

TECH NOTE :: PMX with Siemens PLC and ProfiNet

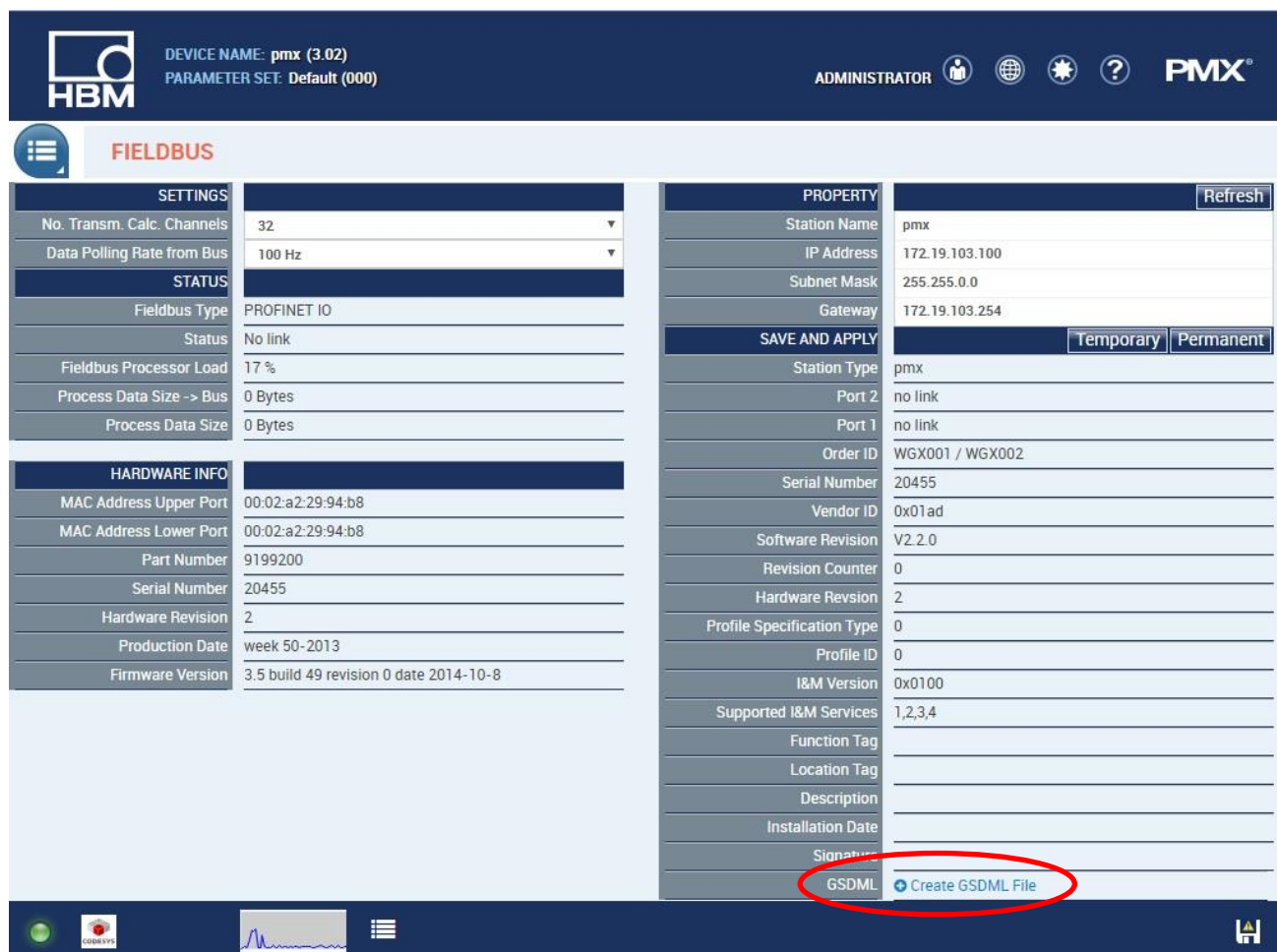
Version: 2018-04-13
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 Status: HBM: Public

Brief description

This is an instruction for creating a project with Siemens Tia Portal that connects the PMX to a Siemens PLC. Furthermore, there is a short explanation about how to monitor measurements from the PMX in TiA Portal. Basic knowledge about ProfiNet connections and the PMX is recommended.

Generate GSE File

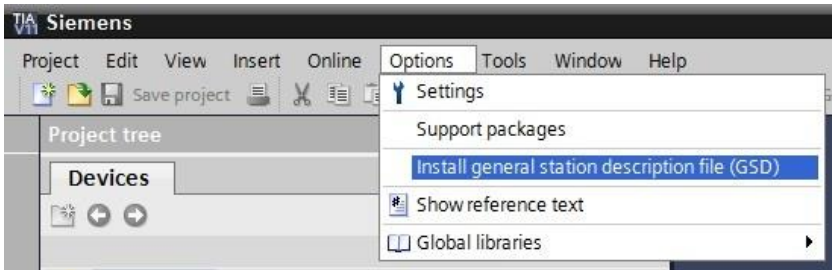
Since firmware version 2.00 it is possible to automatically generate an individual GSE file from each PMX. It includes the device configuration and names of all channels. Therefor go to settings -> fieldbus. Now click “Create GSDML File” on the bottom. This approach saves time and is more resistant to mistakes compared to a manual configuration in the TiA-Portal.



