PENKO Engineering B.V.

Your Partner for Fully Engineered Factory Solutions

How to…

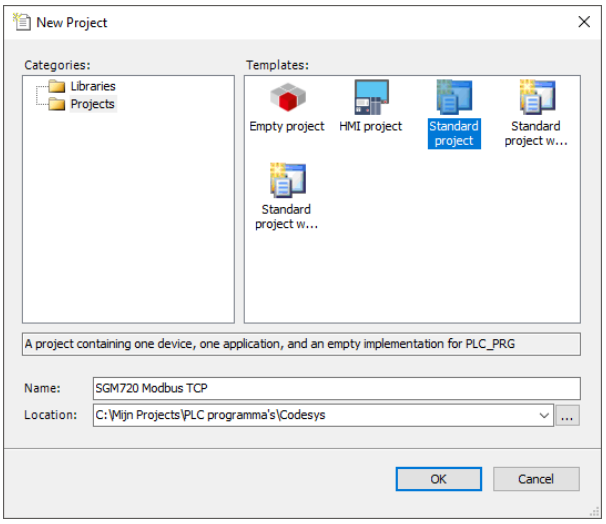
Connect a SGM720 to a Codesys PLC with Modbus TCP

PENKO
an ETC Company

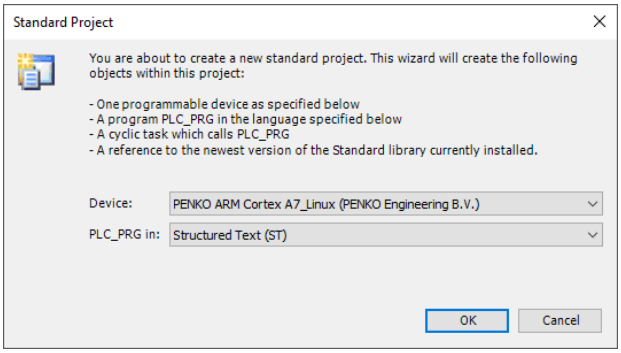
Inhoudsopgave

Set up the Codesys project

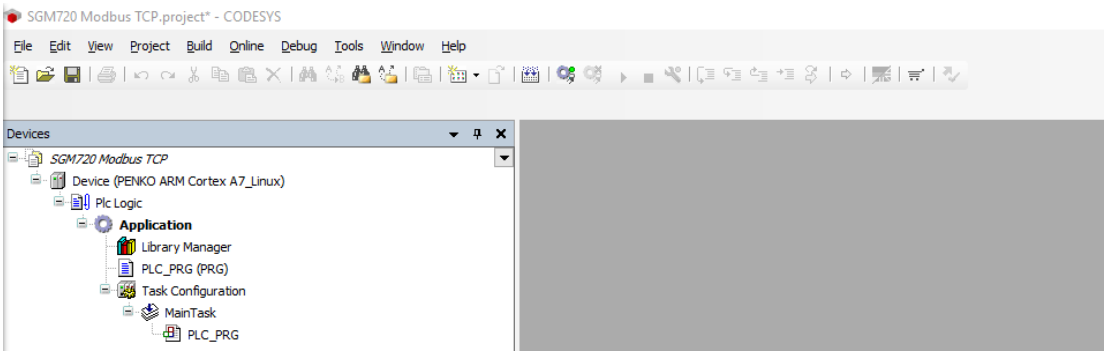
Open Codesys and open a new project.



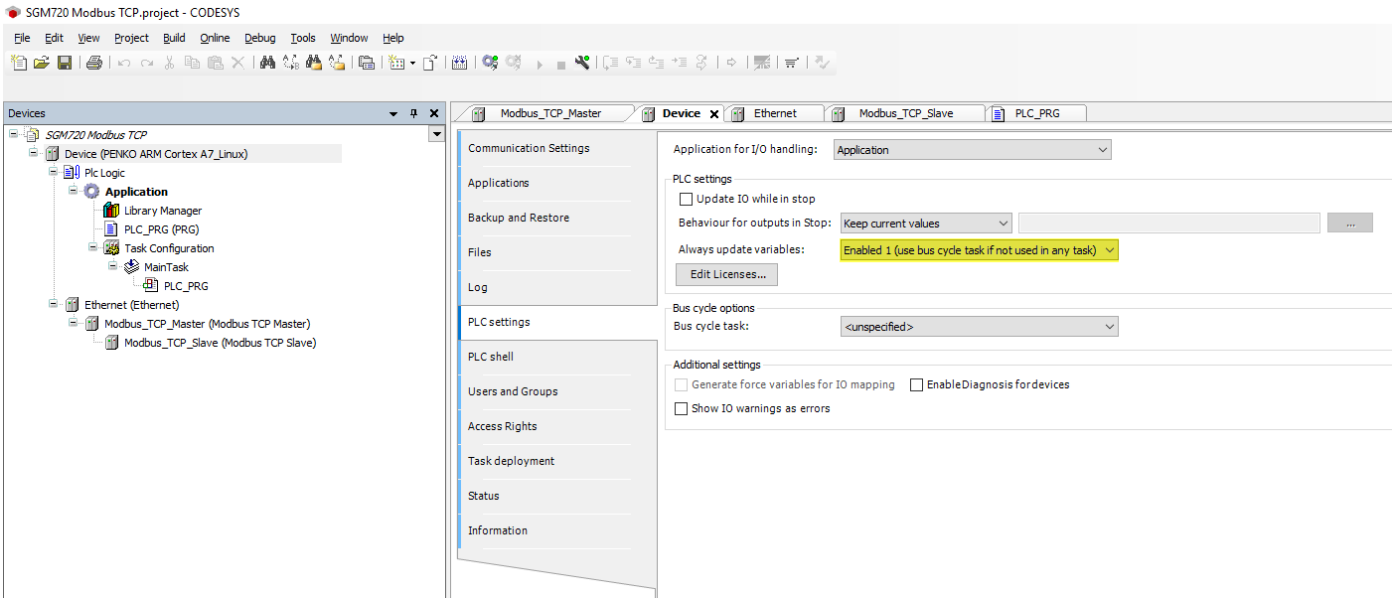
Select your device and choose Structured Text.



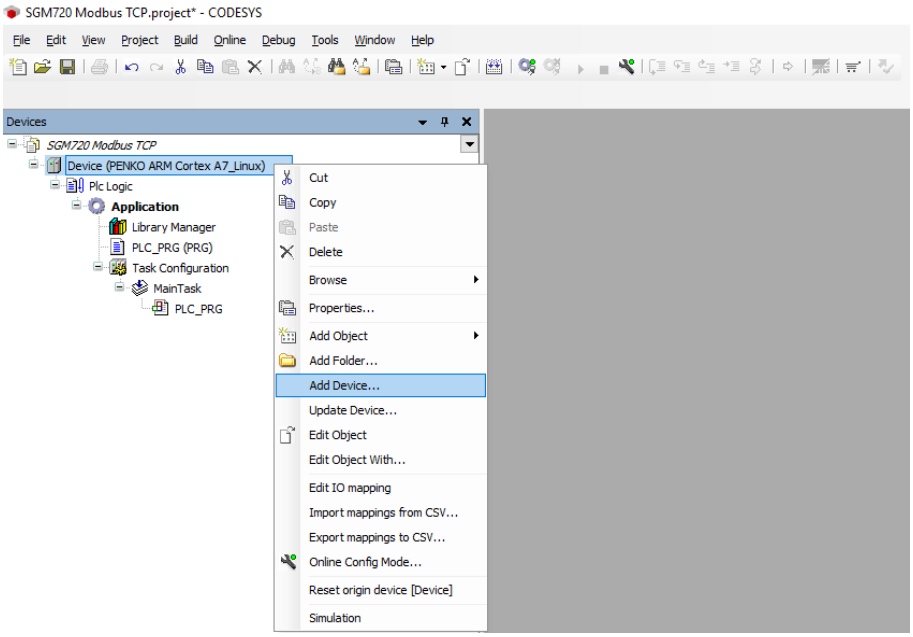
Now the project is opened.



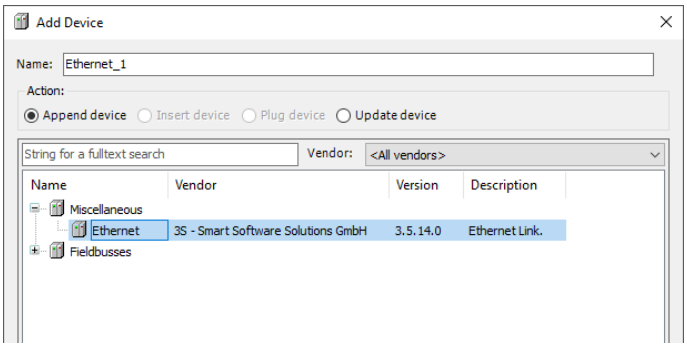
Double click on Device and open the Tab PLC Settings and set Always update variables to Enabled 1 (use bus cycle if not used in any task).



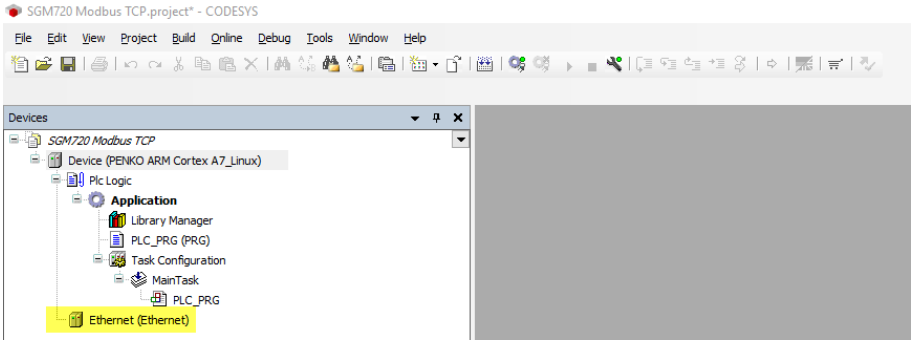
Right-click on Device and click on Add Device.



