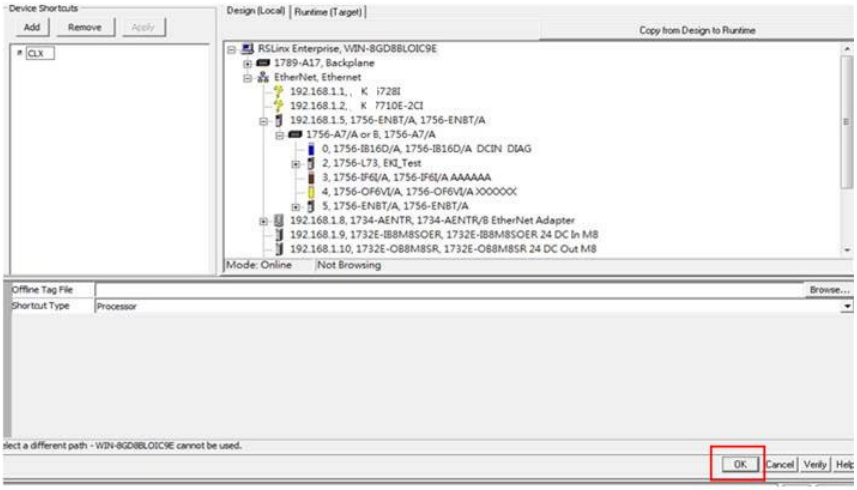


Figure 2.31 Adding a New Runtime Device Shortcut

30. In the event that the Device Shortcut is not named CLX in RSLinx Enterprise, then the imported parameters file (K_PARAM1), must be modified, see the example and figure as follows:
    EXAMPLE:
    - Open the K_PARAM1 file.
    - Change the non-remark line to read as follows: #1=[CLX]K_Switch1
    - Save and close the parameters file.

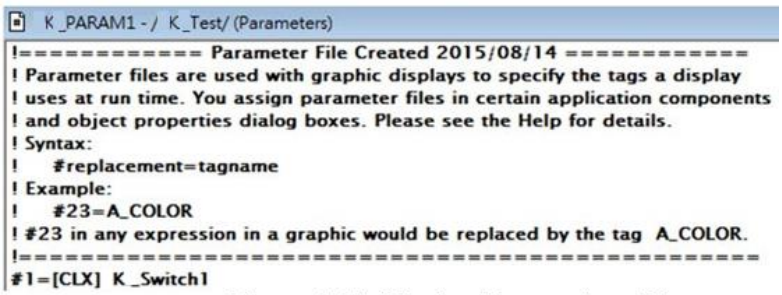


Figure 2.32 Altering Parameters File

31. In the Explorer window, navigate to **Application** > **Create Runtime Applica- tion** and click on it.
32. Download the previously created parameter file to the device.

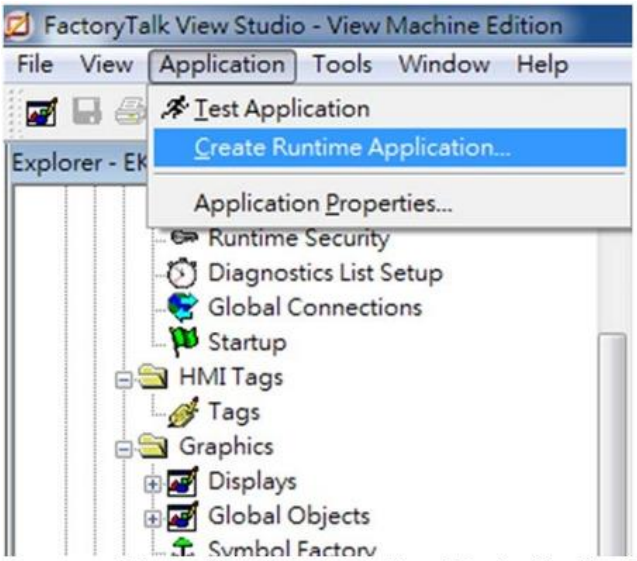


Figure 2.33 Downloading File to the Device

33. Start the Runtime application.

The runtime application is configured and uploaded to the device effectively programming the device through the FactoryTalk® View ME application.

1.4.3 Configuring in ME Image Control Panel

1. Open human machine interface PanelView Plus. The following screen displays.

Figure 2.34 Opening ME Image Control Panel

2. Click **Switch** and enter the **Device Information** screen. Different device models are represented by their respective images.
3. On the top right of the screen is a function bar (tool bar), with icons representing specific tasks available in the PanelView Plus main menu.

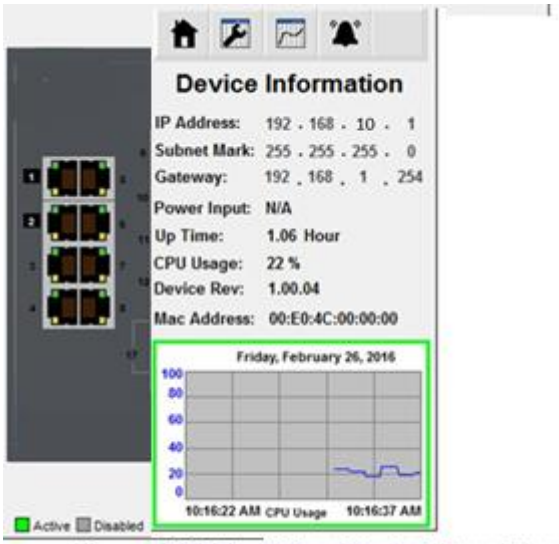


Figure 2.35 Identifying Control Panel Menu

Function	Description
	Home page
	Configures port status
	Displays port status
	Alarm info

4. Click the status icon to see the status for a selected port. To switch between port selections, use the arrow icons to select a specific port.

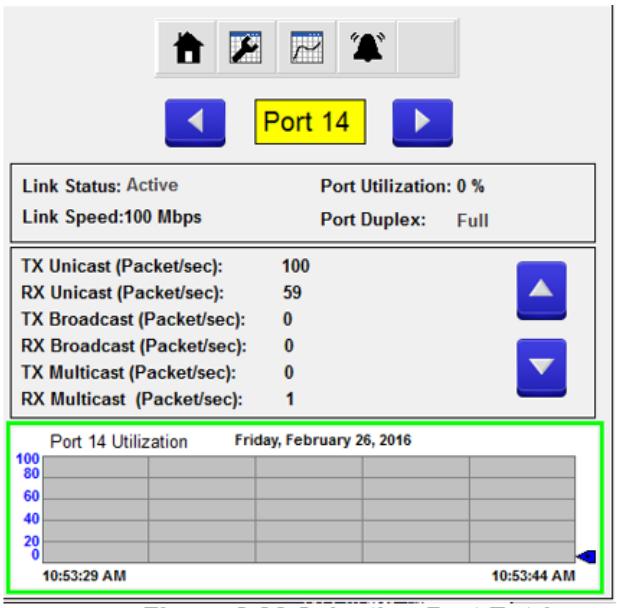


Figure 2.36 Selecting Port Entries

5. Click the tool icon to enter the Port Settings menu.
6. Select the setting to change and use the arrow icons to change the settings.
7. Click Enter to apply the new setting changes. If the Enter button is not pressed the changes do not take effect.

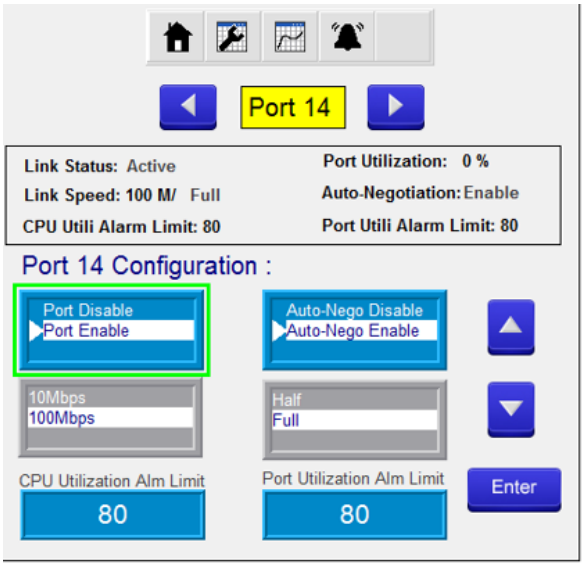


Figure 2.37 Configuring Port Settings

8. If a setting is grayed out, the setting is cannot be modified.

   When ports are disabled, the following options are not available: Auto-Nego,

Port Speed, and Port Duplex. If Auto-Nego is Enabled, Port Speed and Port Duplex cannot be set. CPU and Port utilization alarm limits are available at the bottom of the screen. A numeric keypad displays to allow entry of limit values

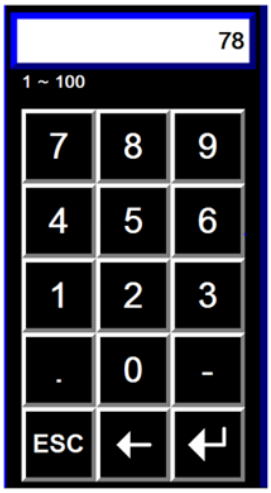


Figure 2.38 Setting CPU, Port and Alarm Value Limits

9. After entering a value, click the return button to return to the previous window.

10. Click Enter to apply the new setting changes.

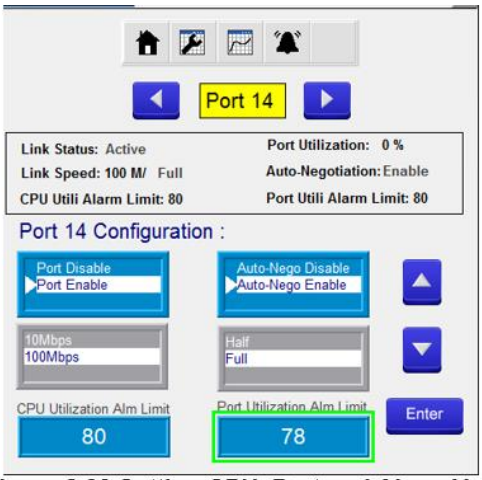


Figure 2.39 Setting CPU, Port and Alarm Value Limits

Enabling or disabling additional settings, such as the Alarm function, is also available through the control panel.

11. Click the alarm icon to enter the alarm list. If an image is grayed out, there are no active alarms. An alarm function is active if the listing is in Red.

