PENKO Engineering B.V.

Your Partner for Fully Engineered Factory Solutions

How to…

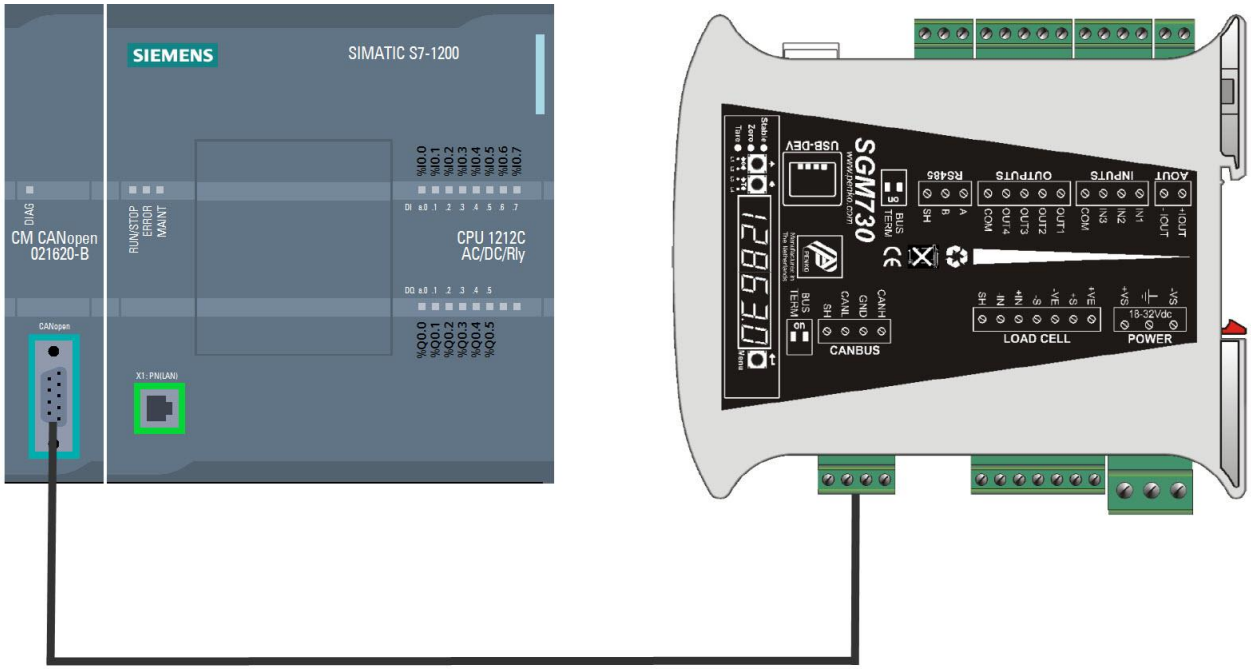
Connect a SGM730 CANopen to a Siemens PLC

PENKO
an ETC Company

Table of Contents

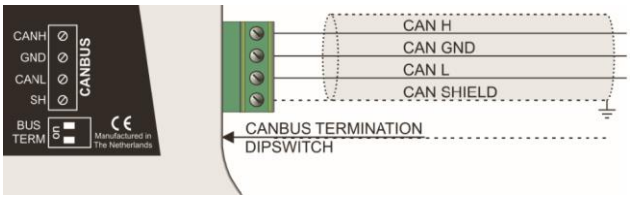
Hardware connection

Connect the HMS 021620-B CANopen module to the PLC. Connect the SGM730 to the HMS 021620-B with the cable connection below.



Cable connection

Cable between HMS 021620-B and Penko SGM730 or SGM830	
9 pin sub-D female connector	4 pin screw connector
2	CAN L
3	GND
5	SH
7	CAN H



Software

The software and files that are used in this How to:

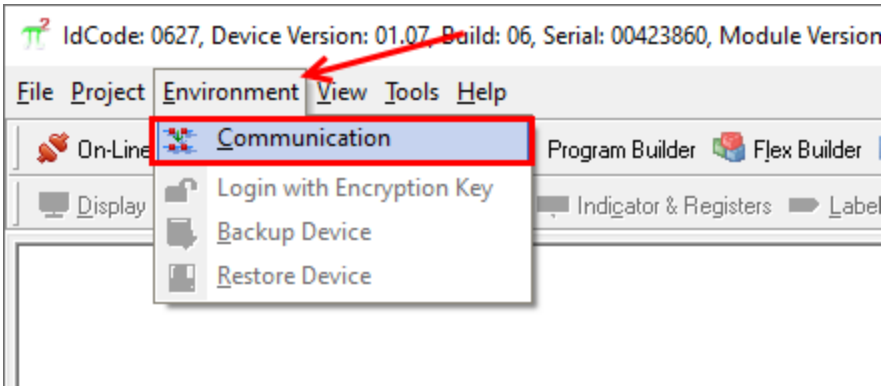
- Pi Mach II Download at https://penko.com/Support/Software/
- Penko USB divers Download at https://penko.com/Support/Software/
- SGM730 EDS file Download at https://penko.com/Support/Software/
- CM CANopen Configuration Studio Download at https://www.ixxat.com/technical-support/resources/downloads-and-documentation?ordercode=021620-B
- HSP for TIA Portal V15.1 – Configuration File Download at https://www.ixxat.com/technical-support/resources/downloads-and-documentation?ordercode=021620-B
- Tia Portal V15.1

USB drivers

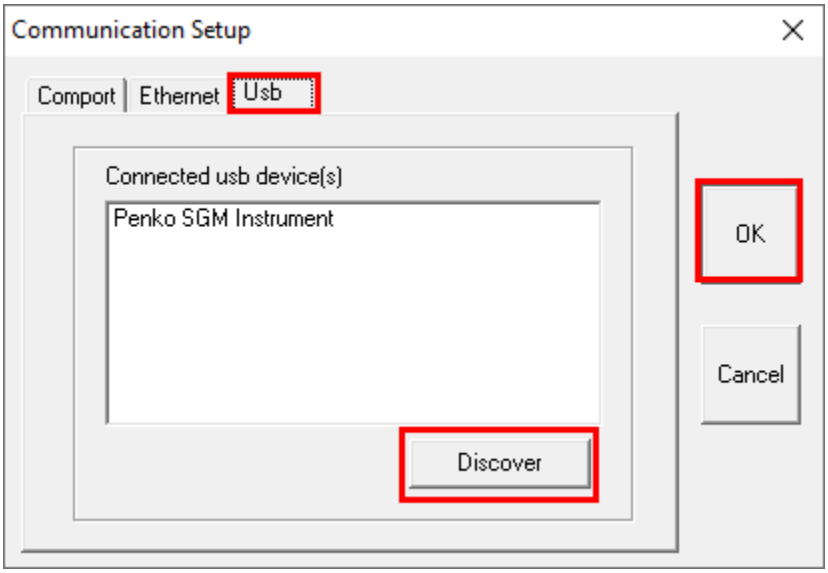
Install the USB drivers for your system.

Pi Mach II

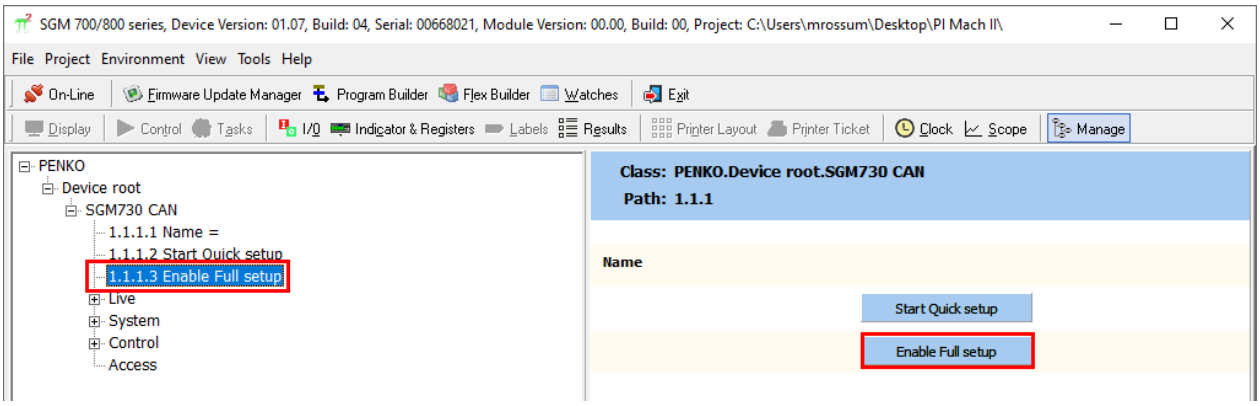
When the USB drivers are installed, connect the SGM730 to your PC with a USB cable. Open Pi Mach II, if the SGM730 is not detected, go to Environment and click on Communication.



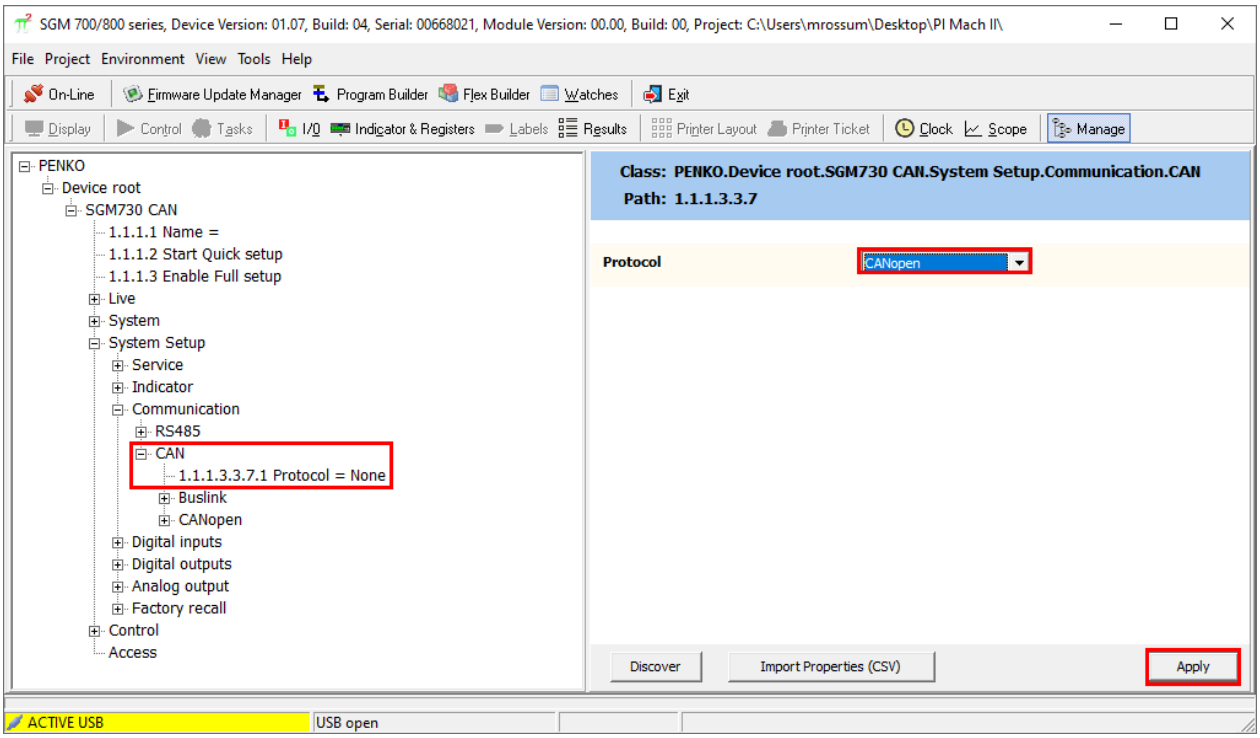
Go to the tab Usb and the Penko SGM Instrument is detected, if not click on Discover. Then click on OK.