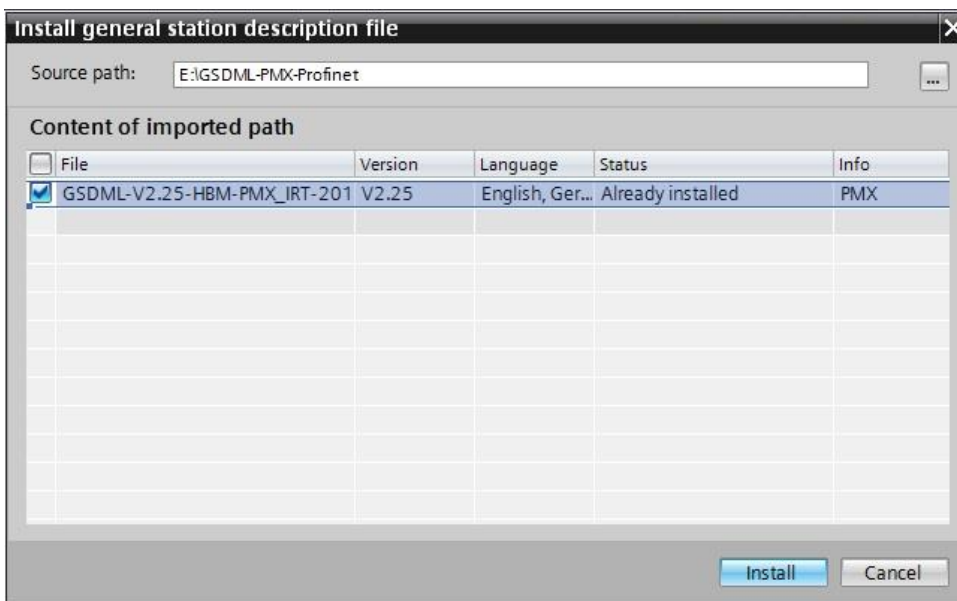
Important: It is essential to not change the file name. It is normed and includes important information for the software. Also define the number of transmitted calculated channels before generating the file. In the device there has to be mounted at least one measurement card (PX878 is not a measurement card).

Create a Project

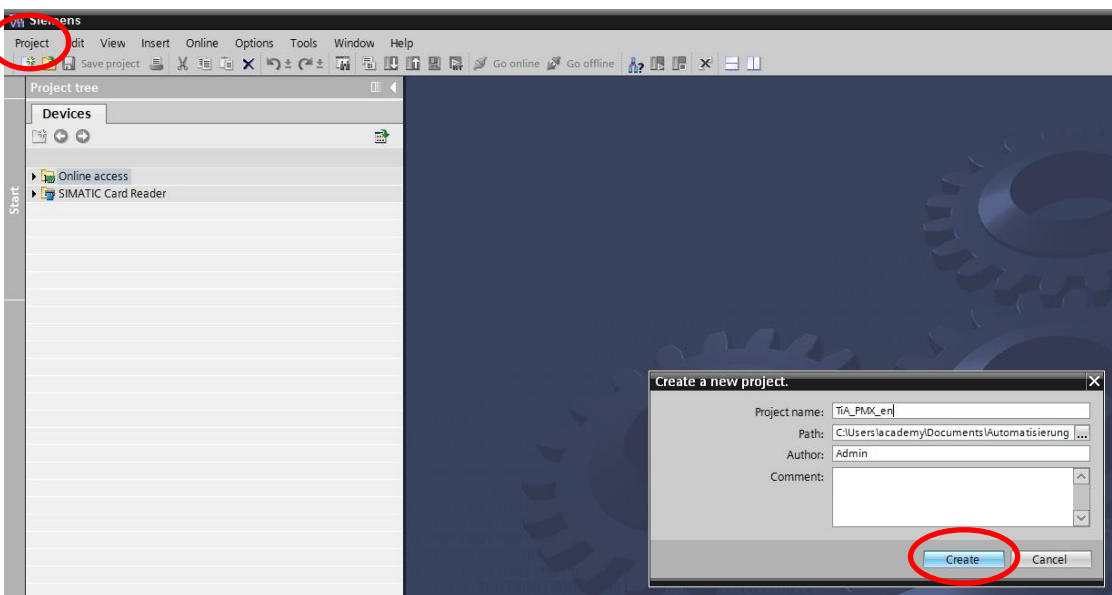
Go to “Options” and click “Install general station description file (GSD)”.



Define the location of the GSD and press “Install”.

