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How to…

Setup the Hilscher NL 51N-DPL for the Flex controller

PENKO

an ETC Company

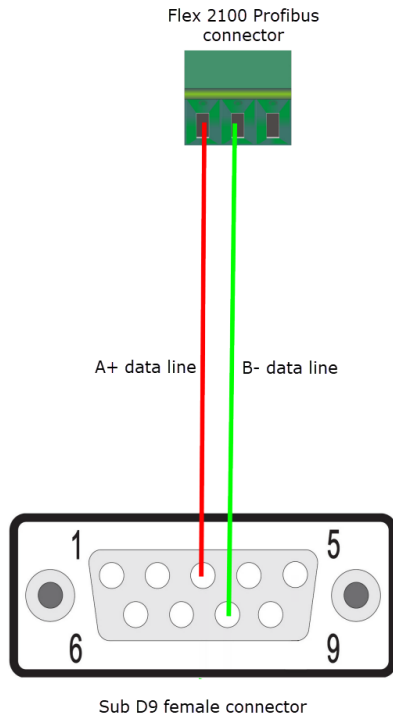## Table of Contents

Hardware setup

Connect the device to the Profibus connector of the Flex and connect 24Vdc to the NL 51N-DPL.

For the Flex 2100 you have te make an adapter for Profibus:

Setup the Flex

To setup the Profibus settings in the Flex, press on System settings – System Setup – Port Setup – Profibus Setup. Set the Channel to value 2 and Format to Integer. Then press OK and Home to return to the Selection menu.
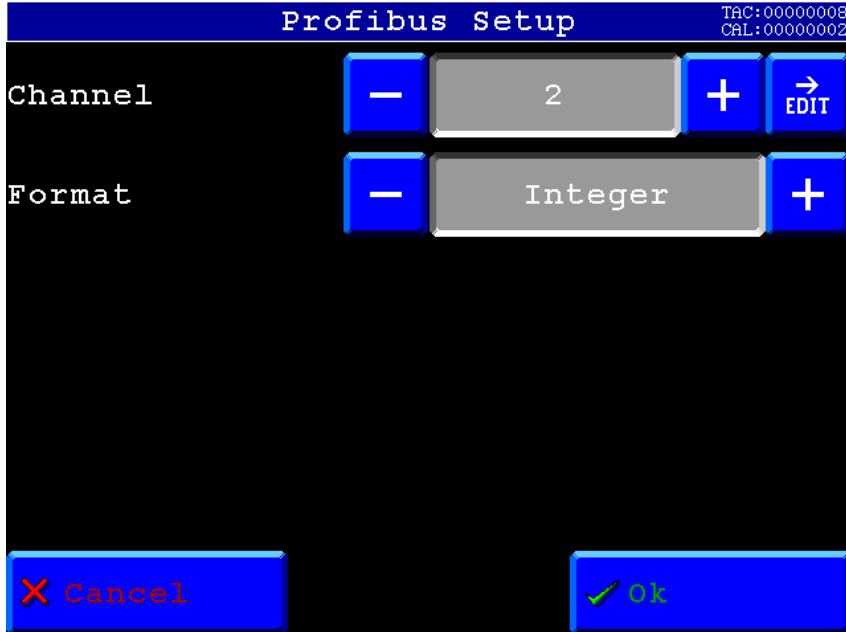
Required software and files

Download and install the program for the Hilscher NL 51N-DPL from the manufacture website:

https://www.hilscher.com/products/product-groups/gateways/for-direct-mounting-plug/nl-51n-dpl/

Download the GSD file for the Flex from the Penko site:
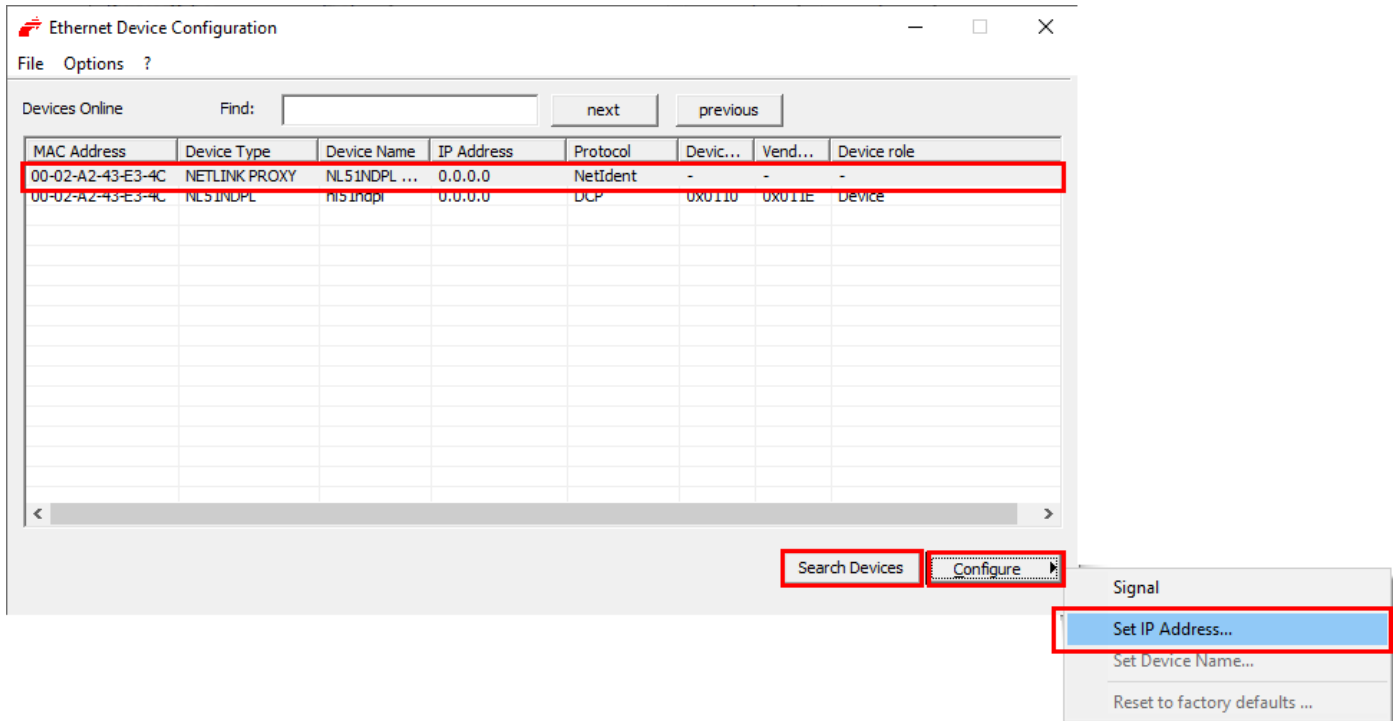
https://penko.com/Support/Software/

The name of the GSD file for the Flex is PFLX053D.GSD.

The PLC used in this how to is a Siemens PLC, the fore Tia Portal is used.

Ethernet Device Configuration (1)

Open the installed program **Ethernet Device Setup** .

Click on Search Devices, the adapter is found twice. Select the line with the NetIdent protocol and click on Configure. Then click on Set IP Address.
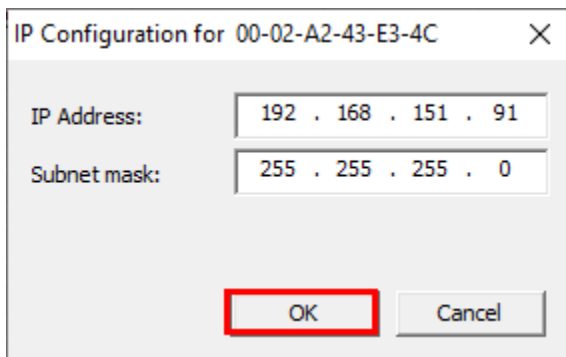

Set an IP address (in your local network) and subnet mask and click on OK.

The set IP address is now shown, you can now close the program.

SYCON.net

Open the installed program ![SYCON.net]
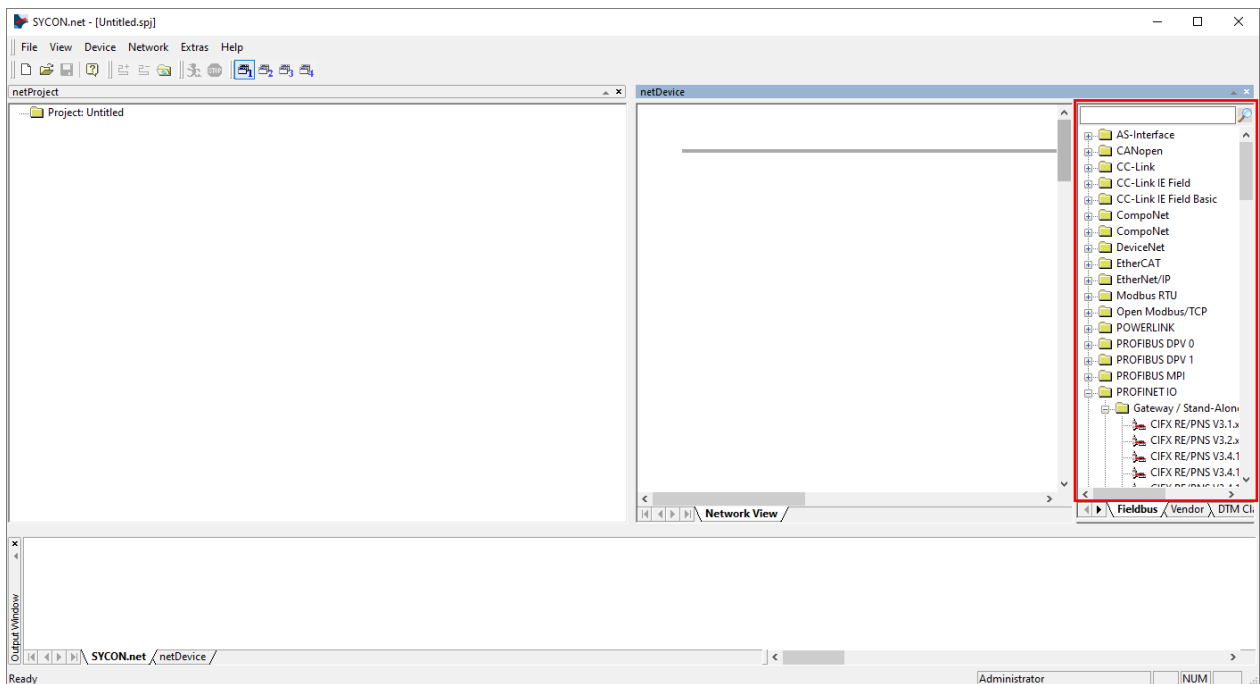
The default login is Administrator with no password.
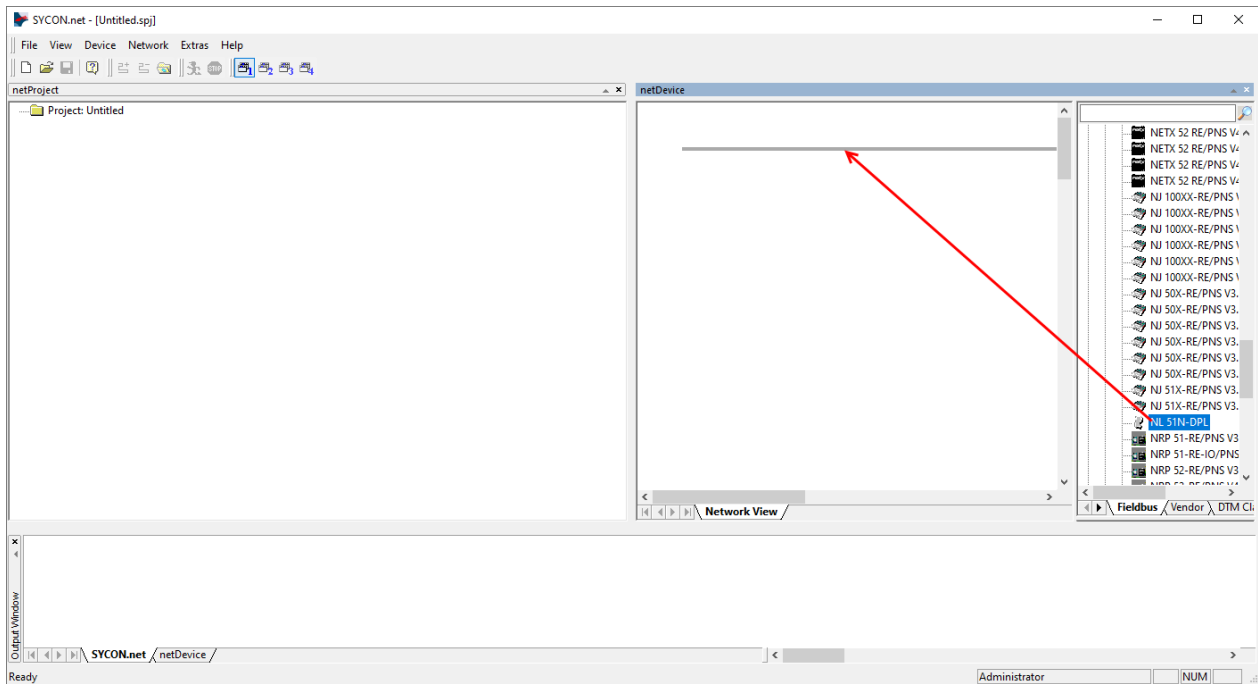

In the right column, search under Profinet IO – Gateway / Stand-Alone for the NL 51N-DPL device.