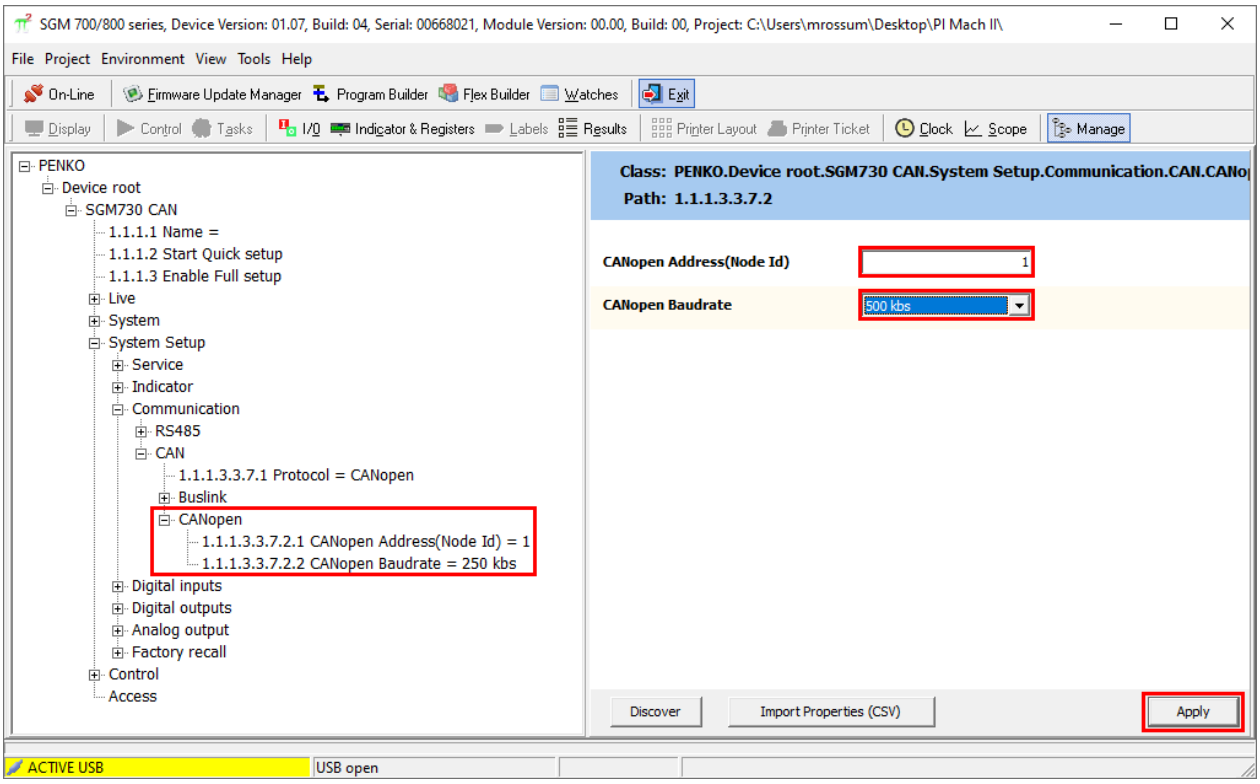
Click on SGM730 CAN – 1.1.1.3 Enable Full Setup, then click on the Enable Full setup button.



Go to System Setup – Communication – CAN, set the protocol on CANopen and click on Apply.



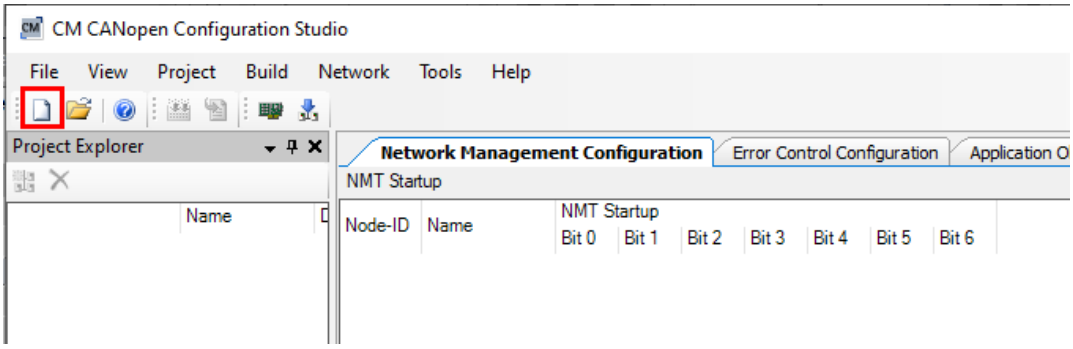
Go to CANopen and set the Node ID for the SGM730 and the baudrate, then click on Apply. In the How to the Node Id is set to 1 and the baudrate is set to 500kbs.



CM CANopen Configuration Studio

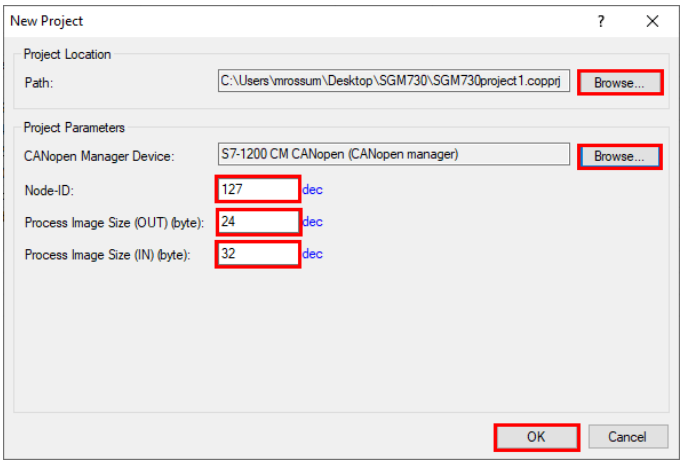
Create a project

Open the CM CANopen Configuration Studio and click on New.

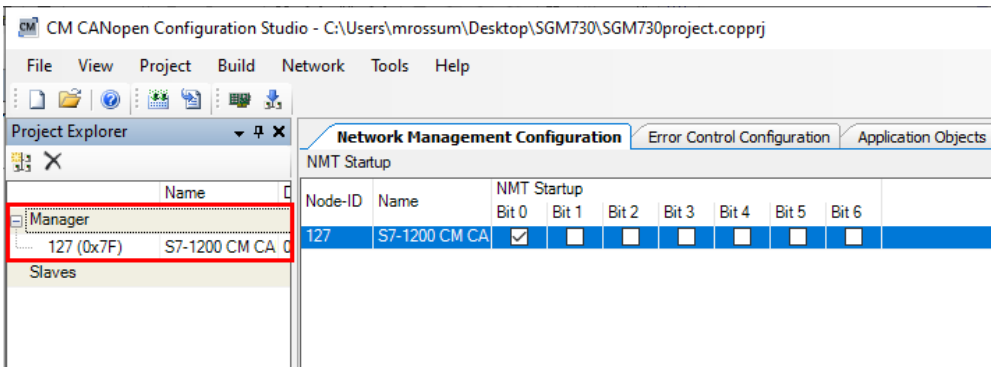


First set the project Location where you want your project to be saved, then set the Project Parameter to S7-1200 CM CANopen (CANopen Manager).

Set the Node-ID to 127, Process Image Size (OUT) (byte) to 24 and Process Image Size (IN) (byte) to 32 then click on OK.

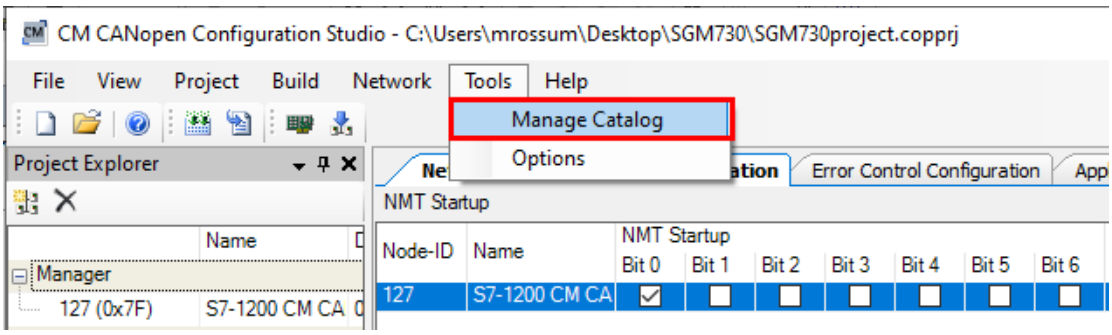


The manager device is now added into the project.

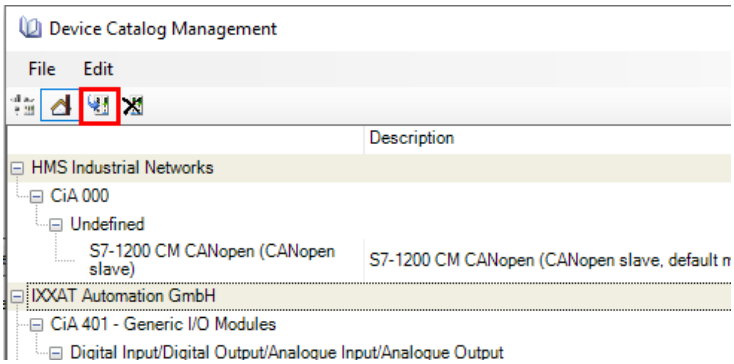


Install the EDS file

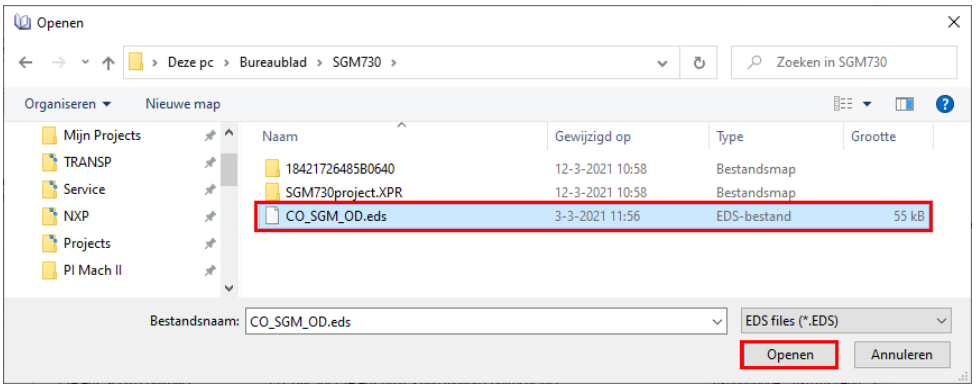
To install the SGM730 EDS file into the project, click on Tools – Manage Catalog.



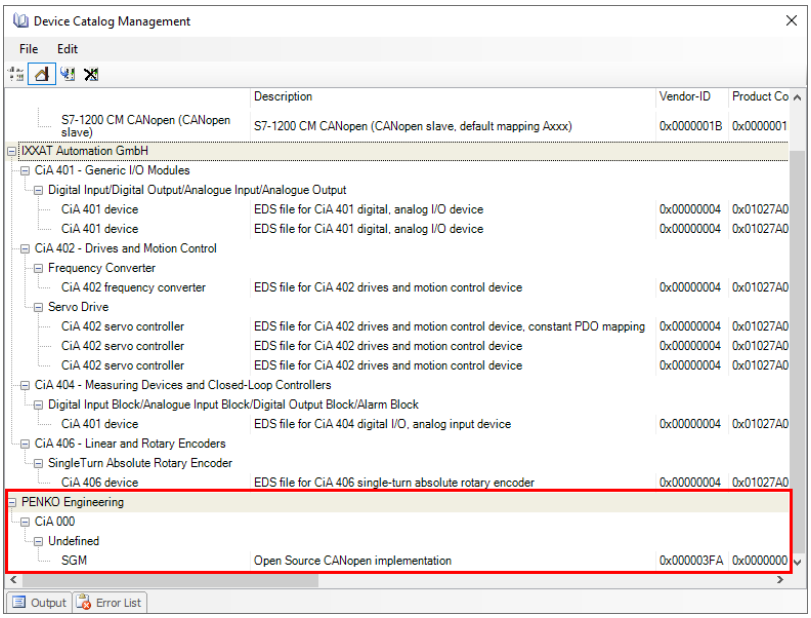
Click on Import a device.