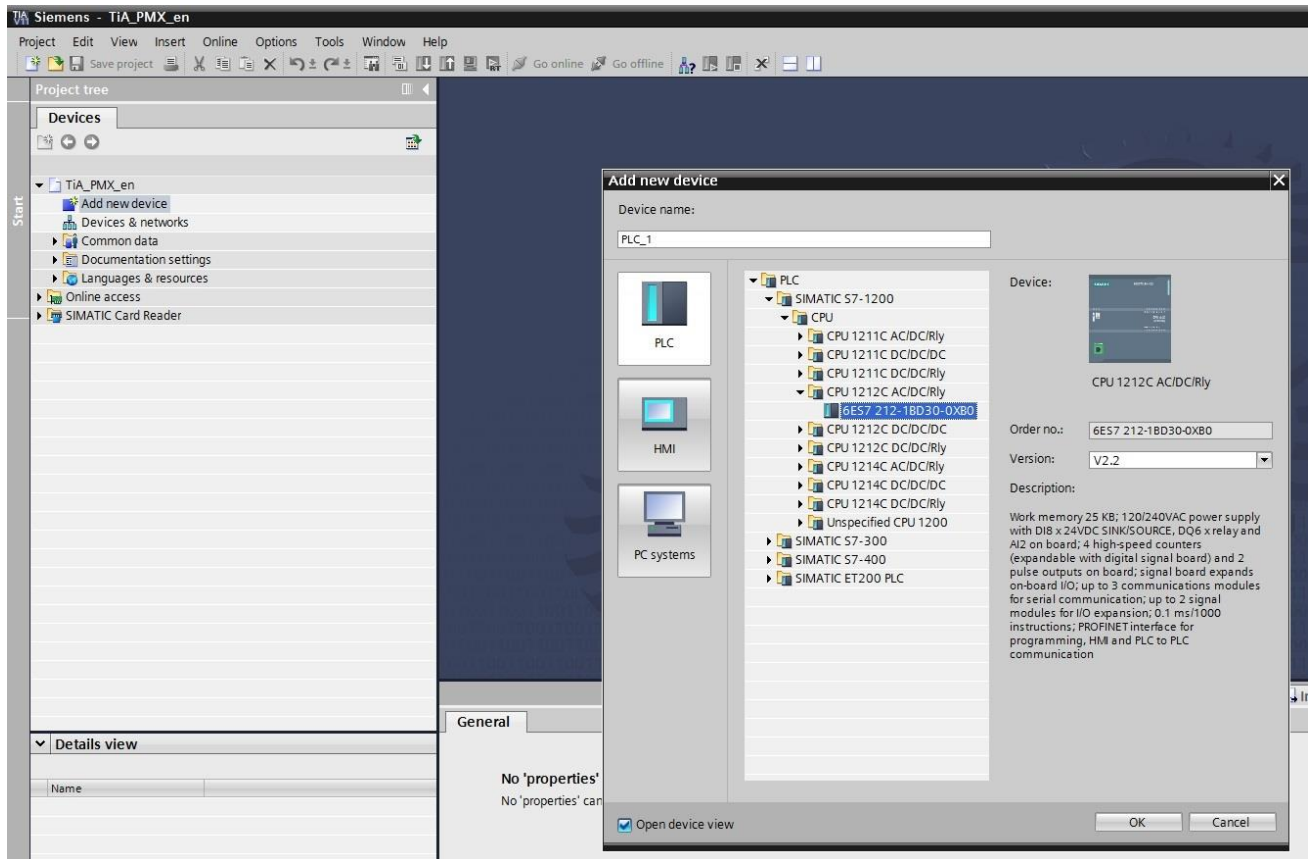


To create a new project go to “Project”, then “New...”. Define a name and path and confirm by pressing “Create”.

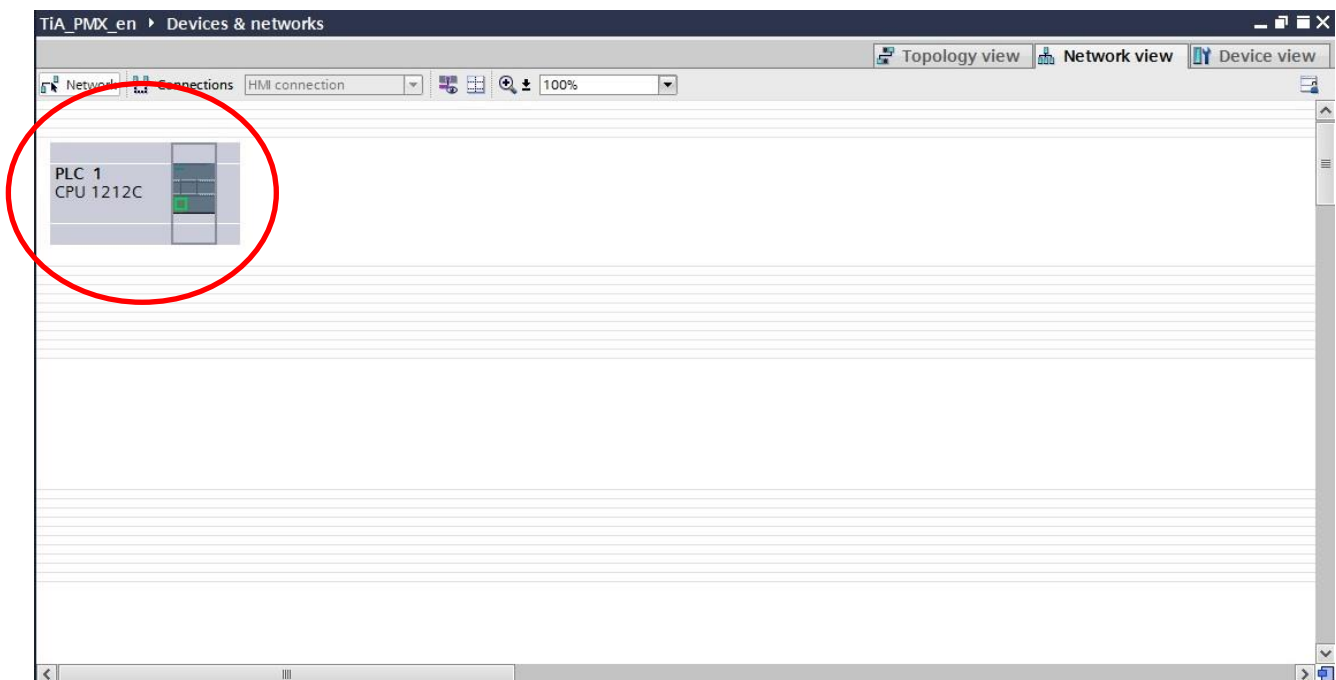


Install devices

First the Siemens PLC is integrated. Double-click “Add new device” in the project tree on the left side. Now choose exactly the type of device that should be integrated (here: CPU1212C AC/DC/Rly).

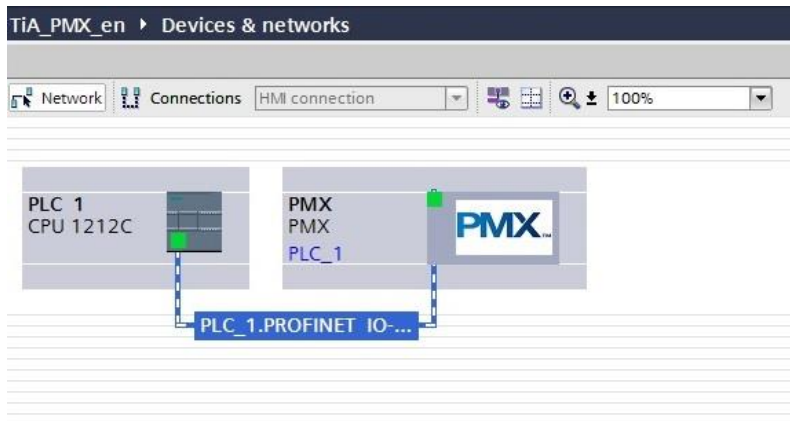


The PLC appears in the Network view.

