BusWorks® XT Series
XT1xx3-000 I/O Models for Profinet
10/100MB Industrial Ethernet I/O Modules

Application Note – Profinet Modules

Communicating with Acromag Model XTxxx3-000 Profinet I/O Modules from a Siemens S7-1200 PLC

Table of Contents

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This document illustrates a procedure for configuring communications between Acromag BusWorks® Profinet modules and a Siemens S7-1200 Programmable Logic Controller. Acromag assumes no responsibility for any errors that may occur in this document, and makes no commitment to update, or keep this information current.   Be sure to visit Acromag on the web at **https://www.acromag.com.**

COMMUNICATING WITH S7-1200 CONTROLLERS

When setting up a Profinet network, Profinet controllers are programmed with a special Profinet Configuration tool, like the Step7 from Siemens. This document illustrates an example procedure for configuring communications between Acromag BusWorks® Series Profinet modules and a Siemens S7-1200 Programmable Controller. It is assumed that the user has a working knowledge of the Siemens TIA Portal environment, ladder logic programming, and the S7-1200 hardware. TIA Portal V11 is used for illustration purposes. At this point, it is assumed the user has already created a project and installed and configured an S7-1200.
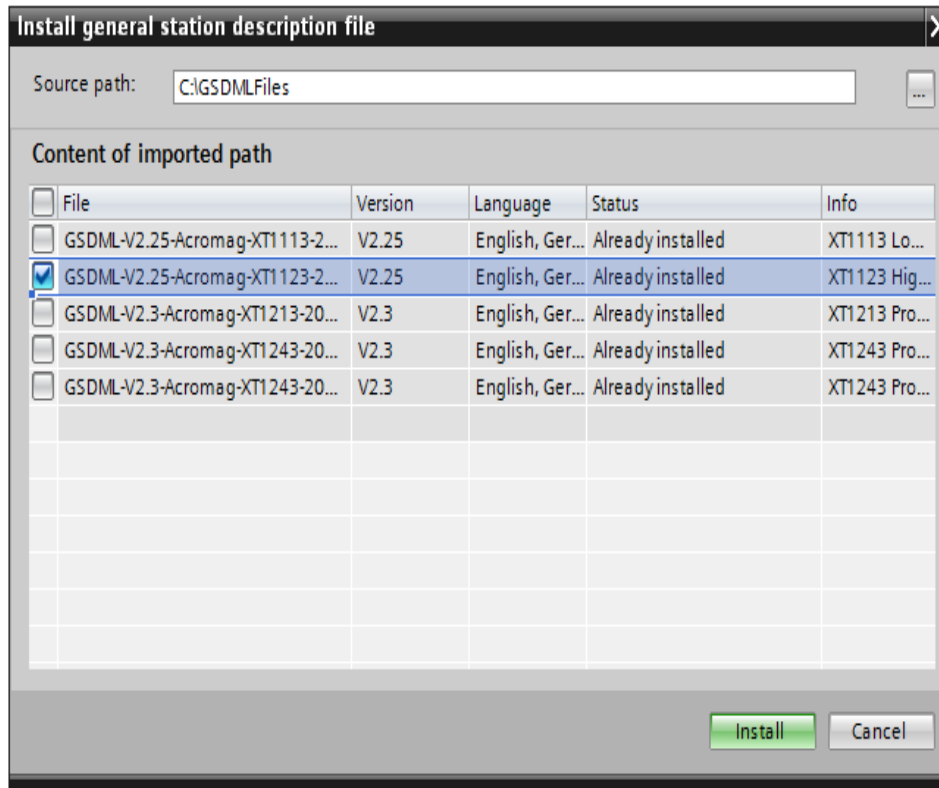
Installing the GSDML File

The process of configuration of Profinet devices is based on electronic device datasheets, or GSD files specific to the device. This file defines the electronics of the device and its relevant communication parameters to the network IO Controller or Supervisor. This file is formatted in GSDML (Generic Station Description Markup Language) and it describes the implementation of a Profinet device to another device on a Profinet network. Note that GSDML is a combinational acronym taken from its language XML (eXtensible Markup Language) and its function GSD (General Station Description).
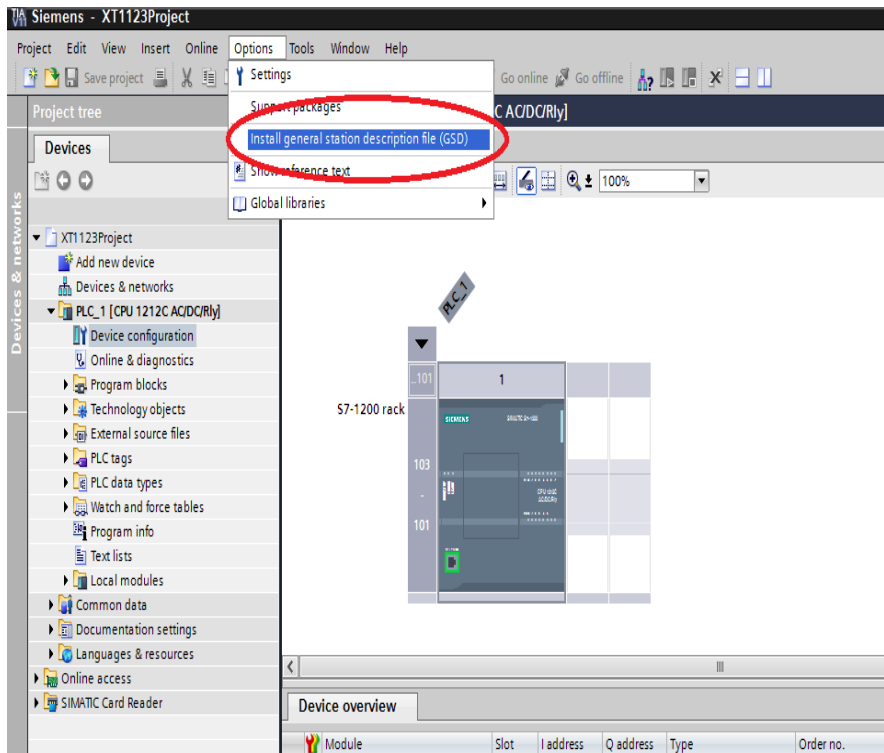
The first thing we want to do is install the GSDML file for our example device into the PLC.

1. From the Options tab, select **"Install general station description file"**.

Installing the GSDML File…

File	Version	Language	Status	Info
☐ Install general station description file				
Source path: C:\GSDMLFiles				
Content of imported path				
☐ GSDML-V2.25-Acromag-XT1113-2…	V2.25	English, Ger…	Already installed	XT1113 Lo…
☑ GSDML-V2.25-Acromag-XT1123-2…	V2.25	English, Ger…	Already installed	XT1123 Hig…
☐ GSDML-V2.3-Acromag-XT1213-20…	V2.3	English, Ger…	Already installed	XT1213 Pro…
☐ GSDML-V2.3-Acromag-XT1243-20…	V2.3	English, Ger…	Already installed	XT1243 Pro…
☐ GSDML-V2.3-Acromag-XT1243-20…	V2.3	English, Ger…	Already installed	XT1243 Pro…