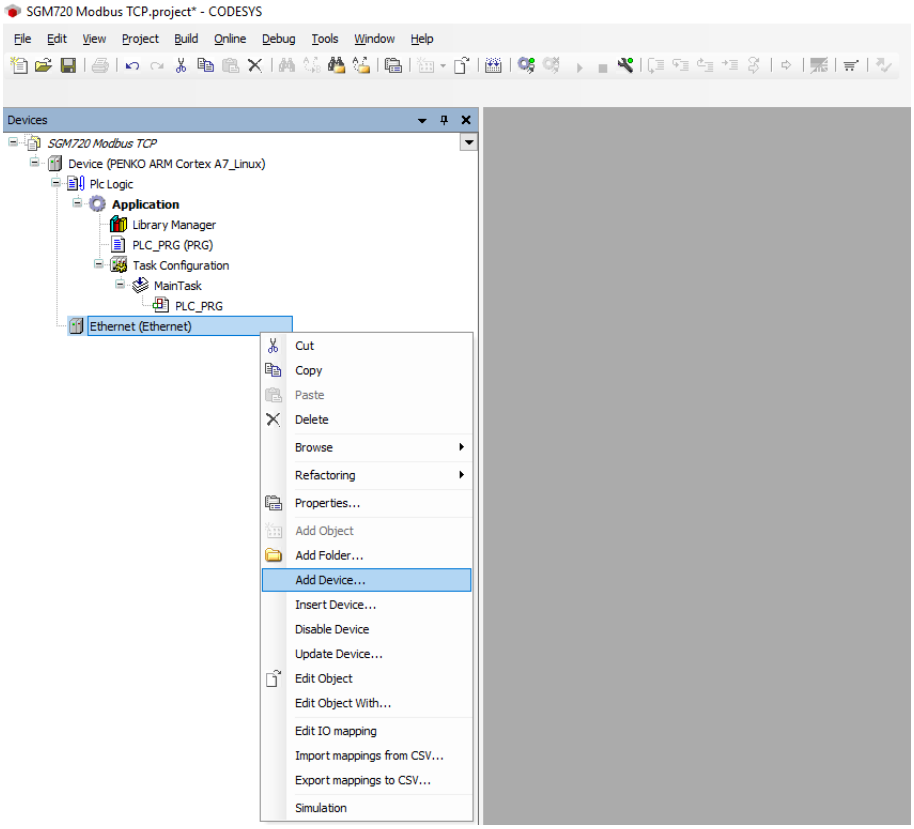
Open Miscellaneous and double click on Ethernet and close the window.



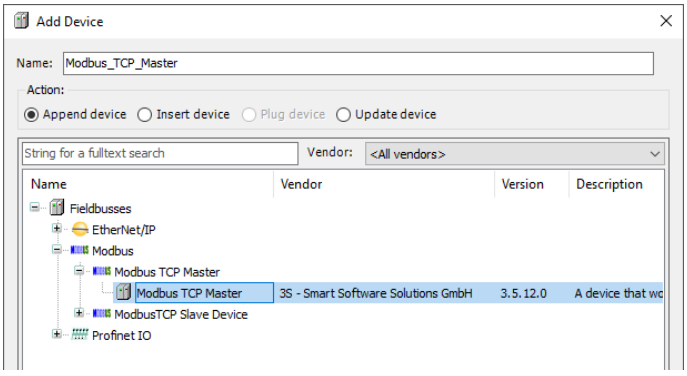
Now the Ethernet port is added to the project.



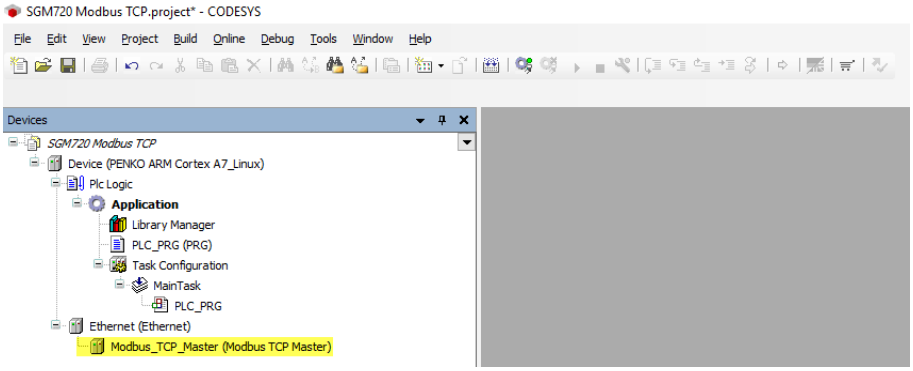
Right-click on Ethernet and click on Add Device.



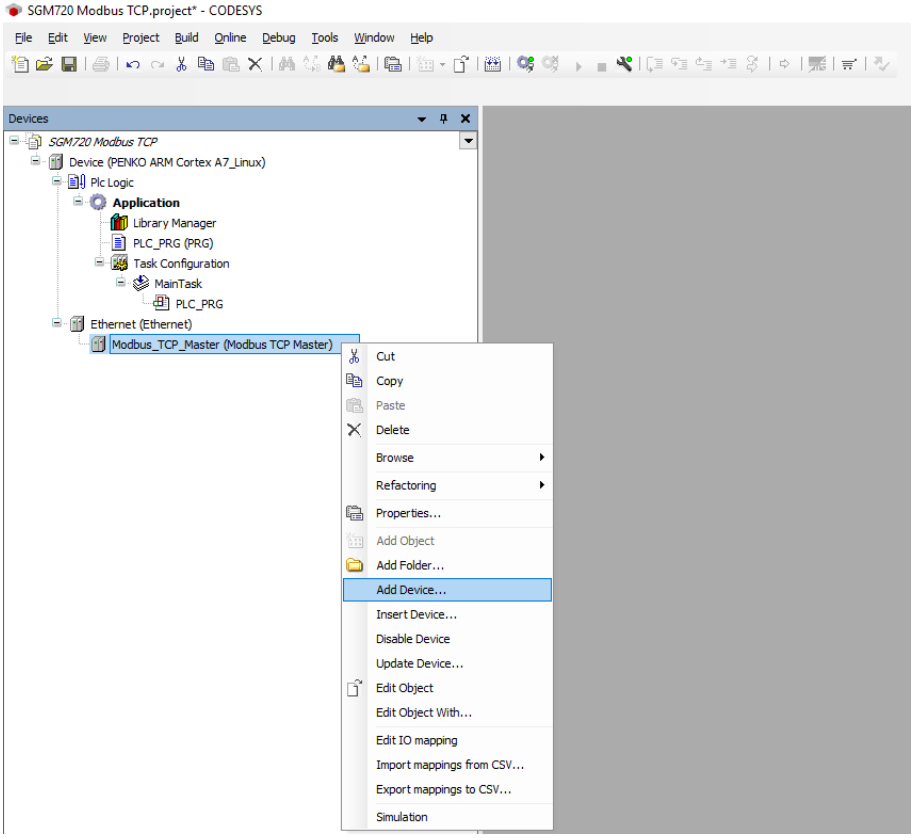
Open Fieldbusses – Modbus – Modbus TCP Master and double click on Modbus TCP Master and close the window.



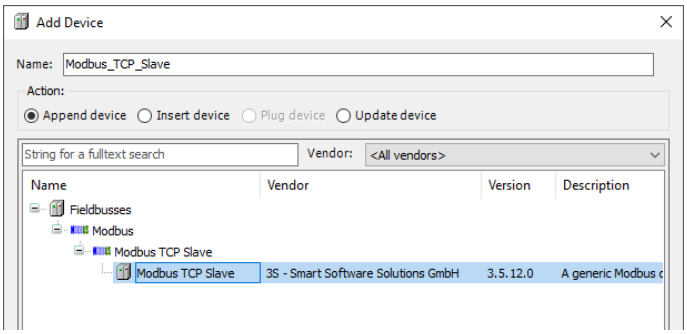
Now the Modbus TCP Master is added to the project.



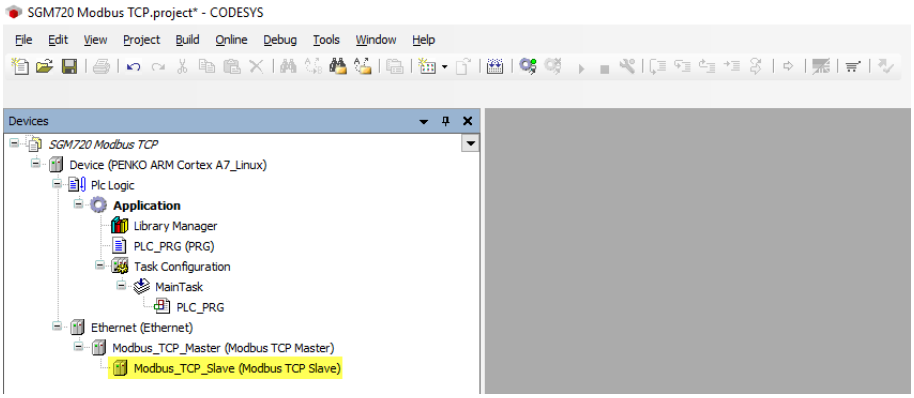
Right-click on Modbus TCP Master and click on Add Device.