12. Click Enable or Disable to change the status of the selected alarm.

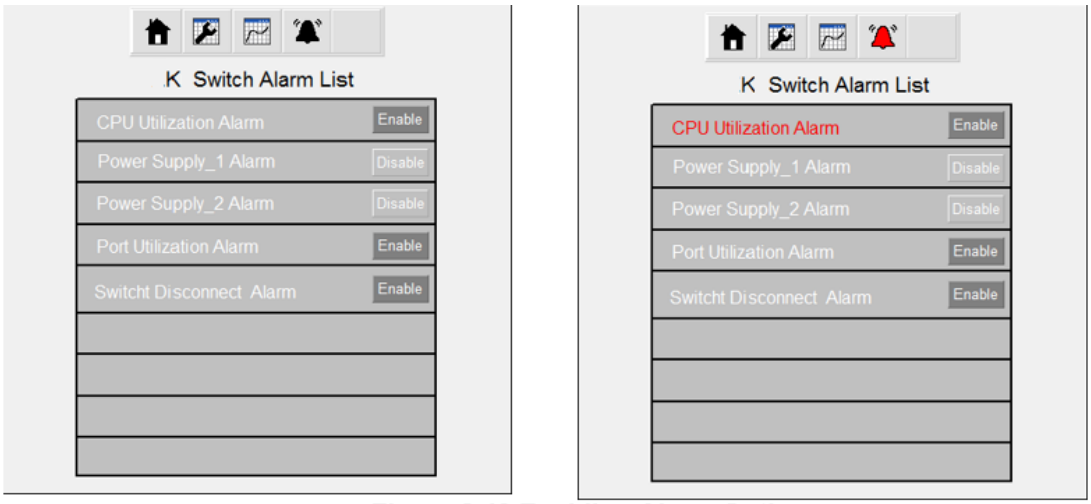


Figure 2.40 Enabling Alarm Options

1.4.4 Configuring in FactoryTalk® View Site Edition

1. Open FactoryTalk® View Studio editor software (v7.0 or higher).
2. The Application Type Selection window displays. Select **View Machine Edition**, and click **Continue**.

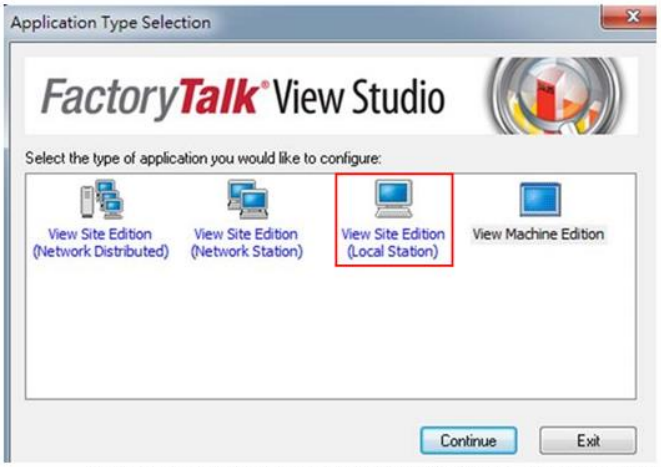


Figure 2.41 Opening View Site Edition Applications

The New/Open Machine Edition Application screen displays.

3. Select the New tab to create a new file; see the following:
   - In the **Application** name field, enter the name of the file.
   - In the **Description** field, type a brief description of the file (optional).
   - Click the **Language** drop-down menu and select en-US to designate the language tag for the file.
   - Enter an application name and click **Create** to create the new application file.

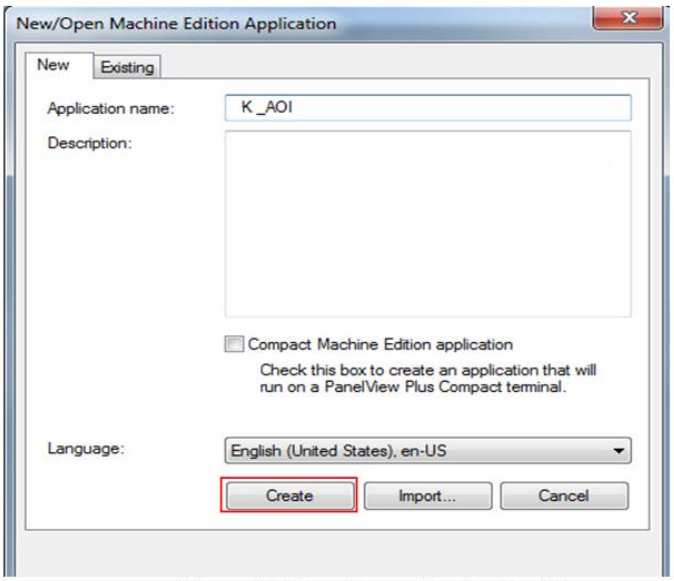


Figure 2.20 Creating an Application File

Or

4. You can open an existing application file, see the following:
   - Click on the **Existing** tab to view a list of available files.
   - Select an option from the list in the open panel.
   - Click **Open** to open the existing file.

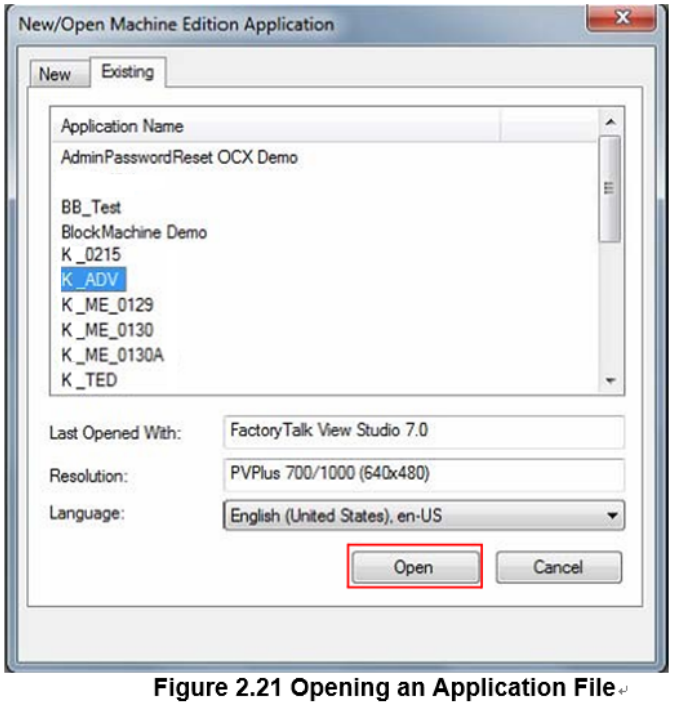


Figure 2.21 Opening an Application File

5. Once the application file is open, you can add components to the configuration. If the explorer window is not open, locate the main tool bar and click View > Explorer Window to open the menu tree for the application file.
6. Under the **Graphics** folder, locate **Images** and right-click to open an options menu.

7. Click Add **Components Into Applications.**

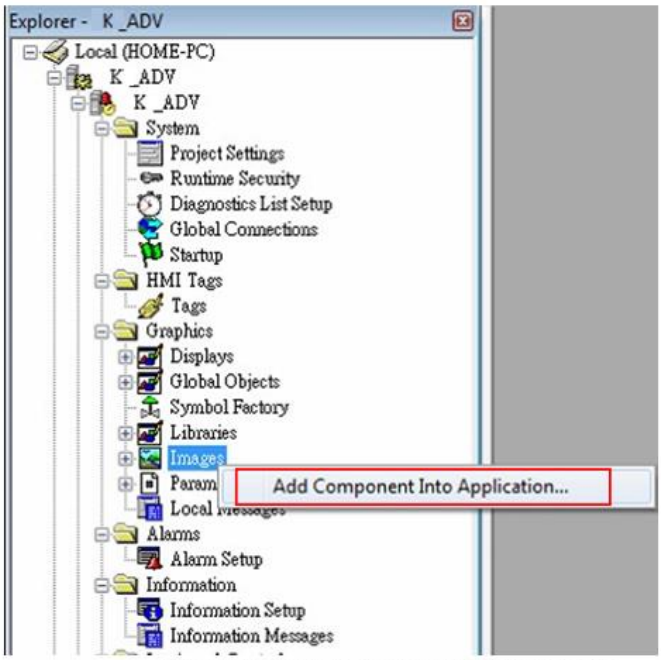


Figure 2.22 Importing an Image File

8. The **Add Components Into Project** window displays. Navigate to the location of the source folder located in the included CD or download the required files from the web site.
9. Select all images in the Images folder (.png and .bmp), and click **Open** to import them.

To view specific supported formats, click the Format drop-down menu and select a specific format to display in the body pane.

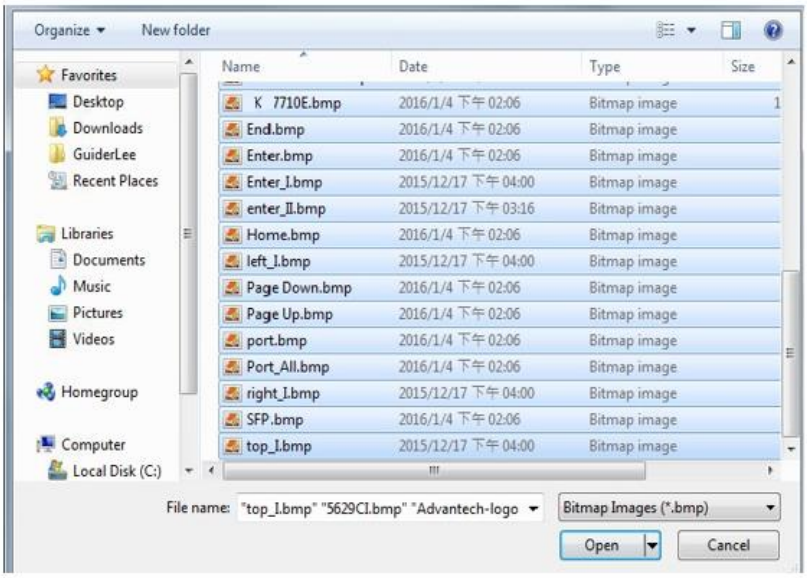


Figure 2.23 Importing Images

The images are imported and the main menu displays.

10. From the menu tree, navigate to **Graphics > Global Objects**.
11. Right-click to open the options menu and select **Add Component Into Application**....