Drag and drop the NL 51N-DPL onto the empty bus line under netDevice.

The device is now added to the bus line, double click on the device to setup the configuration.
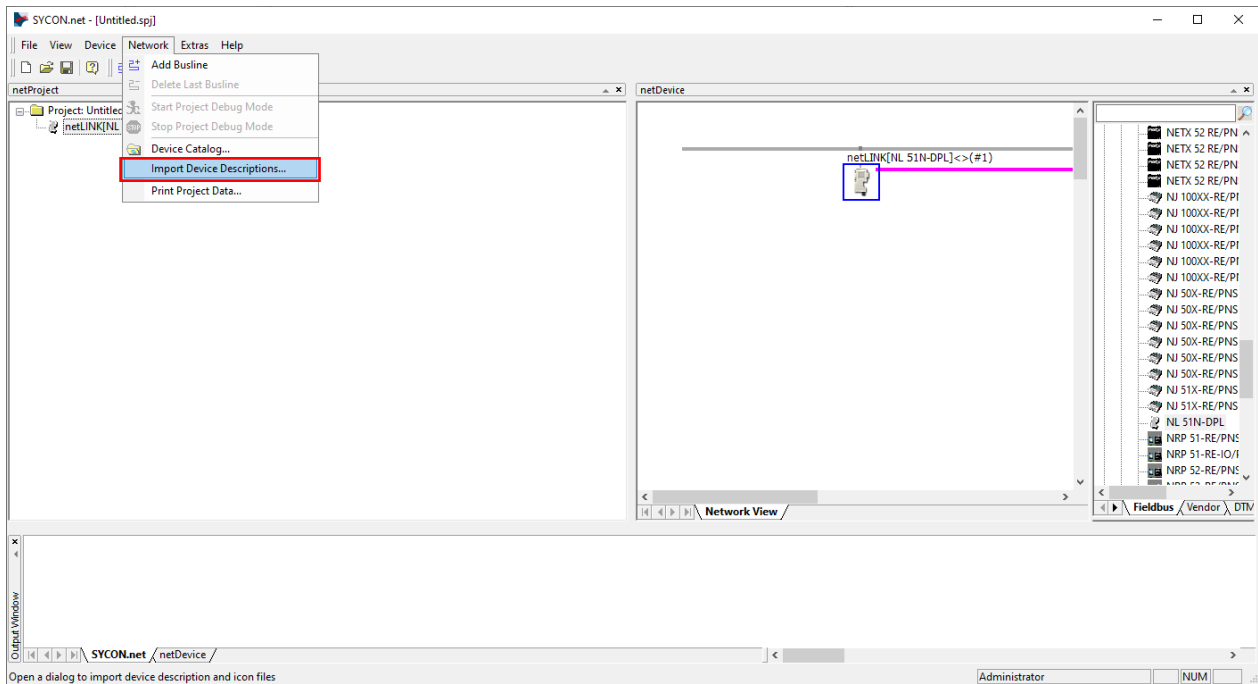
When the dialog is opened click on netX Drive, click the tap TCP Connection. Click on the green + icon, then you can set the assigned IP Address for the NL 51N-DPL and click on Save.

Click on Device Assignment and click on Scan, the device should now be visible in the list, check the box in front of the device and click on Apply. Click on Ok to close the dialog.
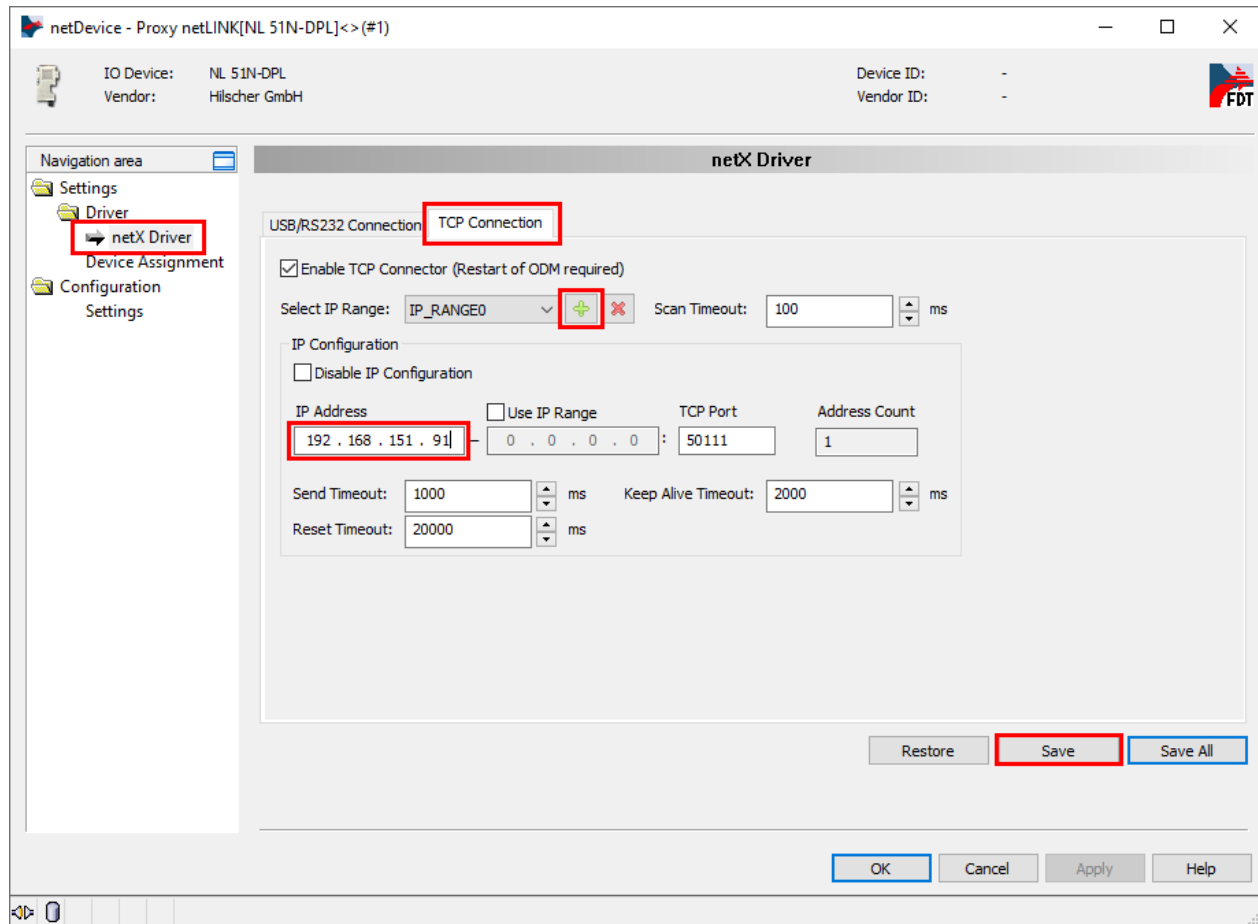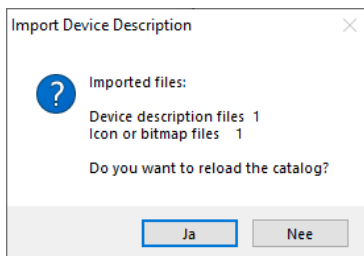
To install the Flex GSD file, click on Network and Import Device Descriptions.

Go to the folder where the Flex GSD file is saved, select the file and click on Open.
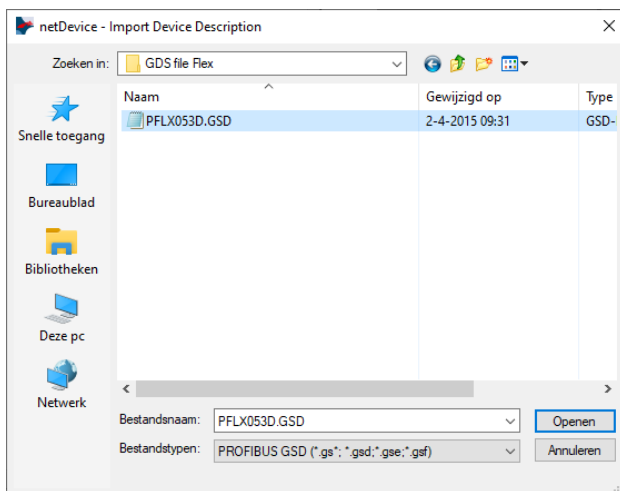
Click Yes to update the catalog.