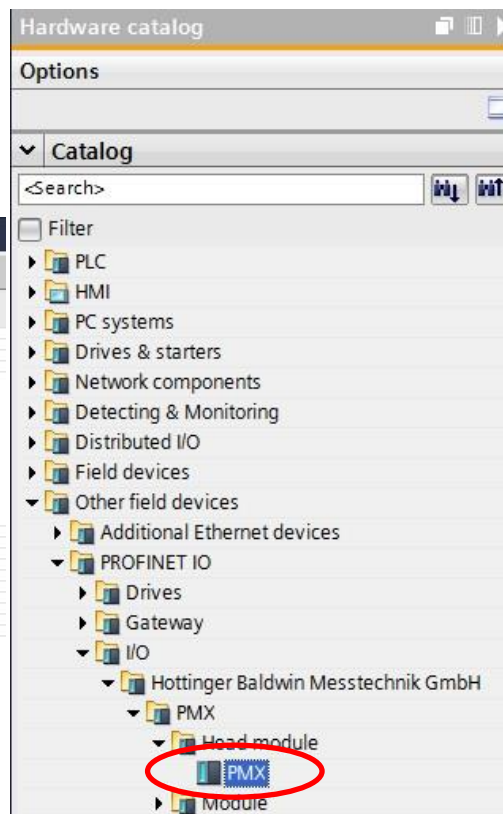


You can find the PMX in the hardware catalog as follows:

Add the device by double-clicking it. Both devices are now visible in the network view. Connect them physically by linking the green dots.



If you have not integrated the individual GSE file of your device, you have to configure your PMX in the software now. By double-clicking the PMX symbol you access the “Device overview”. Equip the PMX accordant to the configuration of the measurement cards. A double-click on the appropriate modules assigns them automatically to the right position.



The screenshot shows the 'Device overview' table for the 'test-pmx' device. The table lists various modules and their configurations.

Module	Rack	Slot	I address	Q address	Type	Order no.	Firmware	Comment
test-pmx	0	0			PMX	WG001 / WG002		
PMX	0	0 1			PMX			
system data	0	0 2	256...285	256...343	system data			
Flags	0	0 3	290...295	344	Flags			
Digital inputs	0	0 4	296...301	345	Digital inputs			
PN-IO	0	0 PN-IO			PMX			
PX878_1	0	1			PX878			
PX401_1	0	2			PX401			
Measuring channel	0	2 1	68...73	64	Measuring channel			
Measuring channel_1	0	2 2	74...79	65	Measuring channel			
Measuring channel_2	0	2 3	80...85	66	Measuring channel			
Measuring channel_3	0	2 4	86...91	67	Measuring channel			
PX455_1	0	3			PX455			
Measuring channel	0	3 1	92...97	68	Measuring channel			
Measuring channel_1	0	3 2	98...103	69	Measuring channel			
Measuring channel_2	0	3 3	104...109	70	Measuring channel			
Measuring channel_3	0	3 4	110...115	71	Measuring channel			
PX460_1	0	4			PX460			
Measuring channel	0	4 1	116...121	72	Measuring channel			
Measuring channel_1	0	4 2	122...127	73	Measuring channel			
Measuring channel_2	0	4 3	128...133	74	Measuring channel			
Measuring channel_3	0	4 4	134...139	75	Measuring channel			
	0	5						
	0	6						
	0	7						
	0	8						
4 calculated channels_1	0	9			4 calculated chann...			
Calculated Channel	0	9 1	140...145	76	Calculated Channel			

Hint: The configuration of all measurement and calculated channels must be exactly the same as the device itself. Otherwise, there will be errors. This can be avoided by implementing the automatically generated GSE file from the device.

Do not forget to assign the number of calculated channels in the PMX identically to the number in the TiA Portal. Therefore, go to the setting for “Fieldbus” in the PMX WebBrowser.

The screenshot shows the PMX WebBrowser interface. At the top, it displays 'DEVICE NAME: pmx (3.02)' and 'PARAMETER SET: Default (000)'. The main content area is titled 'FIELDBUS'. On the left, there are three sections: 'SETTINGS', 'STATUS', and 'HARDWARE INFO'. The 'SETTINGS' section has two rows: 'No. Transm. Calc. Channels' with a value of 32 (circled in red) and 'Data Polling Rate from Bus' with a value of 100 Hz. The 'STATUS' section shows 'Fieldbus Type' as PROFINET IO and 'Status' as 'No link'. The 'HARDWARE INFO' section lists various identifiers like MAC addresses, part numbers, and serial numbers. On the right, the 'PROPERTY' section shows network configuration: Station Name 'pmx', IP Address '172.19.103.100', Subnet Mask '255.255.0.0', and Gateway '172.19.103.254'. Below this are buttons for 'SAVE AND APPLY' (Temporary, Permanent) and a 'Refresh' button.