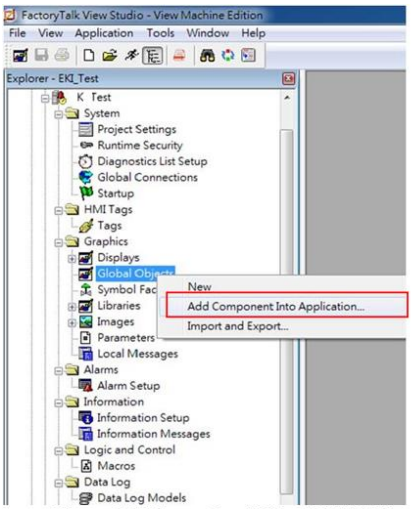
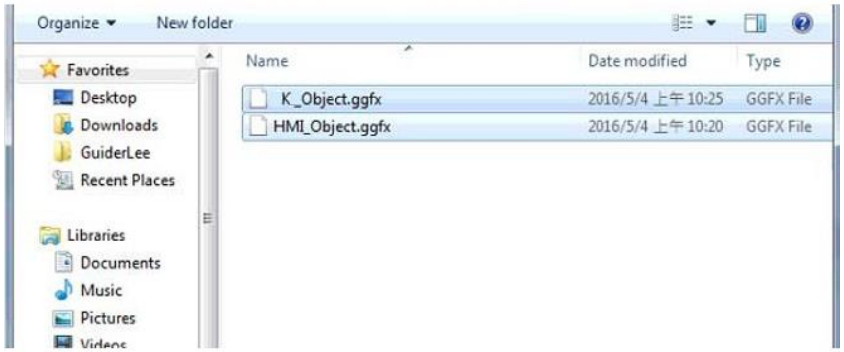


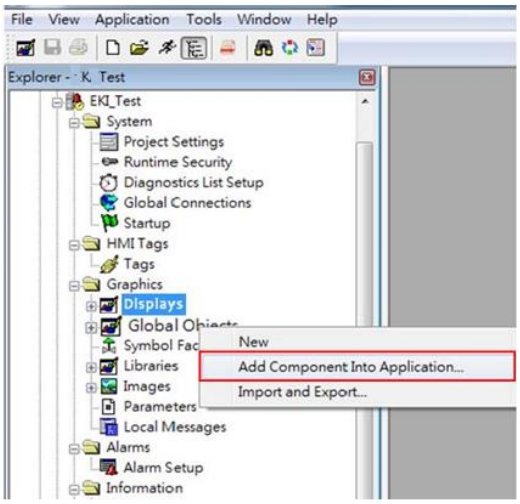
Figure 2.24 Importing EKI and HMI Objects

12. The **Add Components Into Project** window displays. Navigate to the location of the global objects source folder.



13. Select the K_Object and HMI_Object files and click Open to import them.

    To view specific supported formats, click the Format drop-down menu and select a specific format to display in the body pane.
14. From the menu tree, navigate to **Graphics** > **Displays**.
15. Right-click to open the options menu and select **Add Component Into Application...**.



16. The Add Components Into Project window displays. Navigate to the location of the GFX Objects source folder.
17. Select the five files in the GFX folder and click **Open** to import them.

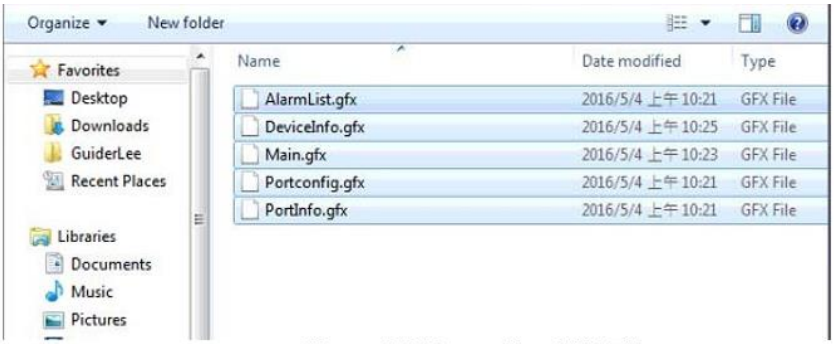


Figure 2.26 Importing GFX Files

The GFX files are imported and the main menu displays.

18. From the menu tree, navigate to **Graphics** > **Parameters**.
19. Right-click to open the options menu and select **Add Component Into Application...**.

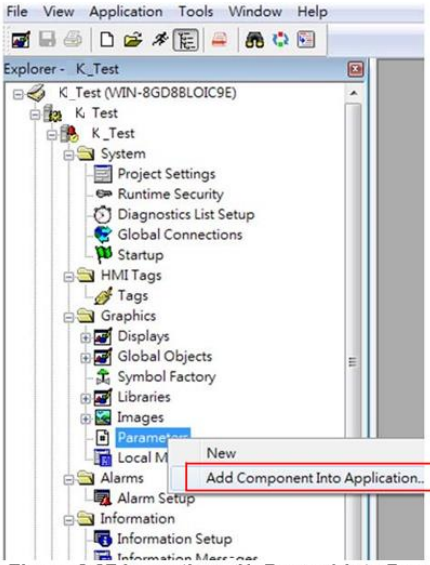


Figure 2.27 Importing K_Param1 into Parameters

20. The **Add Components Into Project** window displays. Navigate to the location of the parameter source folder.
21. Select K_PARAM1 and click **Open** to import the files. To view specific supported formats, click the Format drop-down menu and select a specific format to display in the body pane.

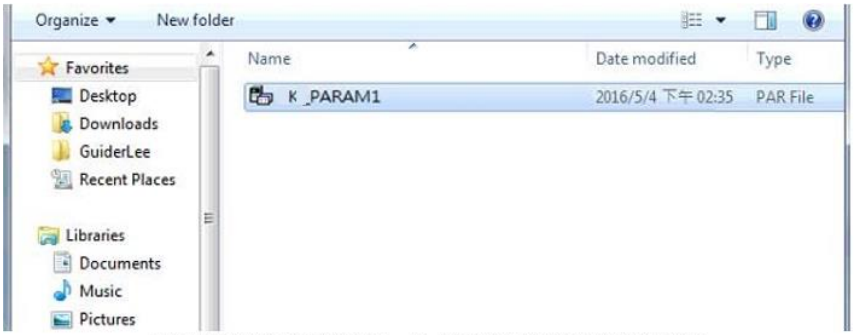
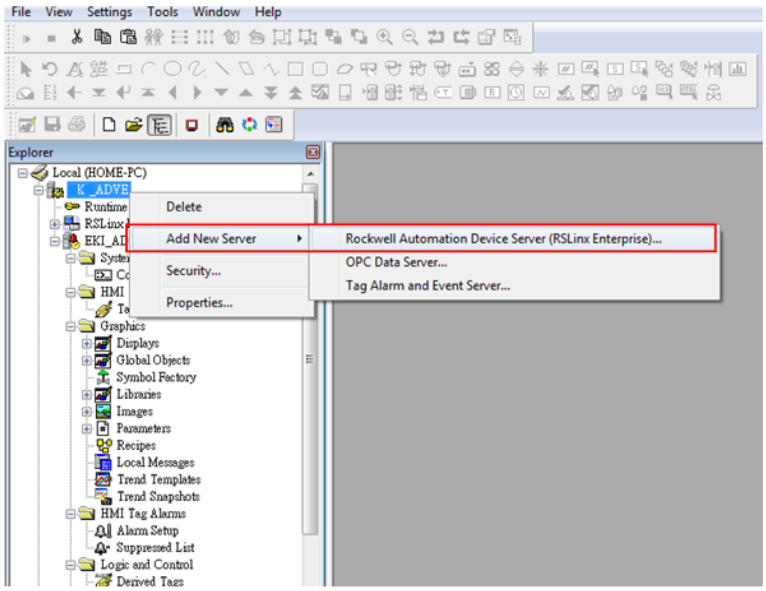


Figure 2.28 Importing K_Param1 into Parameters

22. Click **Open** to import the files.
23. Create a Data Server: Select the project name, and right click to display **Add New Server** > **Rockwell Automation Device Server (RSLinux Enterprise)**.



24. Navigate to **RSLinx Enterprise** > **Communication Setup** and double click to open the options menu.

Figure 2.29 Locating RSLinx Enterprise List

25. Select **Create a new configuration** to create a new runtime configuration.
26. Click **Finish** to continue.

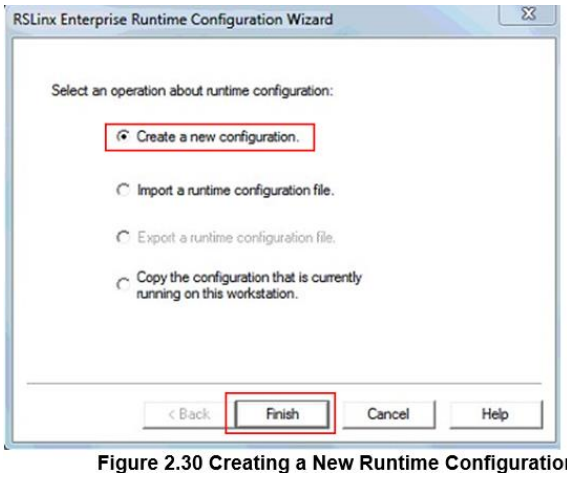


Figure 2.30 Creating a New Runtime Configuration

27. Open RSLinx Enterprise, add a new Device Shortcut. For this example, name the device shortcut CLX and select your PLC controller.
28. Click **Apply and Copy** from Design to Runtime.
29. Click **OK** to continue.

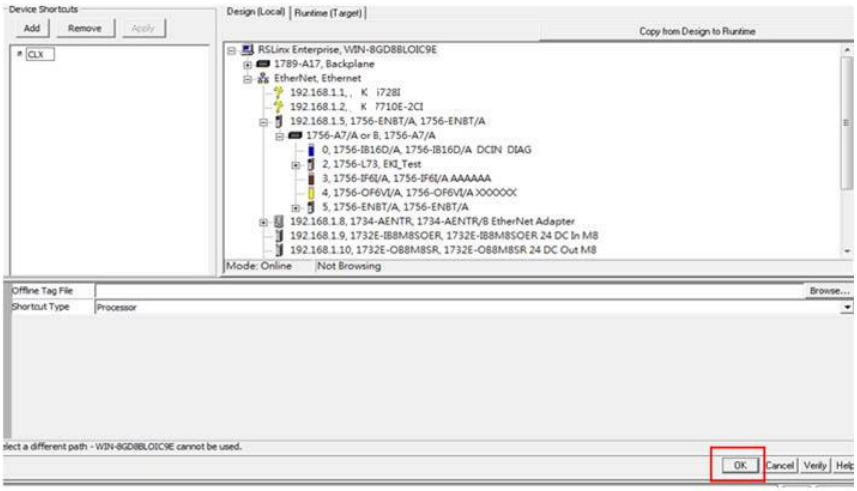


Figure 2.31 Adding a New Runtime Device Shortcut

30. In the event that the Device Shortcut is not named CLX in RSLinx Enterprise, then the imported parameters file (K_PARAM1), must be modified, see the example and figure as follows:
    EXAMPLE:
    - Open the K_PARAM1 file.
    - Change the non-remark line to read as follows: #1=[CLX]K_Switch1
    - Save and close the parameters file.