Open Fieldbusses – Modbus – Modbus TCP Slave and double click on Modbus TCP Slave and close the window.

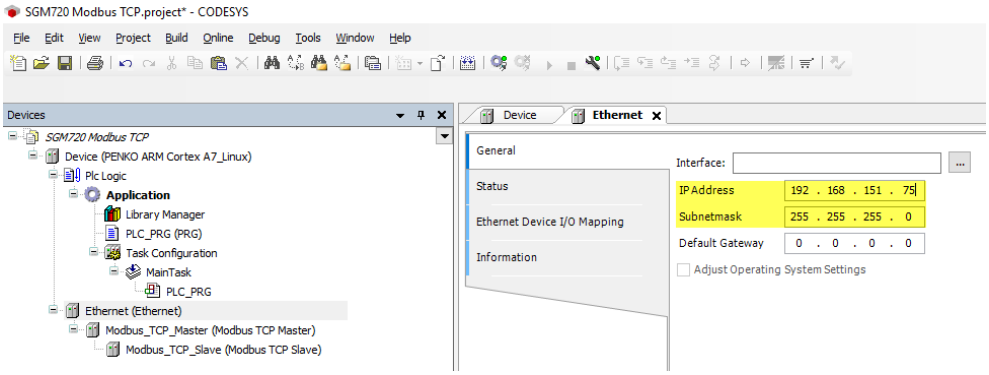


Now the Modbus TCP Master is added to the project.



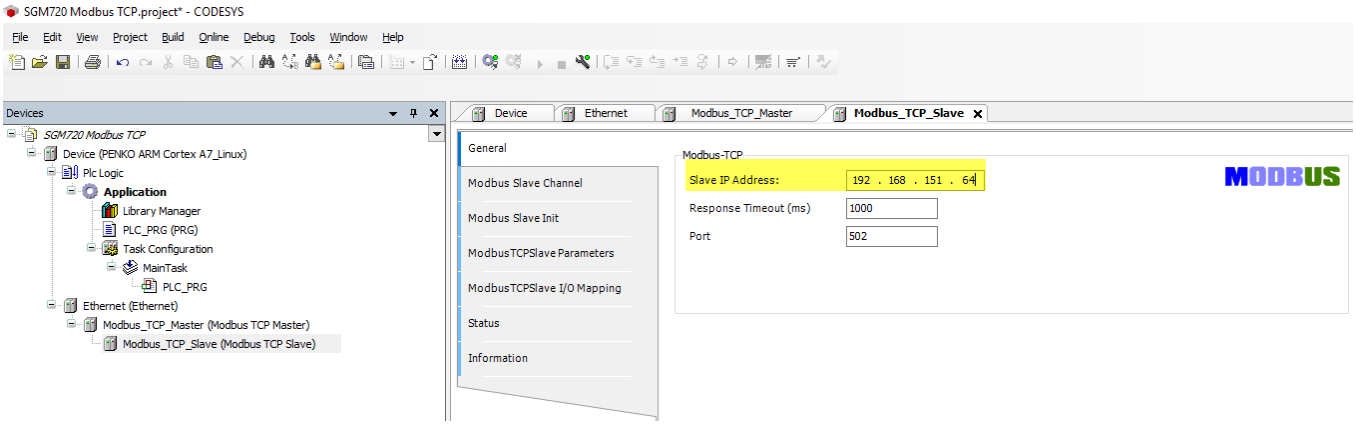
Set up the Modbus TCP Master

Double click on Ethernet and set the IP address and Subnetmask of the Modbus TCP Master in the General Tab.

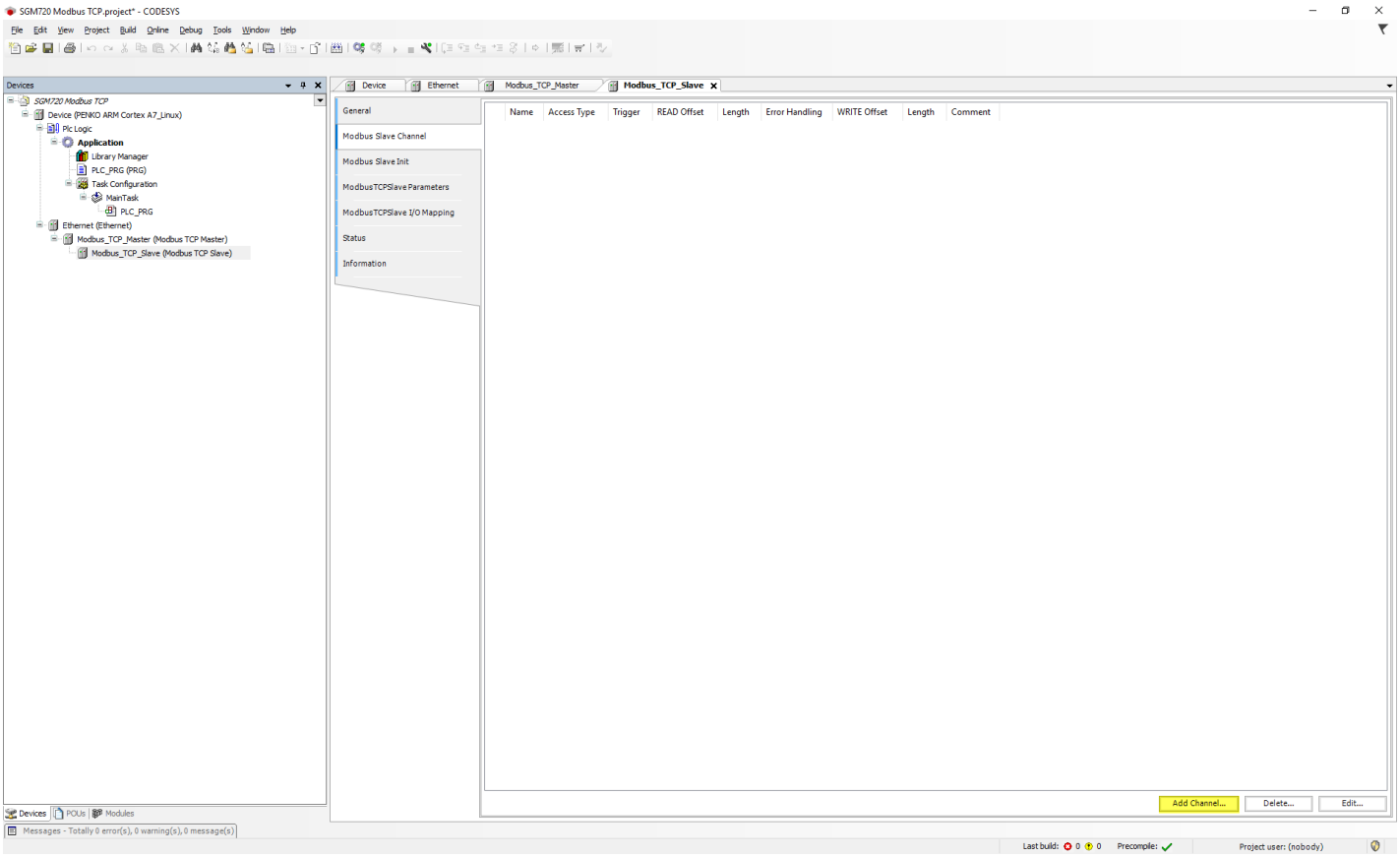


Set up the Modbus TCP Slave

Double click on Modbus TCP Slave and set the IP address of the Modbus TCP Slave in the General Tab.



Open the Tab Modbus Slave Channel and click on Add Channel…



Here you can choose the data that you want to send or receive, in this example we want to read all 19 indicators.

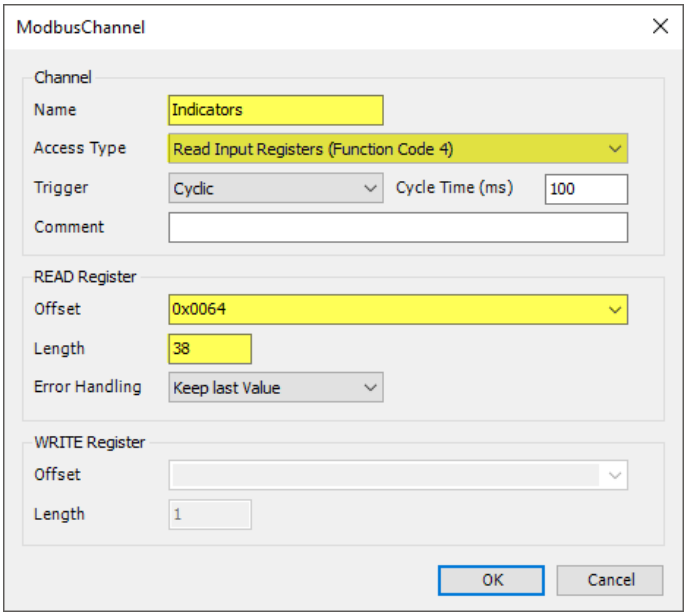
First give the channel a name.

Select the Access Type.