Configure network

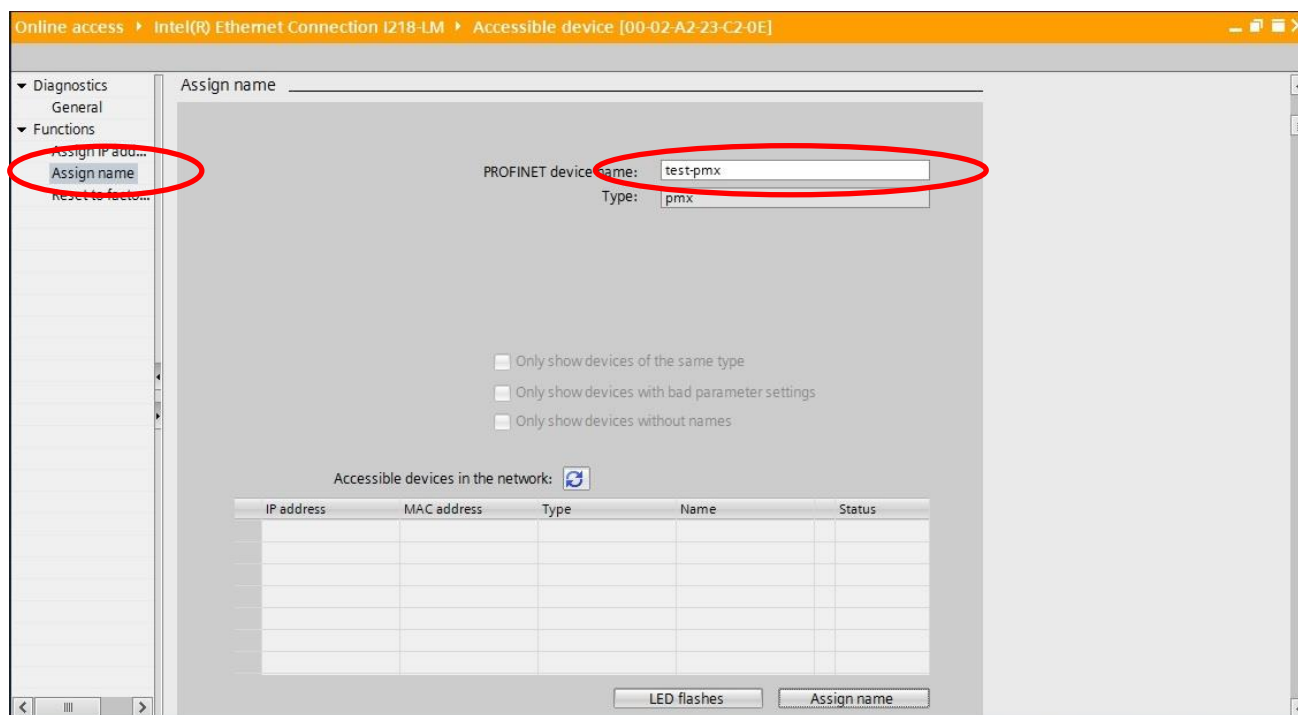
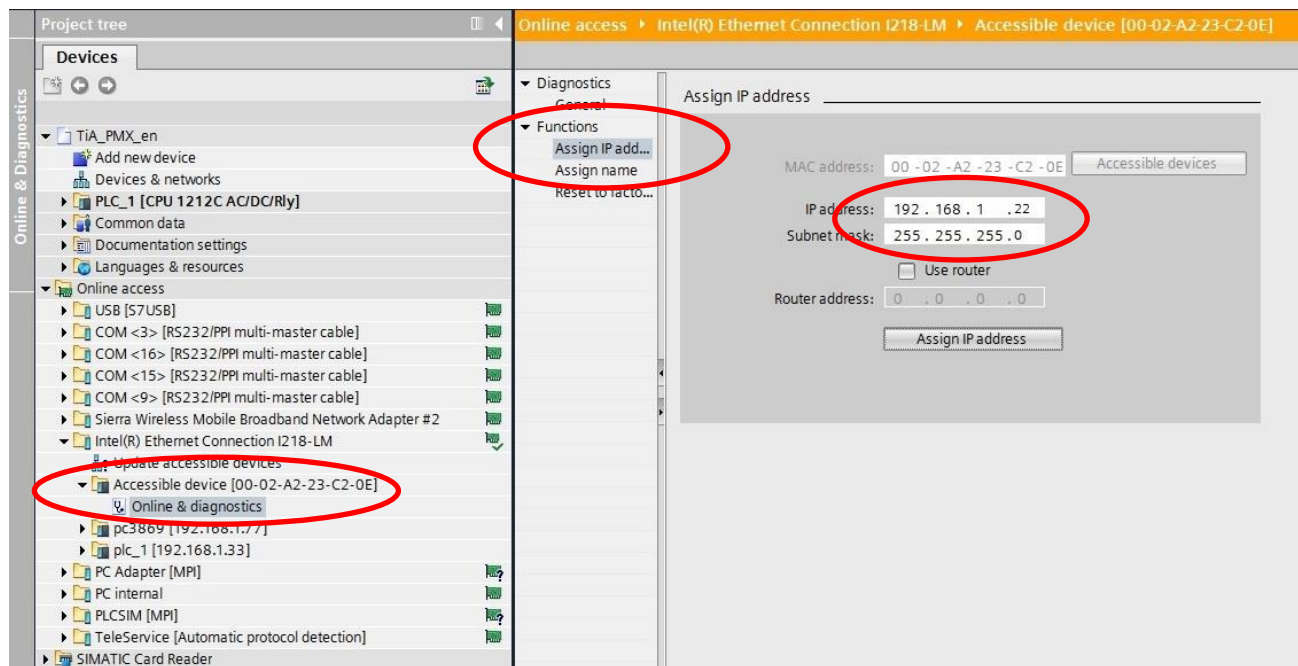
Scan network

Select your network interface card and apply “Update accessible devices”.

Note: If there are any problems concerning the network scan, assign a static IP-address to your computer. DHCP may potentially cause errors.