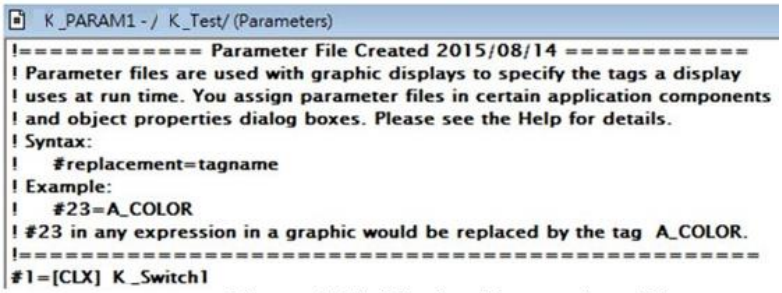


Figure 2.32 Altering Parameters File

31. To complete the procedure, create a Client link and turn it on.

32. Start the Runtime application.

The runtime application is configured and uploaded to the device effectively programming the device through the FactoryTalk® View ME application.

1.4.5 Configuring in SE Image Control Panel

1. Open human machine interface PanelView Plus. The following screen displays.

Figure 2.57 Opening SE Image Control Panel

2. Click **Switch** and enter the **Device Information** screen. Different device models are represented by their respective images.

On the top right of the screen is a function bar (tool bar), with icons representing specific tasks available in the PanelView Plus main menu.

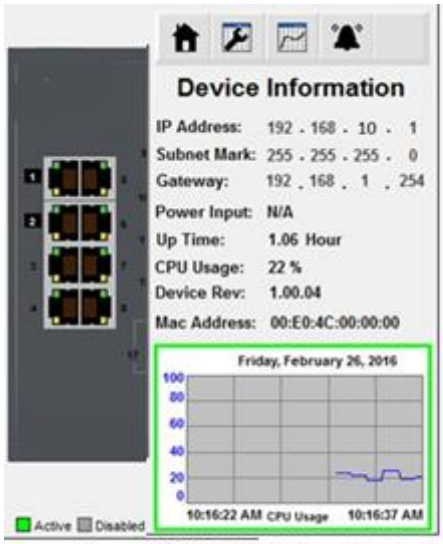


Figure 2.35 Identifying Control Panel Menu

Function	Description
	Home page
	Configures port status
	Displays port status
	Alarm info

3. Click the status icon to see the status for a selected port. To switch between port selections, use the arrow icons to select a specific port.

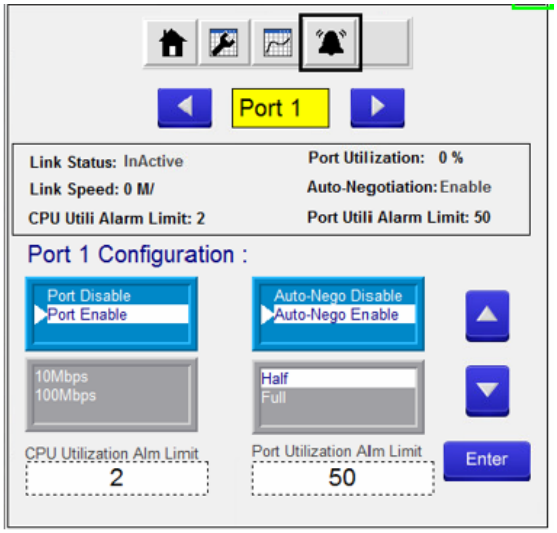


Figure 2.59 Port Settings Menu

4. Click the tool icon to enter the Port Settings menu.

5. Select the setting to change and use the arrow icons to change the settings.

6. Click Enter to apply the new setting changes. If the Enter button is not pressed the changes do not take effect.

If a setting is grayed out, the setting is cannot be modified.

Disabled ports the following options are not available: Auto-Nego, Port Speed, and Port Duplex.

If Auto-Nego is Enabled, Port Speed and Port Duplex cannot be set.

CPU and Port utilization alarm limits are available at the bottom of the screen. After entering a value, click the return button to return to the previous window.

7. Click Enter to apply the new setting changes.

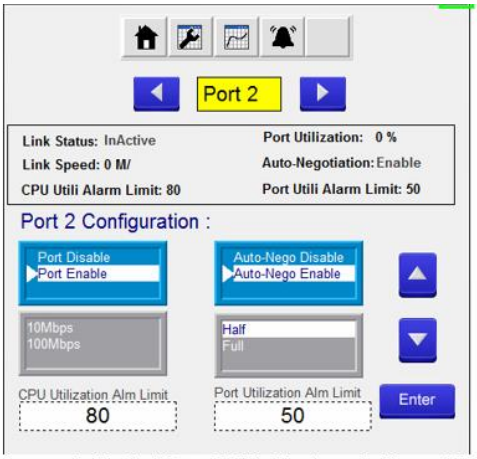


Figure 2.60 Setting CPU, Port and Alarm Value Limits

Enabling or disabling additional settings, such as the Alarm function, is also available through the control panel.

8. Click the alarm icon to enter the alarm list. If an image is grayed out, there are no active alarms. An alarm function is active if the listing is in Red.

9. Click Enable or Disable to change the status of the selected alarm.

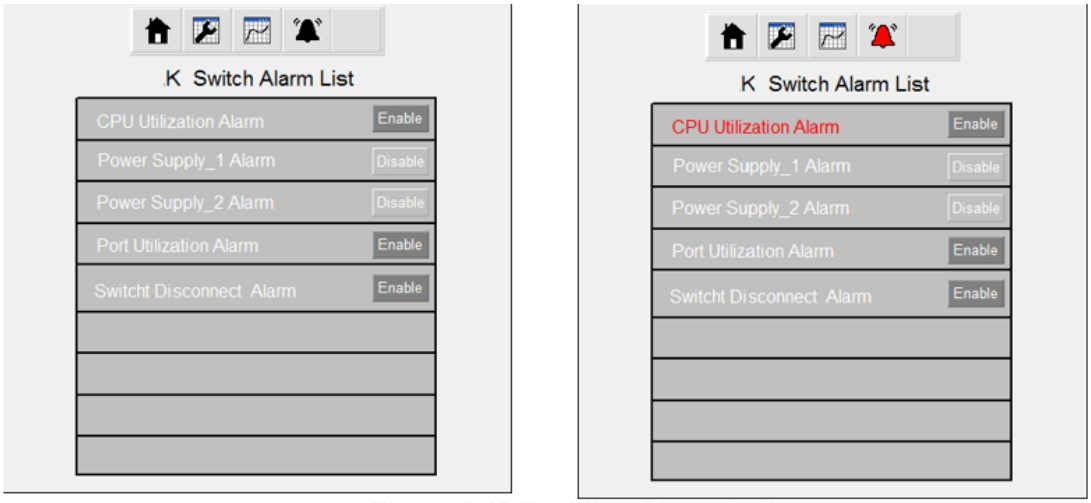


Figure 2.40 Enabling Alarm Options

1.5 EtherNet/IP CIP Objects

The following section identifies supported Common Industrial Protocol (CIP) objects. JetLink serial device server line supports the following monitoring objects for PLC and SCADA devices:

- Identity Objects
- TCP/IP Interface Objects Ethernet Link Objects
- Networking Objects
- Assembly Objects

- Message Router Objects
- Connection Manager Objects
- Base Switch Objects

1.5.1 Identity Objects

1.5.1.1 **Class Attribute List**

Attribute ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Object revision
2	Get	Max Instance	UINT (16)	Maximum instance number of the object
3	Get	Number of instances	UINT (16)	Number of object instances currently created in the class
6	Get	Max ID of class attributes	UINT (16)	The Maximum class attribute ID number which is implemented in the device
7	Get	Max ID of instance attributes	UINT (16)	The Maximum instance attribute ID number which is implemented in the device

1.5.1.2 Instance Attribute Lists

Attribute ID	Access Rule	Name	Data Type	Description
1	Get	VendorID	UINT (16)	ODVA Vendor ID = 148
2	Get	DeviceType	UINT (16)	43, Generic device
3	Get	ProductCode	UINT (16)	Please reset to Product Code Table
4	Get	Revision	Struct	
		Major	SINT (8)	The structure member, major
		Minor	SINT (8)	The structure member, minor.
5	Get	Status	DINT (32)	Summary status of device
6	Get	SerialNumber	UDINT (32)	Serial number of device, the default is 1234567890
7	Get	ProductName	Short STRING	Human readable identification, Please reset to Product Name Table

1.5.1.3 Common Service

Service Code	Class	Instance	Service Name	Description
0x01	•	•	Get_Attributes_All	Returns multiple attributes in numerical order.

Service Code	Class	Instance	Service Name	Description
0x0E	•	•	Get_Attribute_Single	Read instance attribute of the class
0x05		•	Reset	Rest the device

1.5.1.4 GetAttributeAll

0x1		
1	VendorID	UINT (16)
2	DeviceType	UINT (16)
3	ProductCode	UINT (16)
4	Revision	
	Major	SINT (8)
	Minor	SINT (8)
5	Status	DINT (32)
6	SerialNumber	UDINT (32)
7	ProductName	
	length	SINT (8)
	data	length SINT

1.5.2 TCP/IP Interface Objects

1.5.2.1 **Attribute ID**

Attribute ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Object revision
2	Get	Max Instance	UINT (16)	Maximum instance number of the object
3	Get	Number of instances	UINT (16)	Number of object instances currently created in the class
6	Get	Max ID of class attributes	UINT (16)	The Maximum class attribute ID number which is implemented in the device
7	Get	Max ID of instance attributes	UINT (16)	The Maximum instance attribute ID number which is implemented in the device

1.5.2.2 **Instance Attribute List**

Attribute ID	Access Rule	Name	Data Type	Description
1	Get	Status	UDINT (32)	Interface status
2	Get	Configuration_Capability	UDINT (32)	Interface capability flags
3	Get/Set	Configuration_Control	UDINT (32)	Interface control flags

Attribute ID	Access Rule	Name	Data Type	Description
4	Get	Physical Link Object	Struct	
		Path size	UINT (16)	Size of Path
		Path	Padded EPATH	Logical segments identifying the physical link object
5	Get	Interface Config-uration	Struct	
		IP Address	UDINT (32)	The device's IP address
		Network Mask	UDINT (32)	The device's network mask
		Gateway Address	UDINT (32)	Default gateway address
		Name Server	UDINT (32)	Primary name server
		Name Server2	UDINT (32)	Secondary name server
		Domain Name	STRING	Default domain name
6	Get	Hostname	STRING	Host name
8	Get	TTL value	USINT (8)	TTL value for EtherNet/IP multi-cast packets
9	Get	Mcast Config	Struct	Multicast address allocation control word
		Alloc Control	USINT (8)	allocation control
		Reserved	USINT (8)	Reserved for future use
		Num Mcast	UINT (16)	Number of IP multicast address to allocation for EIP
		Mcast Start Addr	UDINT (32)	Starting multicast address from which to begin allocation.
13	Set	Encapsulation Inactivity of inac-tivity before Timeout	UINT (16)	Number of seconds of inactivity before TCP connection is closed