The catalog will now start updating.
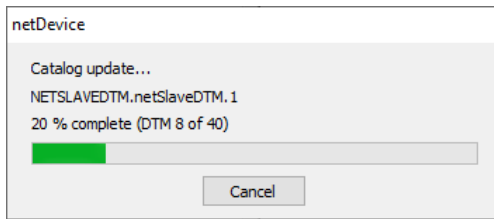
The Flex is now shown under Profibus DPV0 – Slave.
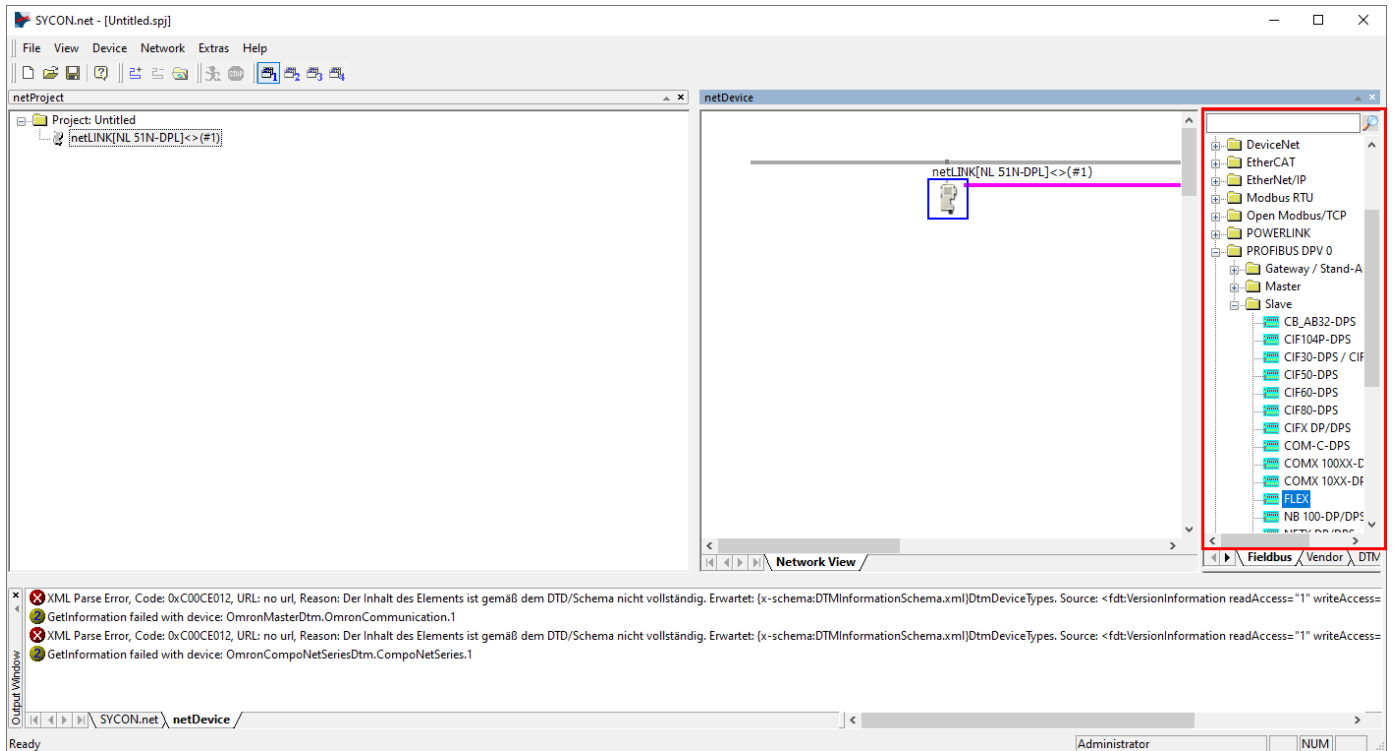
Right click on the NL 51N-DPL device and click on Network Scan.
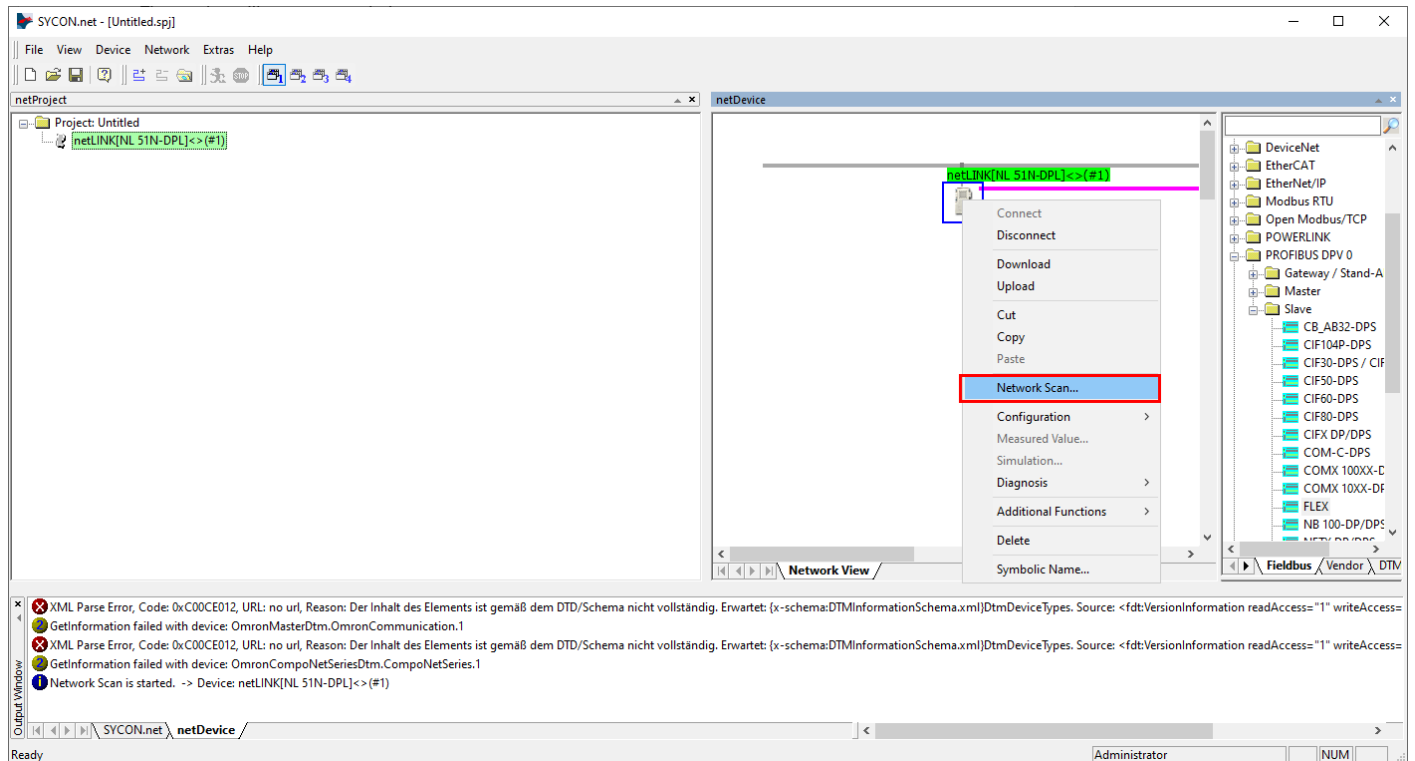
The Profibus network is now scanned and the Flex is shown, click on Create Devices to add the Flex into the Profibus network.
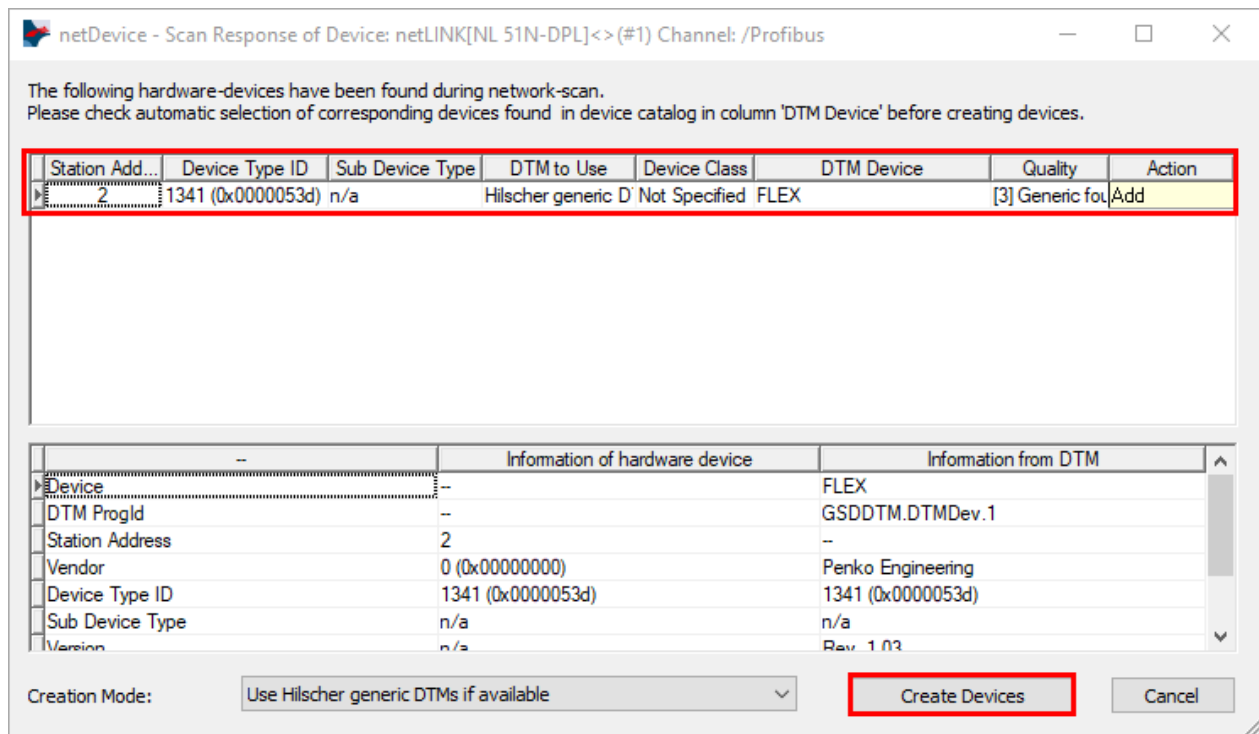
Click on Yes to apply the configuration.
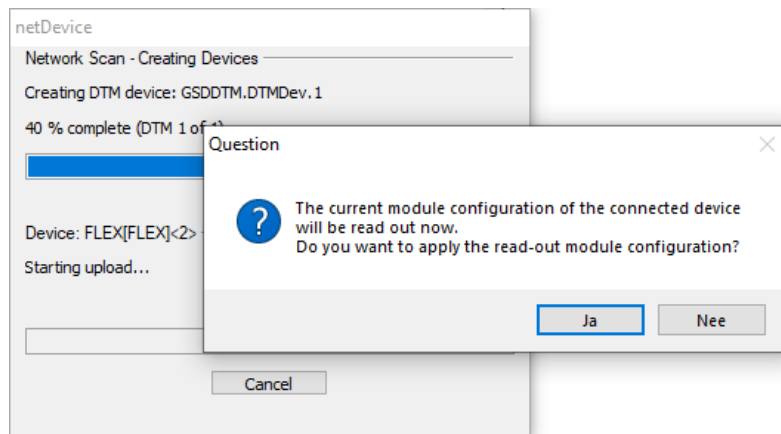
The Flex is now added to the Profibus network, the green highlighted text shows that the Profibus connection is active.
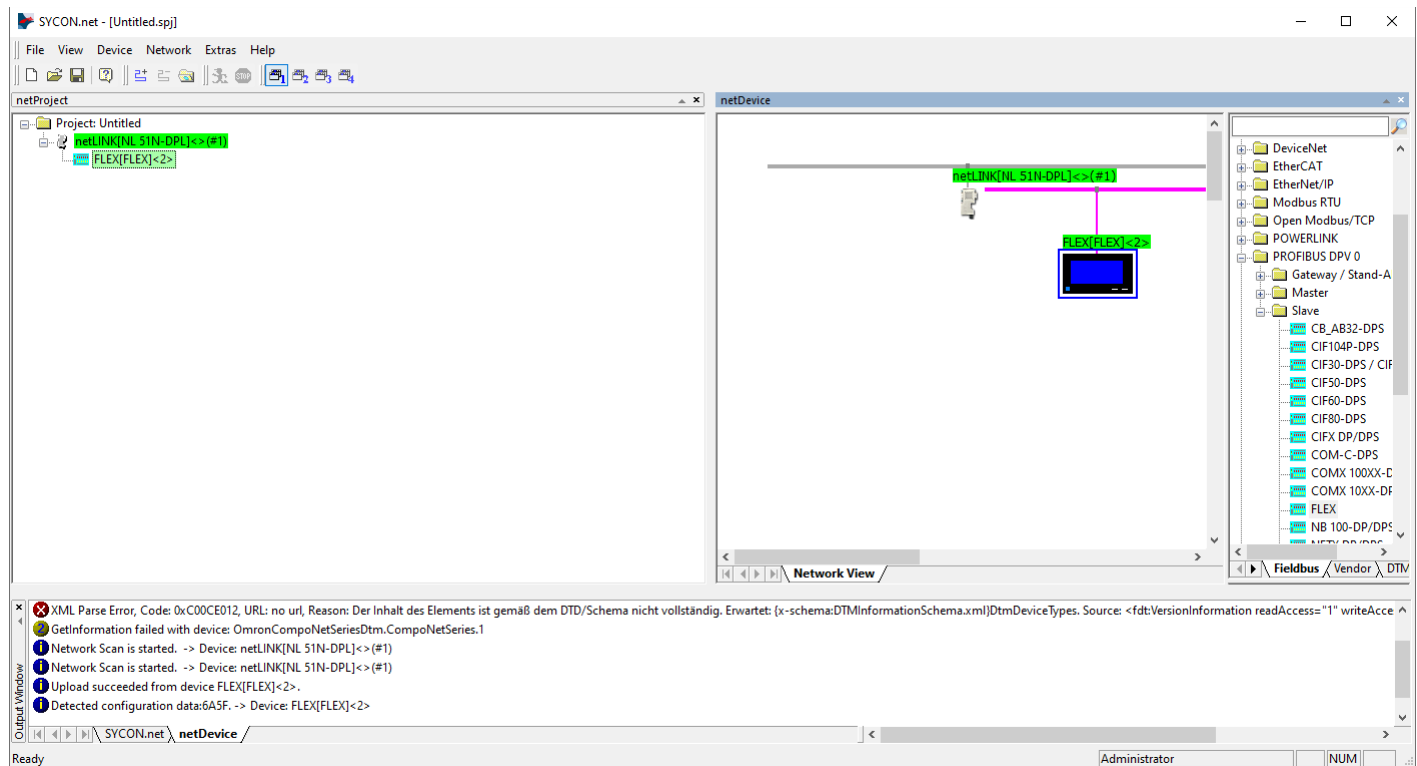
Right click on the device and click on Disconnect.
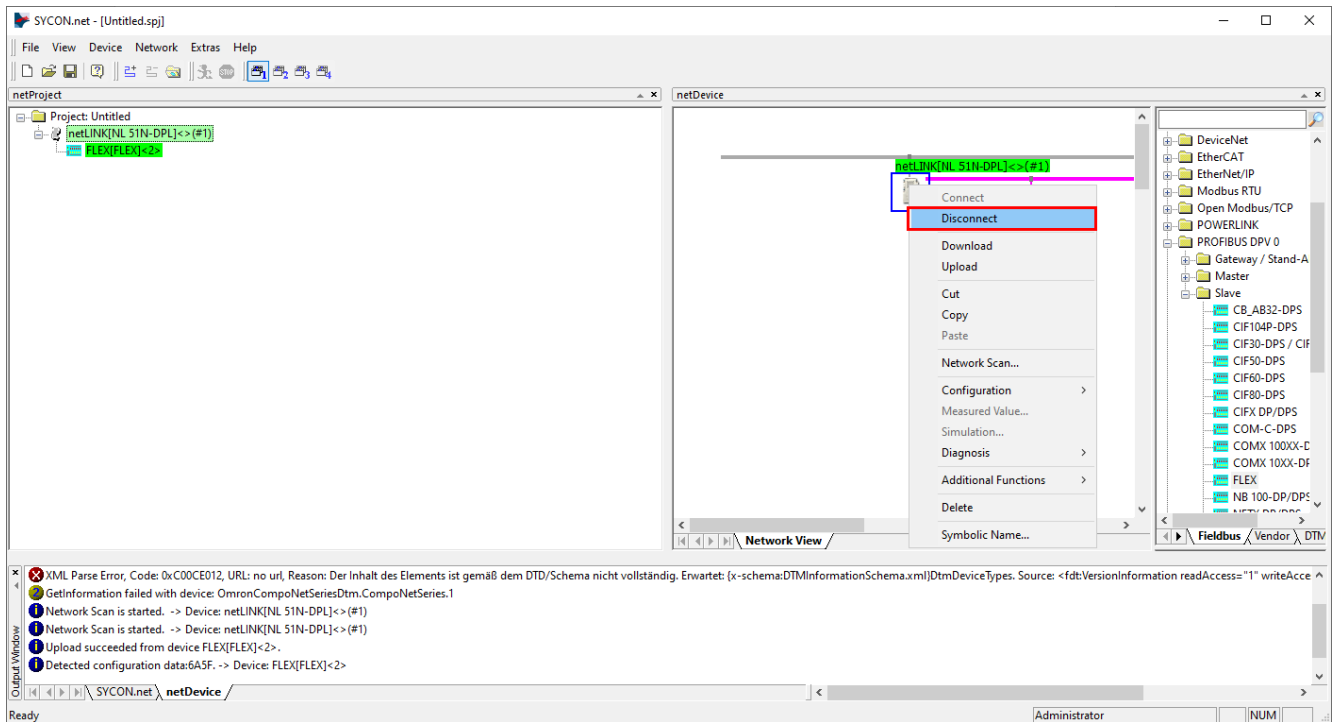
To generate a GSDML file for Profinet right click on the device and click on Additional Functions – Profinet IO Device – Export GSDML.
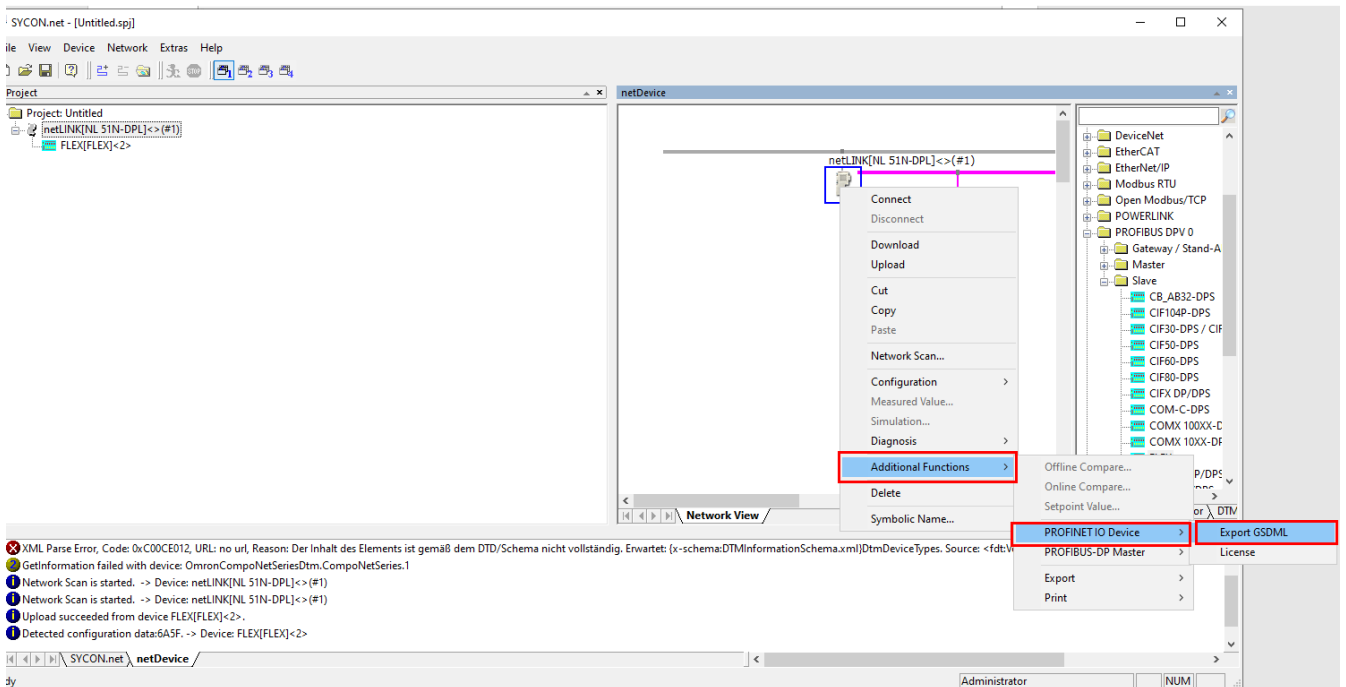
Select a fold to save the GSDML file and click Save.