Install   Cancel

2. In this window, select the GSDML file you wish to install.

    You may need to use the "Browse" button to the right of the "Source path" in order to set the path to where your GSDML files are located. Be sure that the associated image file is in the same directory as the GDSML file.
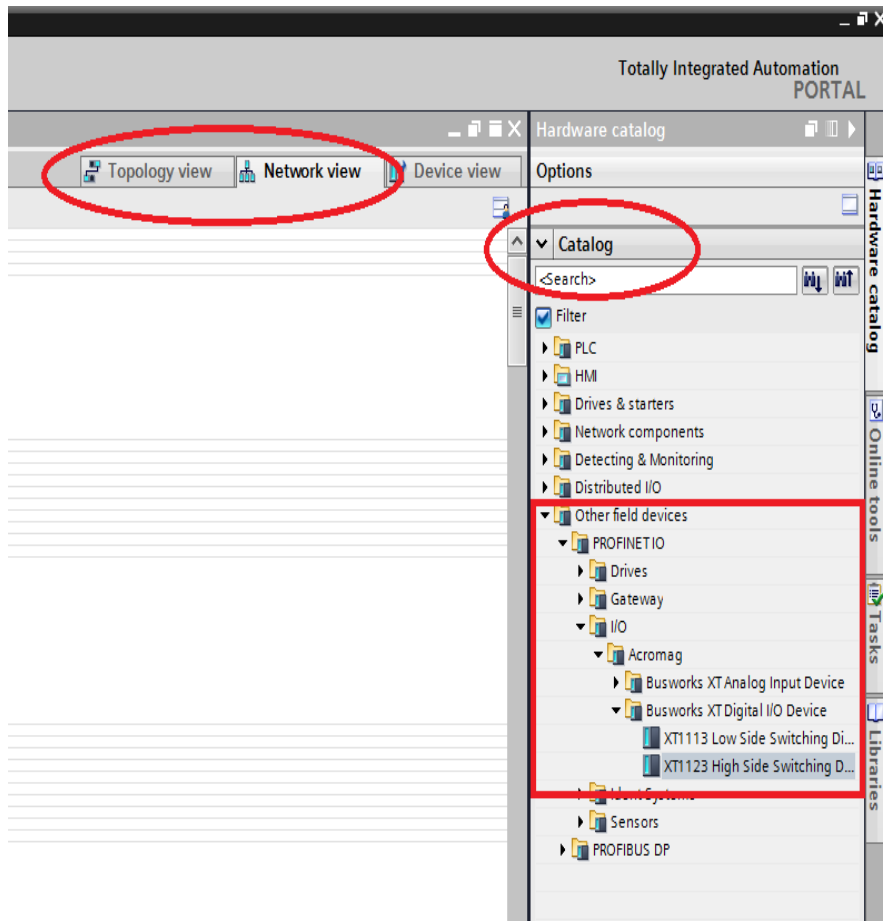
    When ready, click **"Install"**

Adding a BusWorks Module to the TIA Portal Environment
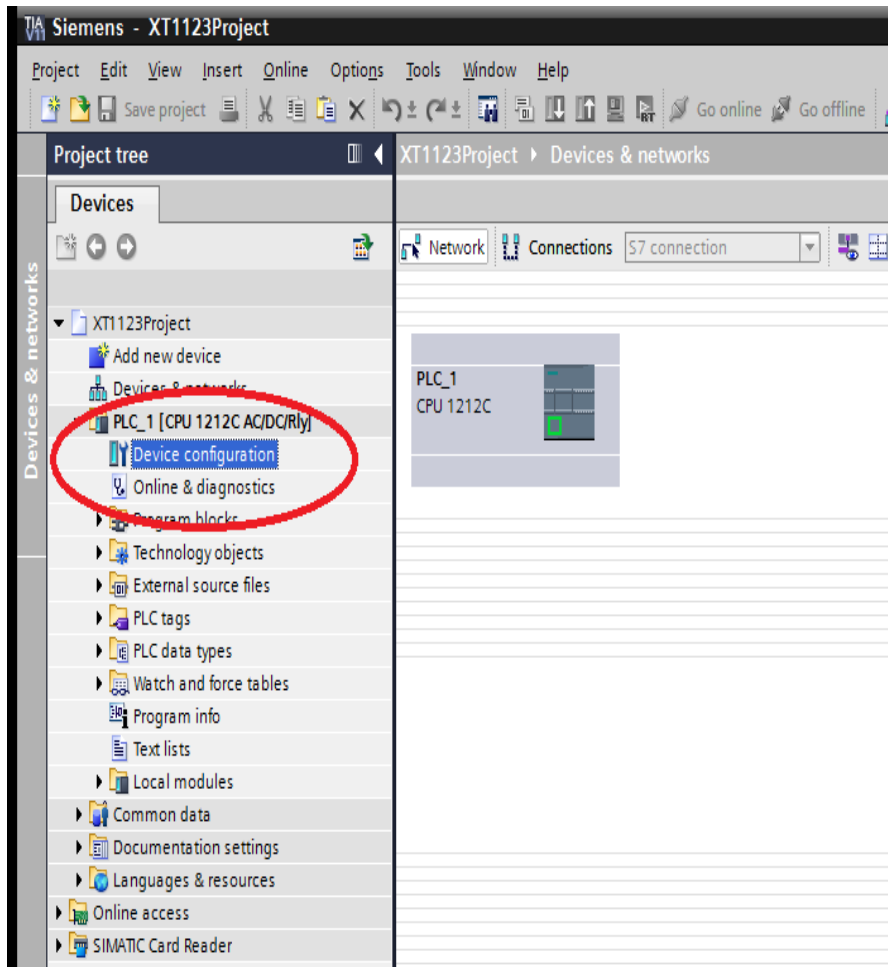
1. Double click the **"Device configuration"** entry for the S7-1200 PLC you have already installed.
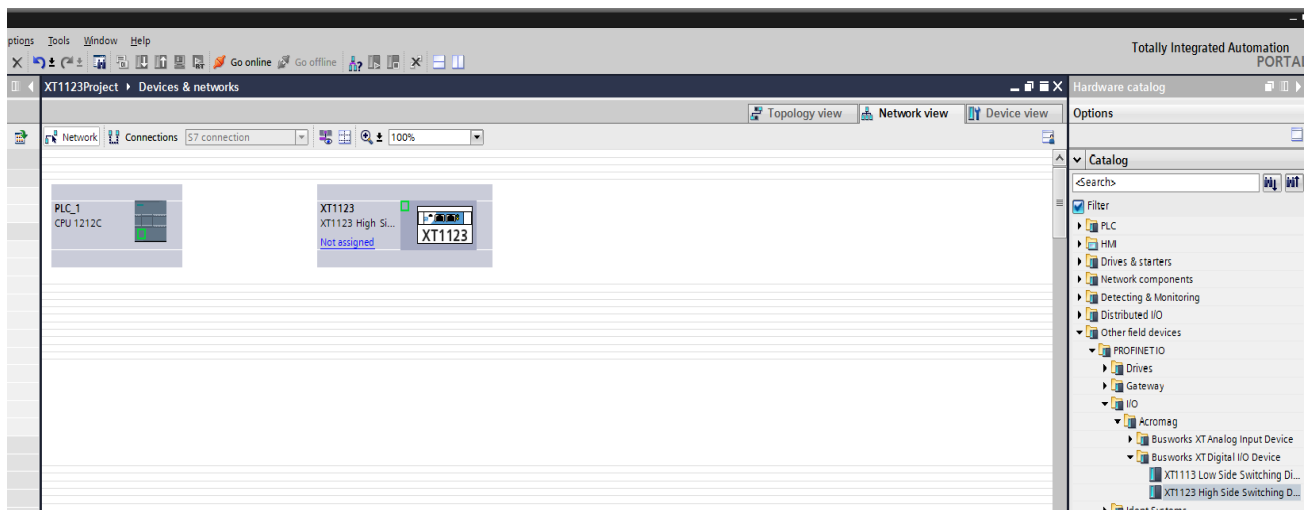
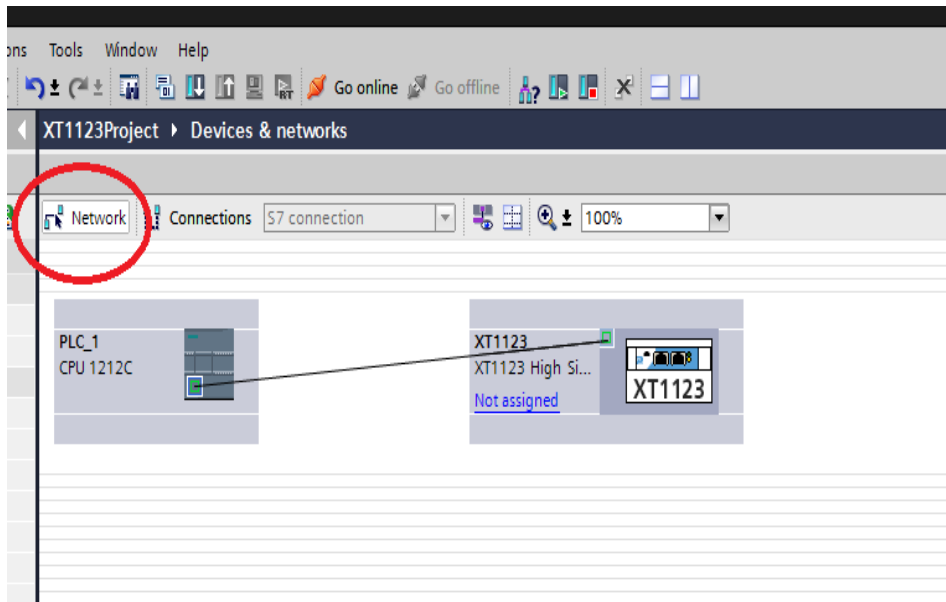## Adding a BusWorks Module to the TIA Portal Environment…

