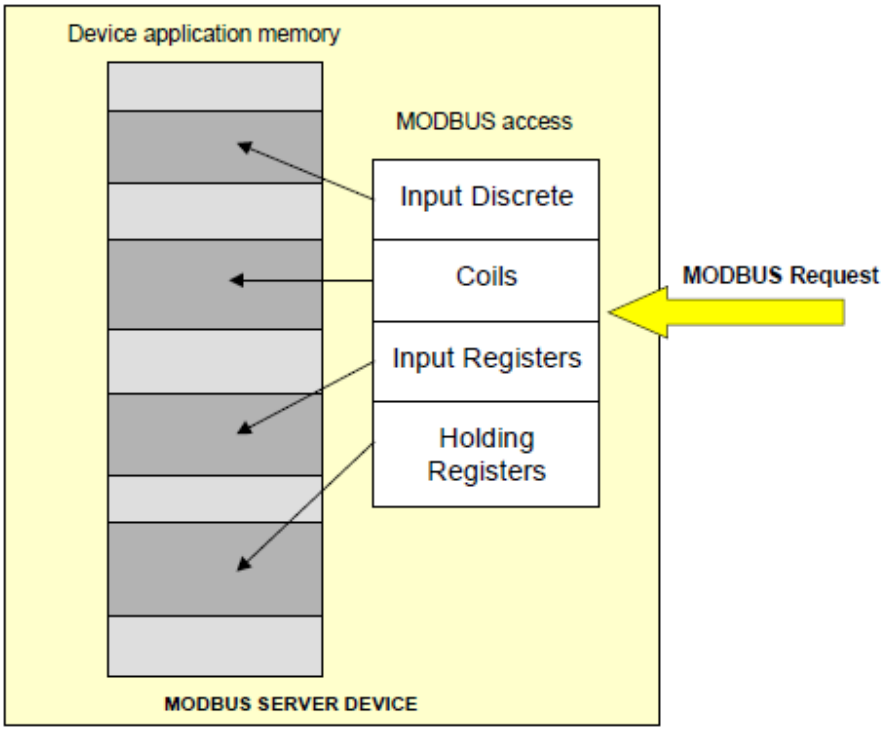

CoDeSys
TIA-PORTAL
SERVER
IP: 192.168.0.162
CLIENT
IP: 192.168.0.1

Index:

The %M area inside the AC500-eCo;

The addressable flag area in the AC500 is limited to 2kByte.
This means you can address %MB0.0 to %MB0.2047.
If you address the area in words it is %MW0.0 to %MW0.1023.

So, if we take the Modbus protocol we notice that there is a small problem with the addresses.
The “Holding Registers” start at address 40001 which is outside the memory area of the AC500-eCo !!!