Go to the folder where the EDS file is stored, select the EDS file and click on Open.

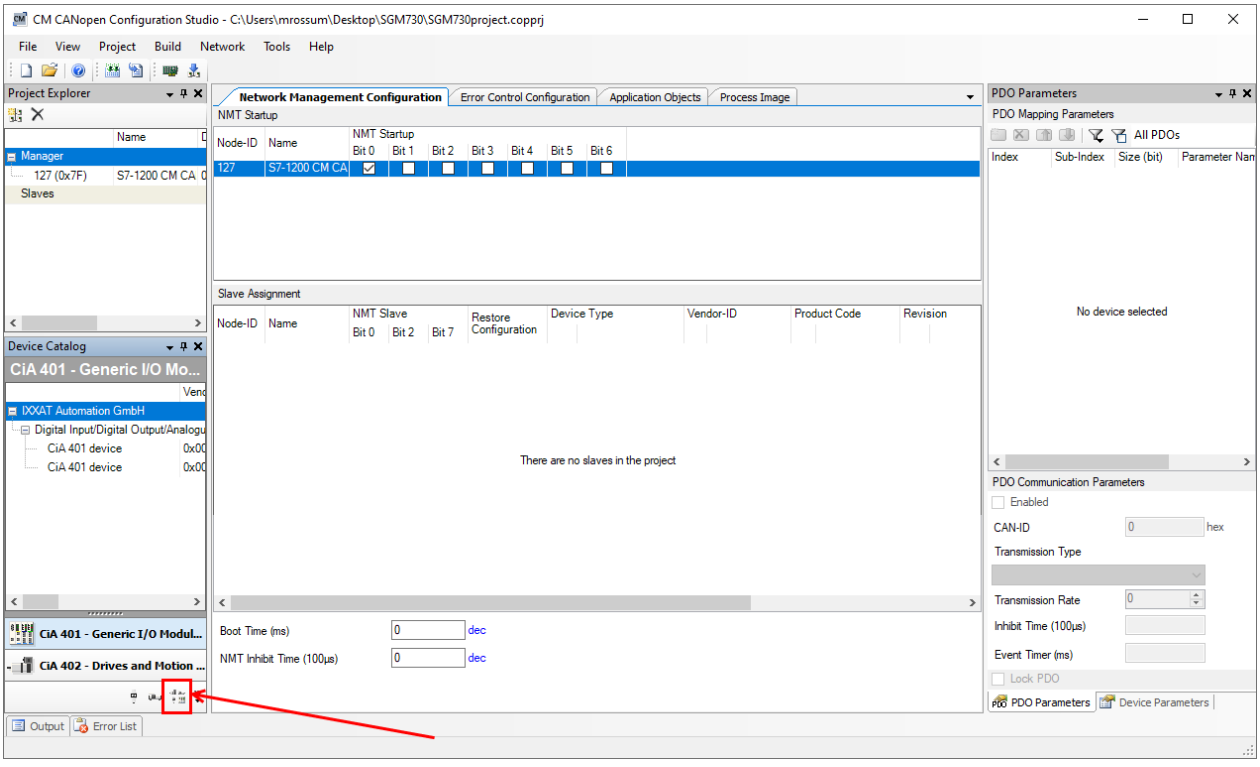


The SGM730 is now added to the device catalog, close the Device Catalog Management window.

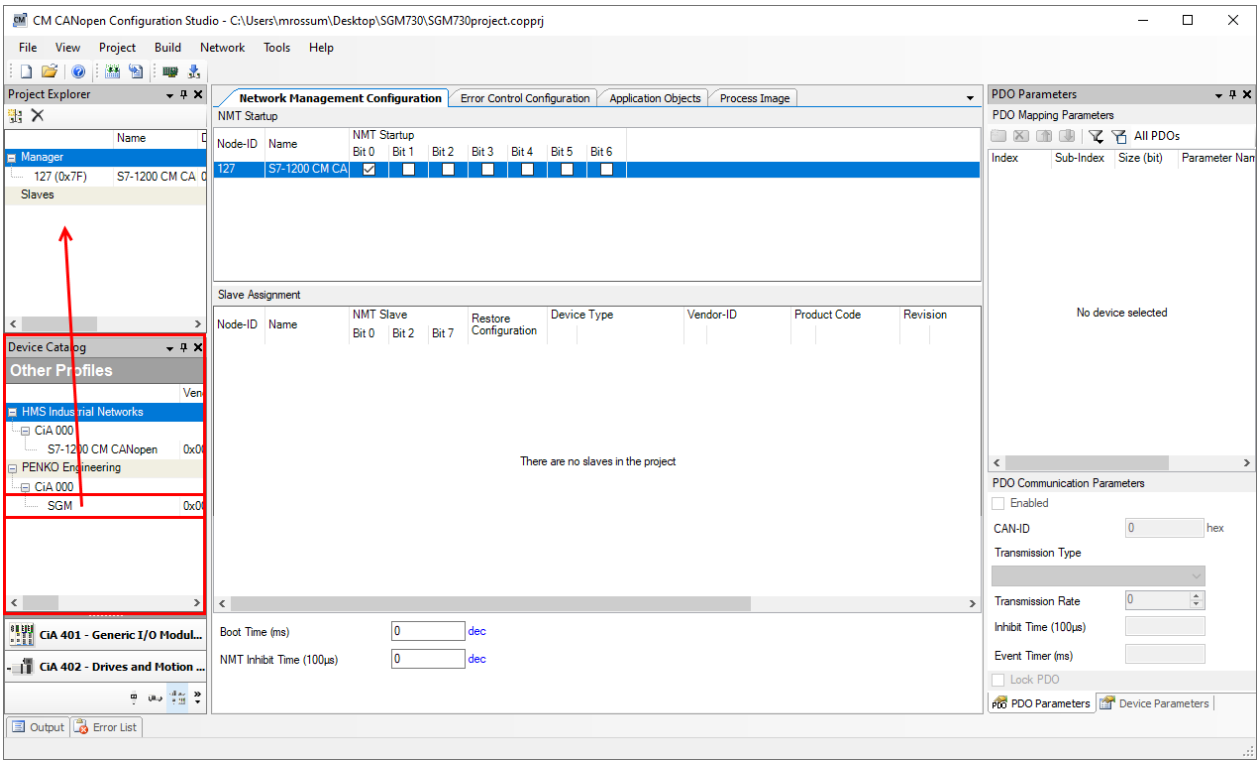


Add the SGM730 into the project

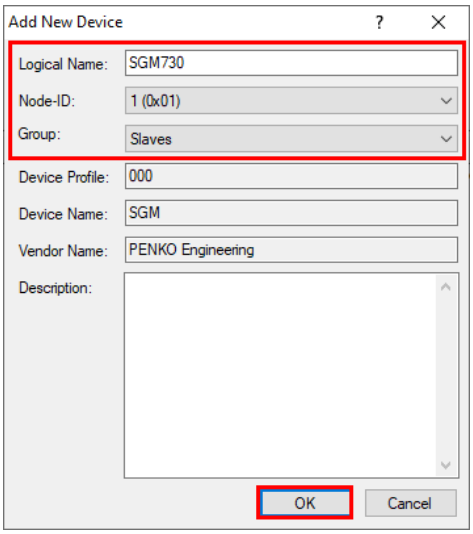
Click on Other profiles.



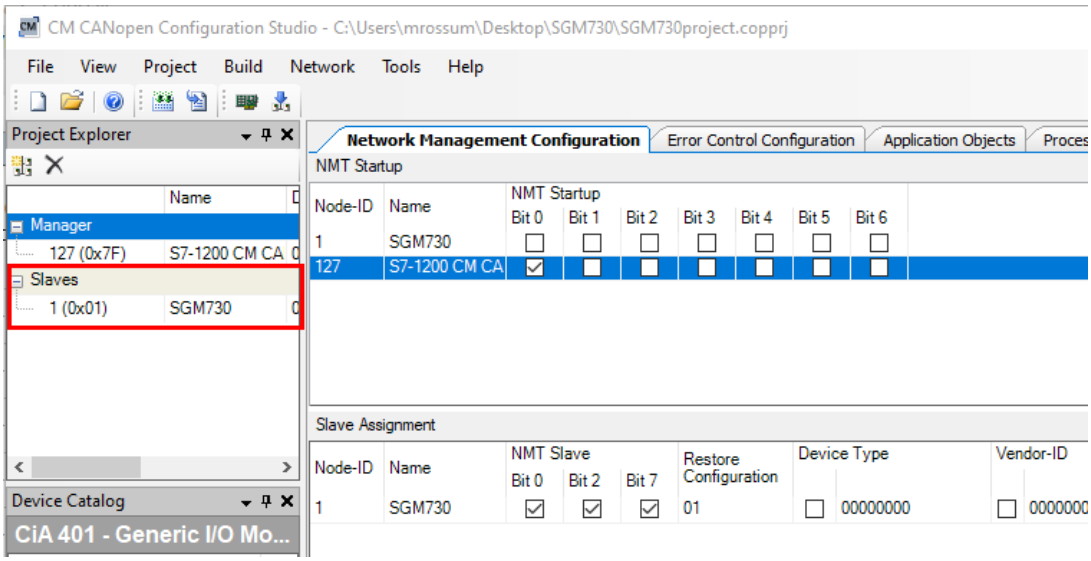
The Device Catalog for Other Profiles is now shown, drag and drop the SGM under Slaves.



The Add New Device window is opened, set a logical name, set the Node-ID to 1 and set Group to Slaves. Then click on OK.

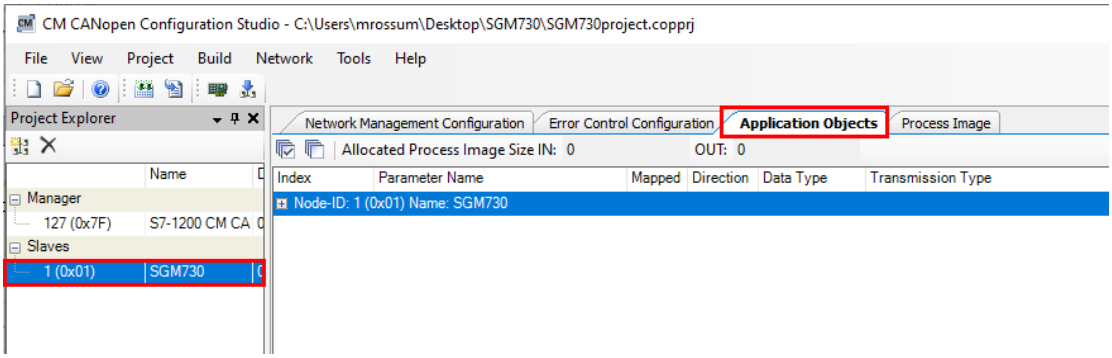


The SGM730 is now added into the project.



Specify data

To specify the data that is read or written from the SGM730, first select the SGM730 under Slaves and then click on the tab Application Objects.



In our example not all options are used.