2. Click on the Network View to bring up the Catalog of devices. You can find the Acromag device selections by clicking **"Other field devices**" > **"Profinet IO"** > **"I/O"** > **"Acromag".**

   In this example, we are installing a digital I/O module, found by drilling down further to **"BusWorks XT Digital I/O Device".**

   Now you can simply click and drag the module into the **"Network View"** page as shown below.

Adding a BusWorks Module to the TIA Portal Environment…

3. With the **"Network"** icon selected, click and drag a line between the PLC and the module's pseudo Ethernet jacks as shown at left.

   If this is done correctly, the connection will look like it does below.
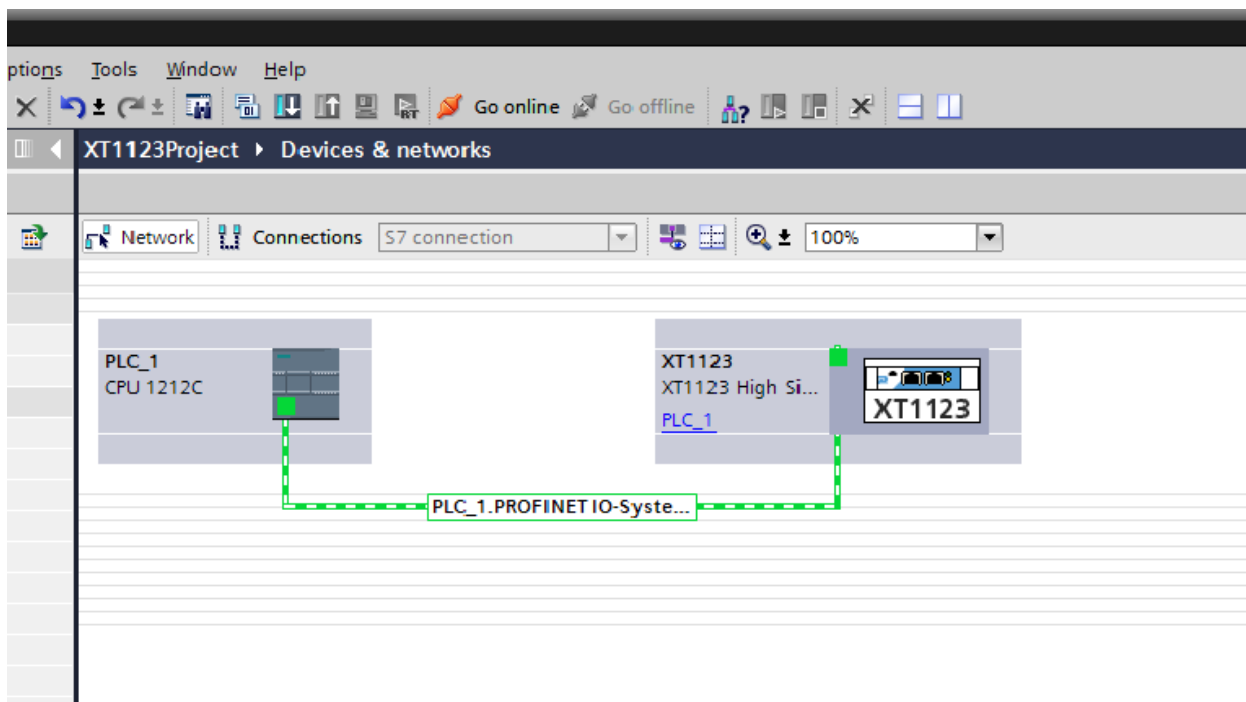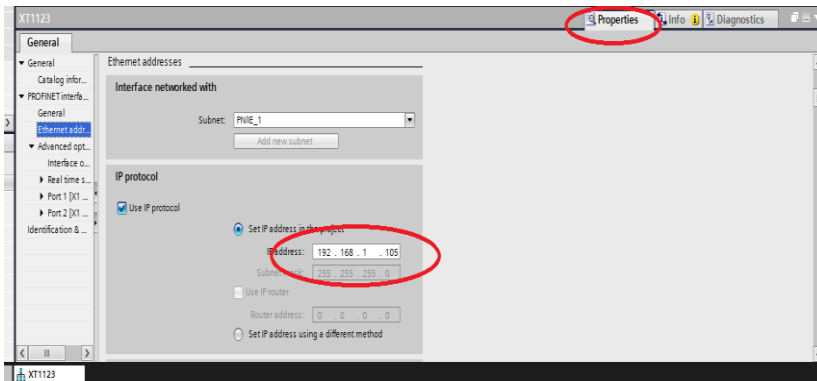
Adding a BusWorks Module to the TIA Portal Environment…
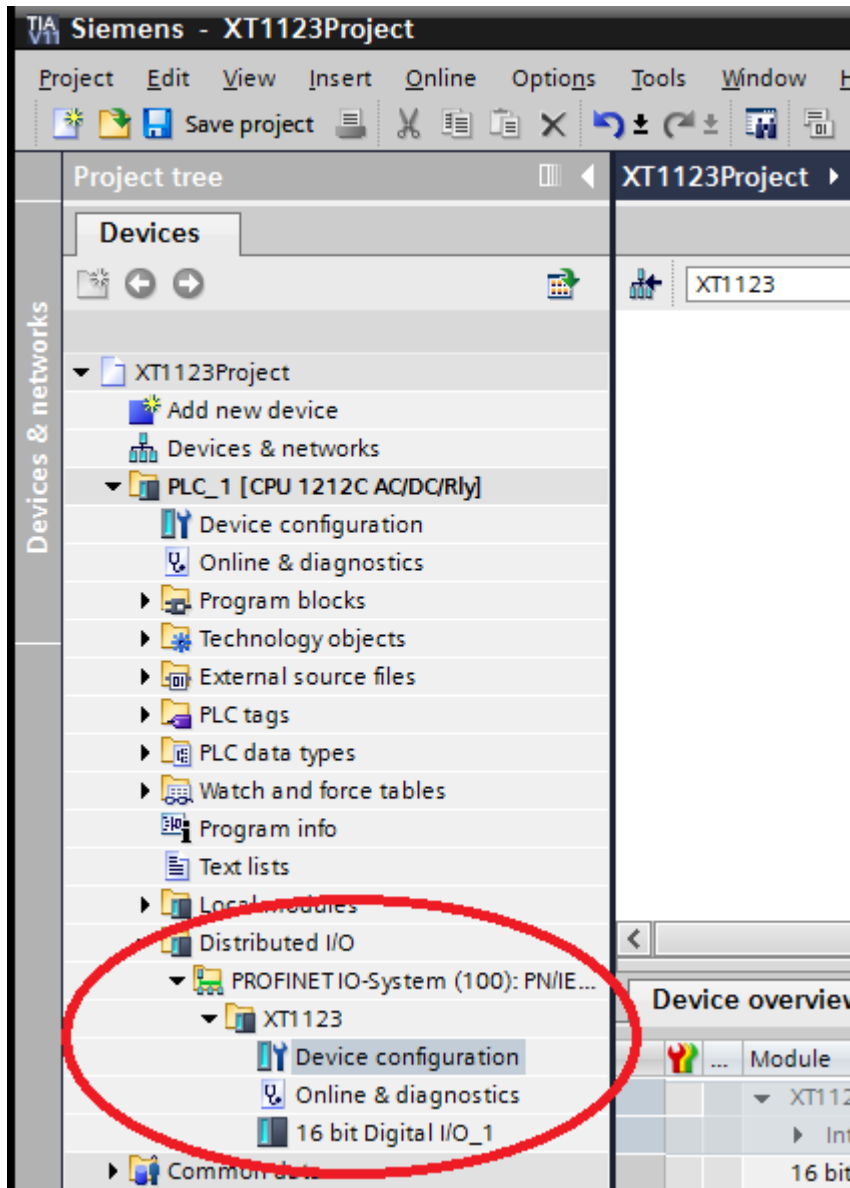
4. If in Step 3 you assigned the BusWorks module to the PLC correctly, you will find it listed under the PLC's **"Distributed I/O"** section as shown at left.