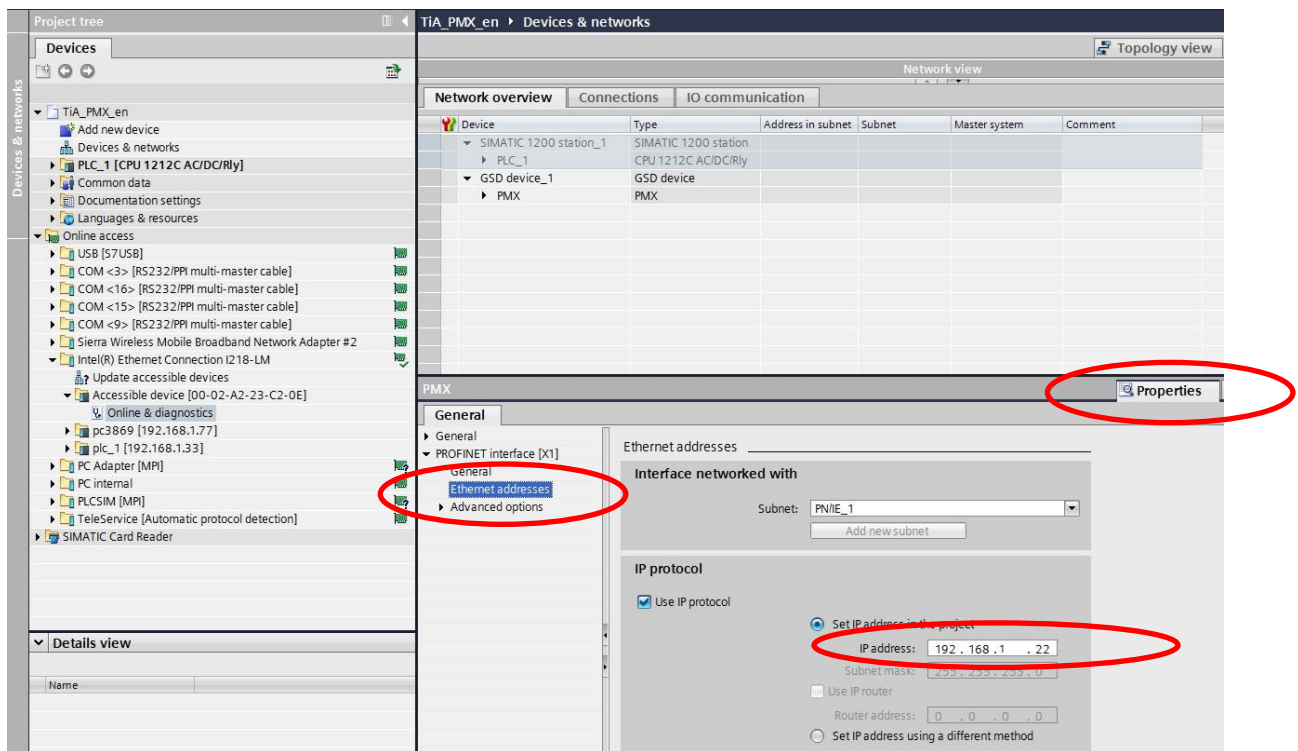
The screenshot shows a 'Project tree' window. Under the 'Devices & networks' section, there is a tree view of network interfaces. The 'Intel(R) Ethernet Connection I218-LM' is expanded, showing a list of accessible devices. The 'Update accessible devices' button is highlighted with a red circle. Below it, several devices are listed, including 'Accessible device [00-02-A2-23-C2-0E]', 'pc3869 [192.168.1.77]', and 'plc_1 [192.168.1.33]'. Other network interfaces like USB, COM ports, and a PC Adapter are also visible in the tree.

If a device has never been integrated in a ProfiNet network so far, it is displayed as “Accessible device” with a MAC address. For this device (here: PMX) a new IP-address and a new name has to be assigned. These parameters can be adjusted manually by double-clicking “Online & diagnostics” below the “Accessible device”.

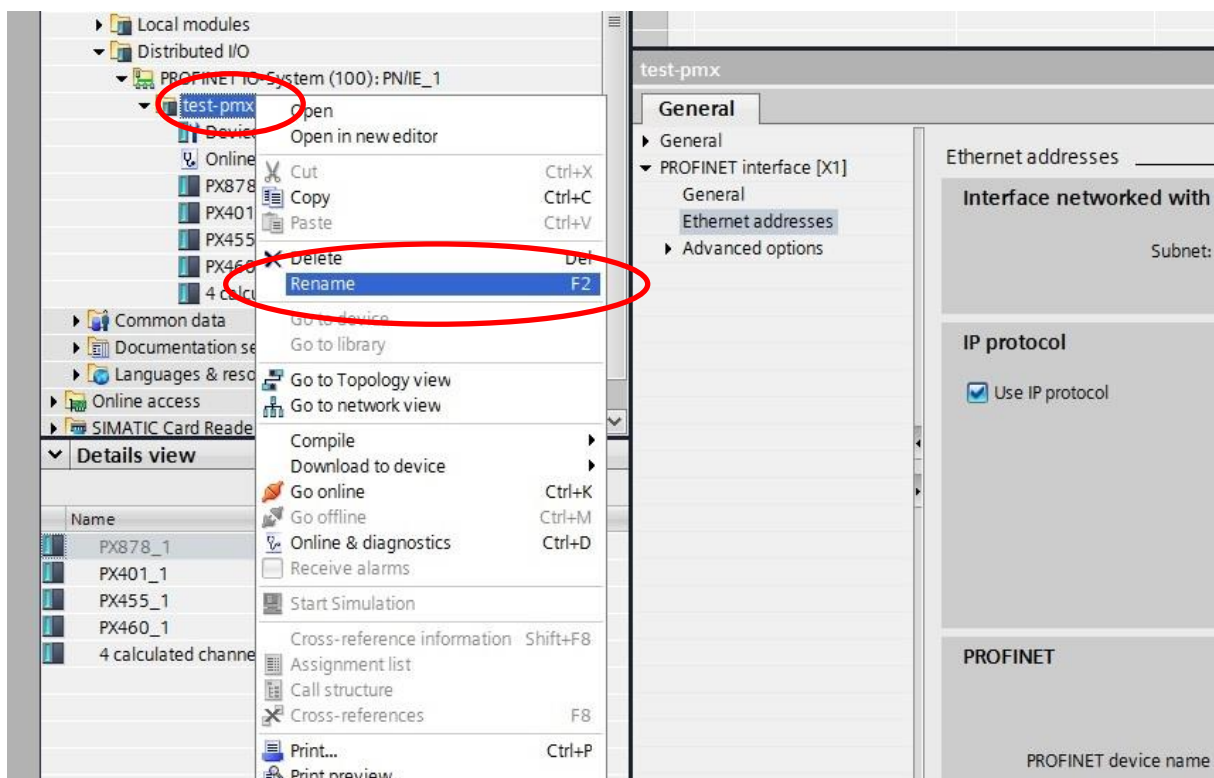


Hint: In the settings for “Fieldbus” in the PMX WebBrowser the IP-address and the name are updated automatically.