Index	Parameter Name	Mapped	Direction	Data Type	Transmission Type	No of SYNC
Node-ID: 1 (0x01) Name: SGM730						
1001	Error register	☐	IN	UNSIGNED8	Event-driven (profile specific)	
1002	Manufacturer status register	☐	IN	UNSIGNED32	Event-driven (profile specific)	
⊞ 1280						
2100	Error status bits	☐	IN	OCTET_STRIN(	Event-driven (profile specific)	
⊞ 2107						
⊟ 3000						
01	Input 1-8	☑	IN	UNSIGNED8	Event-driven (profile specific)	
02	Input 9-16	☐	IN	UNSIGNED8	Event-driven (profile specific)	
⊟ 3001						
01	Output 201-208	☑	IN	UNSIGNED8	Event-driven (profile specific)	
02	Output 209-216	☐	IN	UNSIGNED8	Event-driven (profile specific)	
⊟ 3002						
01	Marker 401-408	☑	IN	UNSIGNED8	Event-driven (profile specific)	
02	Marker 409-416	☑	IN	UNSIGNED8	Event-driven (profile specific)	
03	Marker 417-424	☑	IN	UNSIGNED8	Event-driven (profile specific)	
04	Marker 425-432	☑	IN	UNSIGNED8	Event-driven (profile specific)	
05	Marker 433-440	☐	IN	UNSIGNED8	Event-driven (profile specific)	
06	Marker 441-448	☐	IN	UNSIGNED8	Event-driven (profile specific)	
07	Marker 449-456	☐	IN	UNSIGNED8	Event-driven (profile specific)	
08	Marker 457-464	☐	IN	UNSIGNED8	Event-driven (profile specific)	
⊟ 3100						
01	Marker 969-976	☑	OUT	UNSIGNED8	Event-driven (profile specific)	
02	Marker 977-984	☑	OUT	UNSIGNED8	Event-driven (profile specific)	
03	Marker 985-992	☑	OUT	UNSIGNED8	Event-driven (profile specific)	
04	Marker 993-1000	☑	OUT	UNSIGNED8	Event-driven (profile specific)	
⊟ 3200						
01	Command	☑	OUT	UNSIGNED32	Event-driven (profile specific)	
02	Preset Tare	☑	OUT	UNSIGNED32	Event-driven (profile specific)	
⊞ 3201						
⊞ 3202						
⊞ 3203						
⊞ 3204						
⊞ 3205						
⊞ 3206						
⊟ 3300						
01	index	☑	OUT	INTEGER32	Event-driven (profile specific)	
02	Register[index]	☑	OUT	INTEGER32	Event-driven (profile specific)	
⊟ 3301						
01	Indicator index	☑	IN	INTEGER32	Event-driven (profile specific)	

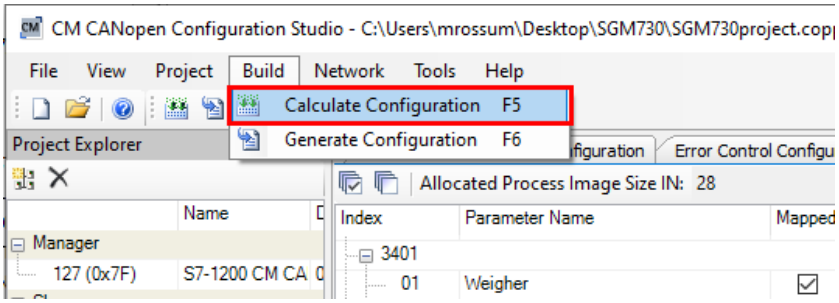
Communication Cycle Period (ms) 0 dec SYNC Producer None

Process Image Size (OUT) (byte) 32 dec

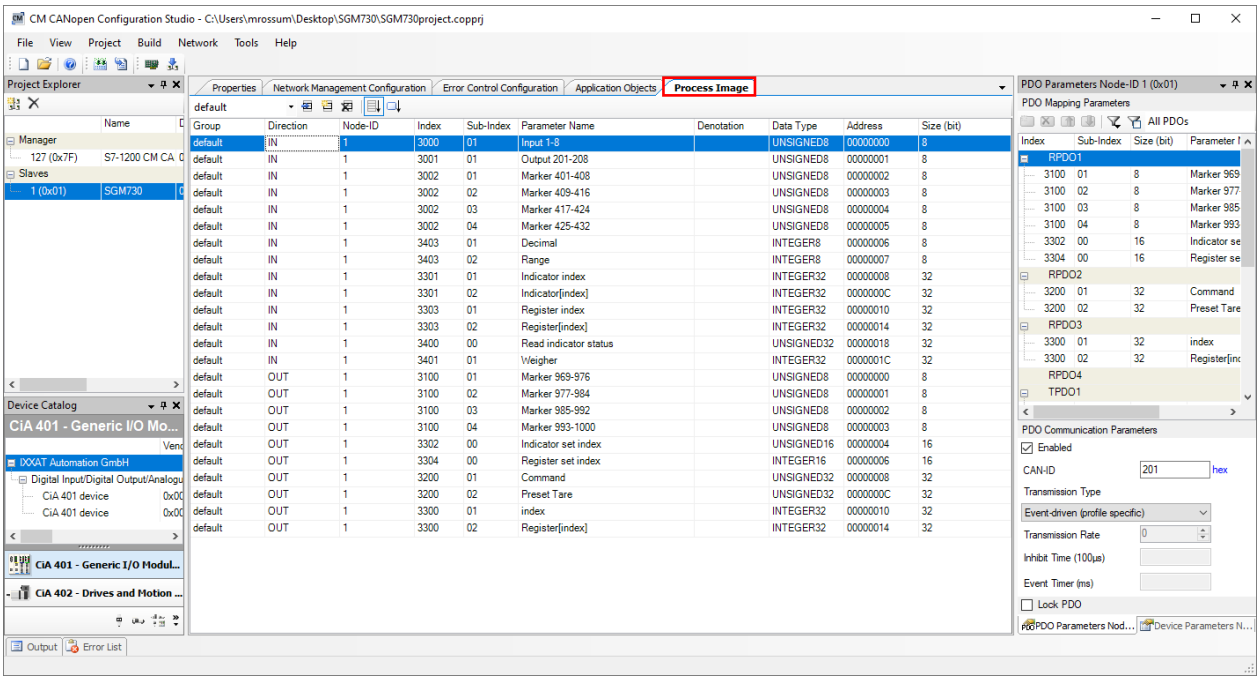
Process Image Size (IN) (byte) 24 dec

3401					
01	Weigher	☑	IN	INTEGER32	Event-driven (profile specific)
02	Gross	☐	IN	INTEGER32	Event-driven (profile specific)
03	Net	☐	IN	INTEGER32	Event-driven (profile specific)
04	Display Gross	☐	IN	INTEGER32	Event-driven (profile specific)
05	Display Net	☐	IN	INTEGER32	Event-driven (profile specific)
06	Tare	☐	IN	INTEGER32	Event-driven (profile specific)
07	Peak	☐	IN	INTEGER32	Event-driven (profile specific)
08	Valley	☐	IN	INTEGER32	Event-driven (profile specific)
09	Hold	☐	IN	INTEGER32	Event-driven (profile specific)
0A	Net x10	☐	IN	INTEGER32	Event-driven (profile specific)
0B	Gross x10	☐	IN	INTEGER32	Event-driven (profile specific)
0C	Preset tare	☐	IN	INTEGER32	Event-driven (profile specific)
0D	Calculated Gross	☐	IN	INTEGER32	Event-driven (profile specific)
0E	Calculated Tare	☐	IN	INTEGER32	Event-driven (profile specific)
0F	Tare x10	☐	IN	INTEGER32	Event-driven (profile specific)
10	Peak x10	☐	IN	INTEGER32	Event-driven (profile specific)
11	Valley x10	☐	IN	INTEGER32	Event-driven (profile specific)
12	Hold x10	☐	IN	INTEGER32	Event-driven (profile specific)
13	Signal(mV)	☐	IN	INTEGER32	Event-driven (profile specific)
3402					
3403					
01	Decimal	☑	IN	INTEGER8	Event-driven (profile specific)
02	Range	☑	IN	INTEGER8	Event-driven (profile specific)
3500	Read analog output	☐	IN	UNSIGNED16	Event-driven (profile specific)
3700					
3701					
3702					

Click on Build – Calculate Configuration to create the data structure.

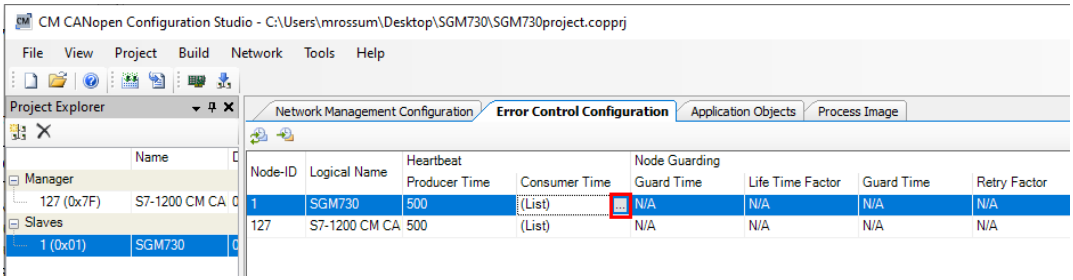


Click on the Process Image tab to view the data structure.

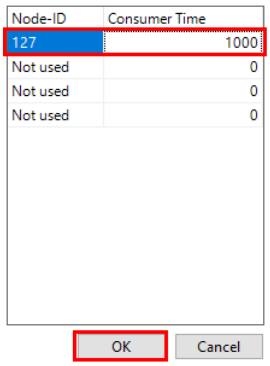


Error detection

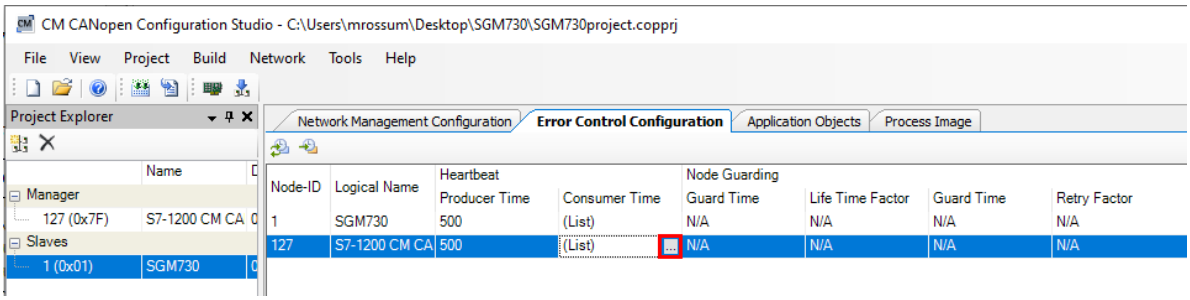
To detect if a node becomes unresponsive a heartbeat is set up, click on the tab Error Control Configuration. Select the SGM730 and click on the .. button under Consumer Time.



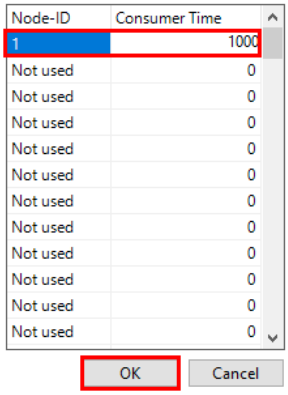
Set the Node-ID to 127 and the Consumer Time to 1000 (msec), then click on OK.



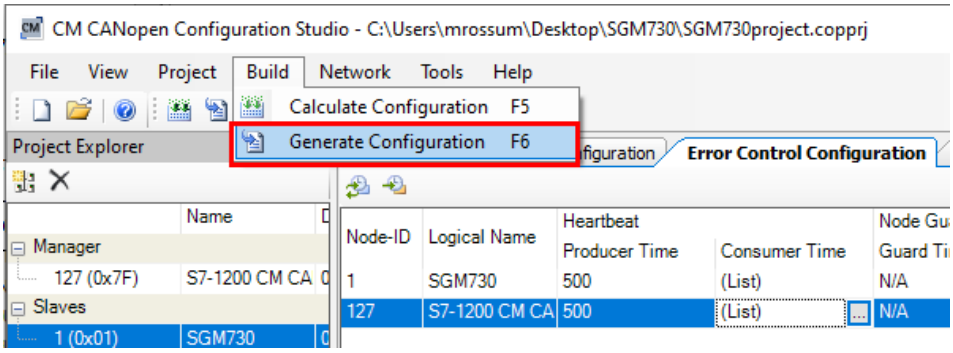
Repeat this step for the S7-1200 CM CANopen, click on the .. button under Consumer Time.



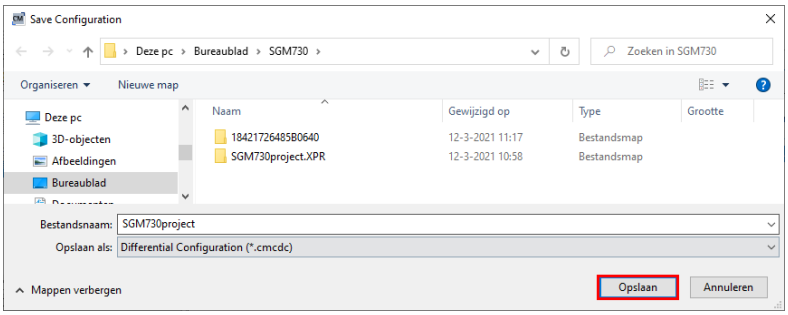
Set the Node-ID to 1 and the Consumer Time to 1000 (msec), then click on OK.