    Double-click on the module's **"Device configuration"** selection.

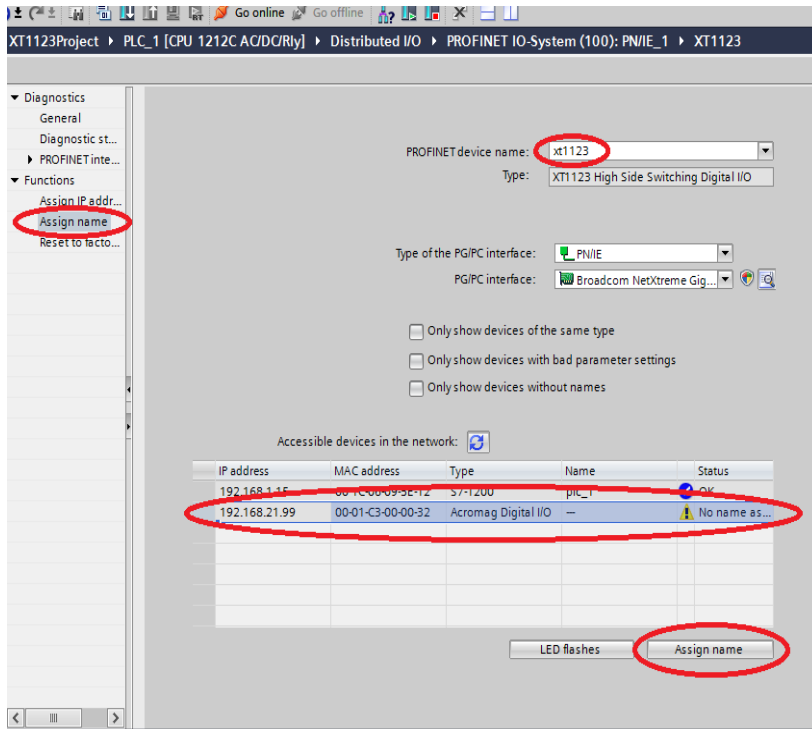## Adding a BusWorks Module to the TIA Portal Environment...

5. Select the module's **"Properties"** tab. Here you can set its *IP Address* and *Name*. Each installed module must have a unique *IP Address* and *Name* assigned.
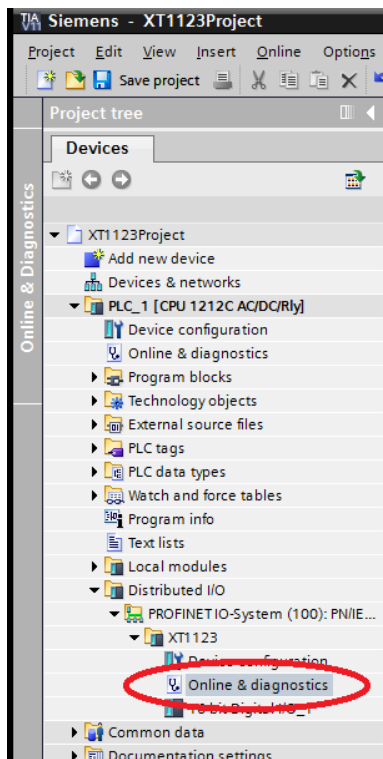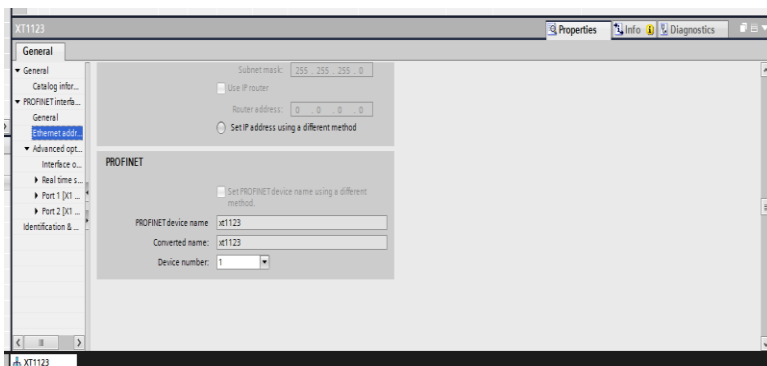
6. Double-click the module's **"Online & diagnostics"** selection.

Adding a BusWorks Module to the TIA Portal Environment…
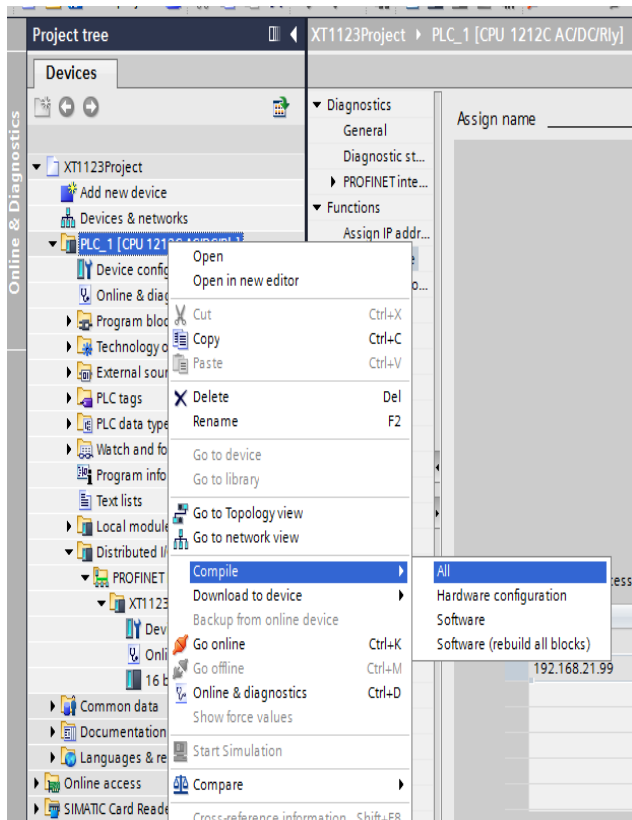