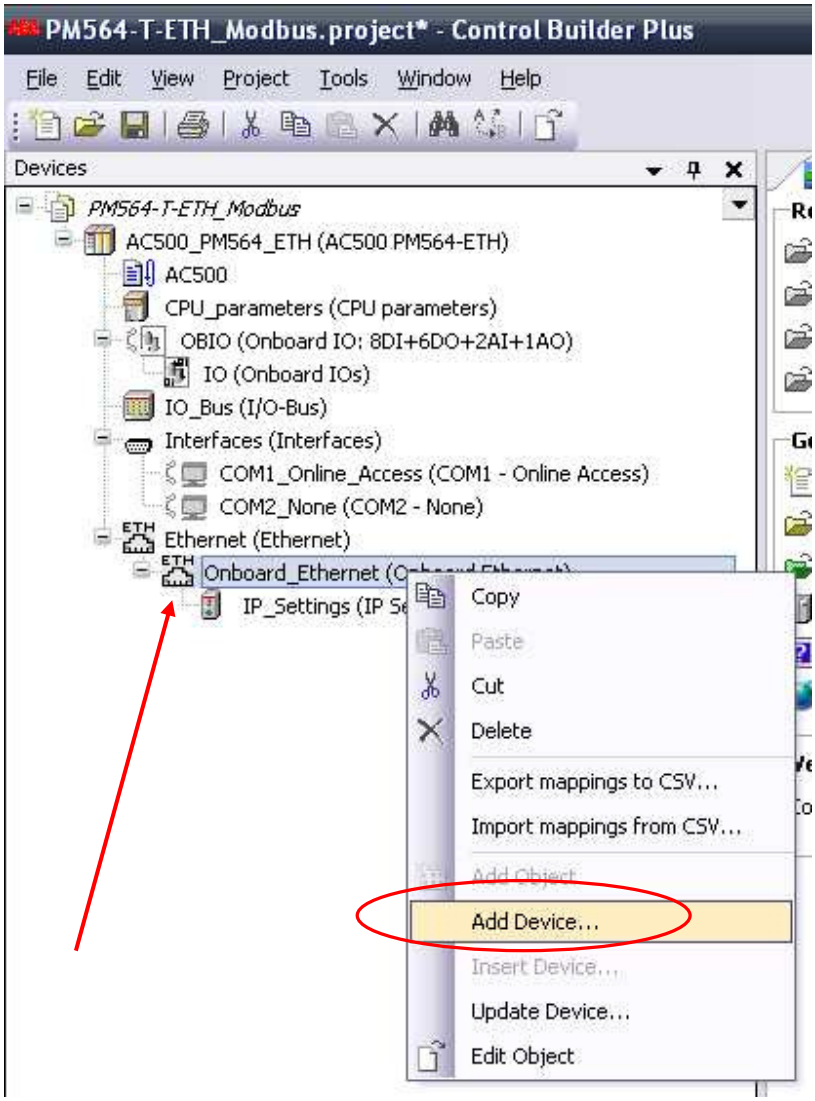


In order to have communication we are going to use the Modbus functions 1 and 15.
These functions read and write to the addresses 1 to 9999. The addresses 1 to 9999 can be partially mapped within the AC500-eCo.

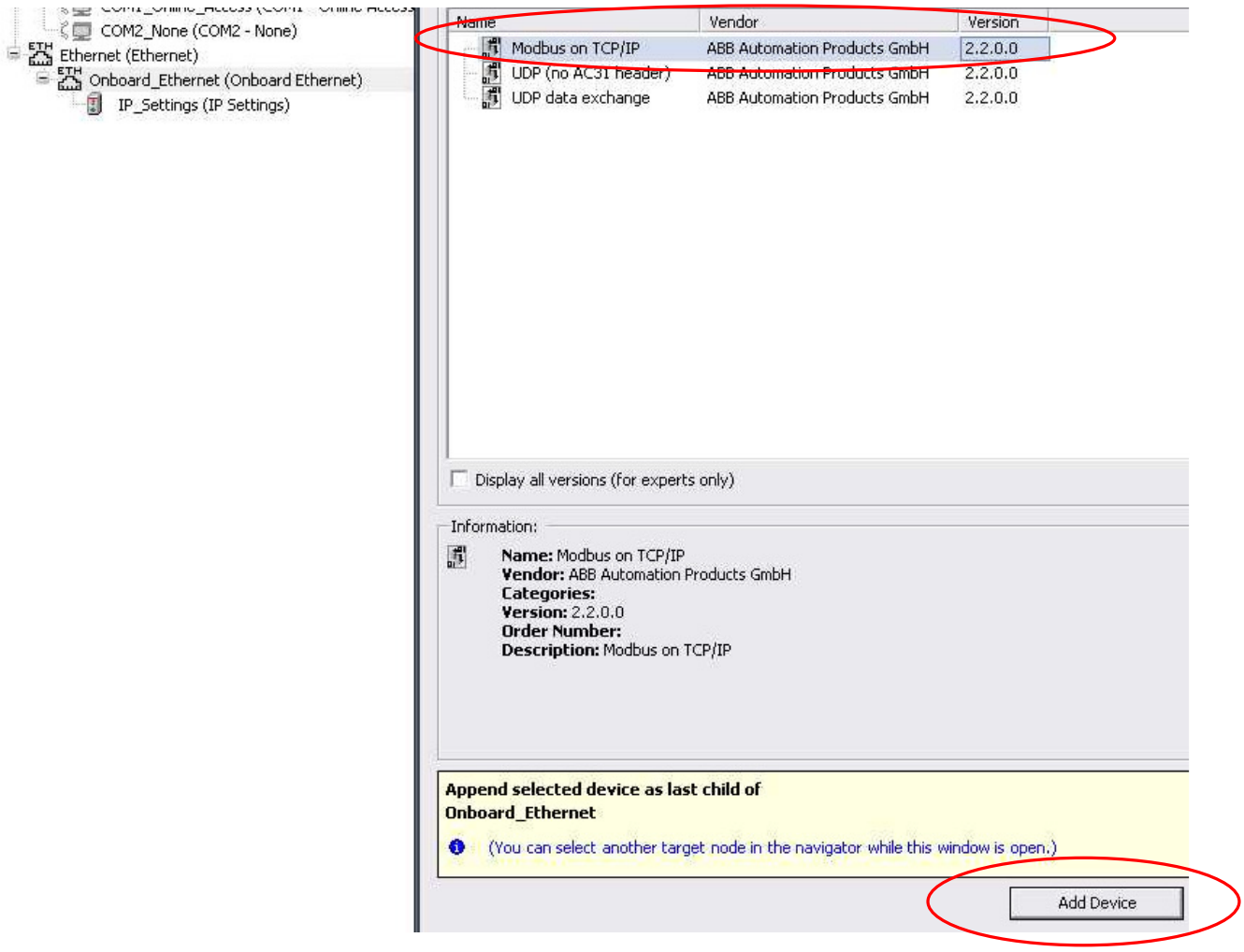
The normal way of communication would have been the use of the holding registers, but as mentioned above that is in our case not possible.