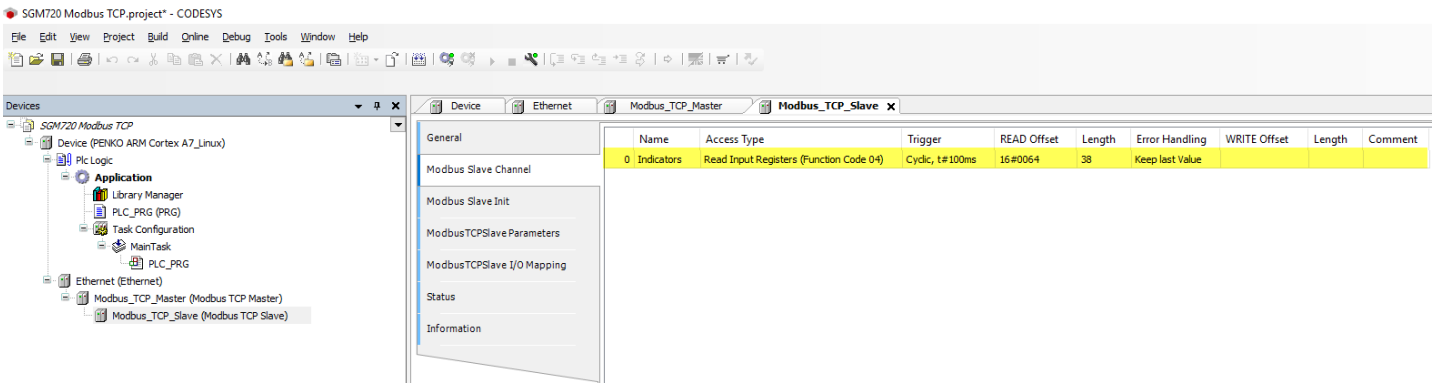
Set the offset (the indicator start at address 101 so the offset is 100 or 0x0064 in hex).

Set the Length in words (19 double words indicators is 38 words).

When everything is set up click on OK.

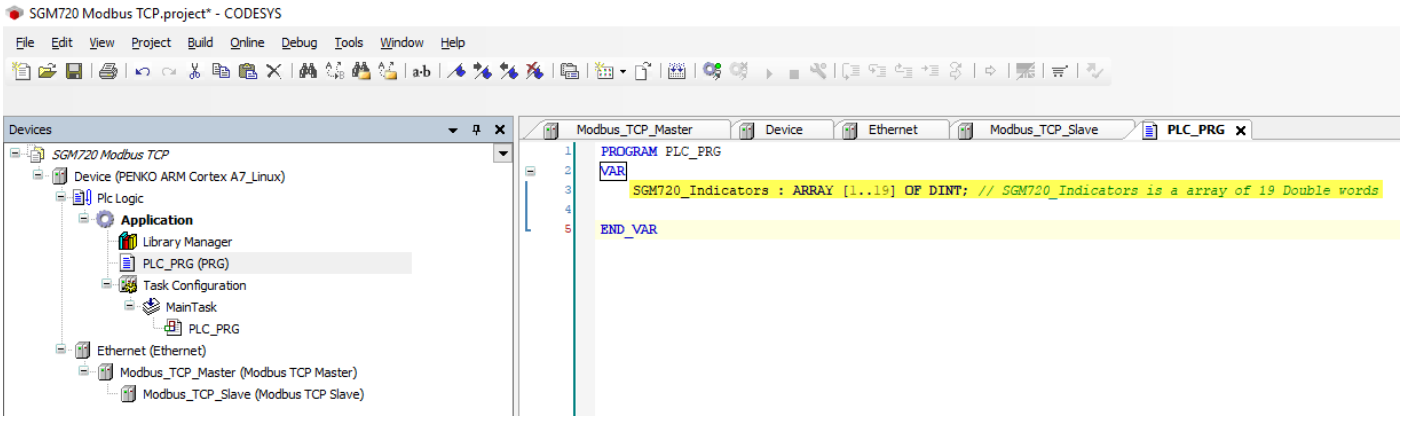


The Channel is now added to the Modbus Slave.

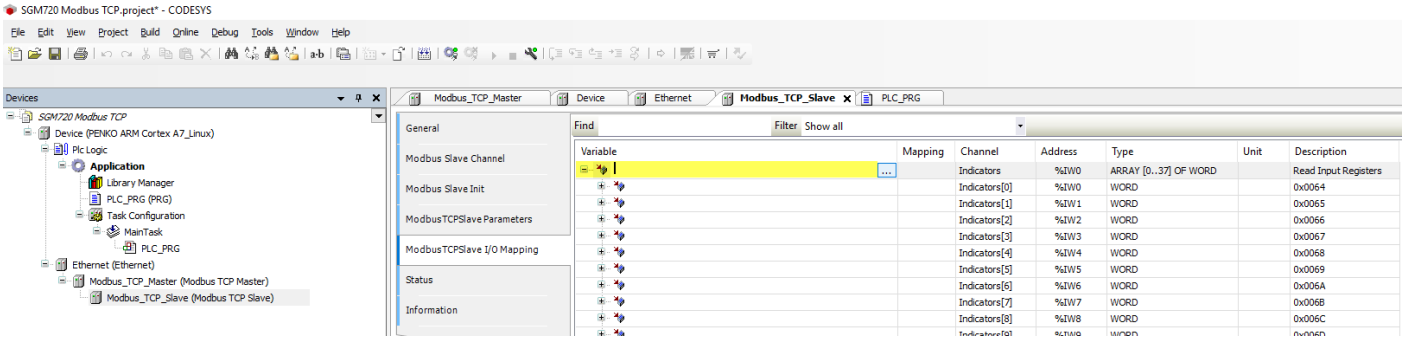


Set up the program

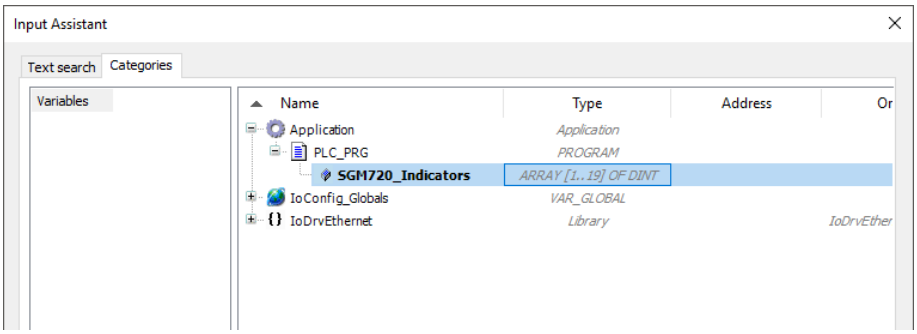
Double click on PLC_PRG and type the code shown in yellow. This will make an array of 19 double integers for the SGM720 indicators.



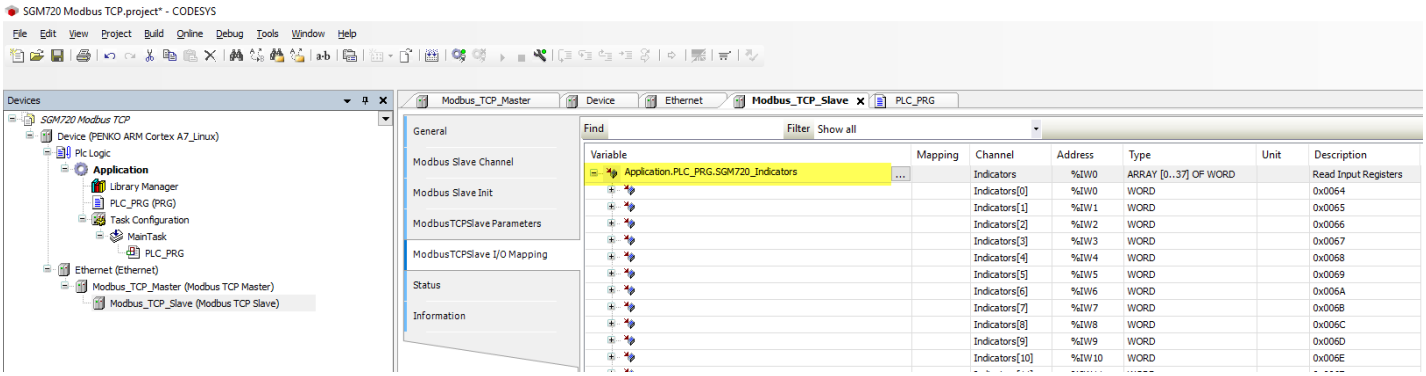
Double click on Modbus TCP Slave and open the Tab ModbusTCPSlave I/O Mapping double click on the empty space marked in yellow. Now the button with 3 dots will appear and click on that button.



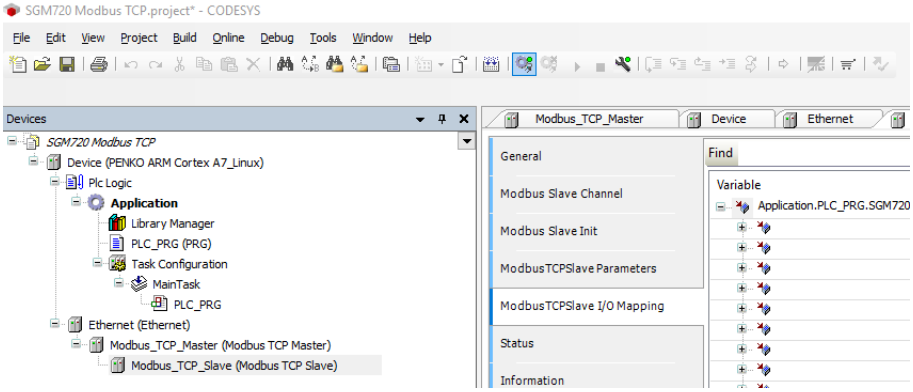
Open Application – PLC_PRG and double click on SGM720_Indicators



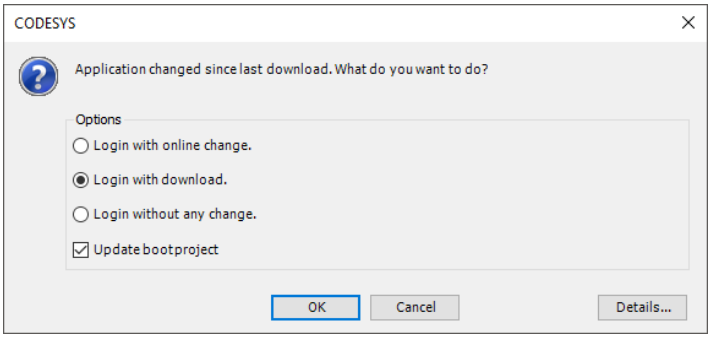
Now the array is linked to the Indicators of the Modbus Slave.