Note: Do not change the file name.
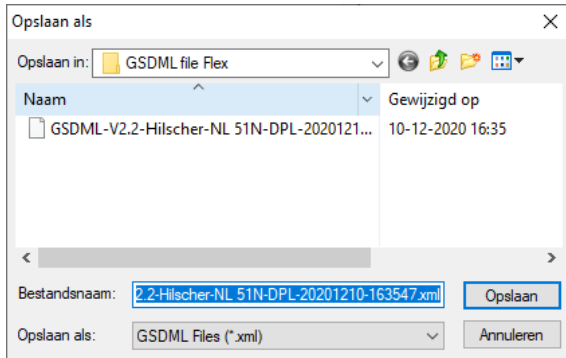
Right click on the device and click on Download, now the Profibus connection is saved into the device.
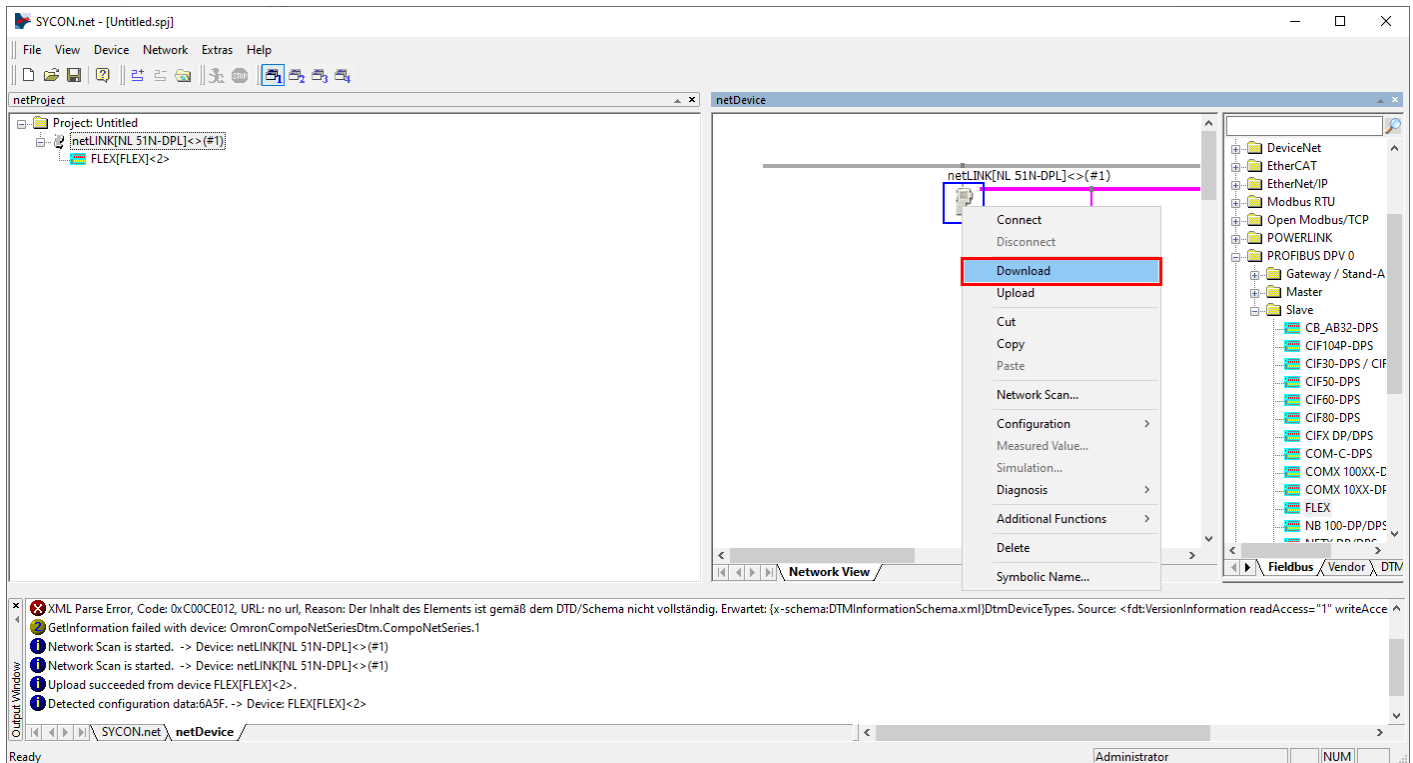
Click Yes to start the download.
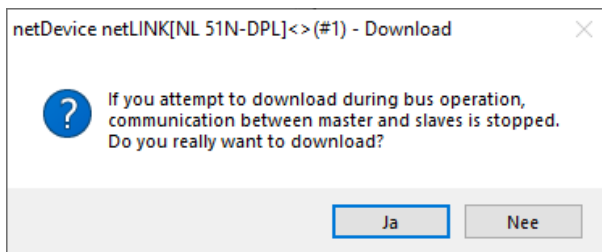
The downloading will start.
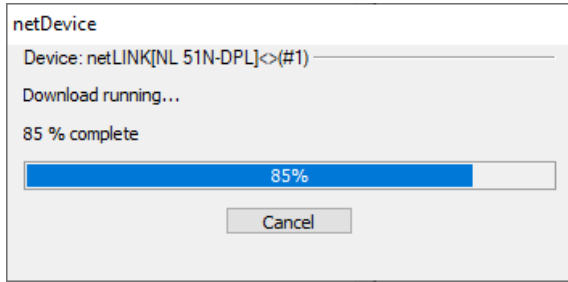
Right click on the device and click on Disconnect.
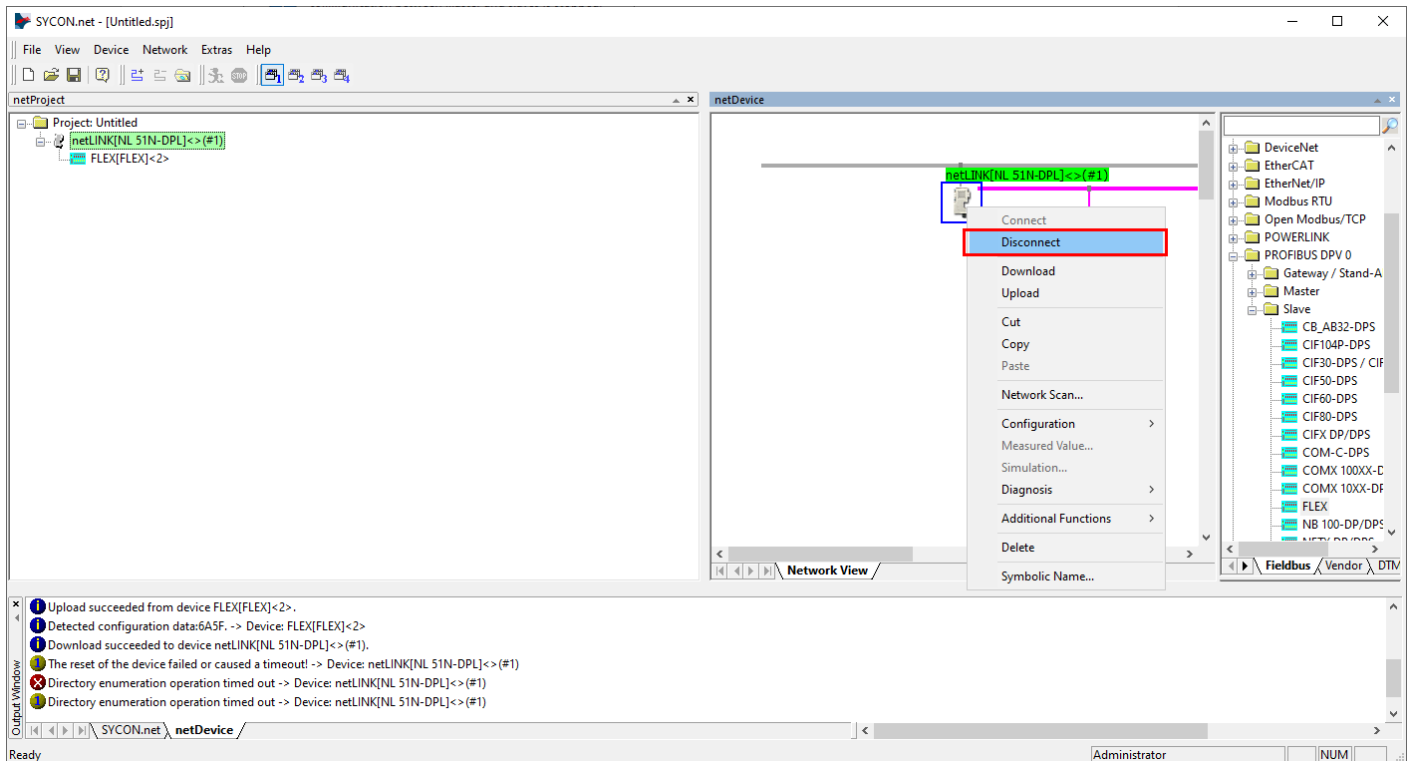
Save the project for later use by clicking on Save as.