1.5.2.3 Common Service

Service Code	Class	Instance	Service Name	Description
0x01	•	•	Get_Attributes_All	Returns multiple attributes in numerical order
0x0E	•	•	Get_Attribute_Single	Read instance attribute of the class
0x10		•	Set_Attribute_Single	Write instance attribute of the class

1.5.2.4 GetAttributeAll

0x1		
1	Status	UDINT (32)
2	Configuration_Capability	UDINT (32)
3	Configuration_Control	UDINT (32)
4	Physical Link Object	
	Path size	UINT (16)
	Path size	path size UINT
5	Interface Configuration	
	IP Address	UDINT (32)
	Network Mask	UDINT (32)
	Gateway Address	UDINT (32)
	Name Server	UDINT (32)
	Name Server2	UDINT (32)
	Domain Name	
	Length	UINT (16)
	Data	length SINT
6	Hostname	
	Length	UINT (16)
	Data	length SINT
	Reserved	6SINT (48)
8	TTL value	USINT (8)
9	Mcast Config	
	Alloc Control	USINT (8)
	Reserved	USINT (8)
	Num Mcast	UINT (16)
	Mcast Start Addr	UDINT (32)
	Reserved	37SINT (37)
13	Encapsulation Inactivity of inactivity before Timeout	UINT (16)

1.5.3 Ethernet Link Objects

1.5.3.1 Class Attribute List

Attribute ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Object revision
2	Get	Max Instance	UINT (16)	Maximum instance number of the object
3	Get	Number of instances	UINT (16)	Number of object instances currently created in the class
6	Get	Max ID of class attributes	UINT (16)	The Maximum class attribute ID number which is implemented in the device
7	Get	Max ID of instance attributes	UINT (16)	The Maximum instance attribute ID number which is implemented in the device

1.5.3.2 Instance Attribute List

Attribute ID	Access Rule	Name	Data Type	Description
1	Get	Interface Speed	UDINT (32)	Interface speed currently in use. Speed in Mbps (e.g., 0, 10, 100, 1000, etc.)
2	Get	Interface Flags	UDINT (32)	Interface status flags
3	Get	Physical Address	ARRAY of 6 USINT (48)	MAC layer address
4	Get	Interface Counters	Struct	
		In Octets	UDINT (32)	Octets received on the interface
		In Ucast Packets	UDINT (32)	Unicast packets received on the interface
		In NUcast Packets	UDINT (32)	Non-unicast packets received on the interface
		In Discards	UDINT (32)	Inbound packets received on the interface but discarded
		In Errors	UDINT (32)	Inbound packets that contain errors (does not include In Discards)
		In Unknown Protos	UDINT (32)	Inbound packets with unknown protocol
		Out Octets	UDINT (32)	Octets sent on the interface
		Out Ucast Packets	UDINT (32)	Unicast packets sent on the interface
		Out NUcast Packets	UDINT (32)	Non-unicast packets sent on the interface
		Out Discards	UDINT (32)	Outbound packets received on the interface but discarded
		Out Errors	UDINT (32)	Outbound packets that contain errors (does not include In Discards)

5	Get	Media Counters	Struct	
		Alignment Errors	UDINT (32)	Frames received that are not an integral number of octets in length
		FCS Errors	UDINT (32)	Frames received that do not pass the FCS check
		Single Collisions	UDINT (32)	Successfully transmitted frames which experienced exactly one collision
		Multiple_Collisions	UDINT (32)	Successfully transmitted frames which experienced more than one collision
		SQE_Test_Errors	UDINT (32)	Number of times SQE test error message is generated
		Deferred_Transmissions	UDINT (32)	Frames for which first transmission attempt is delayed because the medium is busy
		Late Collisions	UDINT (32)	Number of times a collision is detected later than 512 bit-times into the transmission of a packet
		Excessive_Collisions	UDINT (32)	Frames for which transmission fails due to excessive collisions
		MAC_Transmit_Errors	UDINT (32)	Frames for which transmission fails due to an internal MAC sub layer transmit error
		Carrier_Sense_Errors	UDINT (32)	Times that the carrier sense condition was lost or never asserted when attempting to transmit a frame
		Frame_Too_Long	UDINT (32)	Frames received that exceed the maximum permitted frame size
		MAC_Receive_Errors	UDINT (32)	Frames for which reception on an interface fails due to an internal MAC sub layer receive error
6	Get/Set	Interface Control	Struct	
		Control Bits	UINT (16)	Interface Control Bits

		Forced_Interface_Speed	UINT (16) Speed in Mbps (10, 100, 1000, etc.)	Speed at which the interface shall be forced to operate.
10	Get	Interface Level	STRING	Human readable identification
100	Get	Interface Utilization	UINT (16)	Percentage of entire interface Rx/Tx bandwidth being used (0-100), rx - 8bits, tx-8bits
101	Get	Tx Unicast Packet Rate	UDINT (32)	Number of TX unicast packets per second
102	Get	Tx Multicast Packet Rate	UDINT (32)	Number of TX multicast packets per second
103	Get	Tx Broadcast Packet Rate	UDINT (32)	Number of TX broadcast packets per second
104	Get	Rx Unicast Packet Rate	UDINT (32)	Number of RX unicast packets per second
105	Get	Rx Multicast Packet Rate	UDINT (32)	Number of RX multicast packets per second
106	Get	Rx Broadcast Packet Rate	UDINT (32)	Number of RX broadcast packets per second
107	Get/Set	Broadcast Storm	USINT (8)	
108	Get	Authentication status	USINT (8)	

1.5.3.3 Common Service

Service Code	Class	Instance	Service Name	Description
0x01	•	•	Get_Attributes_All	Returns multiple attributes in numerical order.
0x0E	•	•	Get_Attribute_Single	Read instance attribute of the class
0x10		•	Set_Attribute_Single	Write instance attribute of the class
0x4C		•	Get_and_Clear	Get instance attribute of the class and then clear the value

1.5.3.4 GetAttributeAll

0x1		
1	Interface Speed	UDINT (32)
2	Interface Flags	UDINT (32)
3	Physical Address	6USINT (48)
4	Interface Counters	
	In Octets	UDINT (32)
	In Ucast Packets	UDINT (32)
	In NUcast Packets	UDINT (32)
	In Discards	UDINT (32)
	In Errors	UDINT (32)
	In Unknown Protos	UDINT (32)
	Out Octets	UDINT (32)
	Out Ucast Packets	UDINT (32)
	Out NUcast Packets	UDINT (32)
	Out Discards	UDINT (32)
	Out Errors	UDINT (32)
5	Media Counters	
	Alignment Errors	UDINT (32)
	FCS Errors	UDINT (32)
	Single Collisions	UDINT (32)
	Multiple_Collisions	UDINT (32)
	SQE_Test_Errors	UDINT (32)
	Deferred_Transmissions	UDINT (32)
	Late Collisions	UDINT (32)
	Excessive_Collisions	UDINT (32)
	MAC_Transmit_Errors	UDINT (32)
	Carrier_Sense_Errors	UDINT (32)
	Frame_Too_Long	UDINT (32)
	MAC_Receive_Errors	UDINT (32)
6	Interface Control	
	Control Bits	UINT (16)
	Forced_Interface_Speed	UINT (16)
10	Interface Level	
	Length	UINT (16)
	Data	length SINT

1.5.3.5 GetAttributeAll-Vendor1

(0x32)		
100	Interface Utilization	USINT (8)
101	Tx Unicast Packet Rate	UDINT (32)
102	Tx Multicast Packet Rate	UDINT (32)
103	Tx Broadcast Packet Rate	UDINT (32)
104	Rx Unicast Packet Rate	UDINT (32)
105	Rx Multicast Packet Rate	UDINT (32)
106	Rx Broadcast Packet Rate	UDINT (32)
107	Broadcast Storm	USINT (8)
108	Authentication status	USINT (8)

1.5.4 Networking Objects

1.5.4.1 Class Attribute List

Attribute ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Object revision
2	Get	Max Instance	UINT (16)	Maximum instance number of the object
3	Get	Number of instances	UINT (16)	Number of object instances currently created in the class
6	Get	Max ID of class attributes	UINT (16)	The Maximum class attribute ID number which is implemented in the device
7	Get	Max ID of instance attributes	UINT (16)	The Maximum instance attribute ID number which is implemented in the device

1.5.4.2 Instance Attribute List

Attribute ID	Access Rule	Name	Data Type	Description
1	Get	System Uptime	UDINT (32)	Number of seconds since device was powered up
2	Get	FW version	Struct	
		Major1	USINT (8)	The structure member, major1
		Major2	USINT (8)	The structure member, major2
		Minor	USINT (8)	The structure member, minor
		Reserved	USINT (8)	
3	Get	System Fault	UDINT (32)	System fault status
				0 bit: CPU utilization alarm value 0: no alarm value 1: alarm
				1 bit: Power supply 1 value 0: error value 1: ok

Attribute ID	Access Rule	Name	Data Type	Description
				2 bit: Power supply 2 value 0: error value 1: ok
				[3-31] bit: Reserved
4	Get	Port Count	USINT (8)	Total switch port count
5	Get	Port Exist	UDINT (32)	Switch port exists on device
6	Get/Set	Port Enable	UDINT (32)	Switch port en|dis-able
7	Get	Port Link Status	UDINT (32)	Switch port link status
8	Get	CPU Usage	USINT (8)	Percent of CPU usage (0-100)
9	Get/Set	Temperature Upper Limit	UDINT (32)	Upper temperature (C) at which to declare an alarm
10	Get/Set	Temperature Lower Limit	UDINT (32)	Lower temperature (C) at which to declare an alarm
11	Get	Temperature in C	UDINT (32)	Temperature in degrees C. 0x9999 = Not Supported on device.
12	Get	Temperature in F	UDINT (32)	Temperature in degrees F. 0x9999 = Not Supported on device.
13	Set	MIB Reset	USINT (8)	Reset MIB counters
14	Get/Set	CPU Utilization Alarm Limit	USINT (8)	Percent of upper CPU usage at which to declare an alarm, default value is 80
15	Get/Set	Port Utilization Alarm Limit	USINT (8)	Percent of upper port utilization at which to declare an alarm, default value is 80
16	Get/Set	Config Enable	USINT (8)	Output config data en|dis-able
17	Get	MAC address	Short STRING	Human readable mac address
25	Set	Reboot	USINT (8)	Reboot the device