7. Under the **"Functions"** heading, click on **"Assign name".**

    The software will search for Profinet devices on the network.
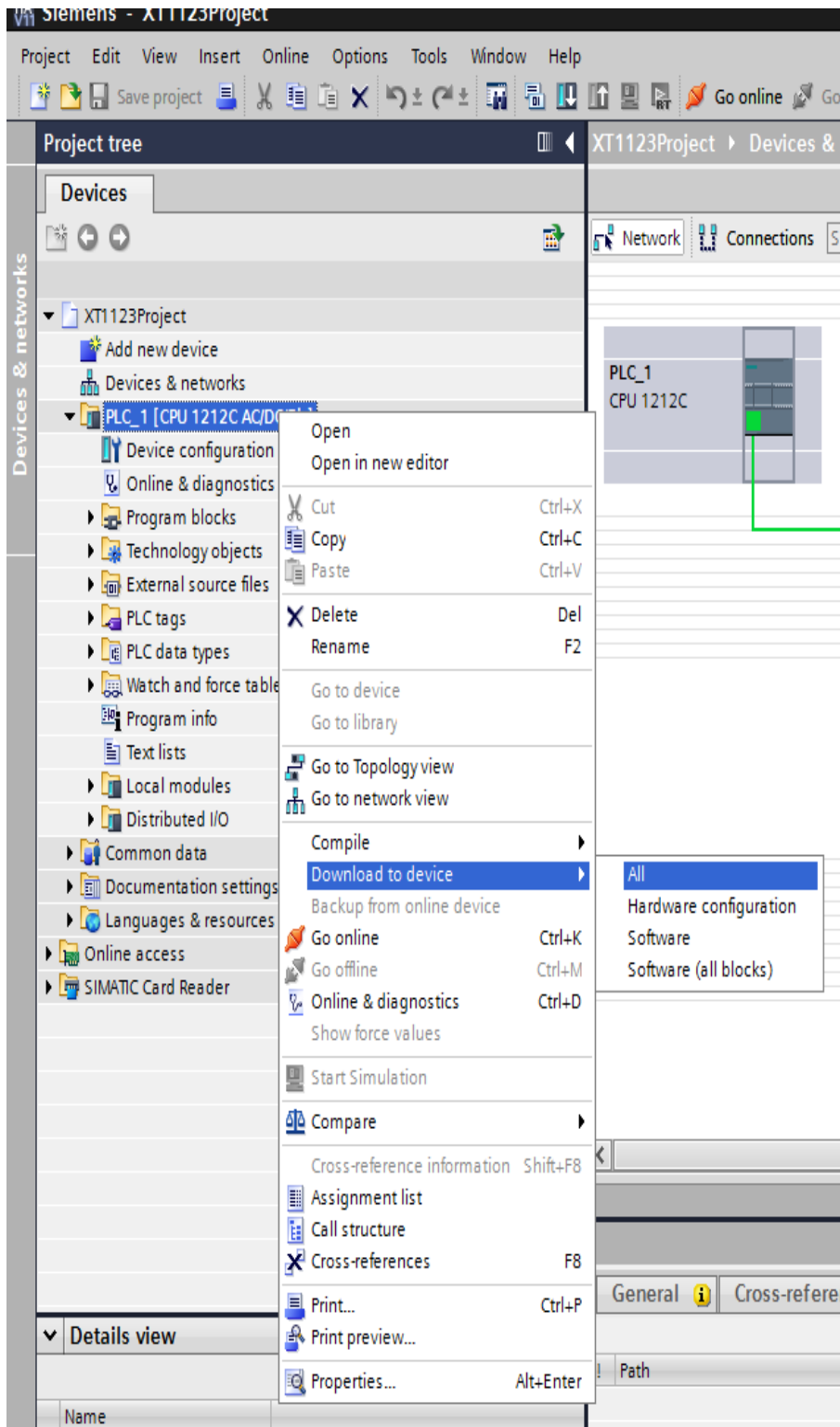
    Select the BusWorks module you are configuring, its "Profinet device name" should be the same as was set earlier.

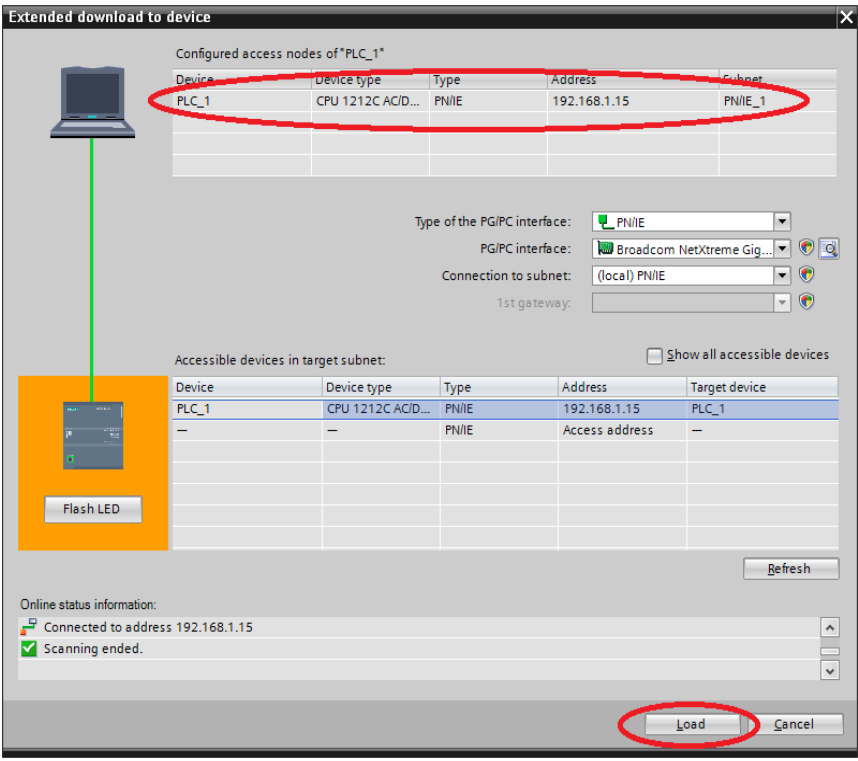   Now click on the **"Assign name"** button.

8. Right-click on the PLC name and select **"Compile"** > **"All"**.

Adding a BusWorks Module to the TIA Portal Environment…
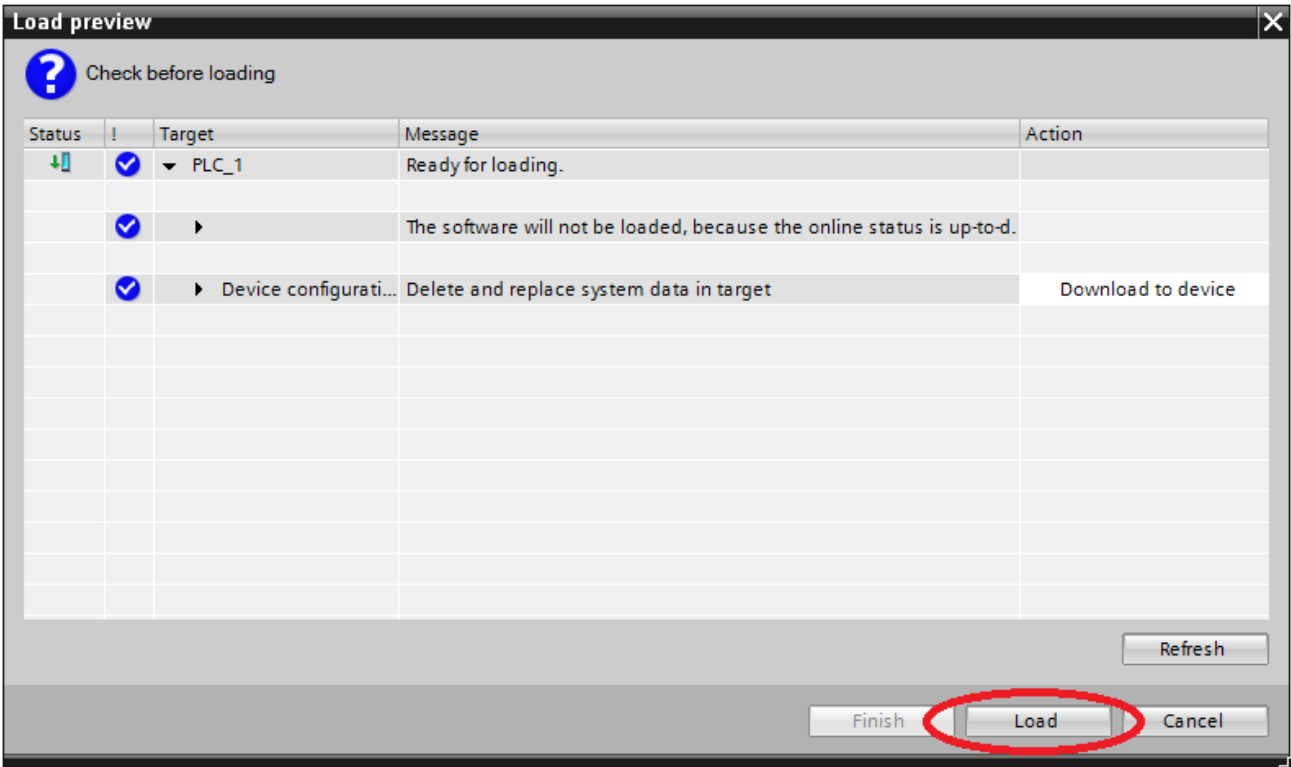