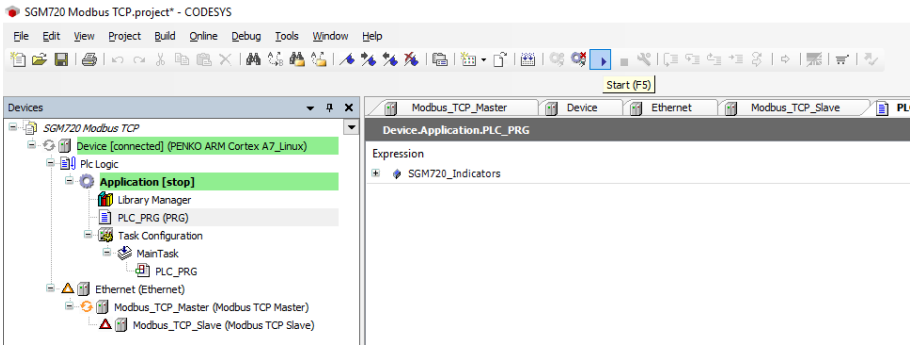
Click on the Login button.



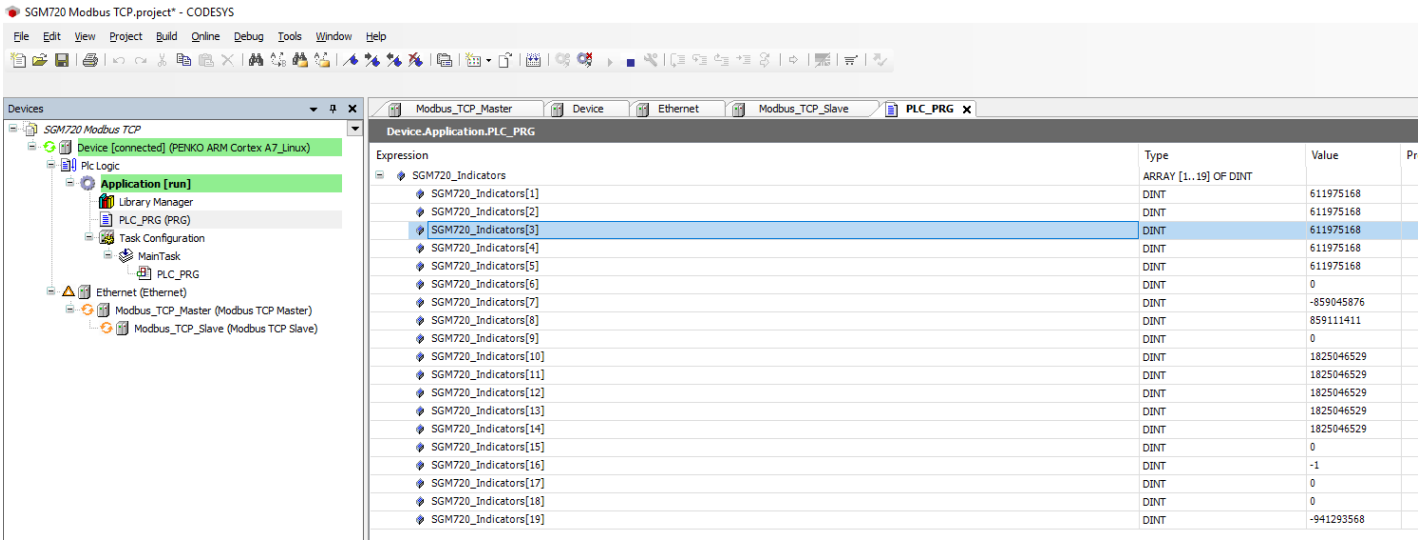
Click on the Login with download and click on OK.



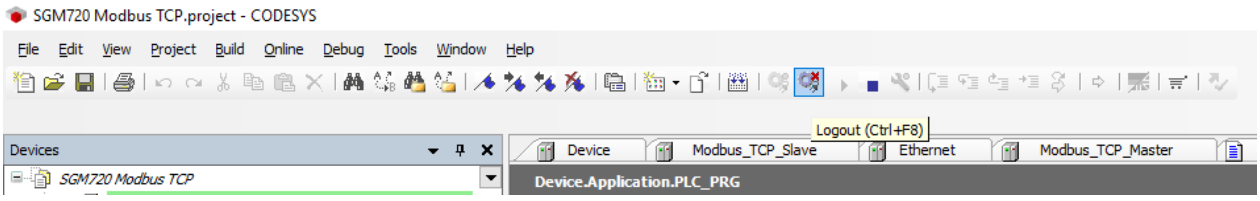
Click on Start.



Double click on PLC_PRG to view the actual SGM720 Indicators. The values are too high so in order to get normal values we need to swap the words.

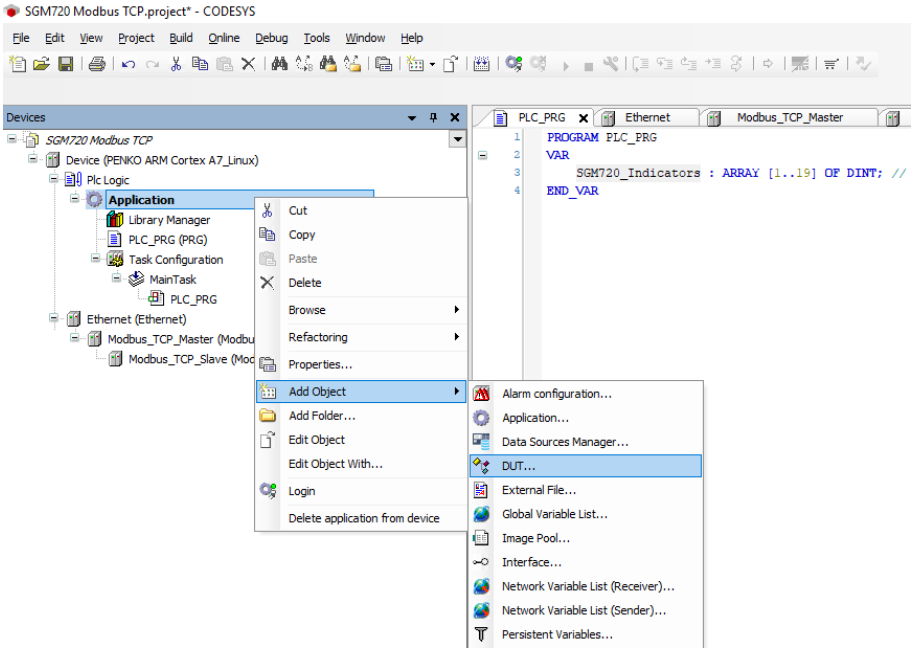


Click on Logout.

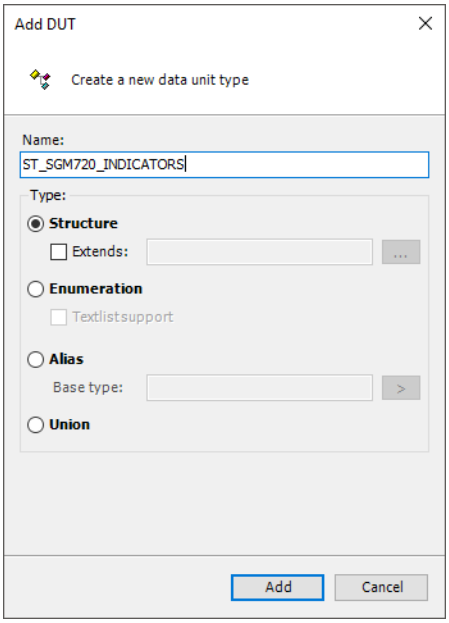


Swap words

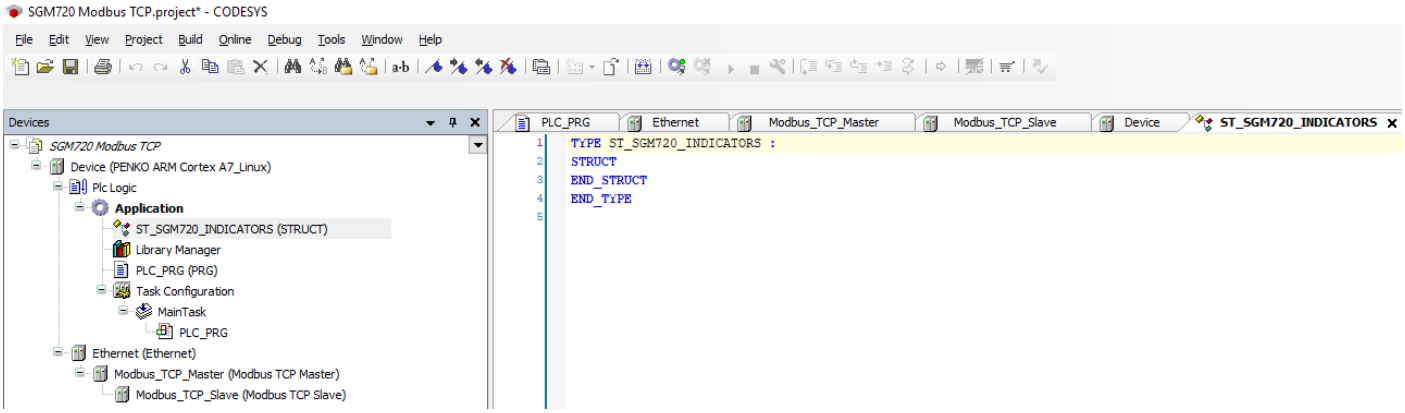
Right-click on Application, click on Add Object and click on DUT…