Click on Build – Generate Configuration.

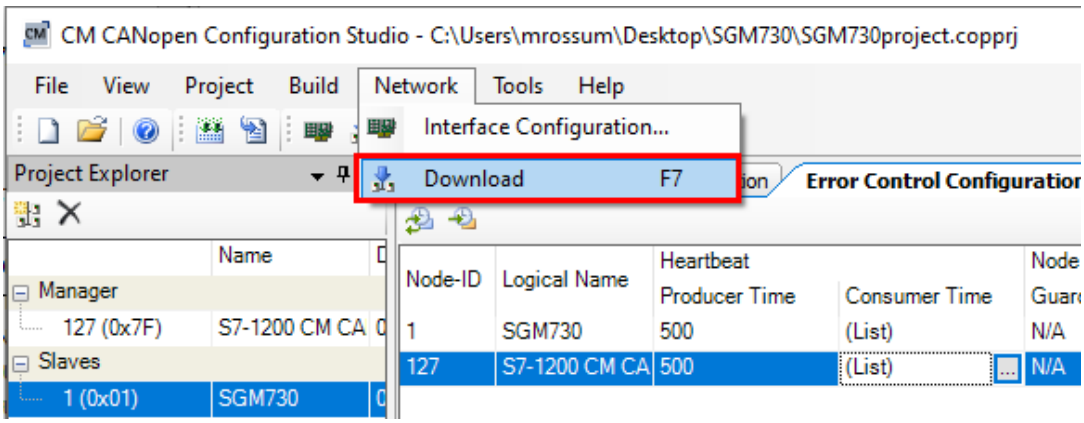


Save the file into the same folder as the project.

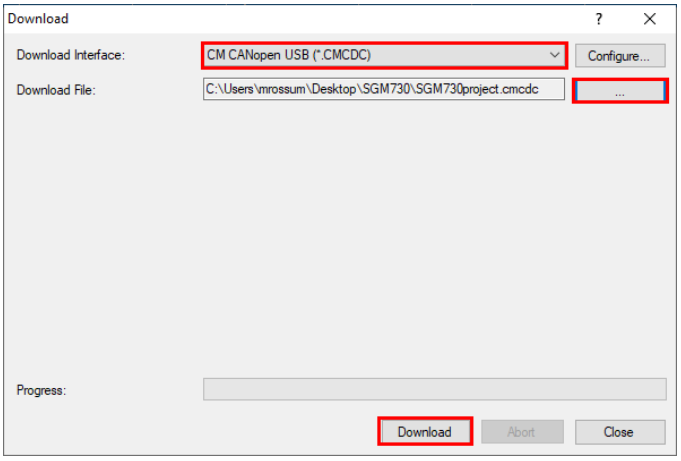


Download the configuration into the module

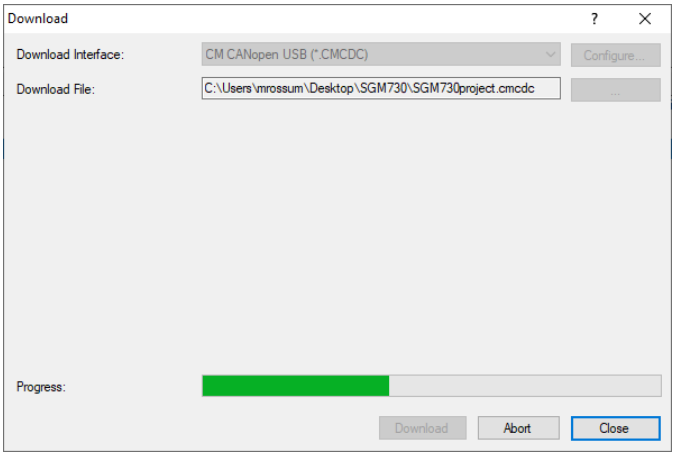
Connect the module to your PC via a mini USB cable, click on Network – Download.



Select the Download Interface, download file and click on Download.



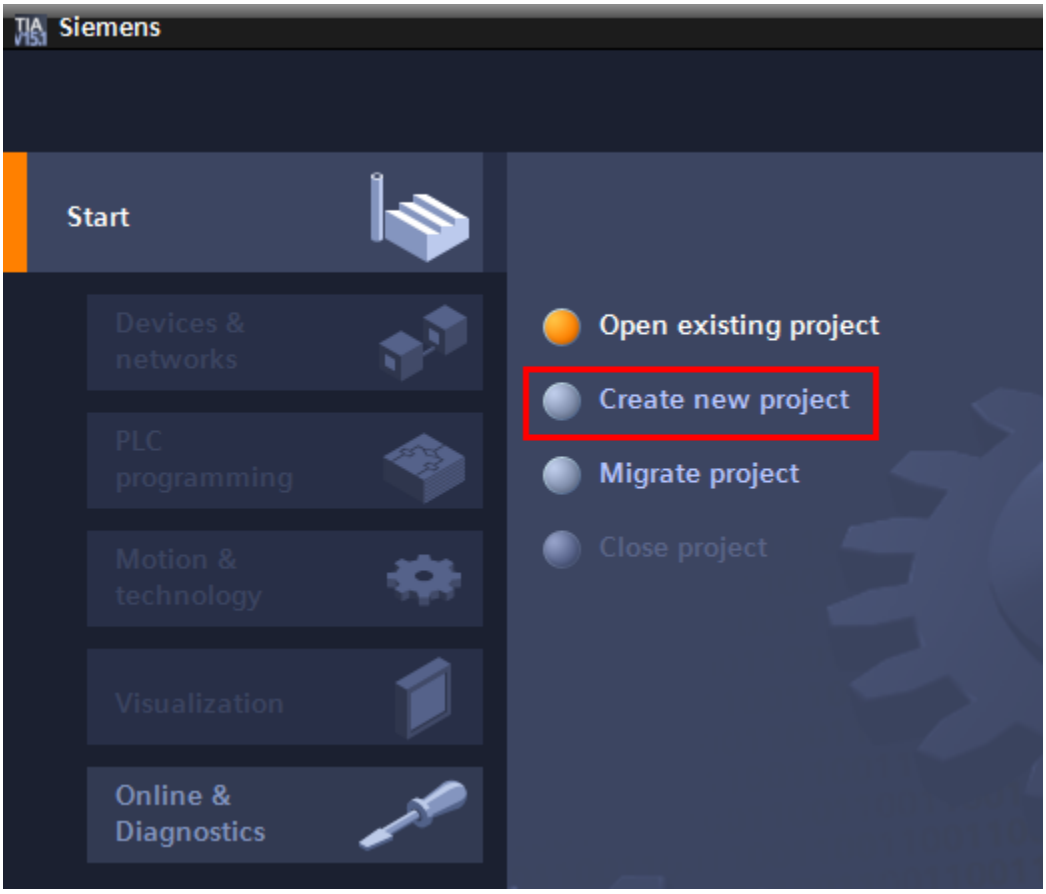
The file is downloaded into the module, when completed click close and close the CM CANopen Configuration Studio.



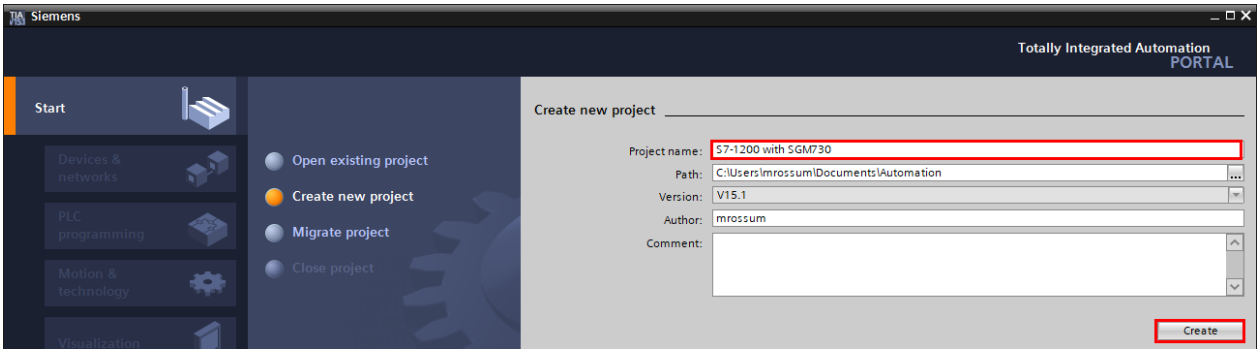
Tia Portal V15.1

Create a project

Open Tia Portal and click on Create new project.

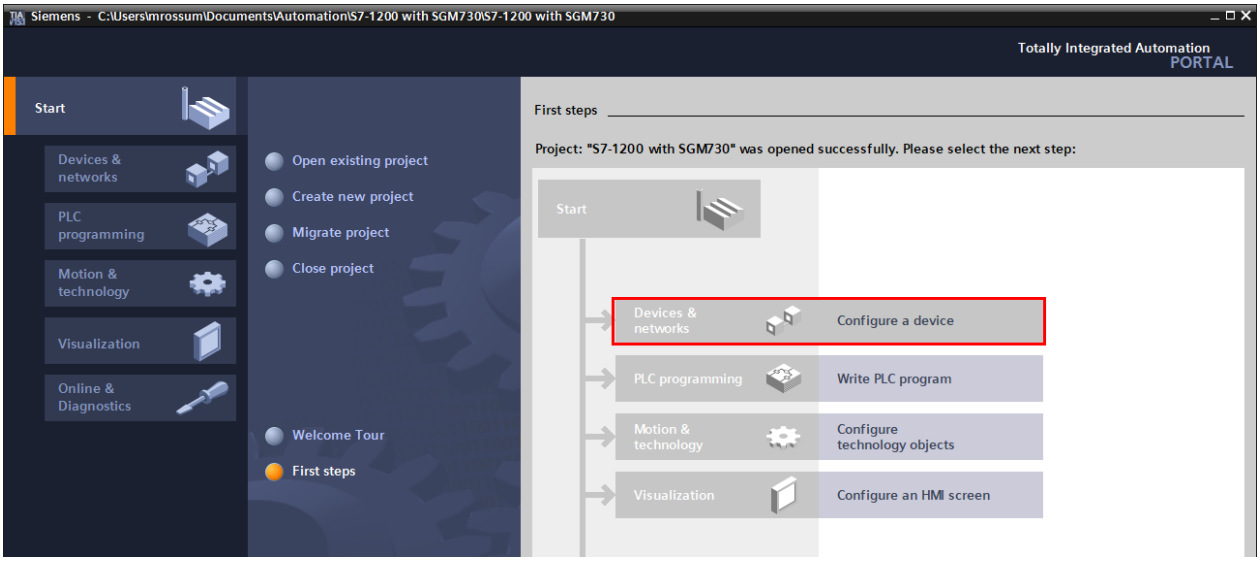


Give the project a name and click on Create.