1.5.4.3 GetAttributeAll

0x1			"
1	System Uptime	UDINT (32)	
2	FW version		
	Major	UINT (16)	
	Minor	UINT (16)	
3	System Fault	UDINT (32)	
			0 bit: CPU utilization alarm value 0: no alarm value 1: alarm
			1 bit: Power supply 1 value 0: error value 1: ok

			2 bit: Power supply 2 value 0: error value 1: ok
			[3-31] bit: Reserved
4	Port Count	USINT (8)	
5	Port Exist	UDINT (32)	
6	Port Enable	UDINT (32)	
7	Port Link Status	UDINT (32)	
8	CPU Usage	USINT (8)	
9	Temperature Upper Limit	UDINT (32)	
10	Temperature Lower Limit	UDINT (32)	
11	Temperature in C	UDINT (32)	
12	Temperature in F	UDINT (32)	
14	CPU Utilization Alarm Limit	USINT (8)	
15	Port Utilization Alarm Limit	USINT (8)	
16	Config Enable	USINT (8)	
17	MAC address		
	length	USINT (8)	
	data	length USINT	

1.5.5 Assembly

	Instance number	size (bit)
Input	100	256
Output	150	256
Config	151	80

1.5.5.1 Class Attribute List

1	Get	Revision	UINT (16)	Object Revision
2	Get	Max Instance	UINT (16)	Maximum instance number of the object
3	Get	Number of instances	UINT (16)	Number of object instances currently created in the class
6	Get	Max ID of class attributes	UINT (16)	The Maximum class attribute ID number which is implemented in the device
7	Get	Max ID of instance attributes	UINT (16)	The Maximum instance attribute ID number which is implemented in the device

1.5.5.2 Instance Attribute List

3	Get/Set	Data	Array of BYTE	The messaging content

1.5.5.3 Common Service

Service Code	Class	Instance	Service Name	Description
0x0E	●	●	Get_Attribute_Single	Read instance attribute of the class
0x10		●	Set_Attribute_Single	Write instance attribute of the class

1.5.5.4 I/O Data

Input	BitMask	Name	Bits	Description
[0]	0-15	ProductCode	16 bits	
	16-23	CPU usage	8 bits	Percent of CPU usage (0-100)
	24-31			Reserved
[1]	0-31	Port status	32 bits	Switch port link status
[2]	0-31	Port duplex	32 bits	Switch port duplex status
[3]	0-31	System uptime	32 bits	Number of seconds since device was powered up
[4]	0-31	System fault	32 bits	The same result with no.3 attribute of class.
[5]	0-31	Port utilization alarm	32 bits	port will be set if port utilization exceed threshold.
[6]	0-31	Port Auth status	32 bits	port authentication status
[7]				Reserved
Output				
[0]	0-7	Port number	8 bits	Which port number want to set
	8	Port en | disable	1 bit	Port number en | disable, 0 = disable, 1 = enable
	9	Port auto-nego en|dis-able	1 bit	Port auto-negotiate en |disable, 0 = disable, 1 = enable
	10	Port duplex	1 bit	Port duplex, 0 = half, 1 = full
	11-15		5 bits	Reserved
	16-31	Port speed	16 bits	Port speed
[1]	0-7	CPU utilization limit	8 bits	Percent of upper CPU usage at which to declare an alarm
	8-15	Port utilization limit	8 bits	Percent of upper port utilization at which to declare an alarm
	16-23	Temperature upper limit	8 bits	Upper temperature (C) at which to declare an alarm

[2]				Reserved
[3]				Reserved
[4]				Reserved
[5]				Reserved
[6]				Reserved
[7]				Reserved

1.5.6 Message Router

1.5.6.1 Class Attribute List

Class Attribute List				
1	Get	Revision	UINT (16)	Object revision
2	Get	Max Instance	UINT (16)	Maximum instance number of the object
3	Get	Number of instances	UINT (16)	Number of object instances currently created in the class
6	Get	Max ID of class attributes	UINT (16)	The Maximum class attribute ID number which is implemented in the device
7	Get	Max ID of instance attributes	UINT (16)	The Maximum instance attribute ID number which is implemented in the device

1.5.6.2 Common Service

Service Code	**Class**	**Instance**	**Service Name**	**Description**
0x0E	•	•	Get_Attribute_Single	Read instance attribute of the class

1.5.7 Connection Manager

1.5.7.1 Class Attribute List

1	Get	Revision	UINT (16)	Object revision
2	Get	Max Instance	UINT (16)	Maximum instance number of the object
3	Get	Number of instances	UINT (16)	Number of object instances currently created in the class
6	Get	Max ID of class attributes	UINT (16)	The Maximum class attribute ID number which is implemented in the device
7	Get	Max ID of instance attributes	UINT (16)	The Maximum instance attribute ID number which is implemented in the device

1.5.7.2 Common Service

Service Code	Class	Instance	Service Name	Description
0x0E	•	•	Get_Attribute_Single	Read instance attribute of the class
0x10		•	Set_Attribute_Single	Write instance attribute of the class
0x4E	•	•	Forward_Close	close connection
0x54		•	Forward_Open	open connection

1.5.8 Base Switch

1.5.8.1 Class Attribute List

1	Get	Revision	UINT (16)	Object revision
2	Get	Max Instance	UINT (16)	Maximum instance number of the object
3	Get	Number of instances	UINT (16)	Number of object instances currently created in the class
6	Get	Max ID of class attributes	UINT (16)	The Maximum class attribute ID number which is implemented in the device
7	Get	Max ID of instance attributes	UINT (16)	The Maximum instance attribute ID number which is implemented in the device

1.5.8.2 Instance Attribute List

1	Get	Device Up Time	UDINT (32)	Time since device was powered up
2	Get	Total port count	UDINT (32)	Number of physical ports
3	Get	System Firmware Version	Short String	Human readable representation of System Firmware Version
4	Get	Power Source	INT (16)	Status of switch power source
5	Get	Port Mask Size	UINT (16)	Number of DWORDs in port array attributes
8	Get	Global Port Link Status	Array of DWORD	Ports Link Status

1.5.8.3 Common Service

Service Code	Class	Instance	Service Name	Description
0x01	•		Get_Attributes_All	Returns multiple attributes in numerical order.
0x0E	•	•	Get_Attribute_Single	Read instance attribute of the class

2.1 PROFINET

2.1.1 Introduction

PROFINET is the standard for industrial networking in automation. It connects devices, systems, and cells, facilitating faster, safer, less costly and higher quality manufacturing. It easily integrates existing systems and equipment while bringing the richness of Ethernet down to the factory floor.

PROFINET IO recognizes three classes of devices:

- IO devices

  An I/O device is a distributed I/O field device that is connected to one or more I/ O controllers via PROFINET I/O. The I/O device is the provider of input data and the consumer of output data.

- IO controllers

  This is typically the programmable logic controller (PLC) on which the automation program runs. The I/O controller provides output data to the configured I/O-devices in its role as provider and is the consumer of input data of I/O devices.

- IO supervisors.

  This can be a programming device, personal computer (PC), or human machine interface (HMI) device for commissioning or diagnostic purposes.

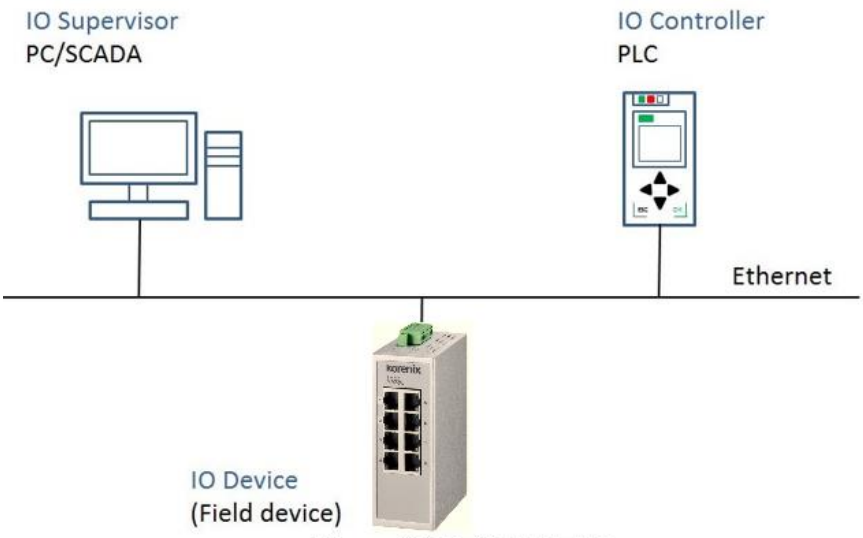


Figure 3.1 PROFINET IO

2.2 Configuring PROFINET

2.2.1 Enable PROFINET I/O

The PROFINET function default is enabled in the PROFINET project series. It can be configure manually in the Web page. To access this page, click **Management >**

PROFINET > PROFINET Settings.

Item	Description
State	Click **Disabled** or **Enabled** to set the PROFINET state.
Apply	Click **Apply** to save the values and update the screen.

2.2.2 PROFINET Cyclic I/O Data

Category	Direction	Byte(s)	Bit	Name	Description
Port Status	Input	0	0	Port1 Connection	0 is not connected, 1 is connected
			1	Port2 Connection	0 is not connected, 1 is connected
			2	Port3 Connection	0 is not connected, 1 is connected
			3	Port4 Connection	0 is not connected, 1 is connected
			4	Port5 Connection	0 is not connected, 1 is connected
			5	Port6 Connection	0 is not connected, 1 is connected
			6	Port7 Connection	0 is not connected, 1 is connected
			7	Port8 Connection	0 is not connected, 1 is connected
		1	0	Port9 Connection	0 is not connected, 1 is connected
			1	Port10 Connection	0 is not connected, 1 is connected
			2	Port11 Connection	0 is not connected, 1 is con-
			3	Port12 Connection	0 is not connected, 1 is connected
			4	Port13 Connection	0 is not connected, 1 is connected
			5	Port14 Connection	0 is not connected, 1 is connected
			6	Port15 Connection	0 is not connected, 1 is connected
			7	Port16 Connection	0 is not connected, 1 is connected

	2	0	Port17 Connection 0 is not connected, 1 is connected
		1	Port18 Connection 0 is not connected, 1 is connected
		2	Reserved
		3	Reserved
		4	Reserved
		5	Reserved
		6	Reserved
		7	Reserved
	3	0	Reserved
		1	Reserved
		2	Reserved
		3	Reserved
		4	Reserved
		5	Reserved
		6	Reserved
		7	Reserved

2.3 TIA Portal V13 Integration

The following steps show how to integrate the switch into a PROFINET network:

1. Create a PROFINET I/O project in TIA Portal

   Create a PROFINET I/O Ethernet project for deploying environment

2. GSD file installation

   Import GSD file into the project

3. Add Devices and configuration

   Search and discover the switch in TIA Portal. Configure PROFINET attributes such as IP address, device name and I/O parameters.