The settings for the AC500-eCo;

To make the AC500-eCo a Modbus server you don't have to programme much…..
The first step is to add the Modbus TCP driver to the Ethernet port. Select the onboard Ethernet and right click on this. The next step is to add a device.

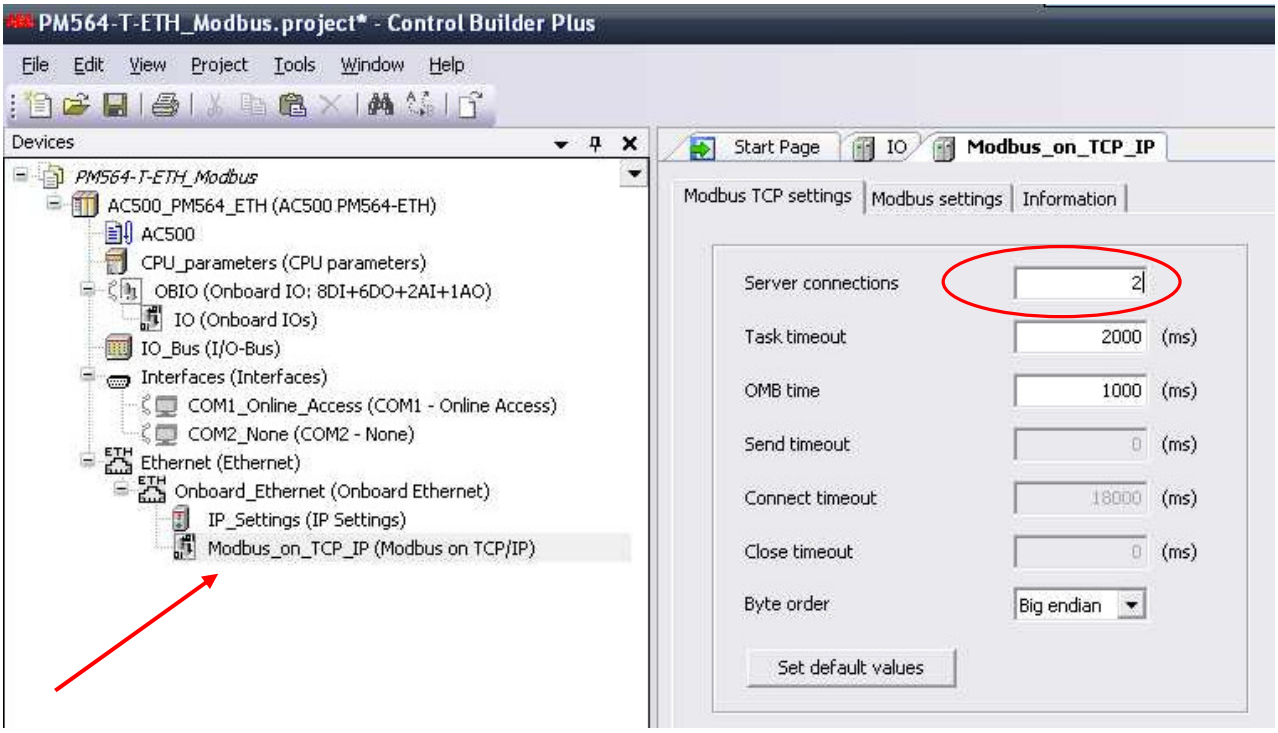


Select in the “Add device” screen the Modbus on TCP/IP driver and click on the Add device button.