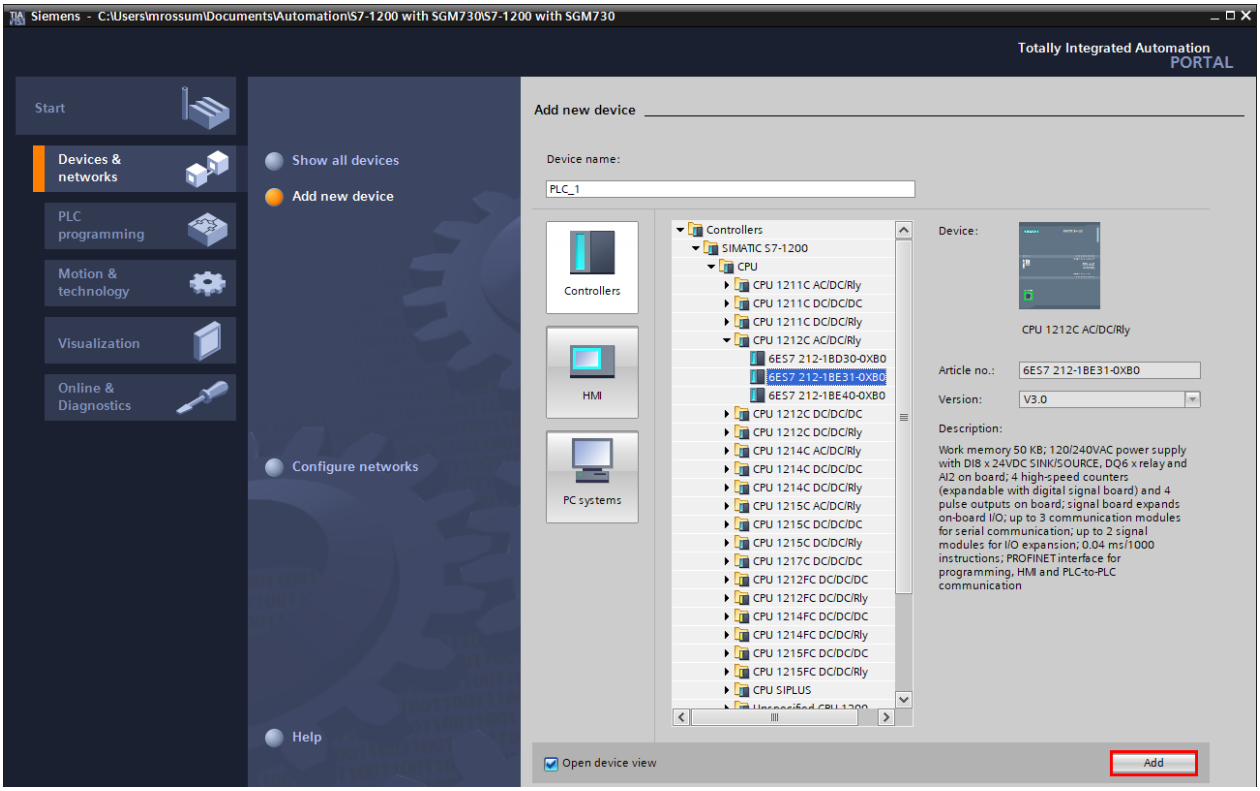


Add a PLC to the project

Click on Configure a device.

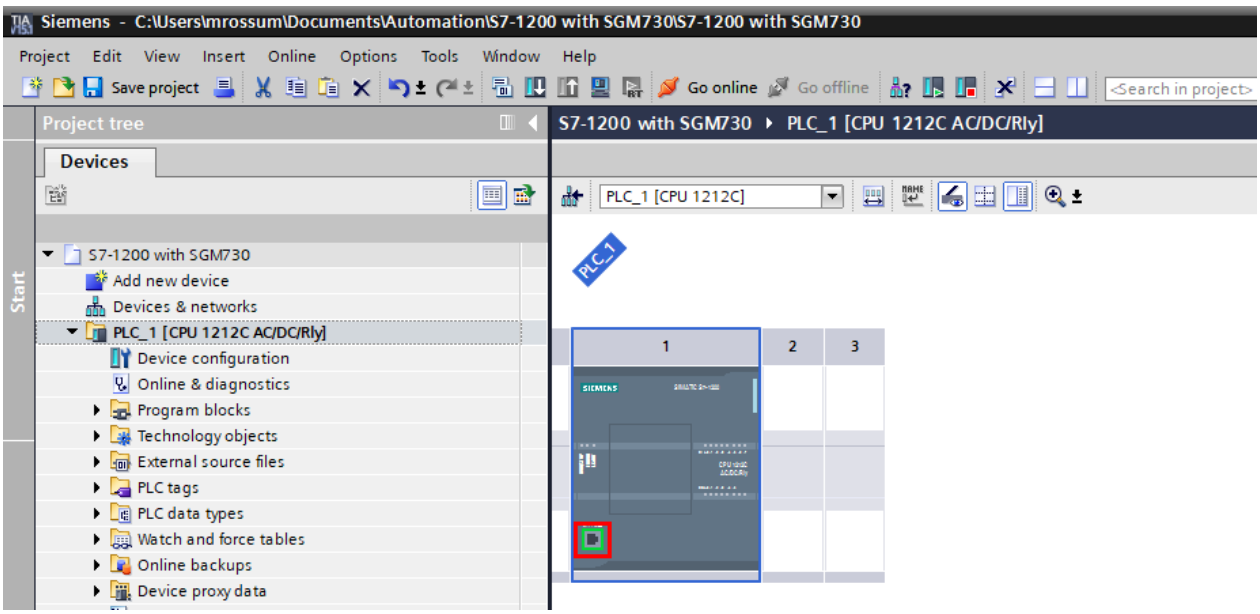


Click on Add new device, select your PLC and click on Add.

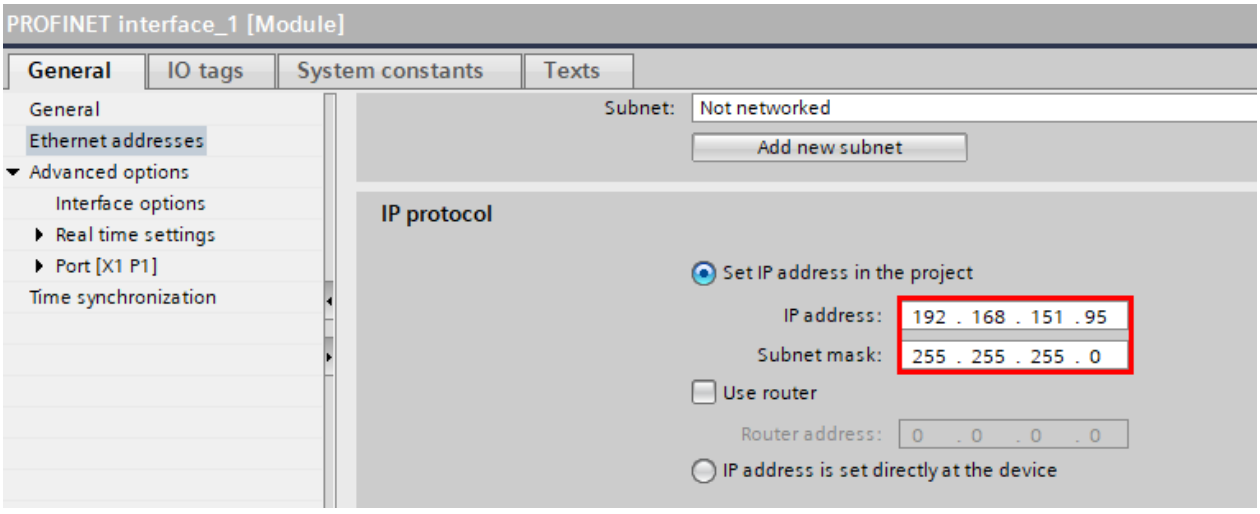


Assign an IP address to the PLC

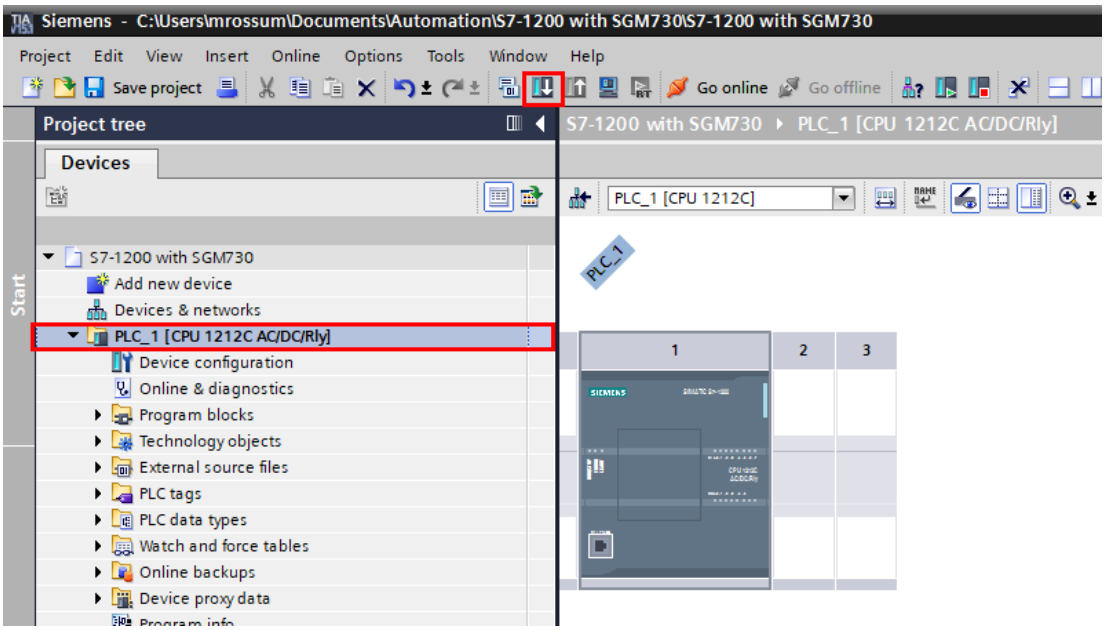
Double click on the green square of the PLC.



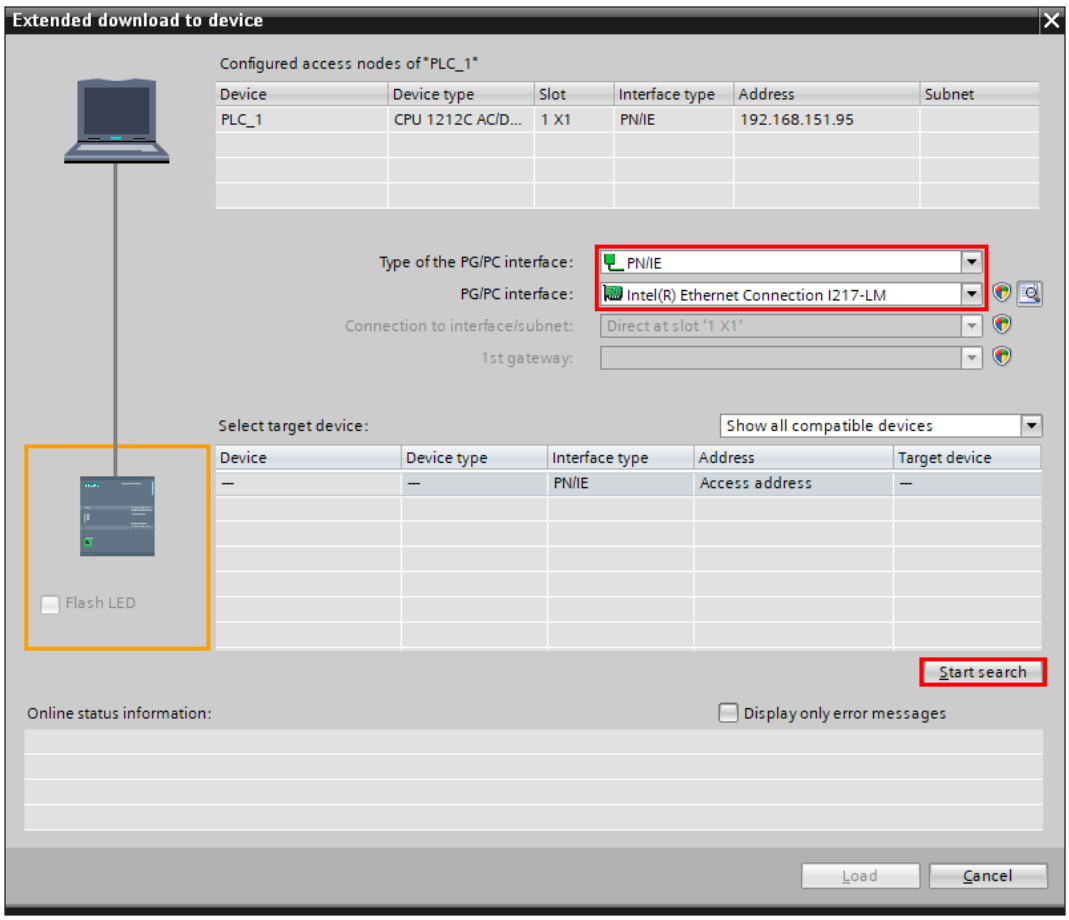
Here you can set the IP address for the PLC.