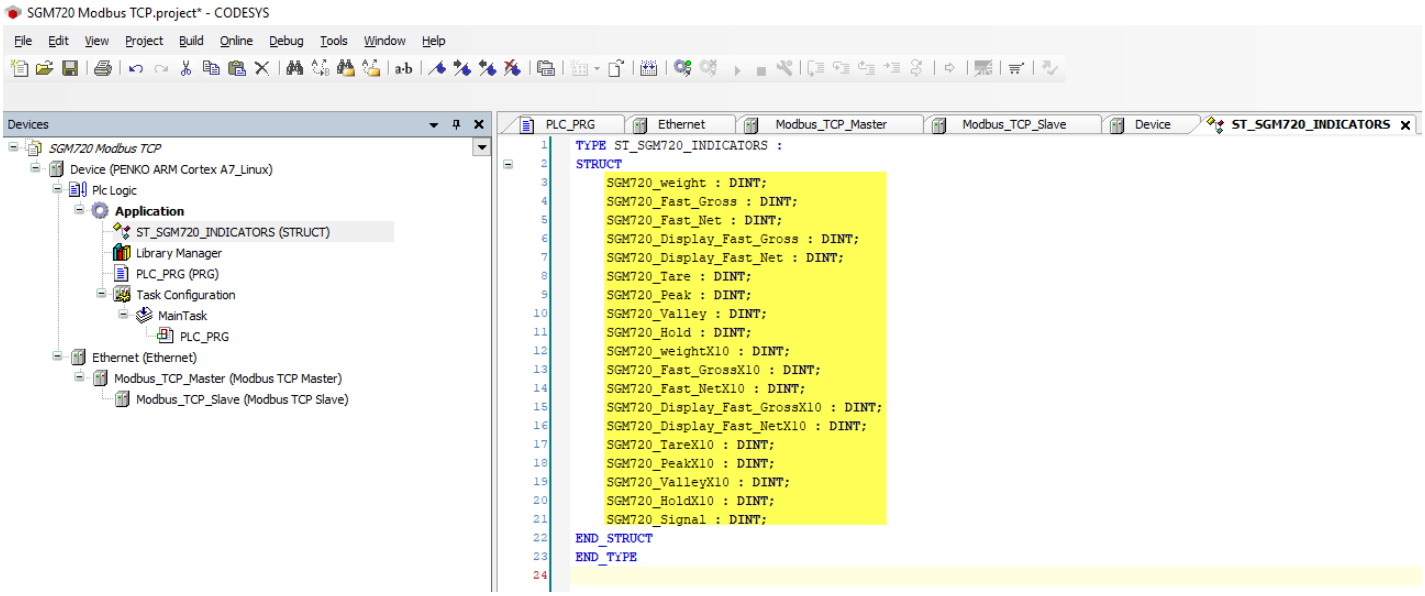
Give the DUT a name and click on Add.



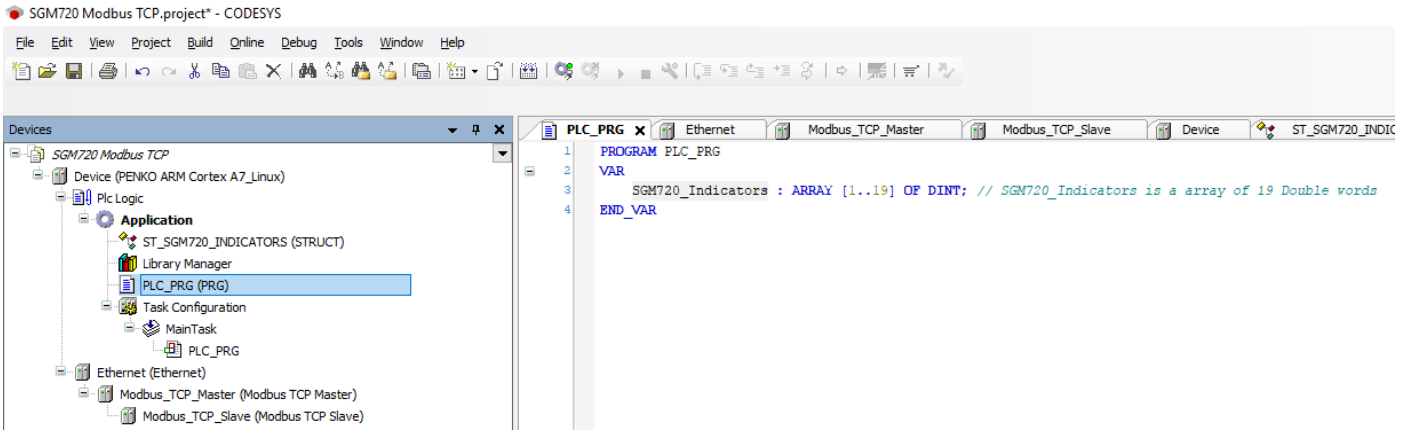
The DUT is now opened.



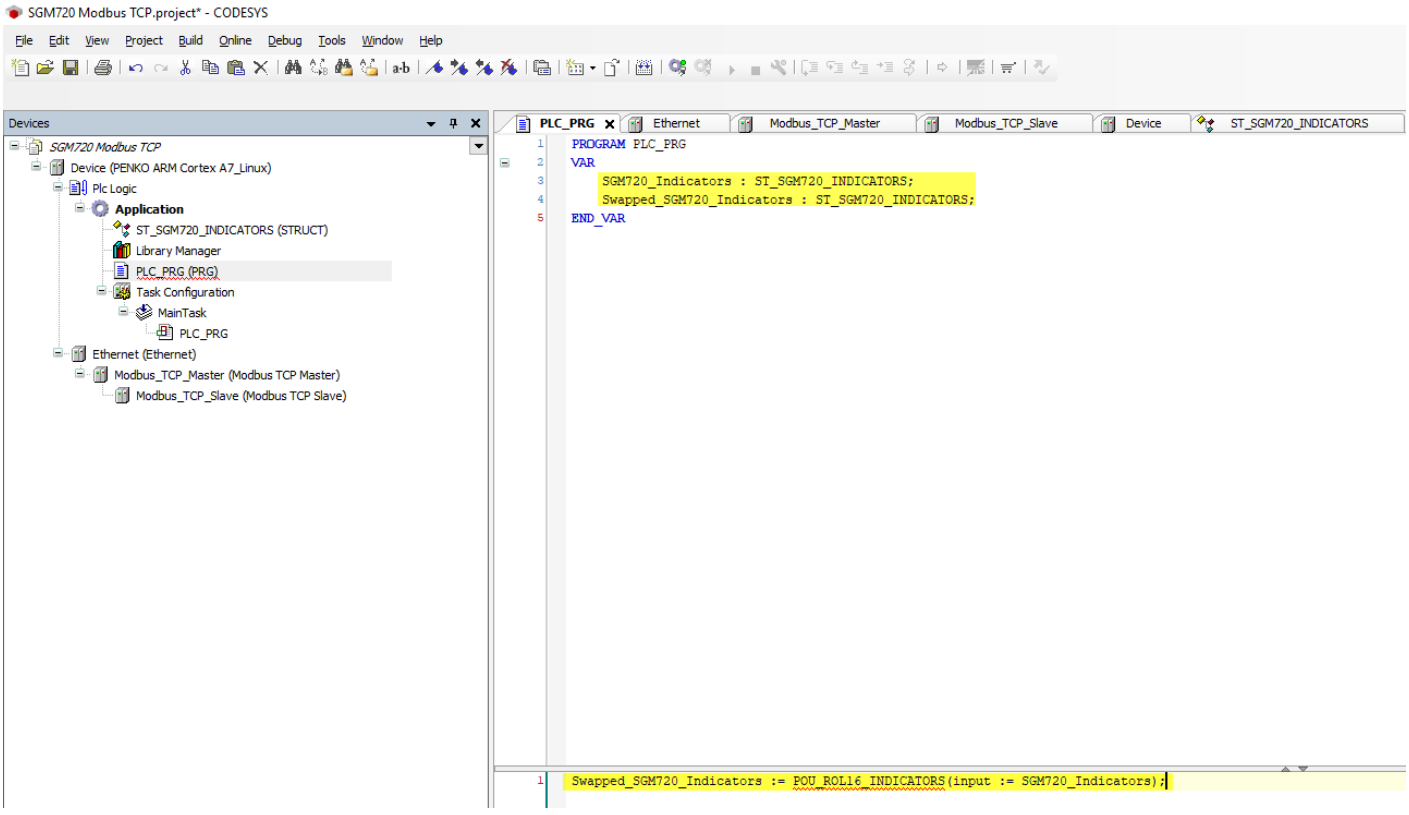
Add the code highlighted in yellow, this will give a name to the array of 19 double integers.