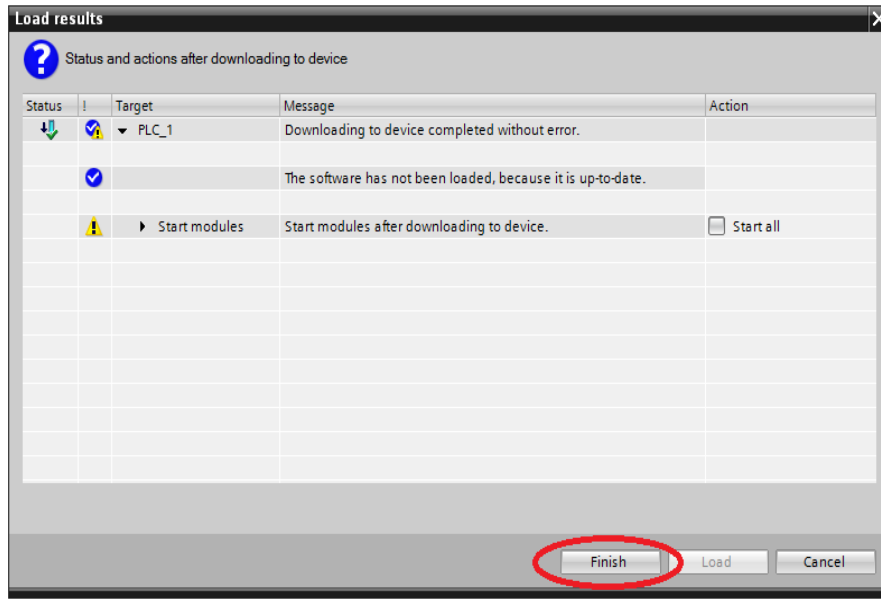9. Right-click on the PLC name and select **"Download to device"** > **"All"**.

Adding a BusWorks Module to the TIA Portal Environment…

10. Highlight the PLC and click **"Load".** Click **"Load"** a second time when the window below appears.
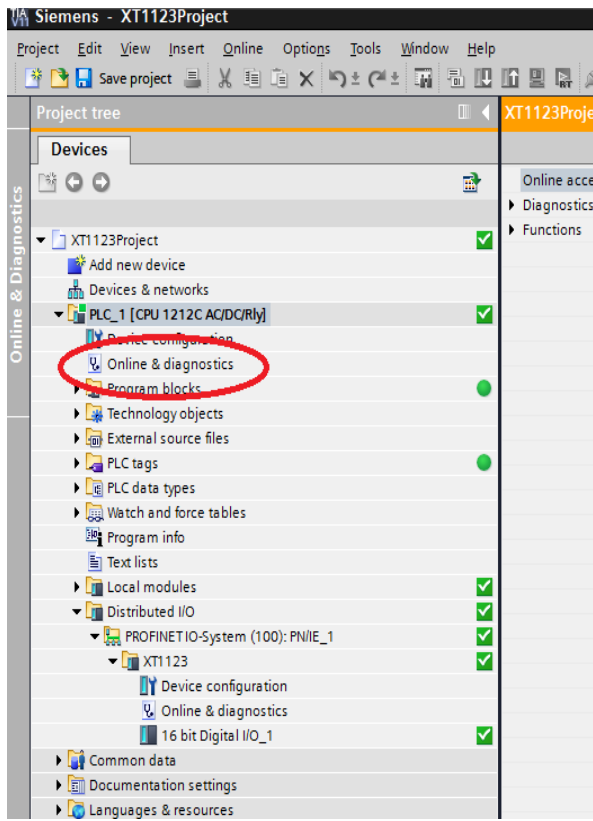
Adding a BusWorks Module to the TIA Portal Environment…
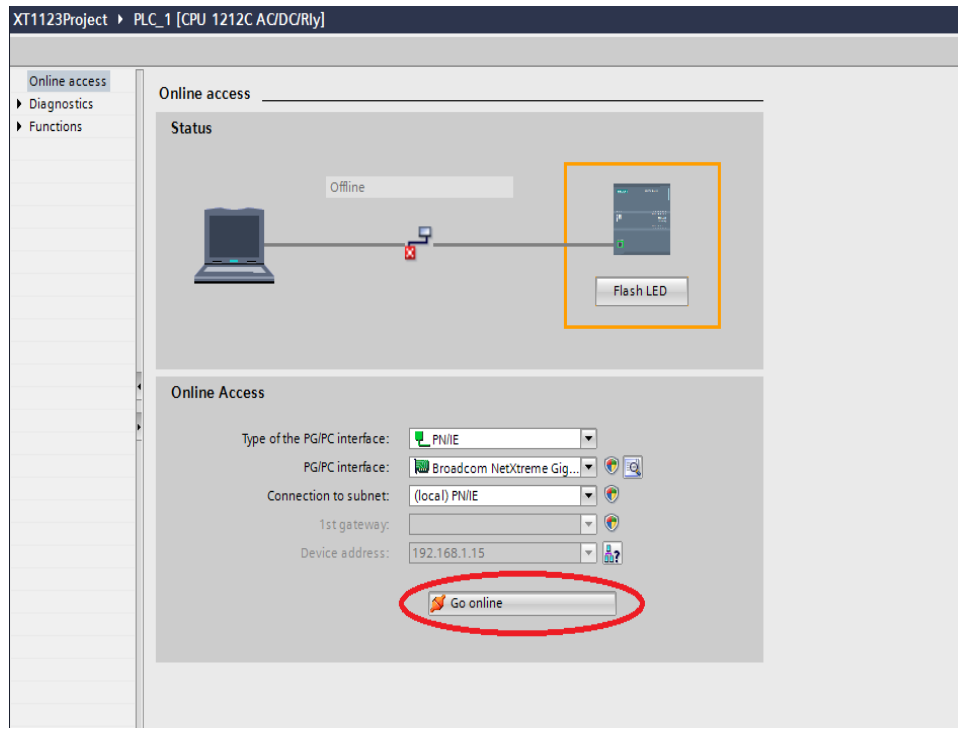

11. Click the **"Finish"** button.

Testing the Connection

1. Double click the **"Online & diagnostics"** selection under the PLC as shown at left.
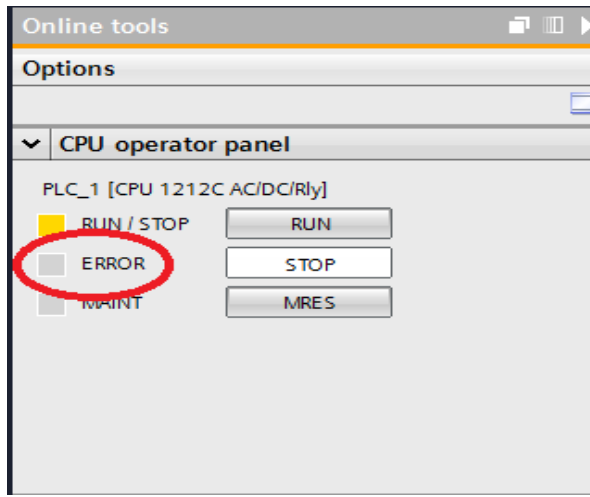
Testing the Connection…

2. Now click the **"Go online"** button, the window should change and be similar to that shown below (note the connection changes color and the filed above it says Online).