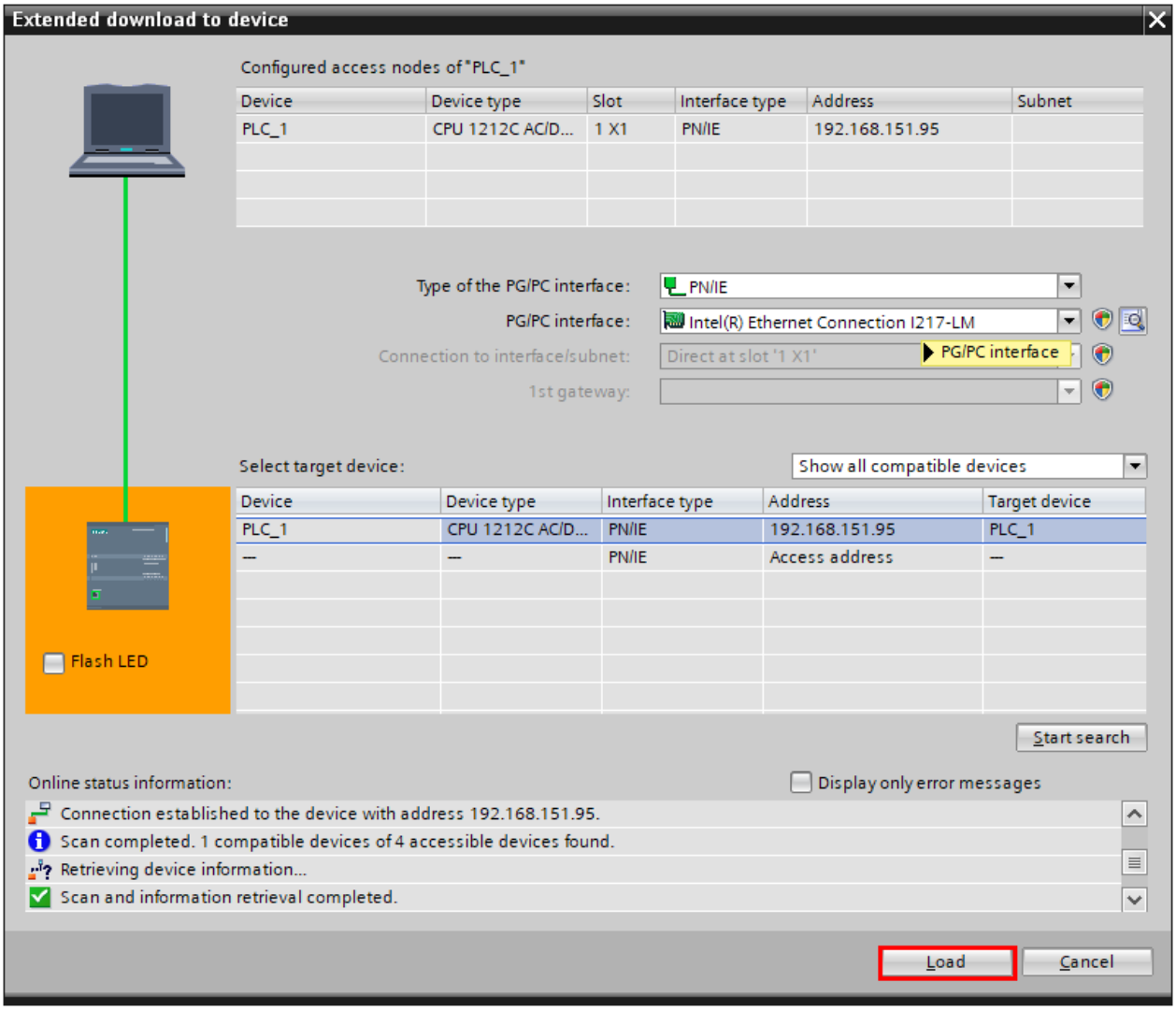
Click on the Line PLC_1 [CPU 1212C AC/DC/Rly] and click on the button Download to device.



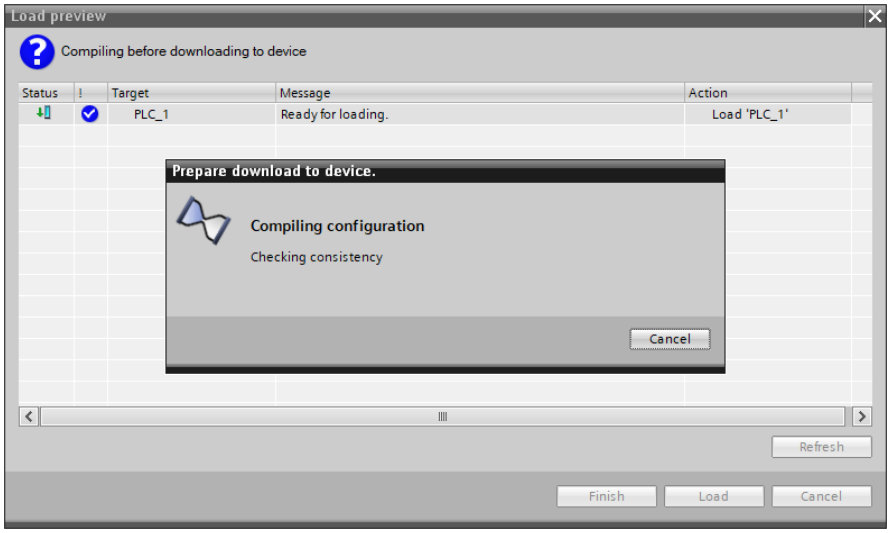
Select the interface that the PLC is connected to and click on Start search.



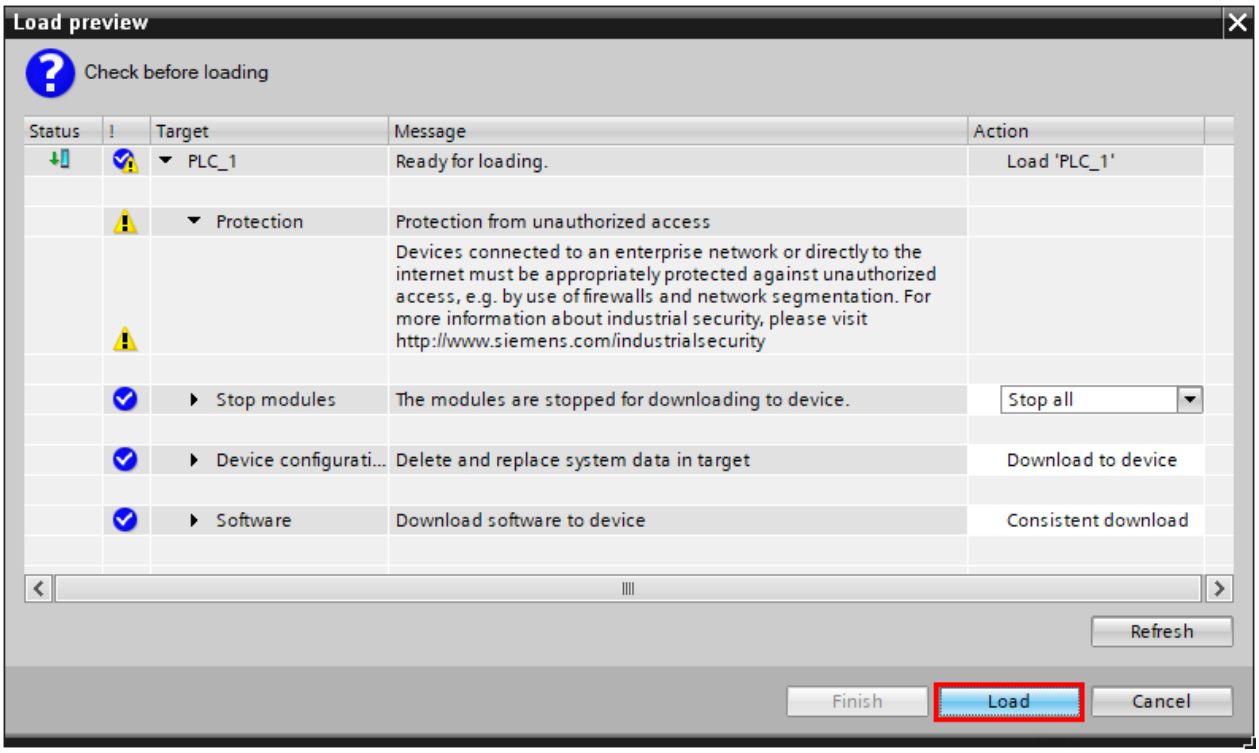
When the PLC is found click on Load. (The example below already had the correct IP address. When the PLC doesn't have an IP address yet, the MAC Address is shown.)



The configuration will compile.

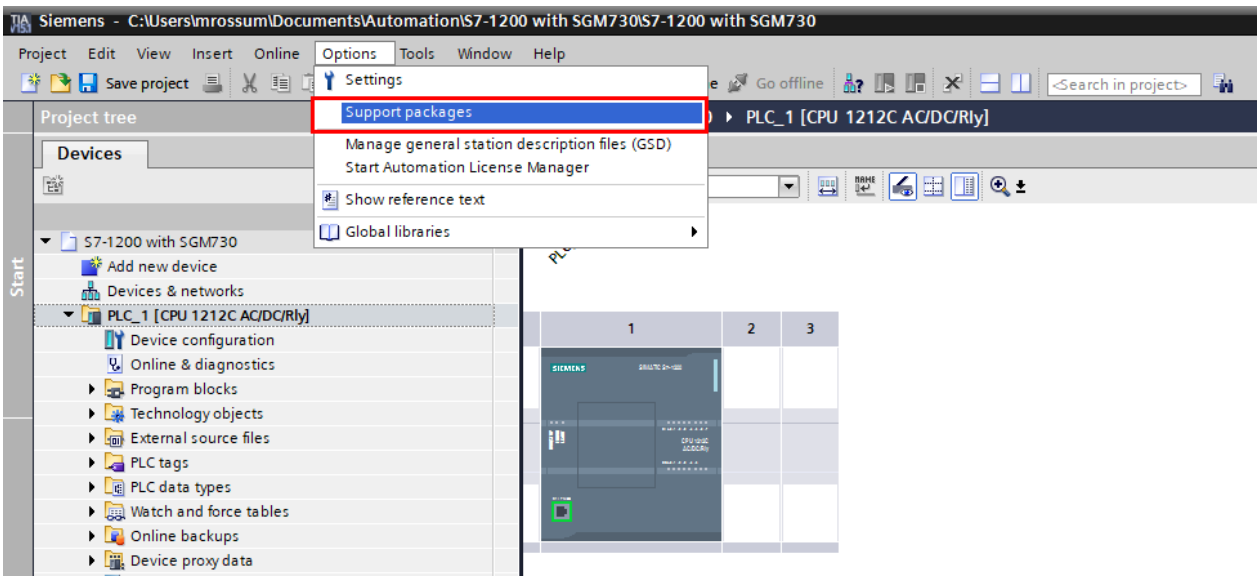


Click on Load to download the configuration into the PLC. When completed click on Finish.