Give the project a name and click Save.

Ethernet Device Configuration (2)

When you open Ethernet Device Configuration and search for Devices, you will notice that the IP Address is set to 0.0.0.0 again after the project is downloaded into the device. This is because the Profinet IO Controller (PLC) will give the device its real IP Address in the Profinet network.

| MAC Address	Device Type	Device Name	IP Address	Protocol	Devic...	Vend...	Device role
00-02-A2-43-E3-4C	NETLINK PROXY	NL51NDPL...	0.0.0.0	NetIdent	-	-	-
00-02-A2-43-E3-4C	NL51NDPL	nl51ndpl	0.0.0.0	DCP	0x0110	0x011E	Device

Tia Portal

Open Tia Portal and create a new project, give the project a name and click on Create.

To import the generated GSDML file into Tia Portal, click on Options – Manage general station description files (GSD). Open the folder where the GSDML file is saved and open the file.

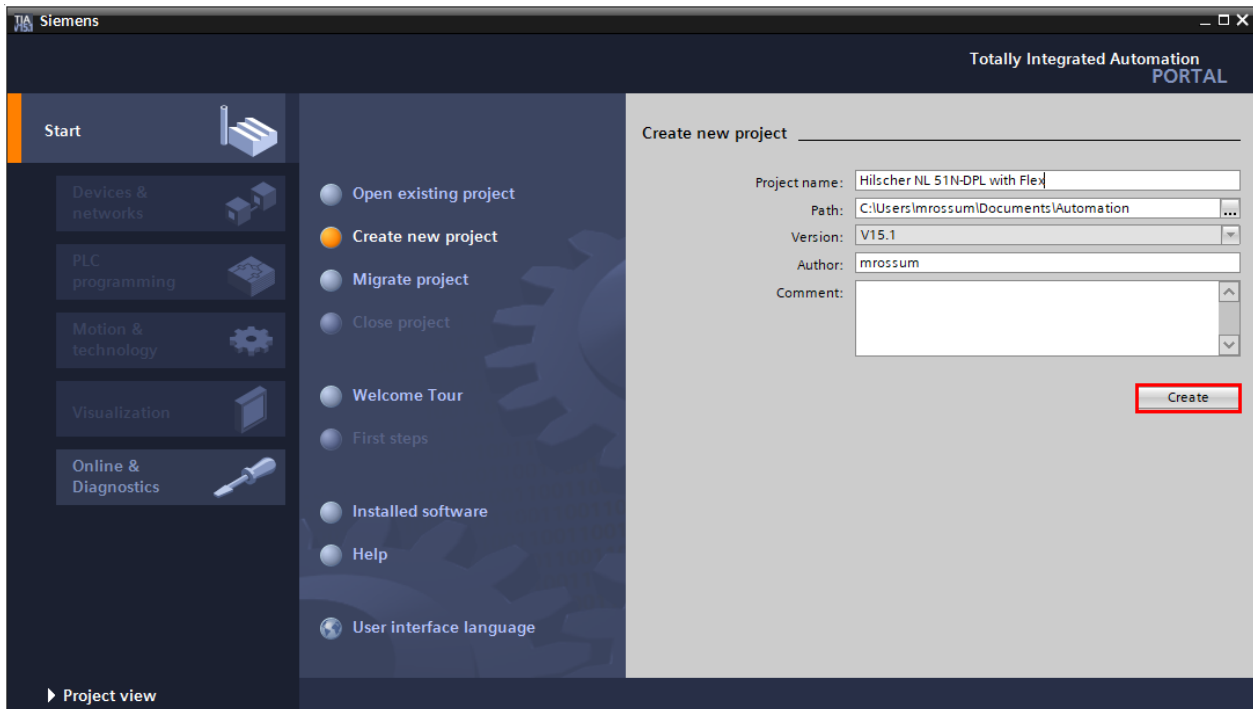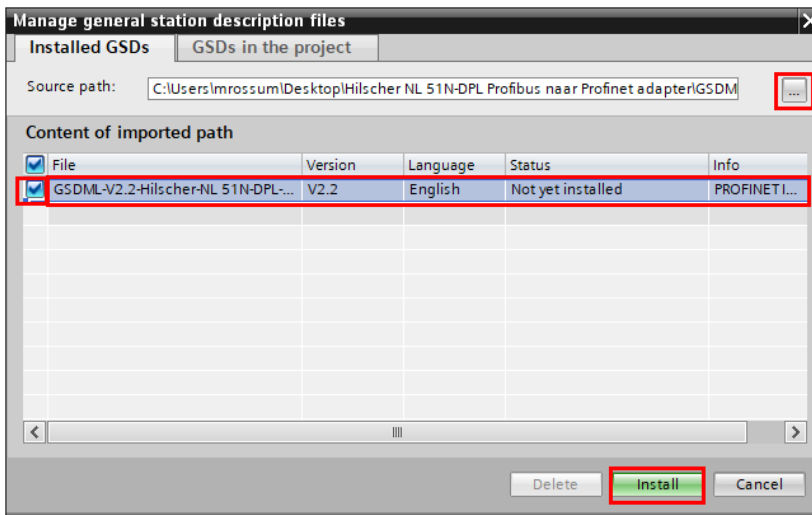The file is now shown but not installed yet, check the box in front of the file and click on Install.