Inside the project the IP-address can be assigned in the “Properties” of the device.



The name can be changed inside the project tree. Right-click the device, then “rename”.



Important:

- The assignment of IP-addresses and names has to be unique and identical for both, online and offline
- Apply this procedure for every device integrated in the network

Run the project

When all devices in the network are configured, compile the project.



If no errors occurred during compiling, load the project into the PLC.



Extended download to device

Configured access nodes of "PLC_1"

Device	Device type	Type	Address	Subnet
PLC_1	CPU 1212C AC/D...	PN/IE	192.168.1.33	PN/IE_1

Type of the PG/PC interface: PN/IE

PG/PC interface: Intel(R) Ethernet Connecti...

Connection to subnet: (local) PN/IE

1st gateway:

Accessible devices in target subnet: Show all accessible devices

Device	Device type	Type	Address	Target device
---	---	PN/IE	192.168.1.33	---
---	---	PN/IE	Access address	---

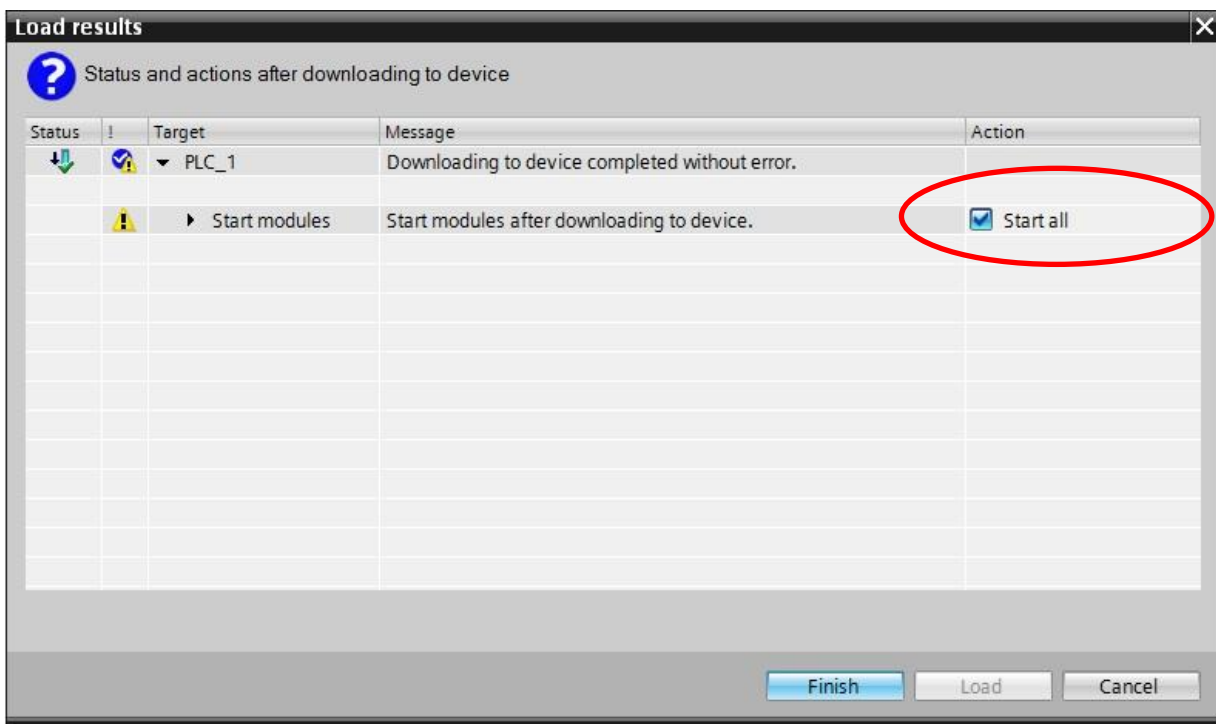
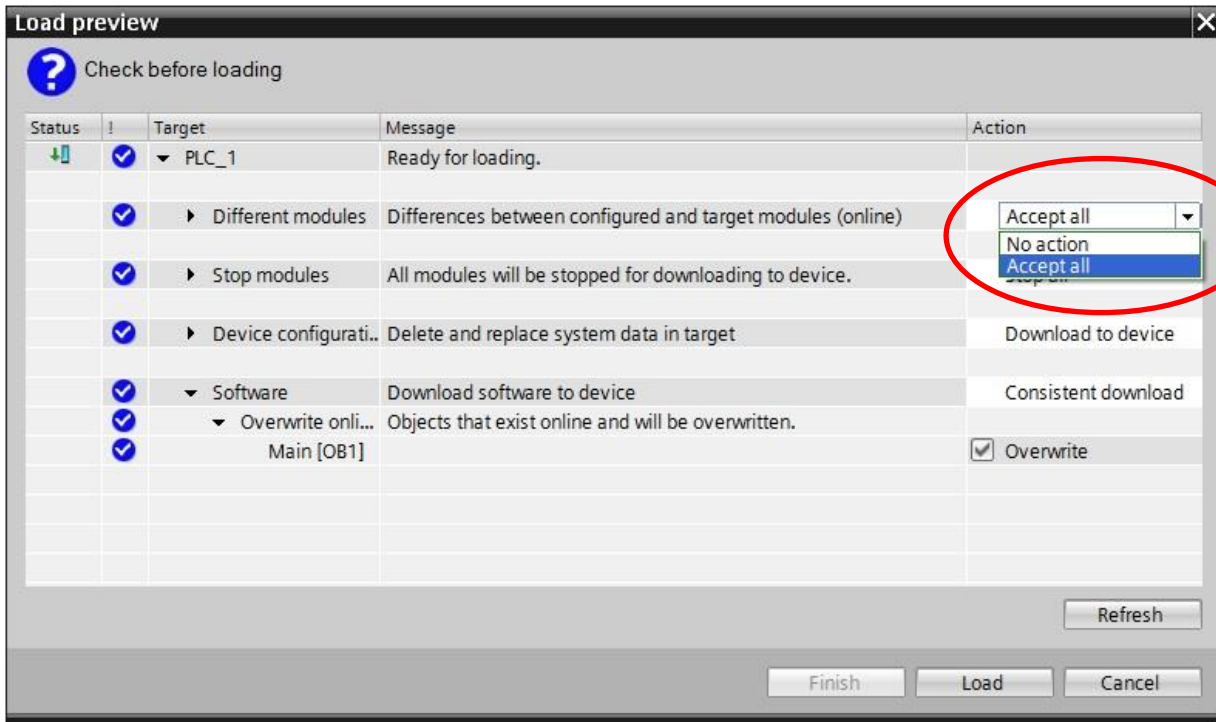
Flash LED