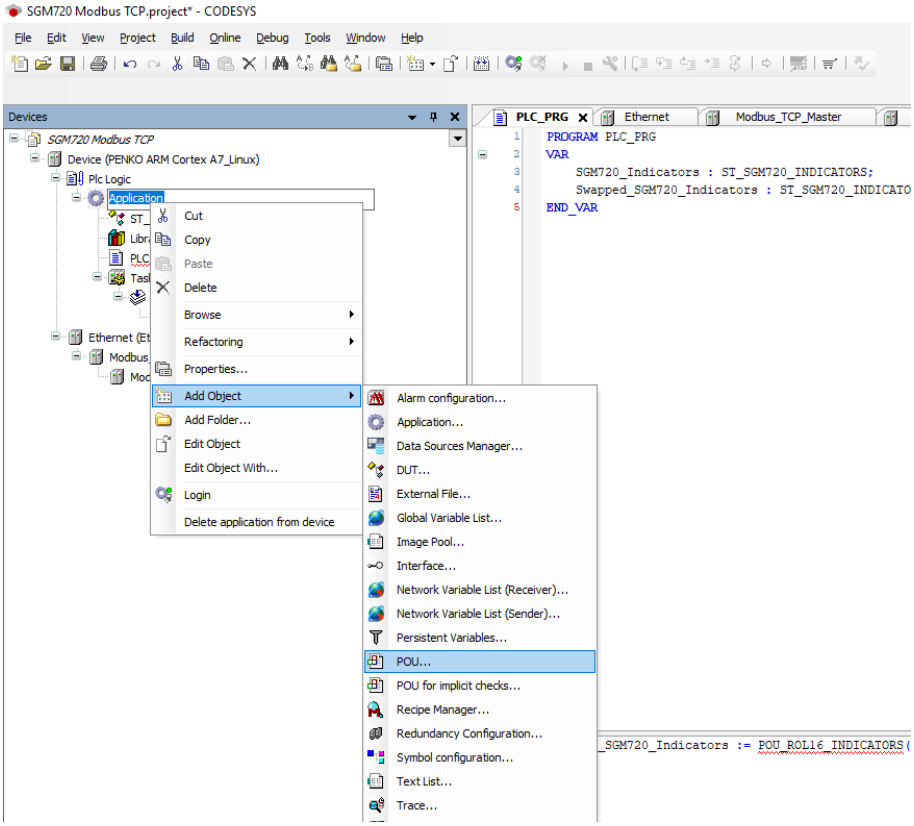
Double click on PLC_PRG and change the old code from:



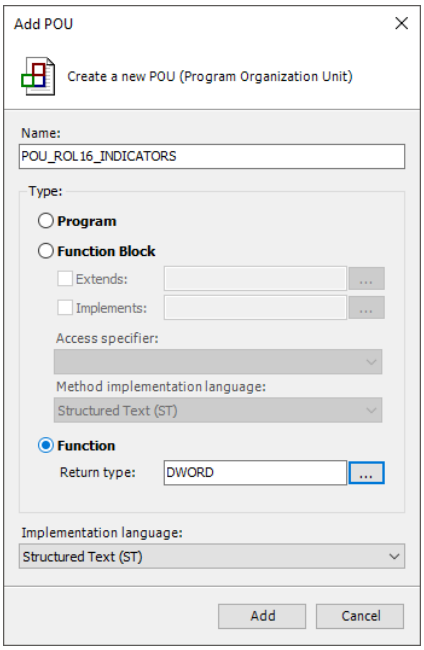
To:



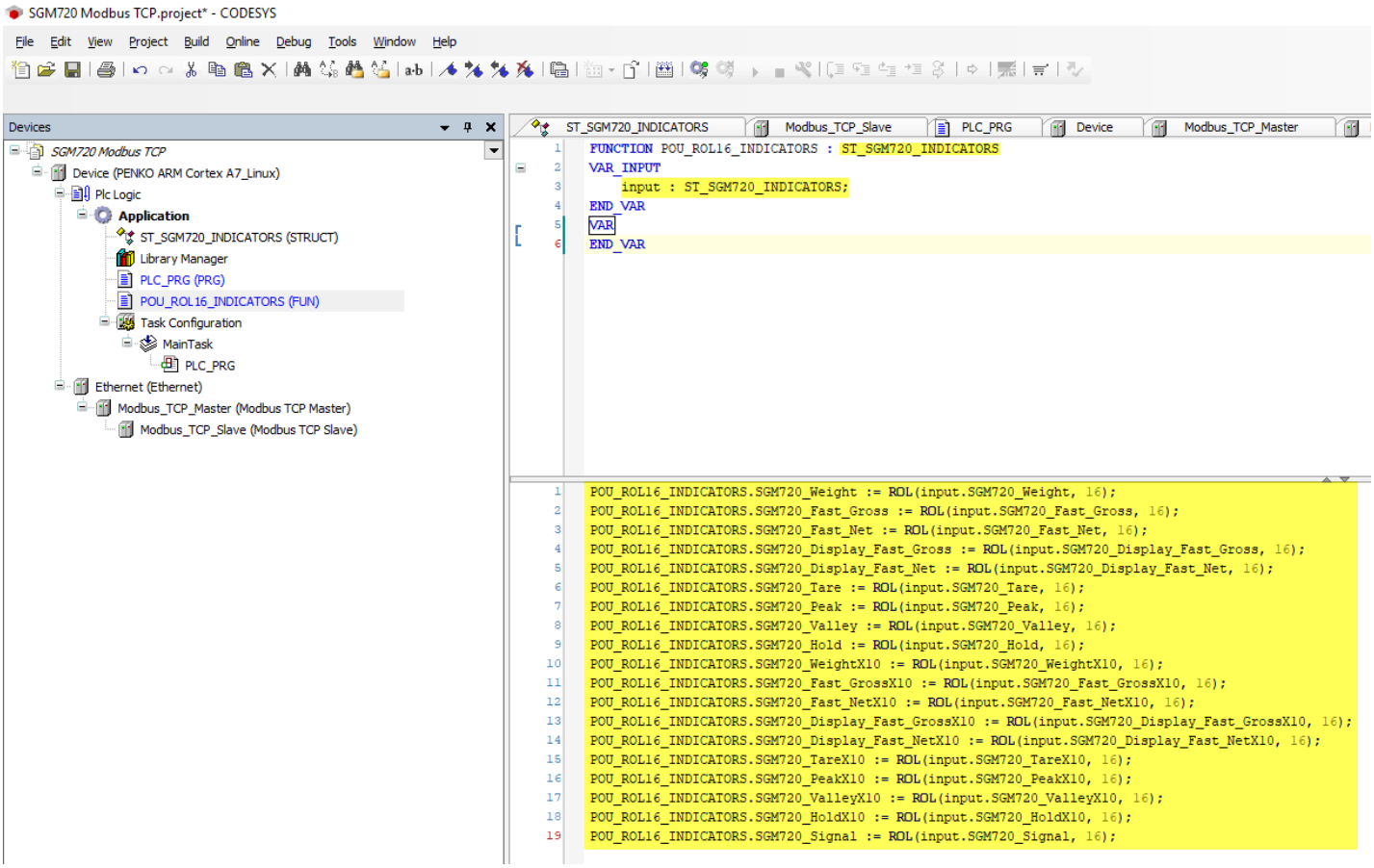
Right-click on Application – Add Object – POU…



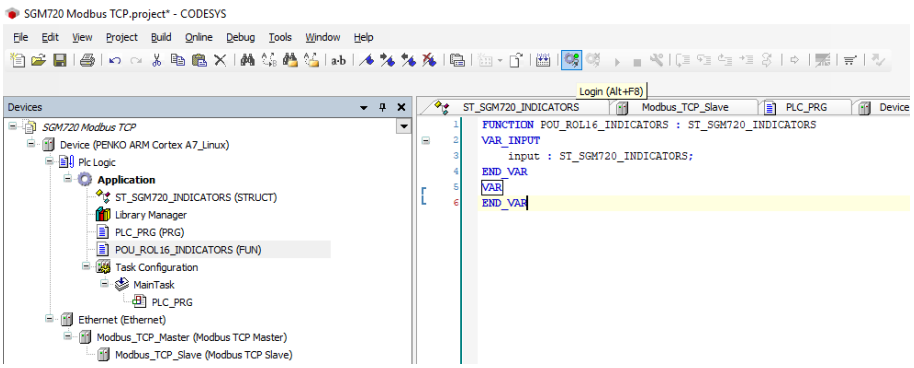
Set up the POU as below:



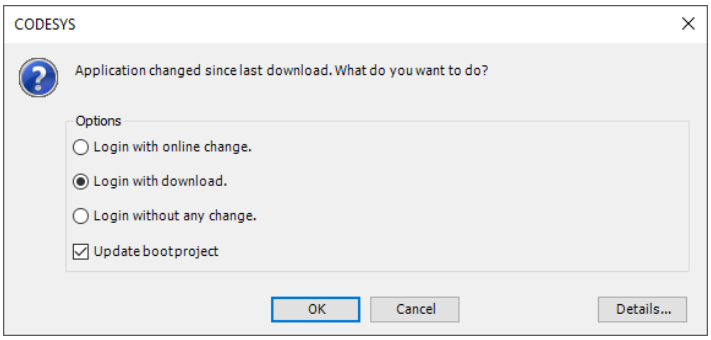
Add the code highlighted in yellow.