The GSDML file will now install.
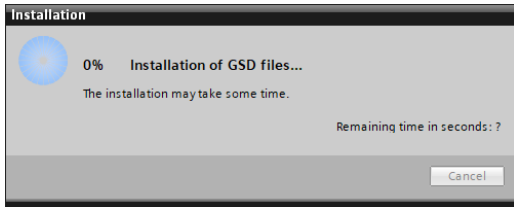
When installed, click on Close, the hardware catalog will start updating.
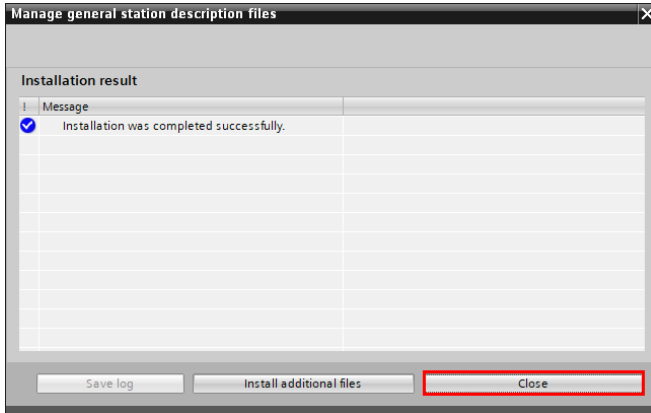
Double click on Add new device, select your PLC and click on OK.
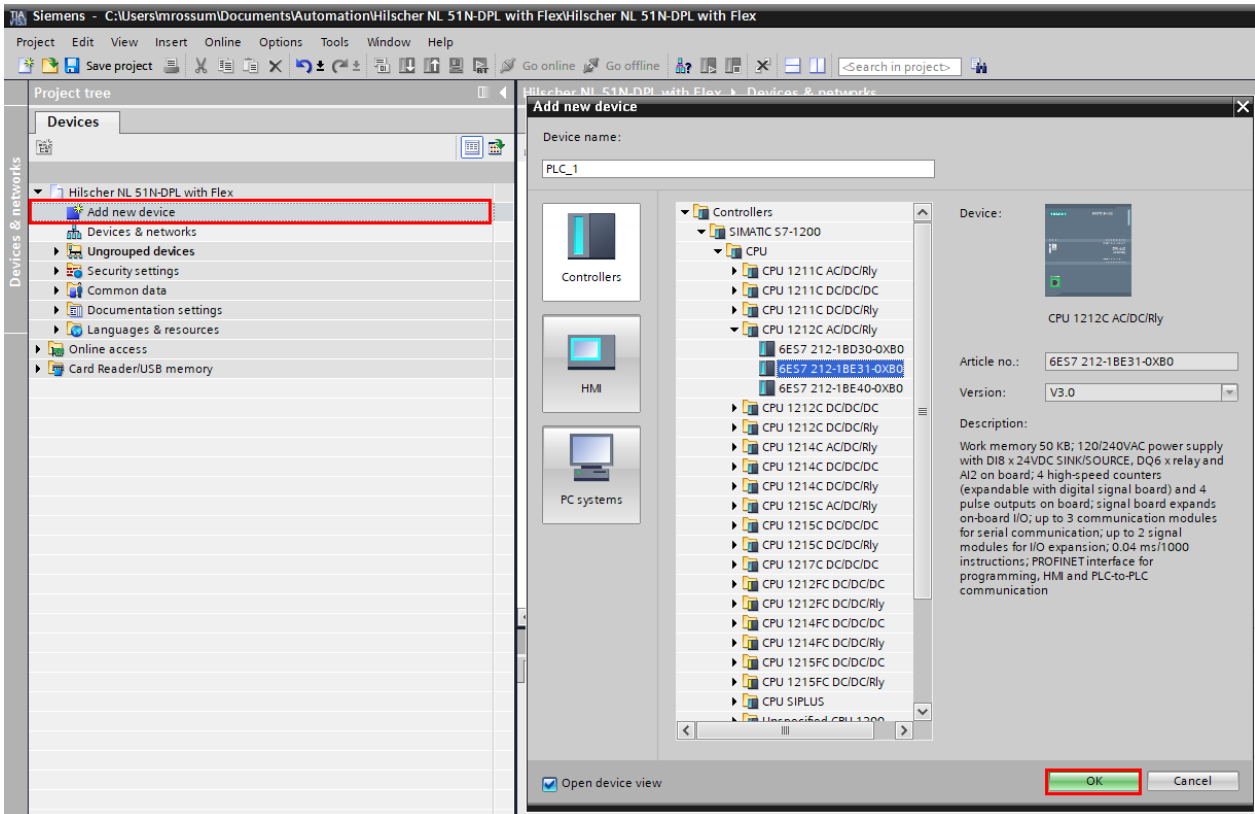
Set the IP Address of the PLC.
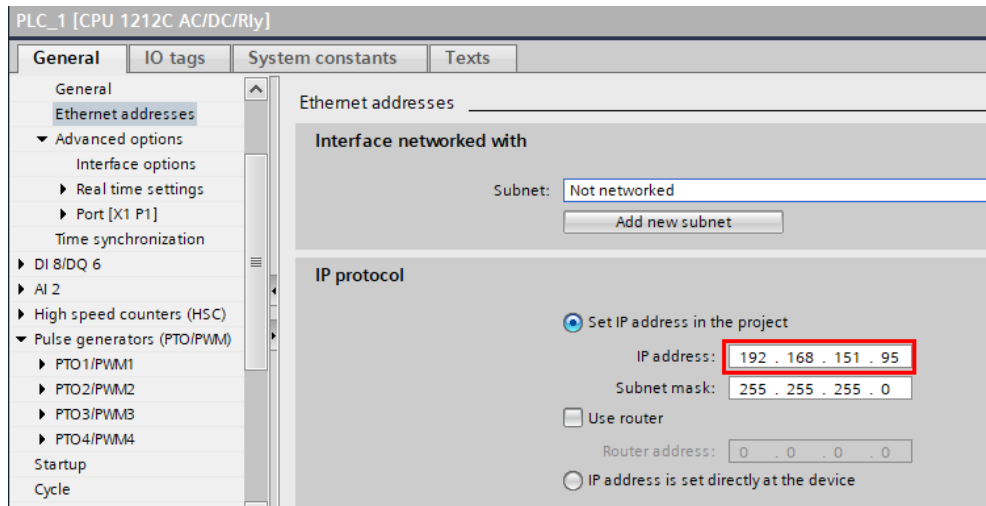
Double click on Devices & networks, open the Hardware catalog and double click on the NL 51N-DPL.
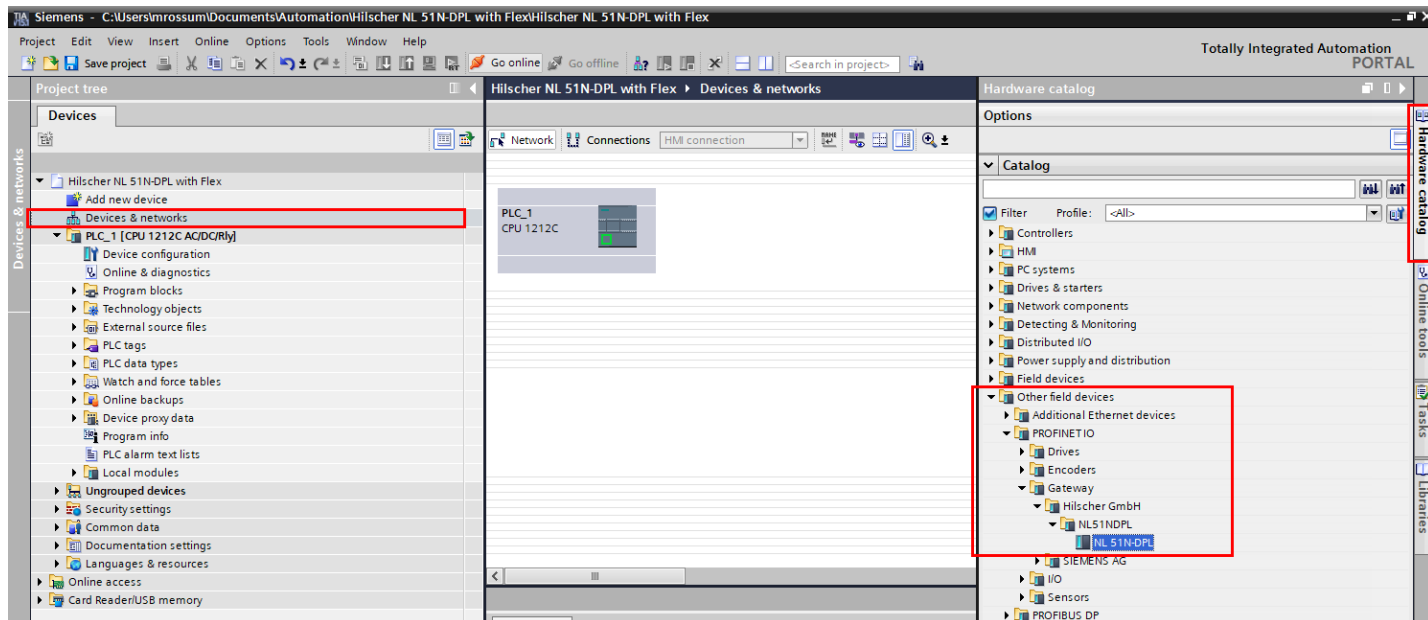
The device is now added into the project.
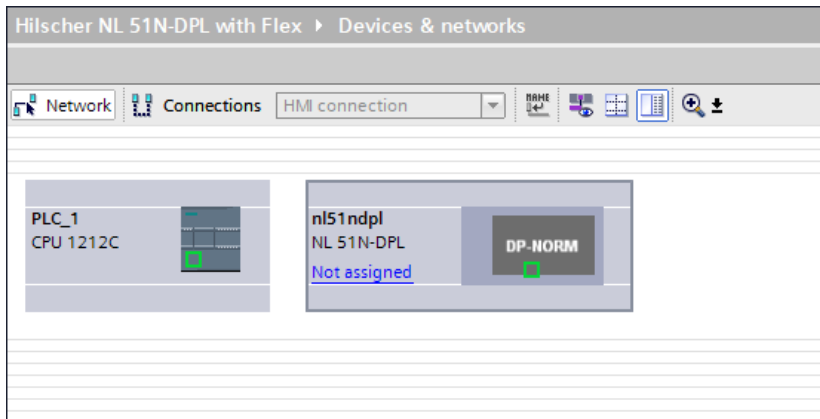
Click on Not assigned and select the PLC.
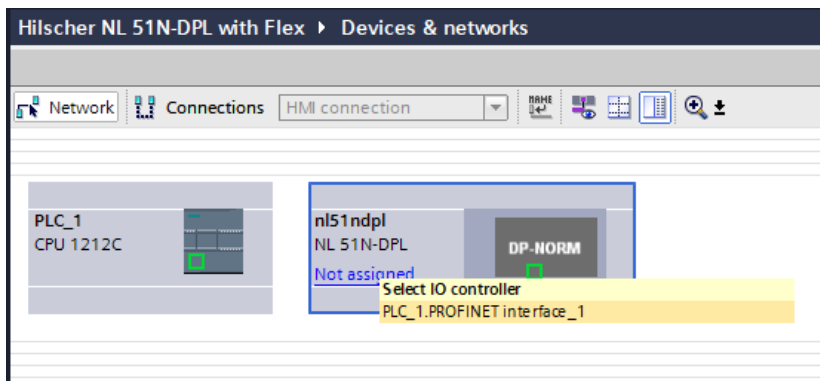
The device is now connected to the PLC.
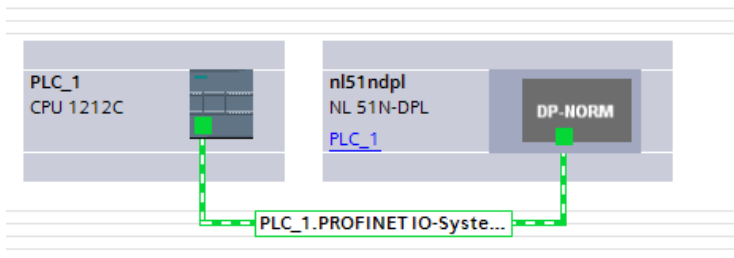
Select the Profinet connection and click on the Name icon.
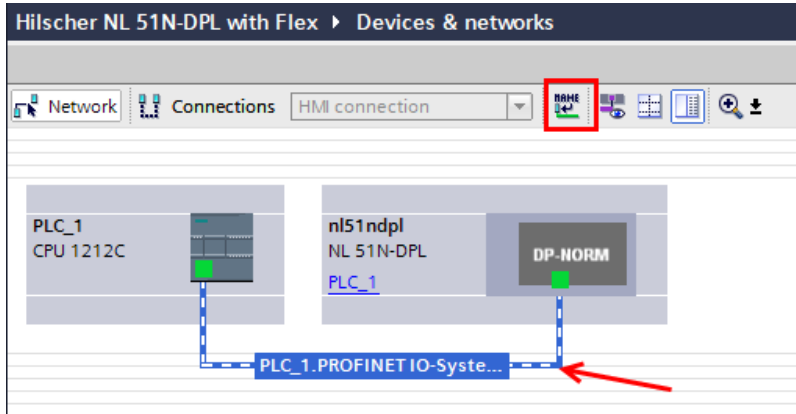