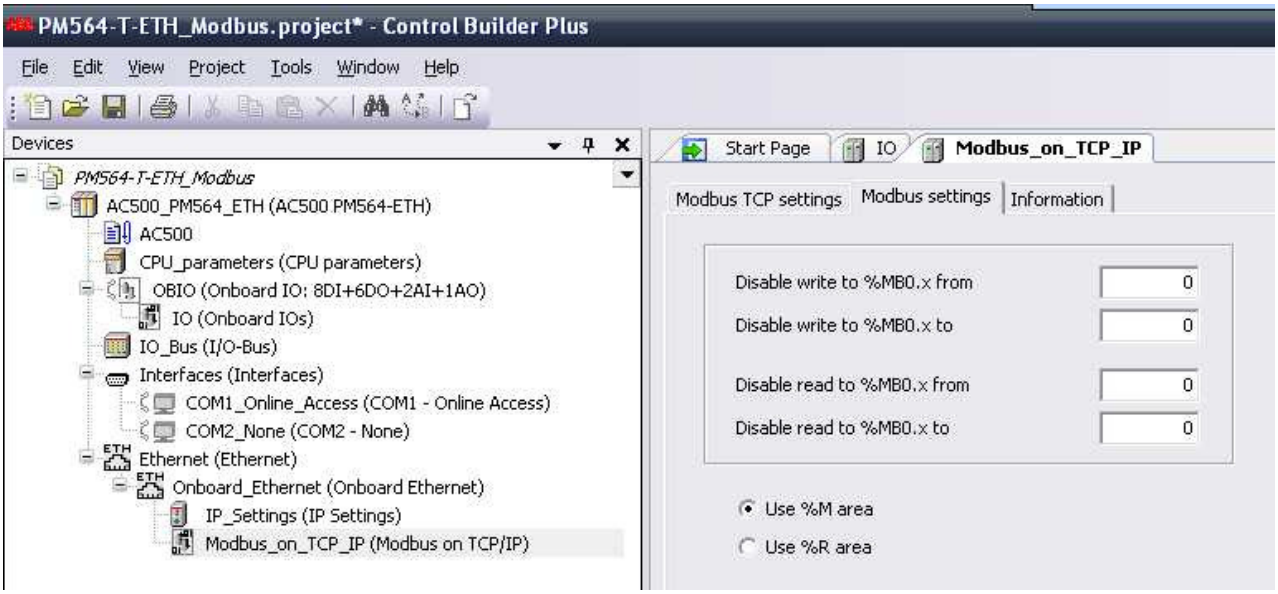
Now you can click on the “Close” button to leave the add device screen.

To activate the server double click on the “Modbus_on_TCP_IP”.



Set the server connections to 2.

Leave the following settings as they are.



The declaration of the Modbus addresses in the %M area;

In our test case we want to exchange only 10 words of data between the 2 plc's.