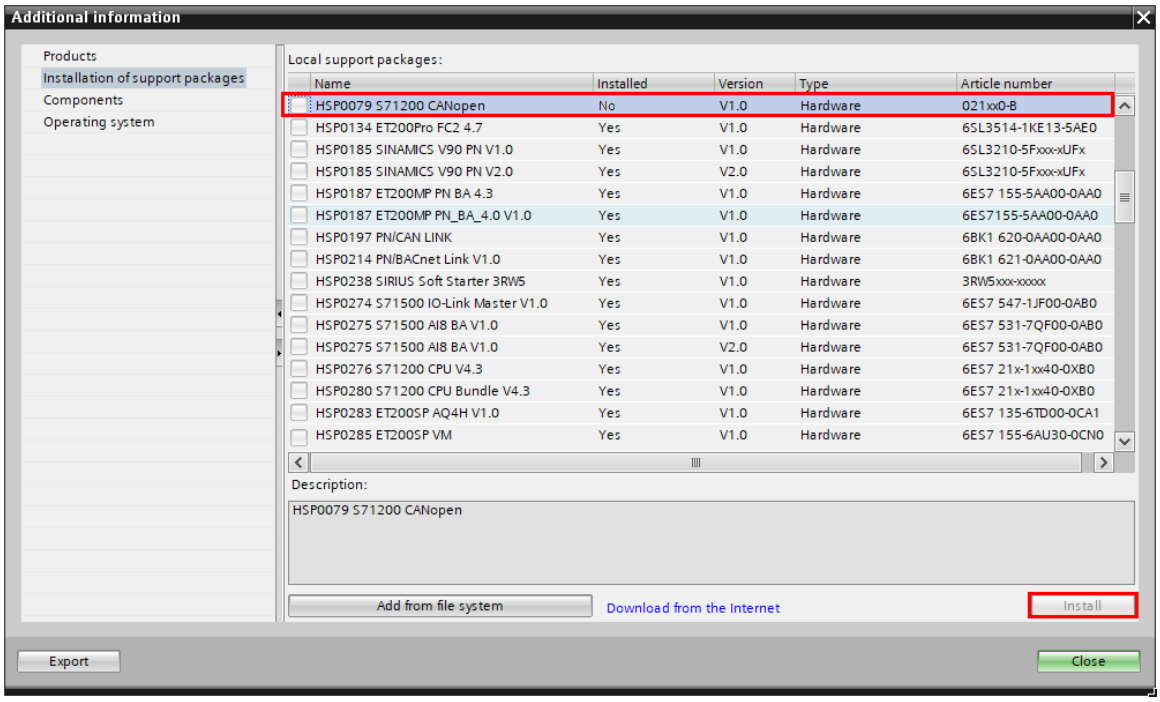


Add the HMS 021620-B support package to the project

Click on Options and click on Support packages.



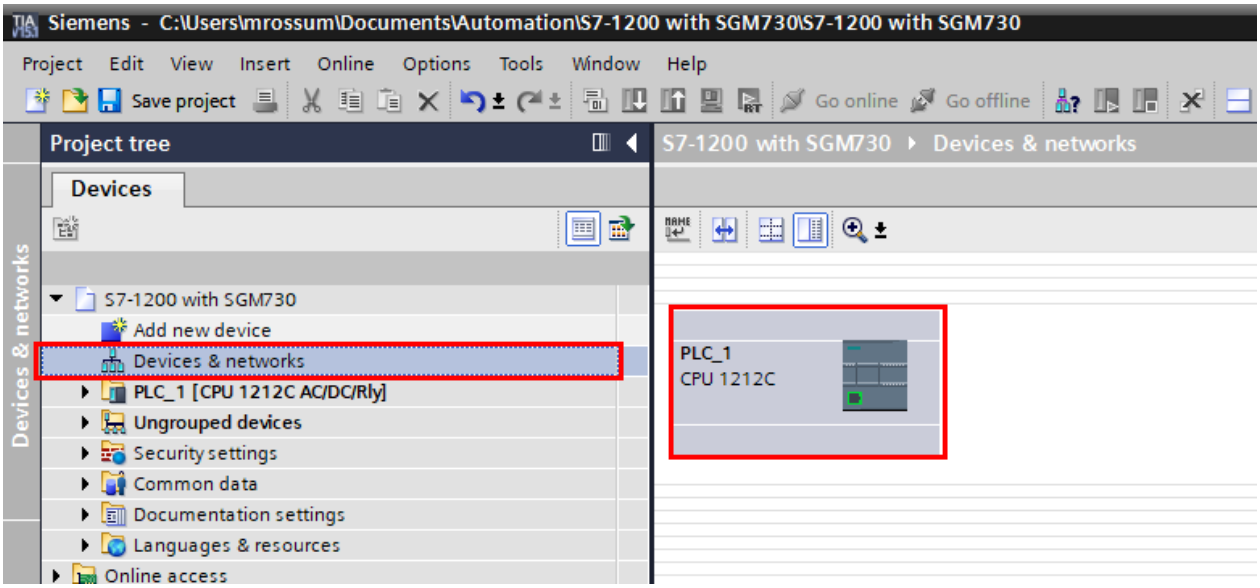
Select the HSP0079 S71200 CANopen file and click on Install. If it is not shown, click on Add form file system and locate the file. When installed, click n Close.



The hardware catalog will be updated.

Devices & networks

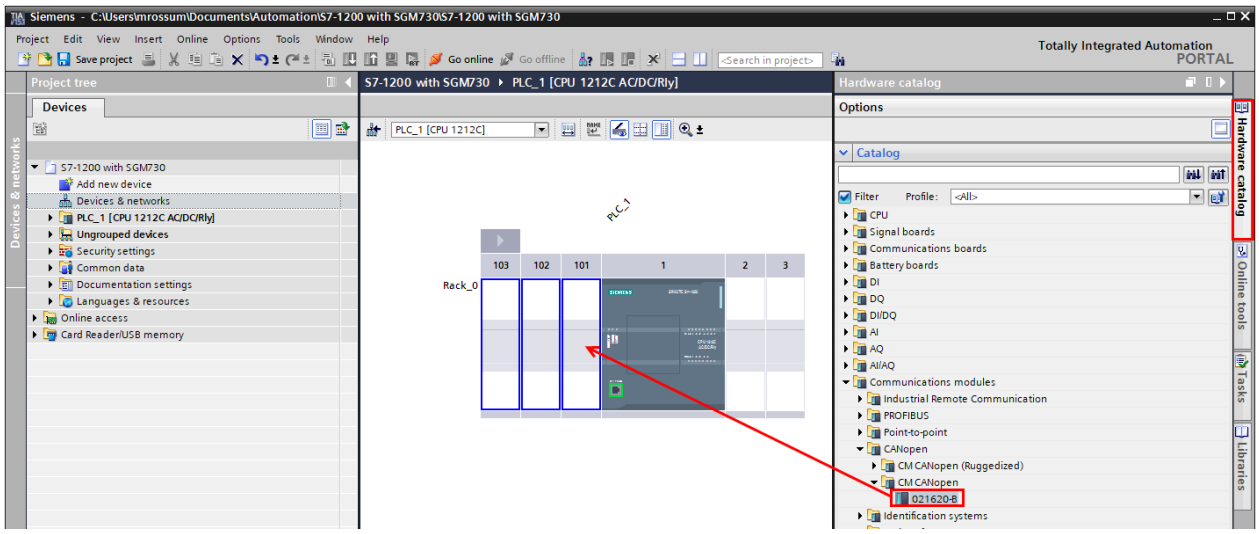
Double click on Devices & networks in the left column. It will show the PLC in the network, double click on the PLC_1.



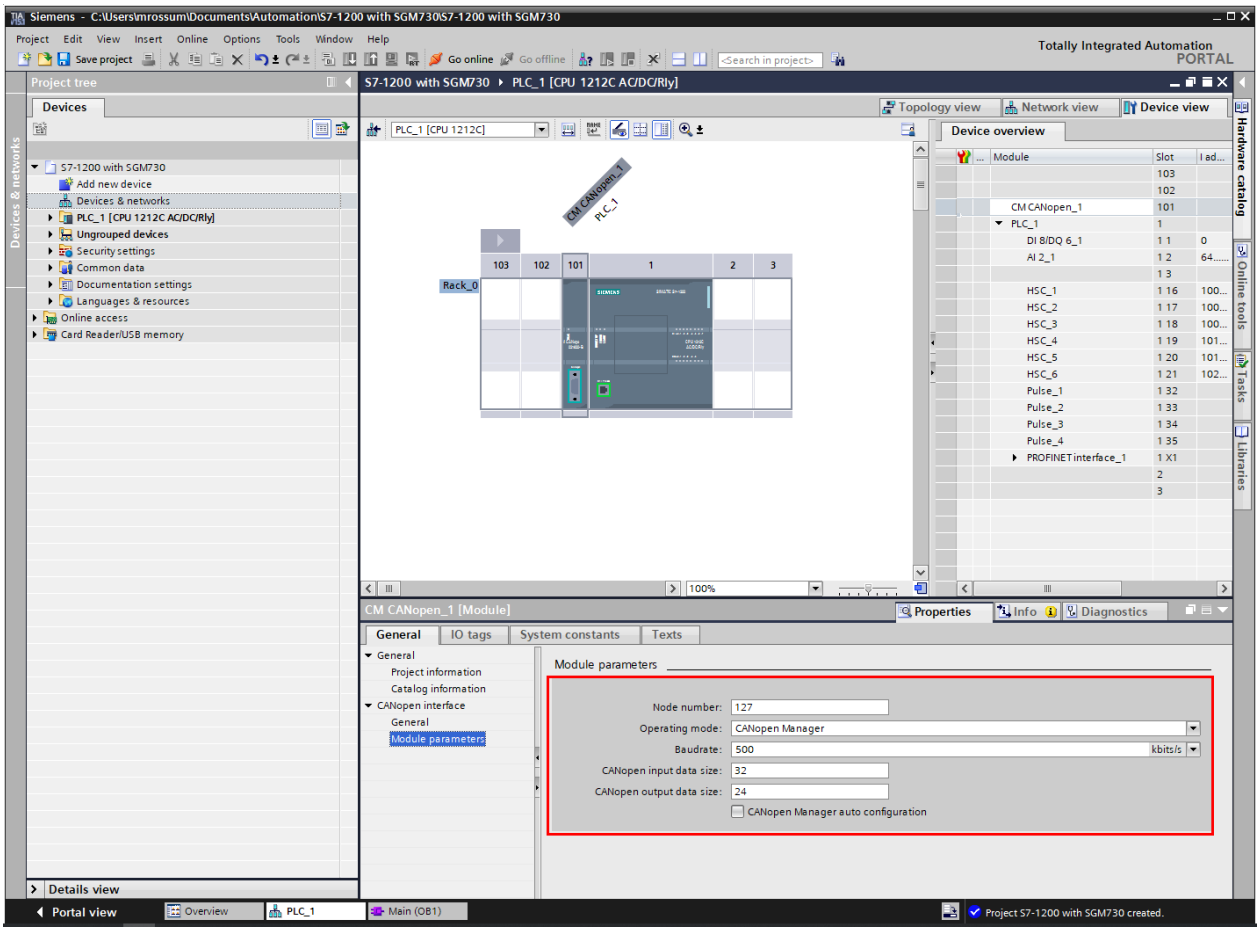
Go to the right column and select the 021620-B in the Hardware catalog. Follow the path:

Communications modules – CANopen – CM CANopen

Drag and drop the 021620-B into Rack position 101.



The HMS 021620-B is now added to the PLC, setup the Module parameters as below.



You are now ready to program the communication between the SGM730 and PLC.

About PENKO

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.

Certifications

PENKO sets high standards for its products and product performance which are tested, certified and approved by independent expert and government organizations to ensure they meet – and even – exceed metrology industry guidelines. A library of testing certificates is available for reference on:
http://penko.com/nl/publications_certificates.html

PENKO Professional Services

PENKO is committed to ensuring every system is installed, tested, programmed, commissioned and operational to client specifications. Our engineers, at our weighing center in Ede, Netherlands, as well as our distributors around the world, strive to solve most weighing-system issues within the same day. On a monthly basis PENKO offers free training classes to anyone interested in exploring modern, high-speed weighing instruments and solutions. A schedule of training sessions is found on: **www.penko.com/training**

PENKO Alliances

PENKO's worldwide network: Australia, Belgium, Brazil, China, Denmark, Germany, Egypt, Finland, France, India, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Syria, Turkey, United Kingdom, South Africa, Slovakia Sweden, Switzerland and Singapore.
A complete overview you will find on: **www.penko.com/dealers**

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