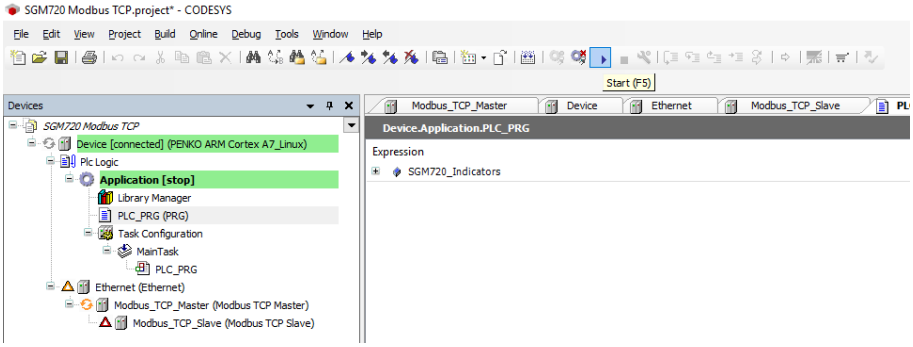
Click on the Login button.



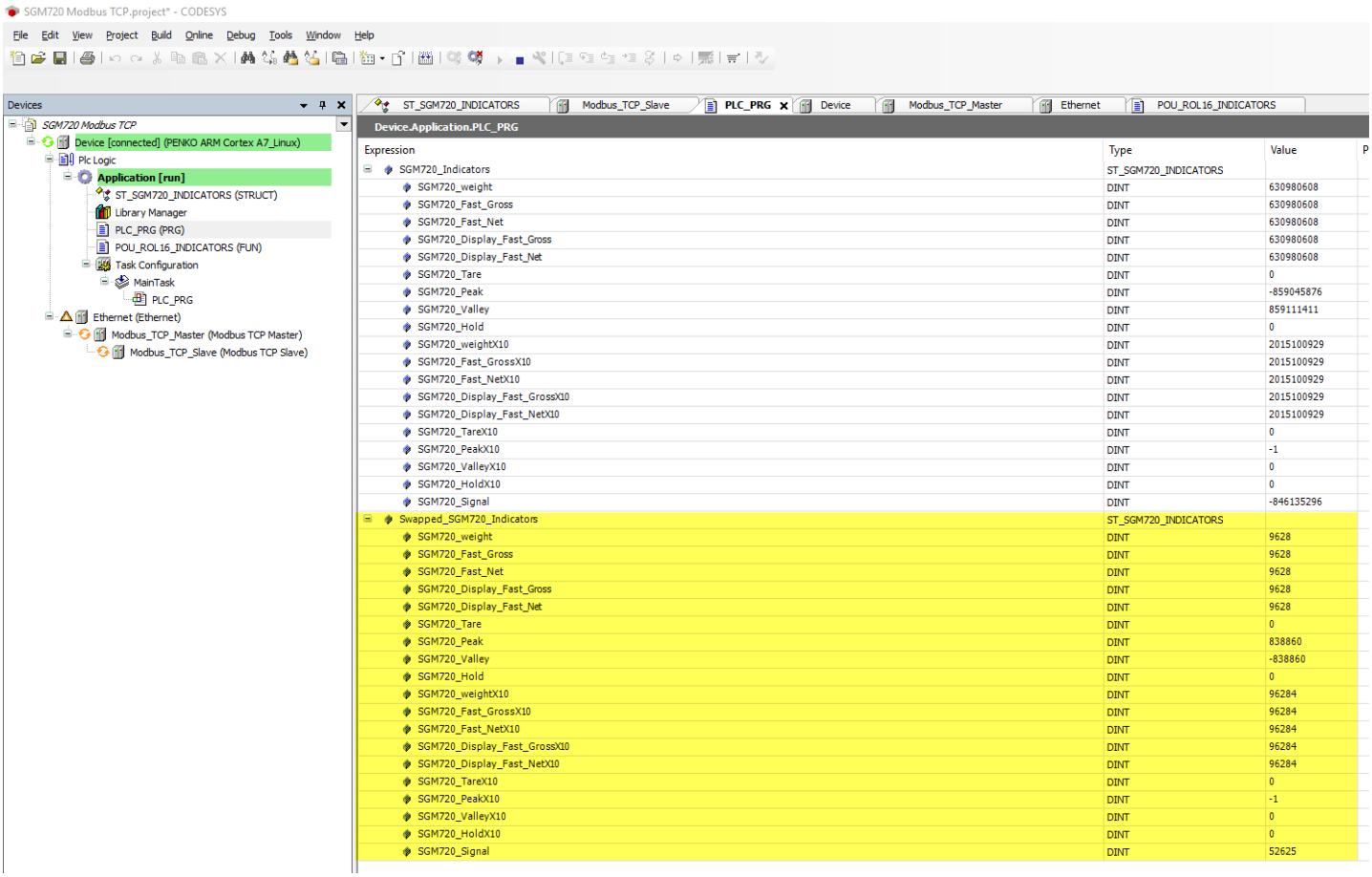
Click on the Login with download and click on OK.



Click on Start.

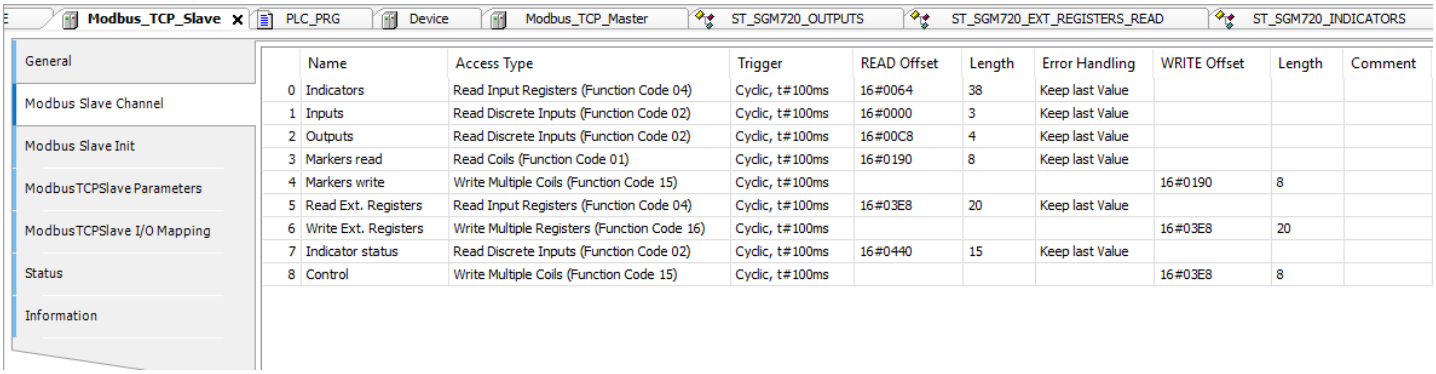


Double click on PLC_PRG to view the actual SGM720 Indicators. Now you can see the values from the Modbus Slave (SGM720) and the swapped data shown in yellow.



Expression	Type	Value
SGM720_Indicators	ST_SGM720_INDICATORS	
SGM720_weight	DINT	630980608
SGM720_Fast_Gross	DINT	630980608
SGM720_Fast_Net	DINT	630980608
SGM720_Display_Fast_Gross	DINT	630980608
SGM720_Display_Fast_Net	DINT	630980608
SGM720_Tare	DINT	0
SGM720_Peak	DINT	-859045876
SGM720_Valley	DINT	859111411
SGM720_Hold	DINT	0
SGM720_weightX10	DINT	2015100929
SGM720_Fast_GrossX10	DINT	2015100929
SGM720_Fast_NetX10	DINT	2015100929
SGM720_Display_Fast_GrossX10	DINT	2015100929
SGM720_Display_Fast_NetX10	DINT	2015100929
SGM720_TareX10	DINT	0
SGM720_PeakX10	DINT	-1
SGM720_ValleyX10	DINT	0
SGM720_HoldX10	DINT	0
SGM720_Signal	DINT	-846135296
Swapped_SGM720_Indicators	ST_SGM720_INDICATORS	
SGM720_weight	DINT	9628
SGM720_Fast_Gross	DINT	9628
SGM720_Fast_Net	DINT	9628
SGM720_Display_Fast_Gross	DINT	9628
SGM720_Display_Fast_Net	DINT	9628
SGM720_Tare	DINT	0
SGM720_Peak	DINT	838860
SGM720_Valley	DINT	-838860
SGM720_Hold	DINT	0
SGM720_weightX10	DINT	96284
SGM720_Fast_GrossX10	DINT	96284
SGM720_Fast_NetX10	DINT	96284
SGM720_Display_Fast_GrossX10	DINT	96284
SGM720_Display_Fast_NetX10	DINT	96284
SGM720_TareX10	DINT	0
SGM720_PeakX10	DINT	-1
SGM720_ValleyX10	DINT	0
SGM720_HoldX10	DINT	0
SGM720_Signal	DINT	52625

Modbus addresses



	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
0	Indicators	Read Input Registers (Function Code 04)	Cyclic, t#100ms	16#0064	38	Keep last Value			
1	Inputs	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0000	3	Keep last Value			
2	Outputs	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#00C8	4	Keep last Value			
3	Markers read	Read Coils (Function Code 01)	Cyclic, t#100ms	16#0190	8	Keep last Value			
4	Markers write	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#0190	8	
5	Read Ext. Registers	Read Input Registers (Function Code 04)	Cyclic, t#100ms	16#03E8	20	Keep last Value			
6	Write Ext. Registers	Write Multiple Registers (Function Code 16)	Cyclic, t#100ms				16#03E8	20	
7	Indicator status	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0440	15	Keep last Value			
8	Control	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#03E8	8	

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**

PENKO Engineering B.V. ▪ Schutterweg 35, NL 6718XC Ede ▪ Tel +31 (0) 318525630 ▪ Fax +31 (0) 31852971 ▪ info@penko.com
Web ▪ www.penko.com ▪