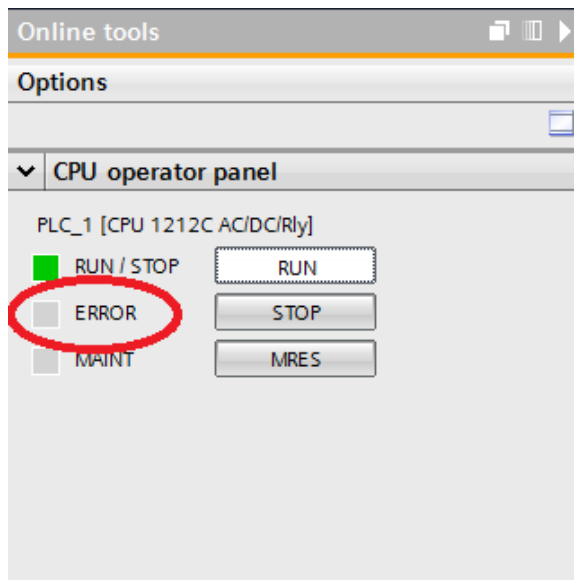   *If you wish to go offline, simply click the* **"Go offline"** *button.*
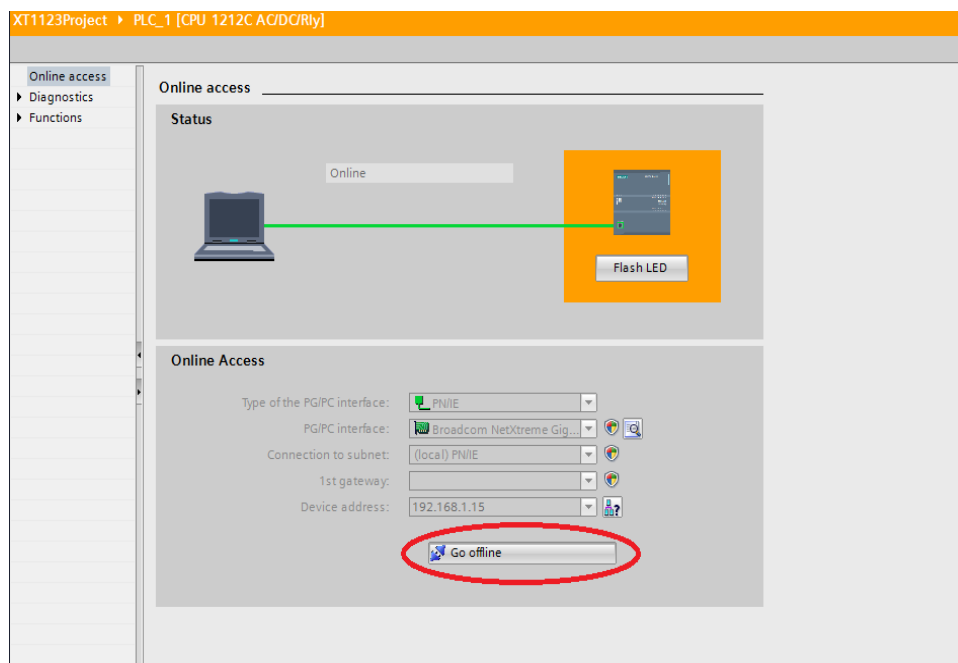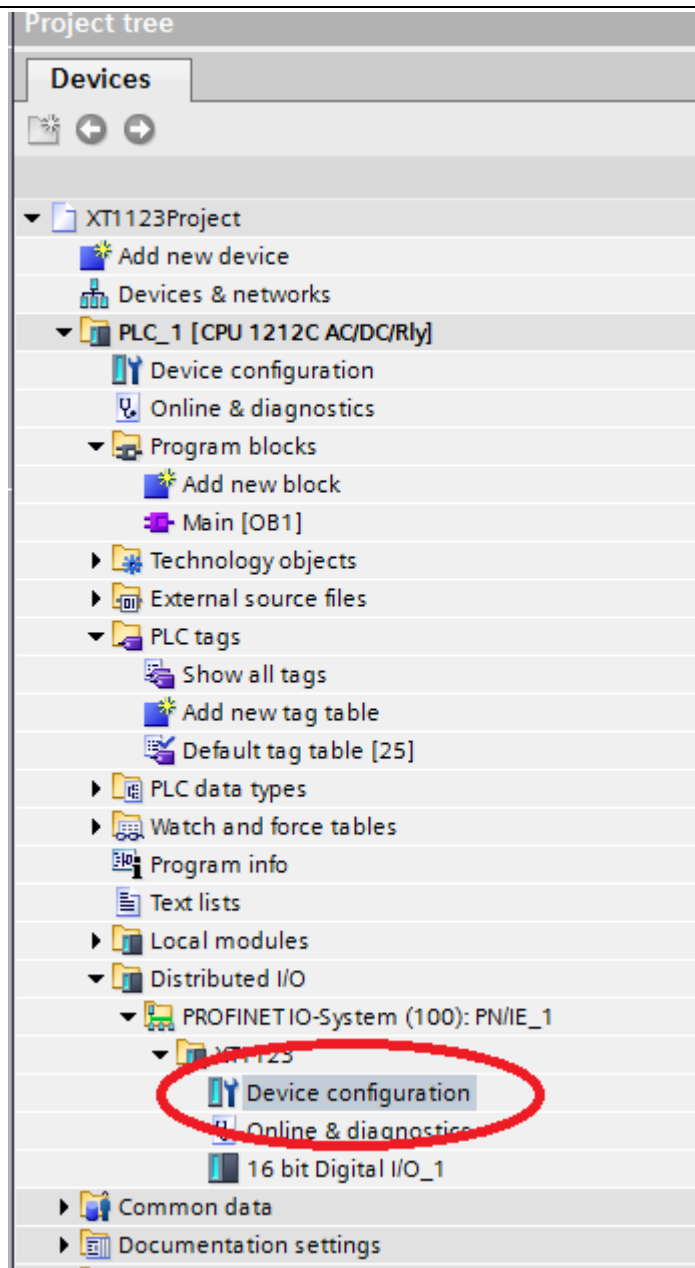
Testing the Connection…

3. The PLC can be in either Run or Stop mode, the important thing to look for is that the simulated error LED is not on or blinking.

   If there is an error indication, you can view the PLC diagnostics page to help determine what is wrong.
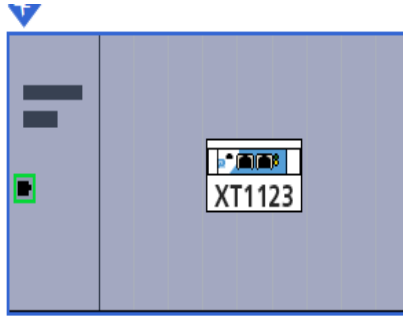
Example to Monitor the Module's Heartbeat

1. Double click the **"Device configuration"** for the module.

## Example to Monitor the Module's Heartbeat…

2. In the module's **"Device Overview",** you can view what address its I/O will appear at in the PLC memory.

   In this case, the Input addresses (I address) are denoted 1 to 10. The outputs addresses (Q address) are denoted 1 to 8.

   From the User Manual, we determine that the heartbeat data is located in the last bytes, I9 and I10.

...	Module	Rack	Slot	I address	Q address	Type	Order no.
	▼ XT1123	0	0			XT1123 High Side S…	XT1123-xxx
	▶ Internal	0	0 X1			XT1123…	
	16 bit Digital I/O_1	0	1	1…10	1…8	16 bit Digital I/O	
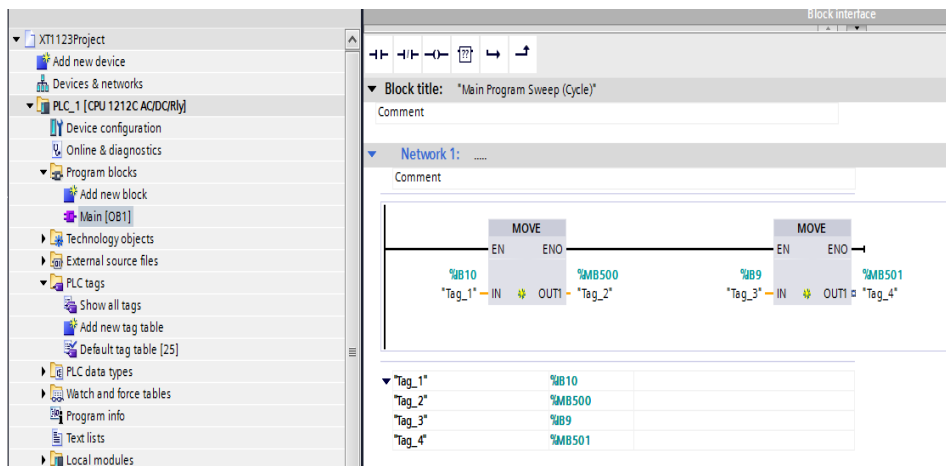
3. Here is some simple ladder logic that retrieves heartbeat data stored at I9 and I10, swaps the bytes, and copies them over to scratchpad addresses 500 and 501. Please note the byte swap as I9 is written to 501 and I10 is written to 500.