Set the correct interface settings and click on Update list, at least two devices should be found, the PLC and the device.
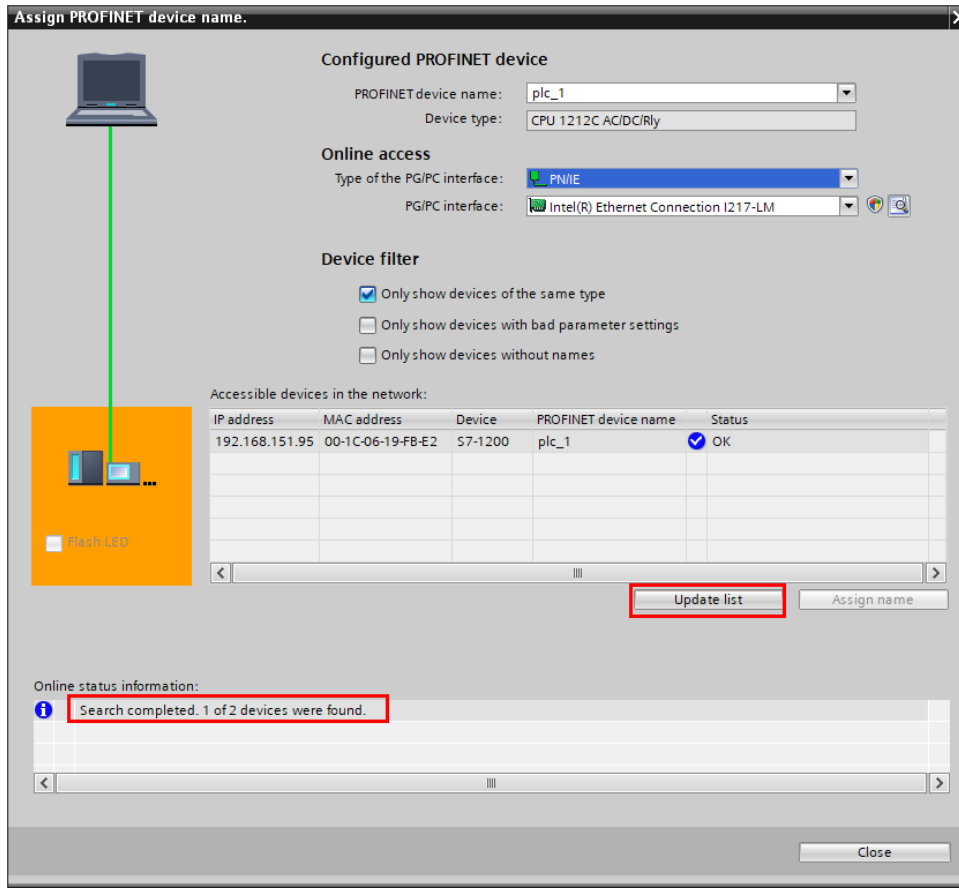
Select the Profinet name nl51ndpl, select the name and click on Assign name. Then click on Close.
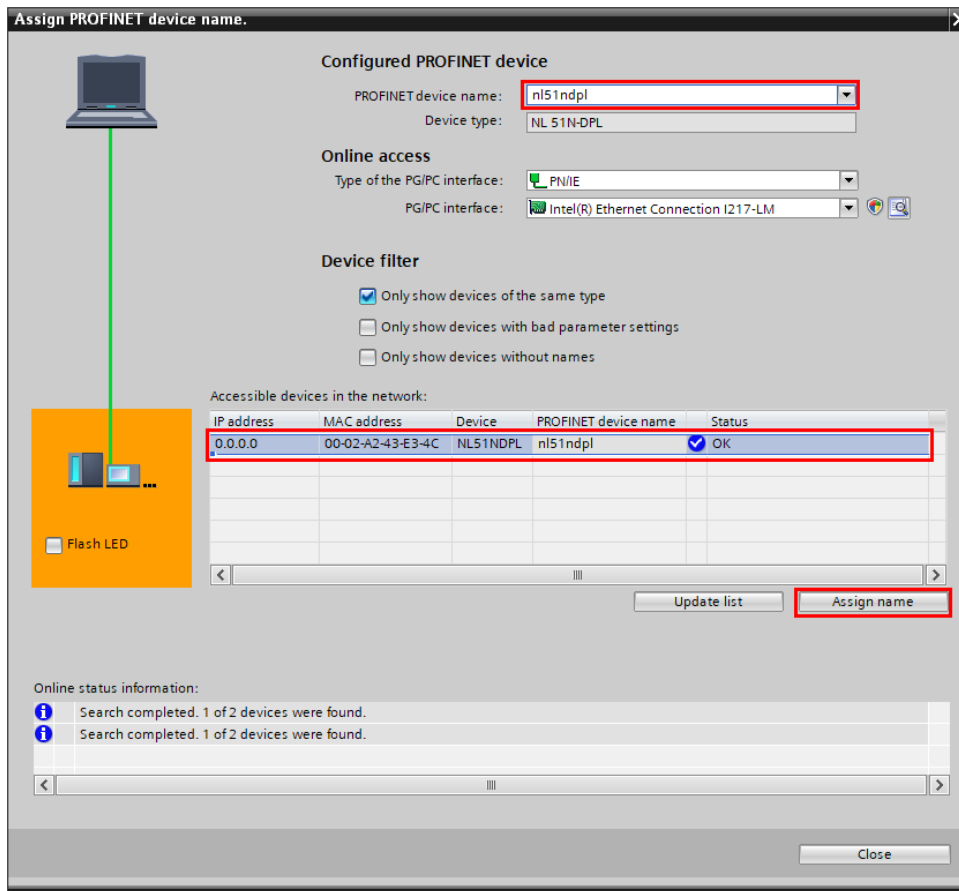
Download the setup into the PLC, click on the Download to device icon.
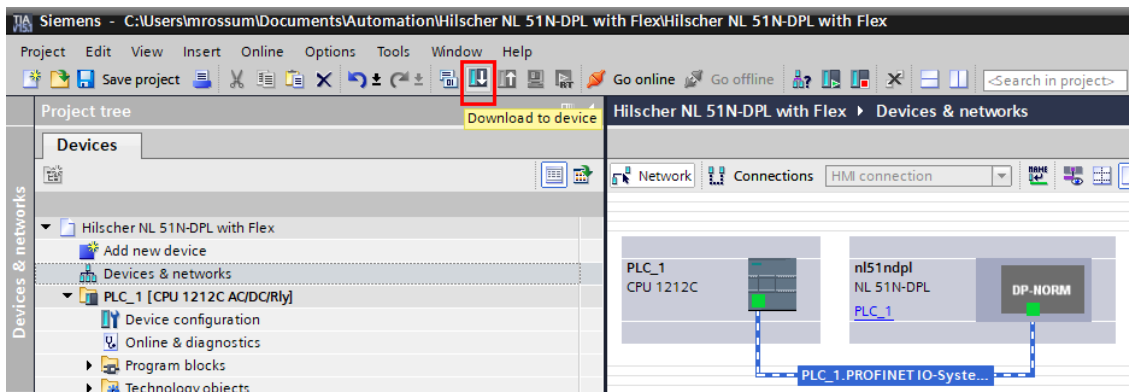
Click on Start search, when the PLC is found select the PLC and click on Load.
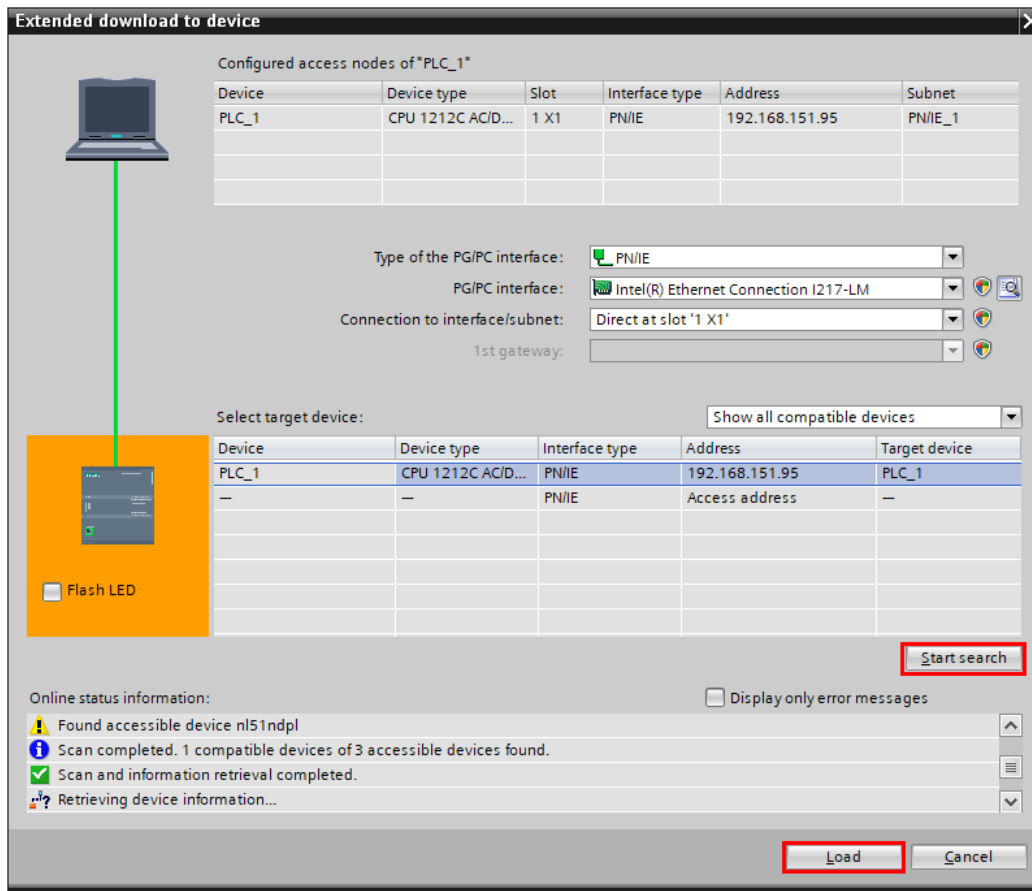
Go Offline, double click on Devices & networks and double click on the nl51ndpl module.
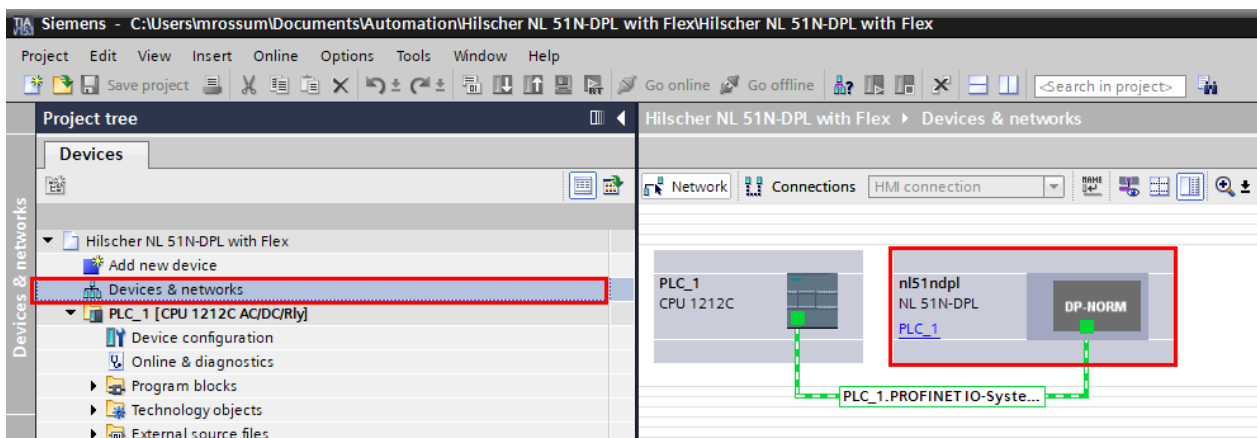
In the device overview you can see the I addresses and Q addresses. These are the addresses where the data can be read or write to the Flex.
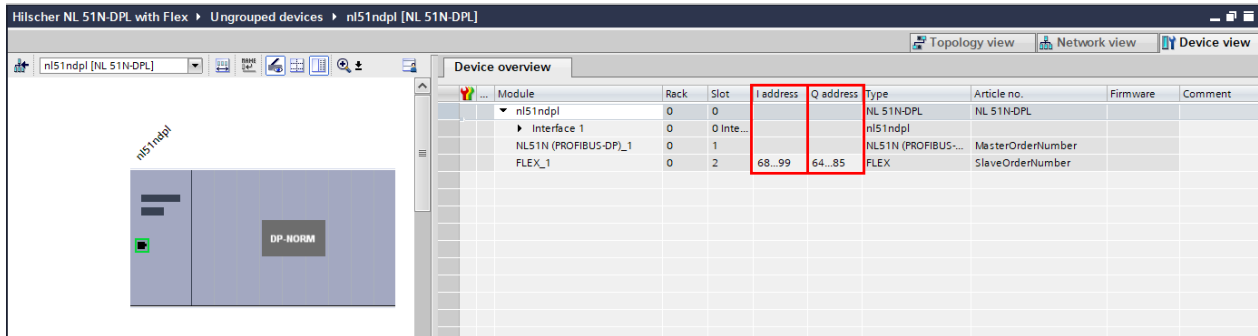
Go to PLC tags and add two new tag tables, name them 'Read data from the Penko Flex' and 'Read data from the Penko Flex'.

