



Solar Technical Product Support Industrial Automation www.solarnederland.info AC500-eCo Modbus TCP server 1 of 9



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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.

🍩 PM564-T-ETH_Modbus.project* -	Control Builder Plus
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■ ご Onboard_Ethernet (O IP_Settings (IP 56 間 メージ	Copy Paste Cut Delete
	Export mappings to CSV
	Add Device Insert Device Update Device Edit Object

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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.

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To activate the server double click on the "Modbus\_on\_TCP\_IP".



# Set the server connections to 2.

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Leave the following settings as they are.

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PM564-T-ETH_Modbus     AC500_PM564_ETH (AC500 PM564-ETH)     AC500     CPU_parameters (CPU parameters)     CPU_parameters (CPU parameters)     IOBIO (Onboard IO: 8DI+6DO+2AI+1AO)     IO (Onboard IO: 8DI+6DO+2AI+1AO)     IO (Onboard IO: 8DI+6DO+2AI+1AO)     IO (Onboard IO: 8DI+6DO+2AI+1AO)     IO (D_Bus (I/O-Bus)     INterfaces (Interfaces)     COM1_Online_Access (COM1 - Online)     Ethernet (Ethernet)     Ethernet (Ethernet)     ID Onboard_Ethernet (Onboard Ethernet)     INP_Settings (IP Settings)     Modbus_on_TCP_IP (Modbus on TCD)	Access) P/IP)		Modbus TCP settings   Modbus settings   Information     Disable write to %MB0.x from   Disable write to %MB0.x from   Disable read to %MB0.x from     Disable read to %MB0.x from   Disable read to %MB0.x from   Disable read to %MB0.x from     Over the field of t	

server



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.

Globa	I_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;	
8000	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	
<u> </u>	1	

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.

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

#### Table 12- 51 Modbus functions



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	Туре	DB	Language	DB	
Information								
Title		Author		Comment		Family		
Version	0.1	User-defined ID						
		1						

Juni Diock Incodes							
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;