4. Save and load the project into the

   PLC Load this project and into the

   PLC

5. Watch tables of the Switch

   Use TIA Portal to watch switch attributes

2.3.1 Create a PROFINET I/O project in TIA Portal

Create a new project.

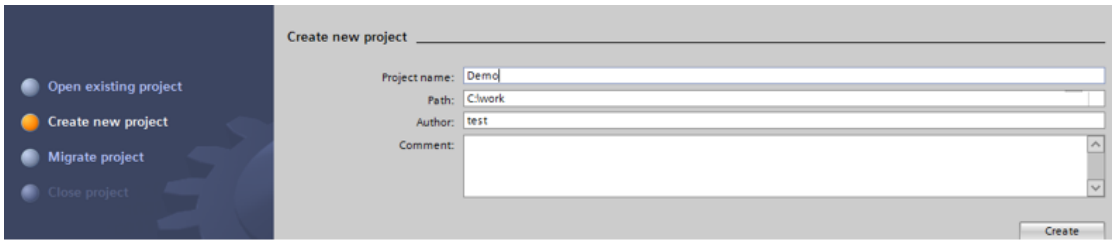


Figure 3.3 Create new project

1.3.2 GSD file installation

Install the GSD file via Options.

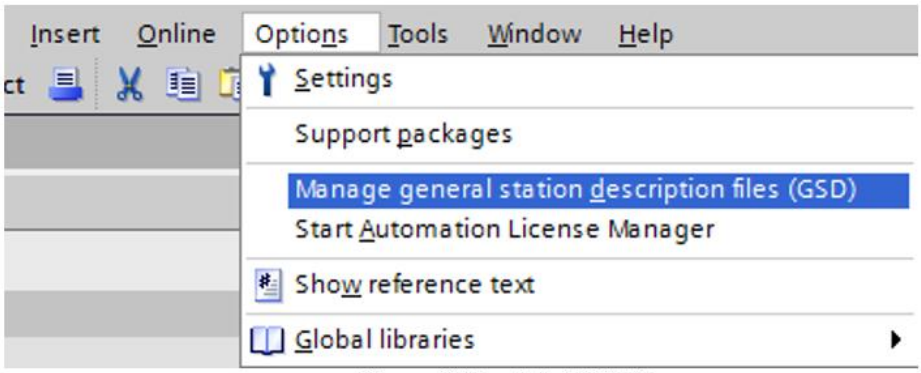


Figure 3.4 Install GSD File

Now the Ethernet Switch can be found in the Hardware catalog tree under **Other field devices > PROFINET IO > Network Components > PROFINET Switch**.

1.3.3 Add Devices and configuration

1. Install the GSD file via Options.

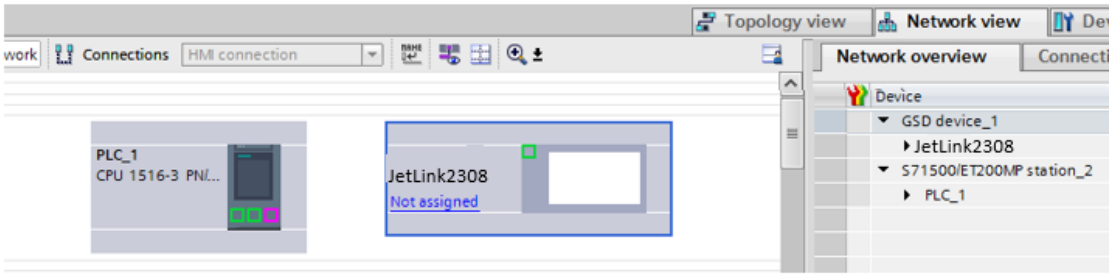


Figure 3.6 Install GSD file

2. Draw the PROFINET IO-system between the PLC and the Switch.

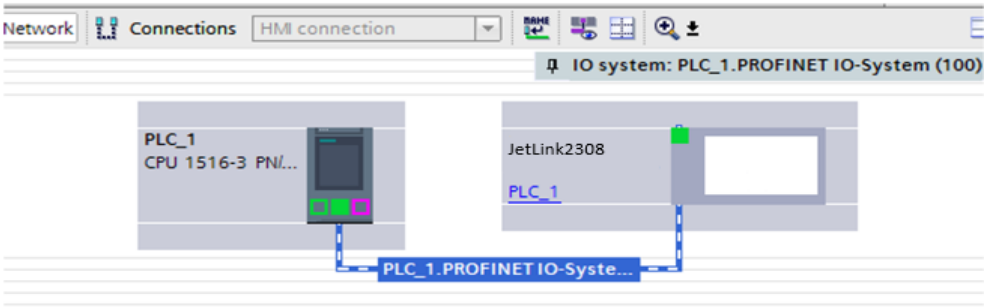


Figure 3.7 Draw PROFINET-IO System

3. Assign a device name under the **Device view**.

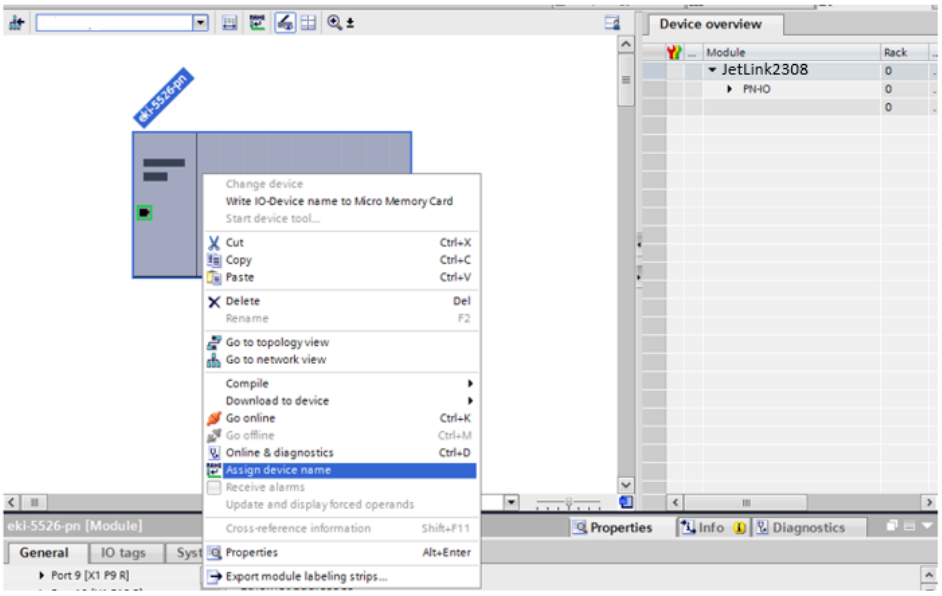


Figure 3.8 Assign Device Name

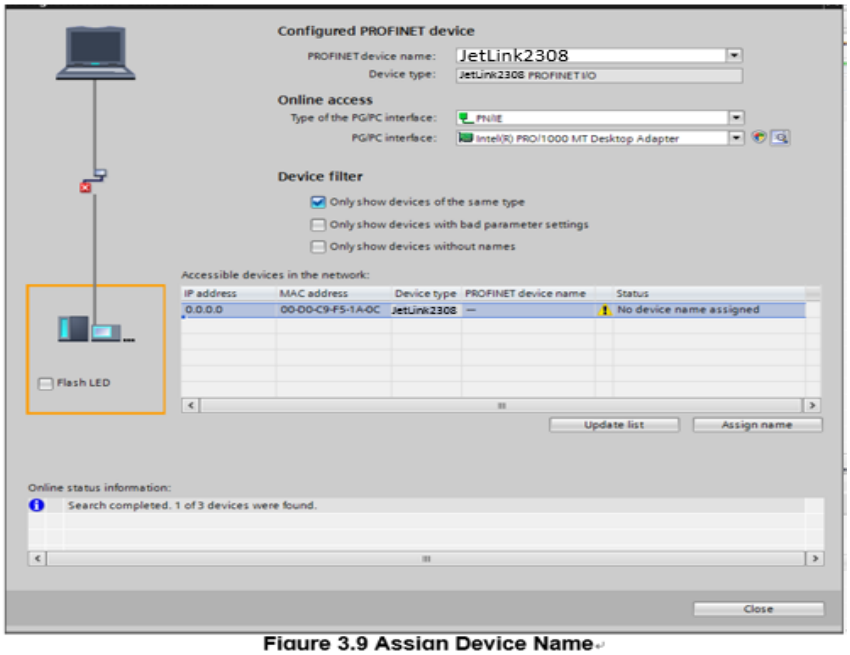


Figure 3.9 Assign Device Name

4. Add Port Link Status to the Module.

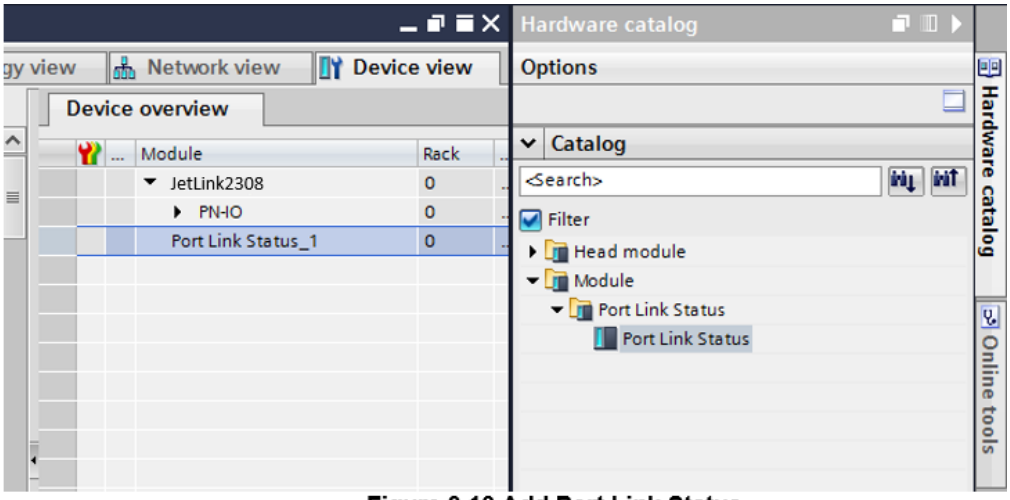


Figure 3.10 Add Port Link Status

1.3.4 Save and load the project into the PLC

Compile and Download to device.