Open the Read data form the Penko Flex, below you can see the tag list to read all the data form the Flex.

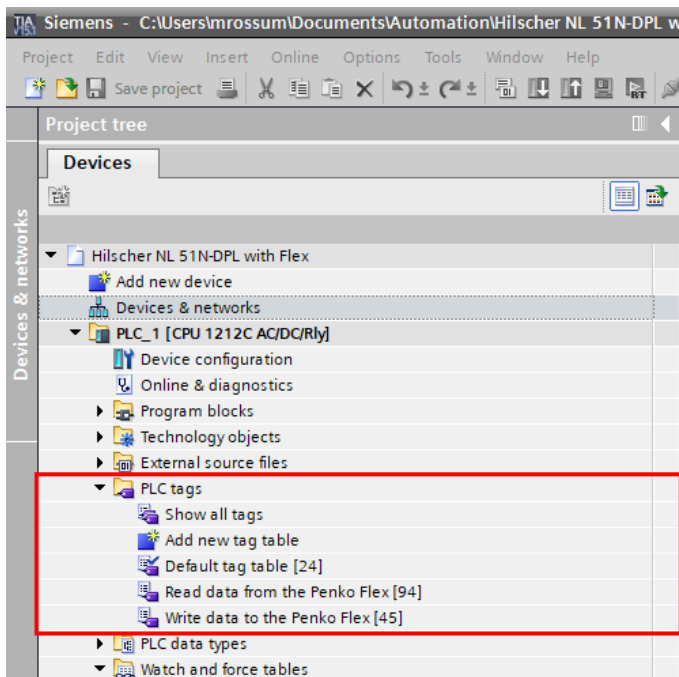| Tag	Type	Address
Weight	DInt	%ID68
Status_Hardware_Overload	Bool	%I73.0
Status_Above_Max_Load	Bool	%I73.1
Status_Stable_Signal	Bool	%I73.2
Status_In_Stable_Range	Bool	%I73.3
Status_Zero_Corrected	Bool	%I73.4
Status_Center_of_Zero	Bool	%I73.5
Status_In_Zero_Range	Bool	%I73.6
Status_Zero_Tracking_Possible	Bool	%I73.7
Status_Tare_Active	Bool	%I72.0
Status_Preset_Tare_Active	Bool	%I72.1
Status_New_Sample_Available	Bool	%I72.2
Status_Calibration_Invalid	Bool	%I72.3
Status_Calibration_Enabled	Bool	%I72.4
Status_Certified_Mode	Bool	%I72.5
Status_Invalid_Weight	Bool	%I72.6
Status_Register_Function_active	Bool	%I72.7
Read_Command_Zero_Reset	Bool	%I74.0
Read_Command_Zero_Set	Bool	%I74.1
Read_Command_Tare_Off	Bool	%I74.2
Read_Command_Tare_On	Bool	%I74.3
Read_Command_Reserved	Bool	%I74.4
Read_Command_Freeze_Weight	Bool	%I74.5
Read_Command_IND_Channel_2^0	Bool	%I74.6
Read_Command_IND_Channel_2^1	Bool	%I74.7
Read_Weight_Select_register	Byte	%IB75
Input_1	Bool	%I77.0
Input_2	Bool	%I77.1
Input_3	Bool	%I77.2
Input_4	Bool	%I77.3
Input_5	Bool	%I77.4
Input_6	Bool	%I77.5
Input_7	Bool	%I77.6
Input_8	Bool	%I77.7
Input_9	Bool	%I76.0
Input_10	Bool	%I76.1
Input_11	Bool	%I76.2
Input_12	Bool	%I76.3
Input_13	Bool	%I76.4
Input_14	Bool	%I76.5
Input_15	Bool	%I76.6
Input_16	Bool	%I76.7
Output_1	Bool	%I79.0
Output_2	Bool	%I79.1
Output_3	Bool	%I79.2
Output_4	Bool	%I79.3
Output_5	Bool	%I79.4
Output_6	Bool	%I79.5
Output_7	Bool	%I79.6
Output_8	Bool	%I79.7
Output_9	Bool	%I78.0
Output_10	Bool	%I78.1
Output_11	Bool	%I78.2
Output_12	Bool	%I78.3
Output_13	Bool	%I78.4
Output_14	Bool	%I78.5
Output_15	Bool	%I78.6
Output_16	Bool	%I78.7

Tag	Type	Address
Marker_401	Bool	%I81.0
Marker_402	Bool	%I81.1
Marker_403	Bool	%I81.2
Marker_404	Bool	%I81.3
Marker_405	Bool	%I81.4
Marker_406	Bool	%I81.5
Marker_407	Bool	%I81.6
Marker_408	Bool	%I81.7
Marker_409	Bool	%I80.0
Marker_410	Bool	%I80.1
Marker_411	Bool	%I80.2
Marker_412	Bool	%I80.3
Marker_413	Bool	%I80.4
Marker_414	Bool	%I80.5
Marker_415	Bool	%I80.6
Marker_416	Bool	%I80.7
Marker_417	Bool	%I83.0
Marker_418	Bool	%I83.1
Marker_419	Bool	%I83.2
Marker_420	Bool	%I83.3
Marker_421	Bool	%I83.4
Marker_422	Bool	%I83.5
Marker_423	Bool	%I83.6
Marker_424	Bool	%I83.7
Marker_425	Bool	%I82.0
Marker_426	Bool	%I82.1
Marker_427	Bool	%I82.2
Marker_428	Bool	%I82.3
Marker_429	Bool	%I82.4
Marker_430	Bool	%I82.5
Marker_431	Bool	%I82.6
Marker_432	Bool	%I82.7
Register_1	DInt	%ID84
Register_2	DInt	%ID88
Register_3	DInt	%ID92
Register_4	DInt	%ID96
<Add new>		

You can also add a Watch table to write data to the Flex.
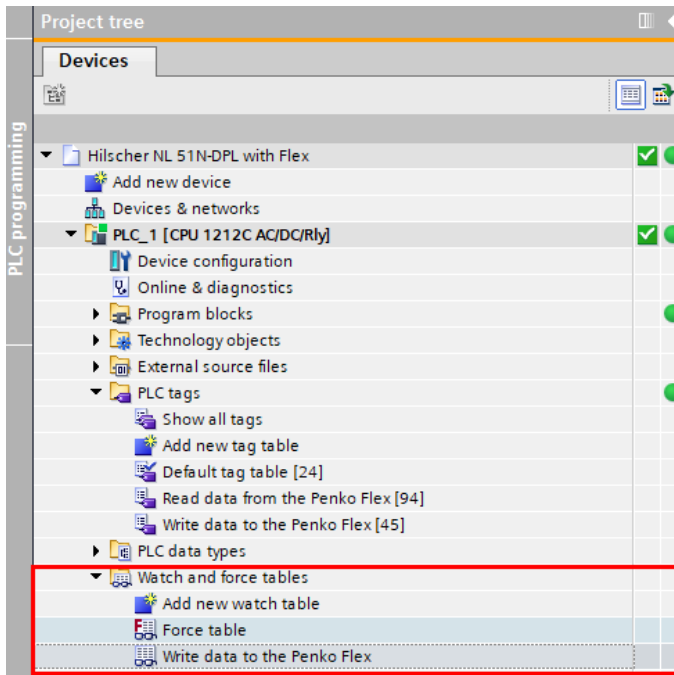
When online you can set command or Markers, and write values into register 97 – 100.

"Write_Command_Zero_Reset"	%Q64.0	Bool	FALSE		☐	
"Write_Command_Zero_Set"	%Q64.1	Bool	FALSE		☐	
"Write_Command_Tare_Off"	%Q64.2	Bool	FALSE	FALSE	☑	⚠
"Write_Command_Tare_On"	%Q64.3	Bool	TRUE	TRUE	☑	⚠
"Write_Command_Reserved"	%Q64.4	Bool	FALSE		☐	
"Write_Command_Freeze_Weight"	%Q64.5	Bool	FALSE		☐	
"Write_Command__IND_Channel_2^0"	%Q64.6	Bool	FALSE		☐	
"Write_Command__IND_Channel_2^1"	%Q64.7	Bool	FALSE		☐	
"Marker_969"	%Q67.0	Bool	TRUE	TRUE	☑	⚠
"Marker_970"	%Q67.1	Bool	FALSE		☐	
"Marker_971"	%Q67.2	Bool	FALSE		☐	
"Marker_972"	%Q67.3	Bool	FALSE		☐	
"Marker_973"	%Q67.4	Bool	FALSE		☐	
"Marker_974"	%Q67.5	Bool	FALSE		☐	
"Marker_975"	%Q67.6	Bool	FALSE		☐	
"Marker_976"	%Q67.7	Bool	FALSE		☐	
"Marker_977"	%Q66.0	Bool	TRUE	TRUE	☑	⚠
"Marker_978"	%Q66.1	Bool	FALSE		☐	
"Marker_979"	%Q66.2	Bool	FALSE		☐	
"Marker_980"	%Q66.3	Bool	FALSE		☐	
"Marker_981"	%Q66.4	Bool	FALSE		☐	
"Marker_982"	%Q66.5	Bool	FALSE		☐	
"Marker_983"	%Q66.6	Bool	FALSE		☐	
"Marker_984"	%Q66.7	Bool	FALSE		☐	
"Marker_985"	%Q69.0	Bool	TRUE	TRUE	☑	⚠
"Marker_986"	%Q69.1	Bool	FALSE		☐	
"Marker_987"	%Q69.2	Bool	FALSE		☐	
"Marker_988"	%Q69.3	Bool	FALSE		☐	
"Marker_989"	%Q69.4	Bool	FALSE		☐	
"Marker_990"	%Q69.5	Bool	FALSE		☐	
"Marker_991"	%Q69.6	Bool	FALSE		☐	
"Marker_992"	%Q69.7	Bool	FALSE		☐	
"Marker_993"	%Q68.0	Bool	TRUE	TRUE	☑	⚠
"Marker_994"	%Q68.1	Bool	FALSE		☐	
"Marker_995"	%Q68.2	Bool	FALSE		☐	
"Marker_996"	%Q68.3	Bool	FALSE		☐	
"Marker_997"	%Q68.4	Bool	FALSE		☐	
"Marker_998"	%Q68.5	Bool	FALSE		☐	
"Marker_999"	%Q68.6	Bool	FALSE		☐	
"Marker_1000"	%Q68.7	Bool	FALSE		☐	
"Register_97"	%QD70	DEC+/-	97	97	☑	⚠
"Register_98"	%QD74	DEC+/-	98	98	☑	⚠
"Register_99"	%QD78	DEC+/-	99	99	☑	⚠
"Register_100"	%QD82	DEC+/-	100	100	☑	⚠

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Our design expertise include systems for manufacturing plants, bulk weighing, check weighing, force measuring and process control. For over 35 years, PENKO Engineering B.V. has been at the forefront of development and production of high-accuracy, high-speed weighing systems and our solutions continue to help cut costs, increase ROI and drive profits for some of the largest global brands, such as Cargill, Sara Lee, Heinz, Kraft Foods and Unilever to name but a few.

Whether you are looking for a simple stand-alone weighing system or a high-speed weighing and dosing controller for a complex automated production line, PENKO has a comprehensive range of standard solutions you can rely on.

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