Refresh

Online status information:

- Connected to address 192.168.1.33
- Scanning ended.

Load Cancel



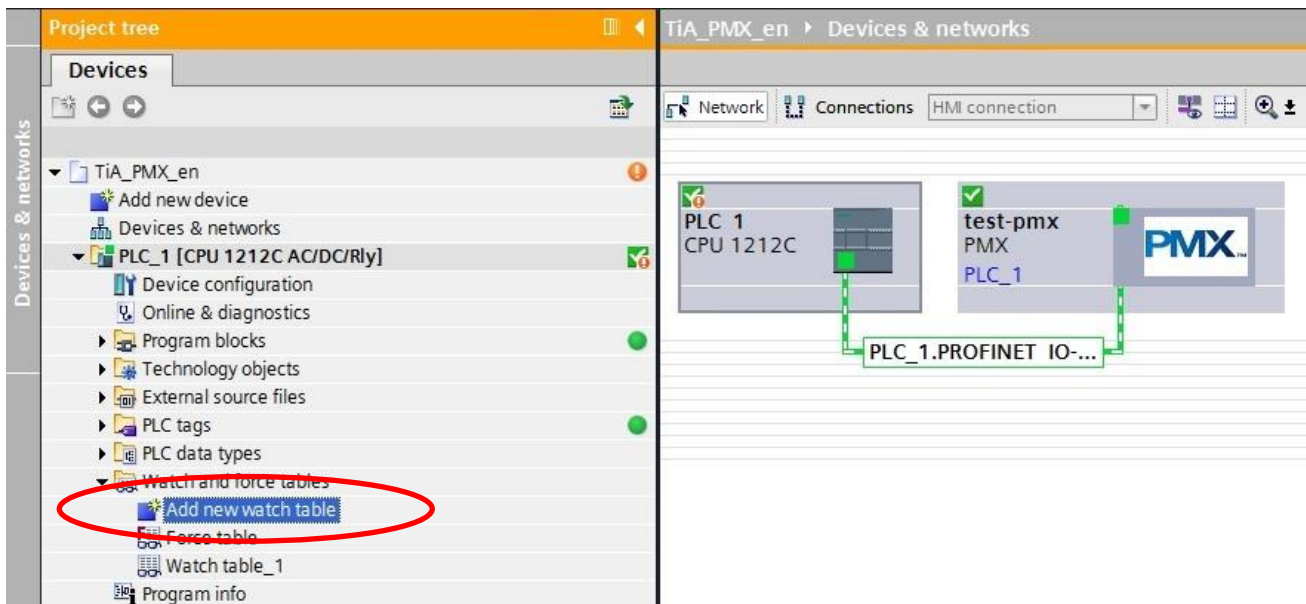
After successfully loading the project into the PLC “Go online”.



Hint: Green checkmarks are a signal for an accurate transmission. If there are any red symbols, check your device configuration and reload the project into the PLC again.

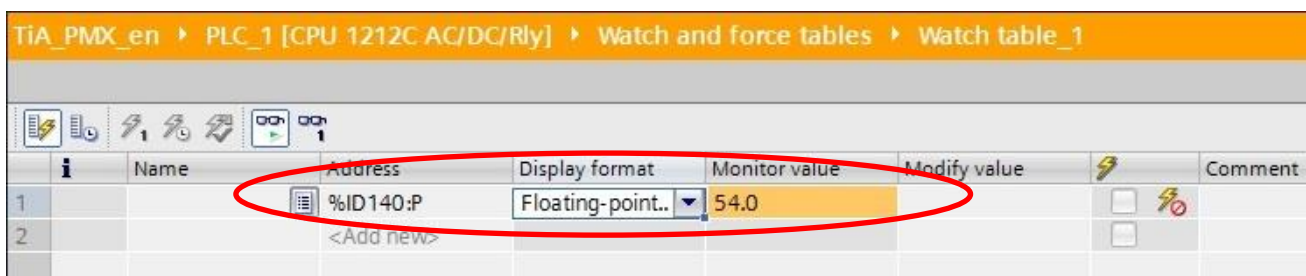
Display a measurement

By double-clicking “Add new watch table” in the section “Watch and force tables” you can create a new watch table. In this particular example we are going to readout values from the first calculated channel of the PMX.



Display values

Insert the address of the channel that should be monitored. (here: PID140). You can find the mapping of the addresses in the device overview. After that define a display format (here: Floating-point number). The monitor value now returns the actual value of the channel.



Disclaimer

These examples are for illustrative purposes only. They cannot be used as the basis for any warranty or liability claims.