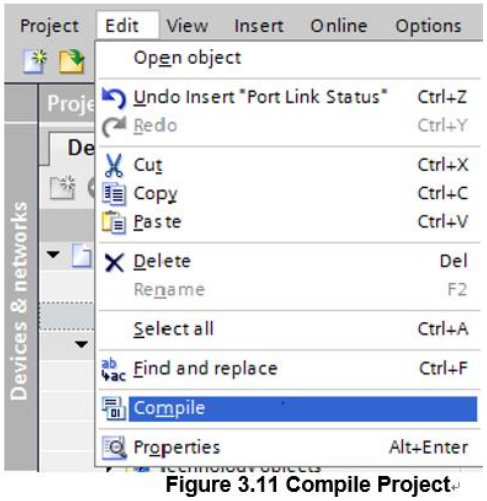


Figure 3.11 Compile Project

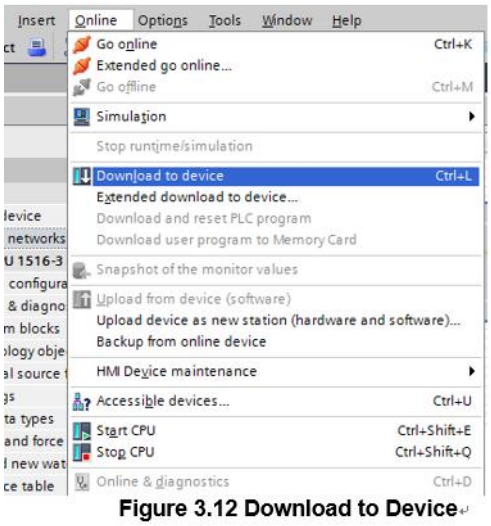


Figure 3.12 Download to Device

1.3.5 Switch Watch tables

1. Add a new watch table to **Project tree > Devices**.

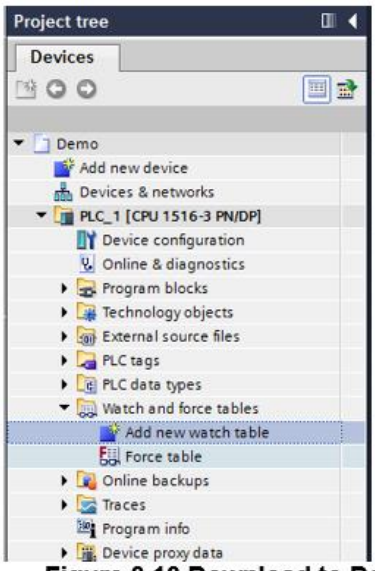


Figure 3.13 Download to Device

2. Drag I/O(**Port_Link_Status_1 > Details View**) into **Watch_table_1**.

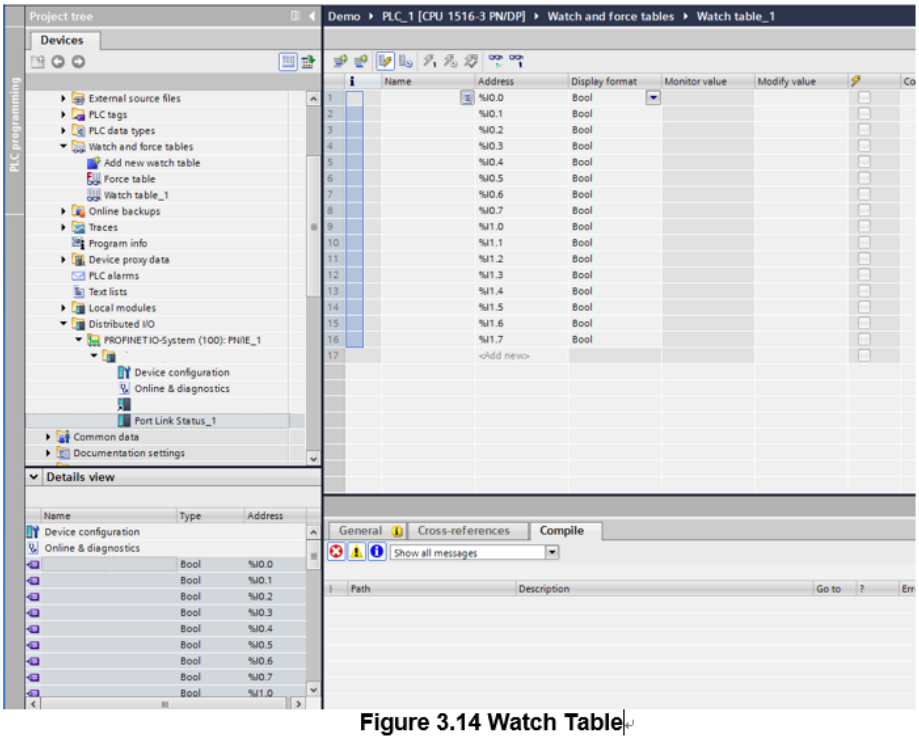


Figure 3.14 Watch Table

3. Monitor via the **Online** menu.

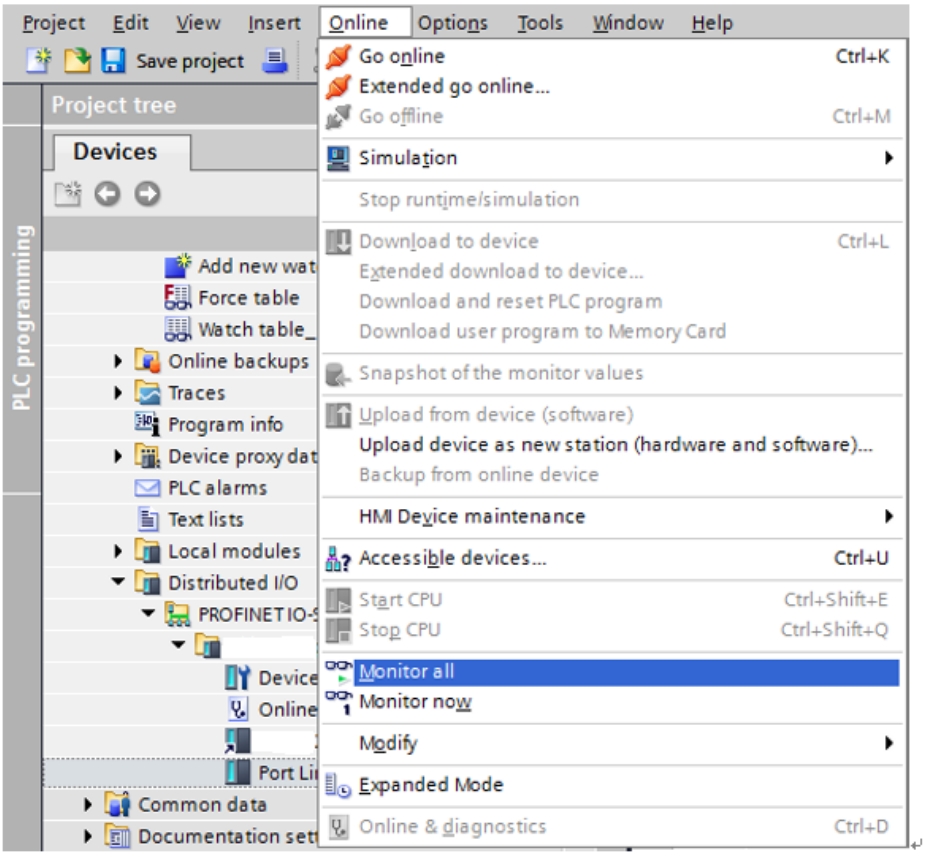
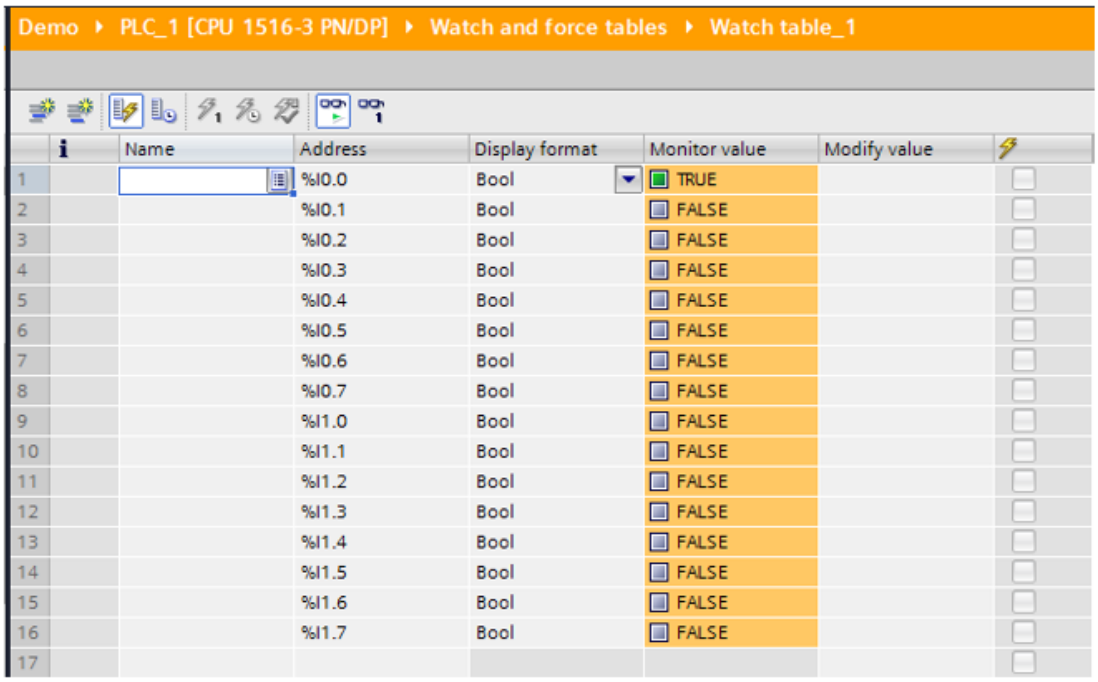


Figure 3.15 Monitoring



	Name	Address	Display format	Monitor value	Modify value
1		%I0.0	Bool	TRUE	
2		%I0.1	Bool	FALSE	
3		%I0.2	Bool	FALSE	
4		%I0.3	Bool	FALSE	
5		%I0.4	Bool	FALSE	
6		%I0.5	Bool	FALSE	
7		%I0.6	Bool	FALSE	
8		%I0.7	Bool	FALSE	
9		%I1.0	Bool	FALSE	
10		%I1.1	Bool	FALSE	
11		%I1.2	Bool	FALSE	
12		%I1.3	Bool	FALSE	
13		%I1.4	Bool	FALSE	
14		%I1.5	Bool	FALSE	
15		%I1.6	Bool	FALSE	
16		%I1.7	Bool	FALSE	
17					

Figure 3.16 Monitoring