Example to Monitor the Module's Heartbeat…
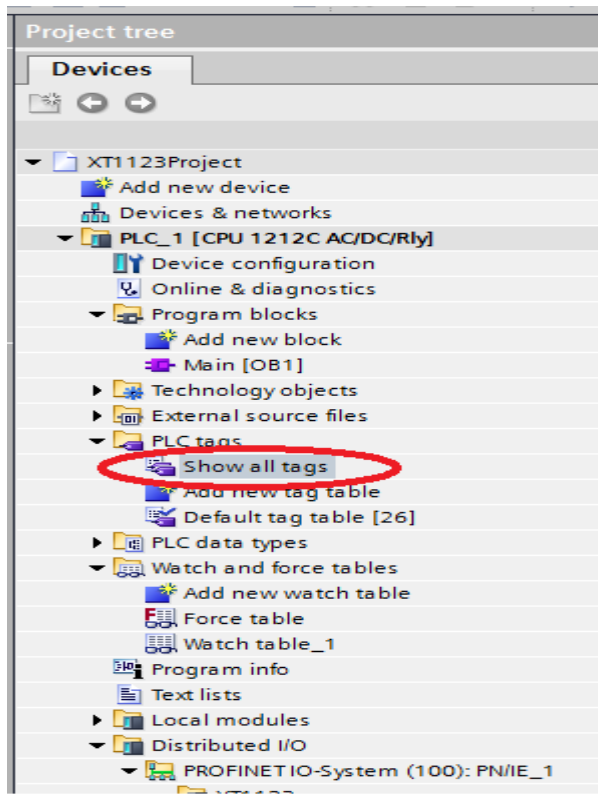


4. Create a new tag by double clicking **"Show all tags"** and entering the information as shown below.

	Name	Tag table	Data type	Address	Retain	Visible..	Acces...	Comment
1	Tag_1	Default tag table	Byte	%IB10	☐	☑	☑	
2	Tag_2	Default tag table	Byte	%MB500	☐	☑	☑	
3	Tag_3	Default tag table	Byte	%IB9	☐	☑	☑	
4	Tag_4	Default tag table	Byte	%MB501	☐	☑	☑	
5	XT1123HeartbeatWord	Default tag table	UInt	%MW500	☐	☑	☑	
6	<Add new>				☐	☑	☑	

Example to Monitor the Module's Heartbeat…
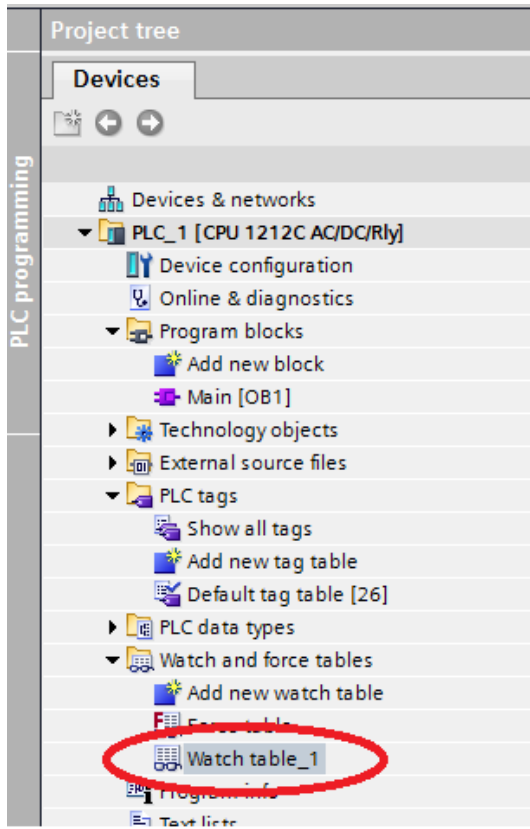
5. Now create an entry in the watch table. Double-click on the watch table to add your entry to, or if you haven't created a watch table, double-click on **"Add new watch table"**.
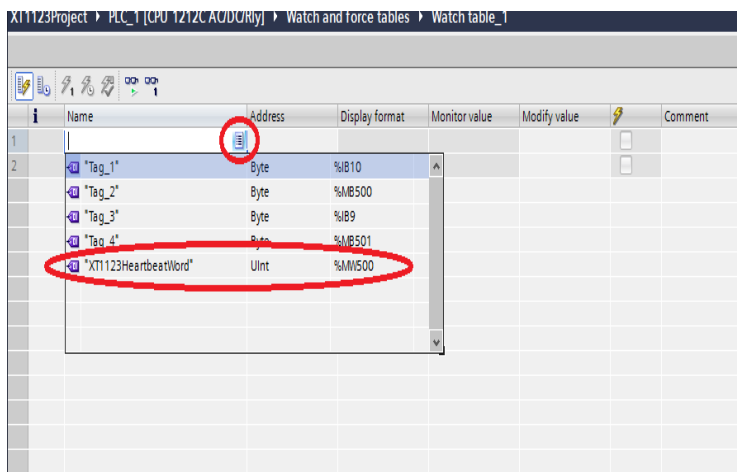
6. Click the small icon to the right of the name field to bring up a list of tag names.

   Select the tag that you would like to watch. You could simply start typing the name of the tag if you already know it.
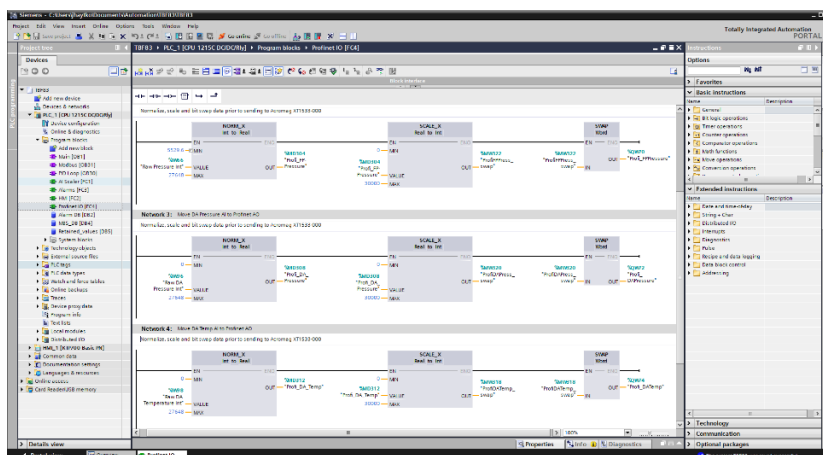
   Compile and download the project as above.

   Bring the PLC online and place it in "Run" mode as described earlier.

   Click on the icon circled in the window on the next page and you should now see the heartbeat value constantly changing.

Example to Monitor the Module's Heartbeat…

Analog Remote I/O Units

When reading or writing to analog Acromag units with the S7-1200 you will need to also swap the byte order.

Depending on your data structure you may need to normalize your data and scale it to the count range. In the example to the left the XT1533-000 is set to 0 to 30000 counts. If legacy mode is selected in the XT15xx software the count range is 0 to 20000.

Notes:

REVISION HISTORY

The following table shows the revision history for this document:

Release Date	Version	EGR/DOC	Description of Revision
07-NOV-2013	A	RH/KLK	Initial Acromag release
11-NOV-2020	B	JEB/ARP	Added additional information on byte swapping data.