Global_Variables

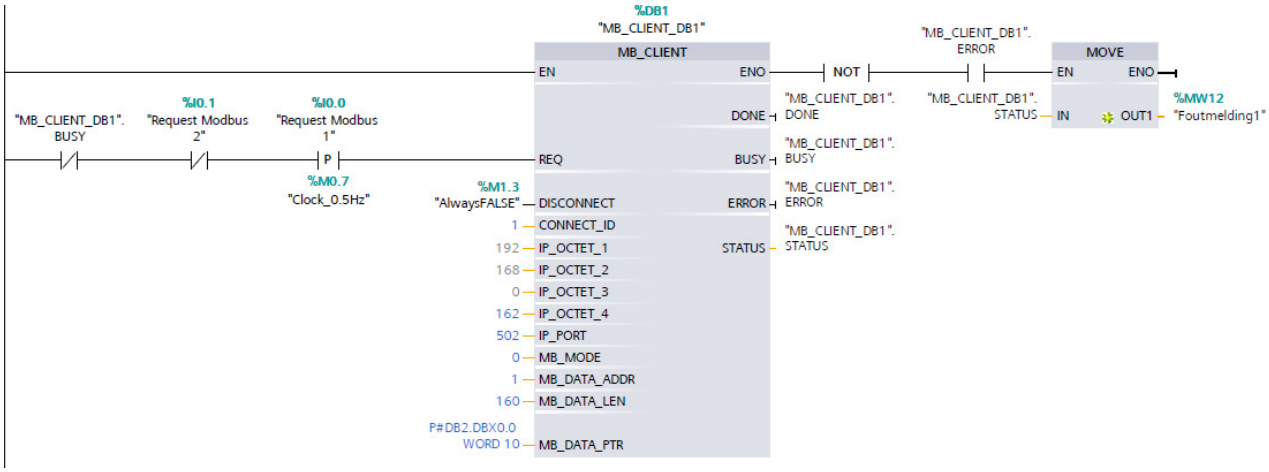
```
0001 VAR_GLOBAL
0002 (* ------------------------------------------------------------*)
0003 (* Modus %M area *)
0004     PM564_ModbusW0 AT %MW0.0:WORD;
0005     PM564_ModbusW1 AT %MW0.1:WORD;
0006     PM564_ModbusW2 AT %MW0.2:WORD;
0007     PM564_ModbusW3 AT %MW0.3:WORD;
0008     PM564_ModbusW4 AT %MW0.4:WORD;
0009     PM564_ModbusW5 AT %MW0.5:WORD;
0010     PM564_ModbusW6 AT %MW0.6:WORD;
0011     PM564_ModbusW7 AT %MW0.7:WORD;
0012     PM564_ModbusW8 AT %MW0.8:WORD;
0013     PM564_ModbusW9 AT %MW0.9:WORD;
0014 (* ------------------------------------------------------------*)
0015
0016 END_VAR
```

So far the story on the AC500-eCo ……

Are there special settings for the S7-1200? No, you only have to programme it.

Below you will find the two MD_CLIENT blocks with their specific settings.

The block to read the Modbus bits.



The construction of the MB_MODE, MB_DATA_ADDR and MB_DATA_LEN are listed below.

Table 12- 51 Modbus functions

MB_MODE	Modbus function	Data length	Operation and data	MB_DATA_ADDR
0	01	1 to 2000	Read output bits: 1 to 2000 bits per request	1 to 9999 ←
0	02	1 to 2000	Read input bits: 1 to 2000 bits per request	10001 to 19999
0	03	1 to 125	Read Holding registers: 1 to 125 words per request	40001 to 49999 or 400001 to 465535
0	04	1 to 125	Read input words: 1 to 125 words per request	30001 to 39999
1	05	1	Write one output bit: One bit per request	1 to 9999
1	06	1	Write one holding register: 1 word per request	40001 to 49999 or 400001 to 465535
1	15	2 to 1968	Write multiple output bits: 2 to 1968 bits per request	1 to 9999 ←

In the programming above you will notice a data length of 160, the unit for this is “bits”.
So the total data which will be read is 10 words

The MB_DATA_PTR is connected with a pointer which points to DB2 from word 0 to 10.
The data block can look like;

Data_block_modbus

Data_block_modbus Properties							
General							
Name	Data_block_modbus	Number	2	Type	DB	Language	DB
Information							
Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Data_block_modbus

Name	Data type	Offset	Start value	Retain	Accessible from HMI	Visible in HMI	Comment
▼ Static							
ModW0.0	Word	0.0	0	False	True	True	
ModW2.0	Word	2.0	4	False	True	True	
ModW4.0	Word	4.0	0	False	True	True	
ModW6.0	Word	6.0	0	False	True	True	
ModW8.0	Word	8.0	0	False	True	True	
ModW10.0	Word	10.0	0	False	True	True	
ModW12.0	Word	12.0	0	False	True	True	
ModW14.0	Word	14.0	0	False	True	True	

The block to write the Modbus bits;