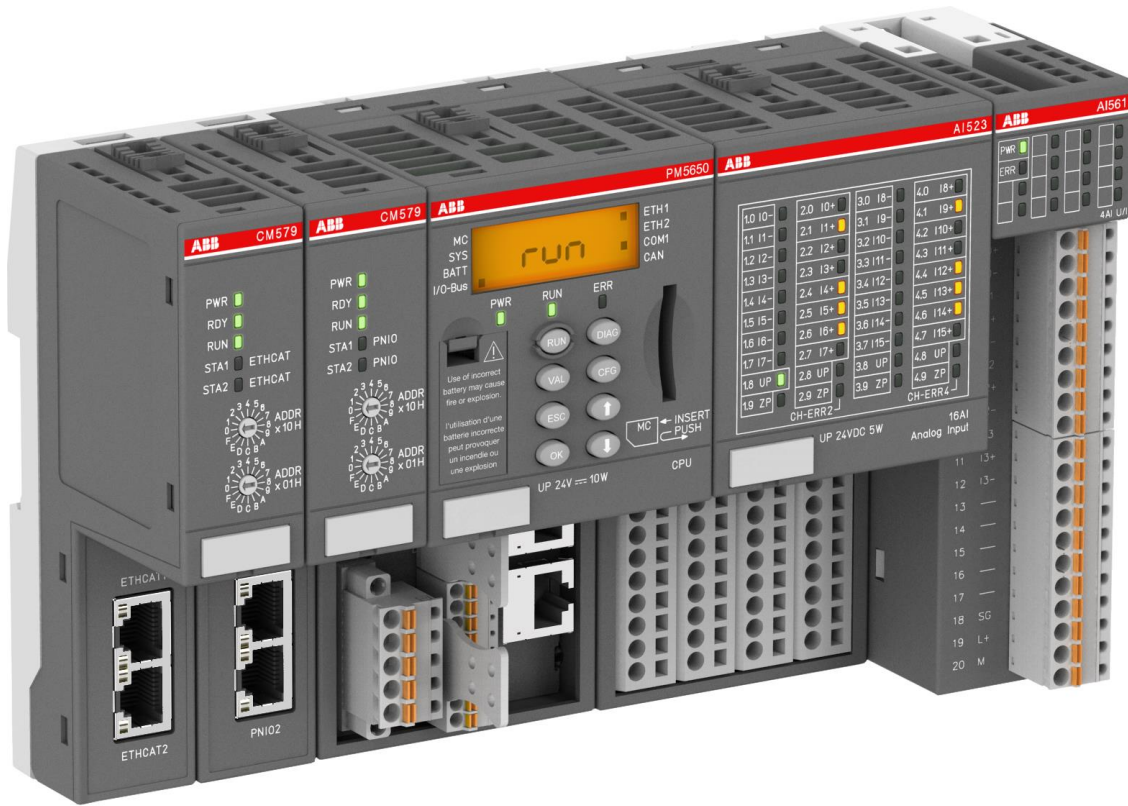




2022-08

Modbus TCP in AC500 V3

Christian Biesenthal, Global Technical Support PLC



Modbus in AC500 V3

Agenda



Fieldbus structure



Hardware



Address registers



Mapping of CI52x

Modbus in AC500 V3

Agenda



Fieldbus structure



Hardware



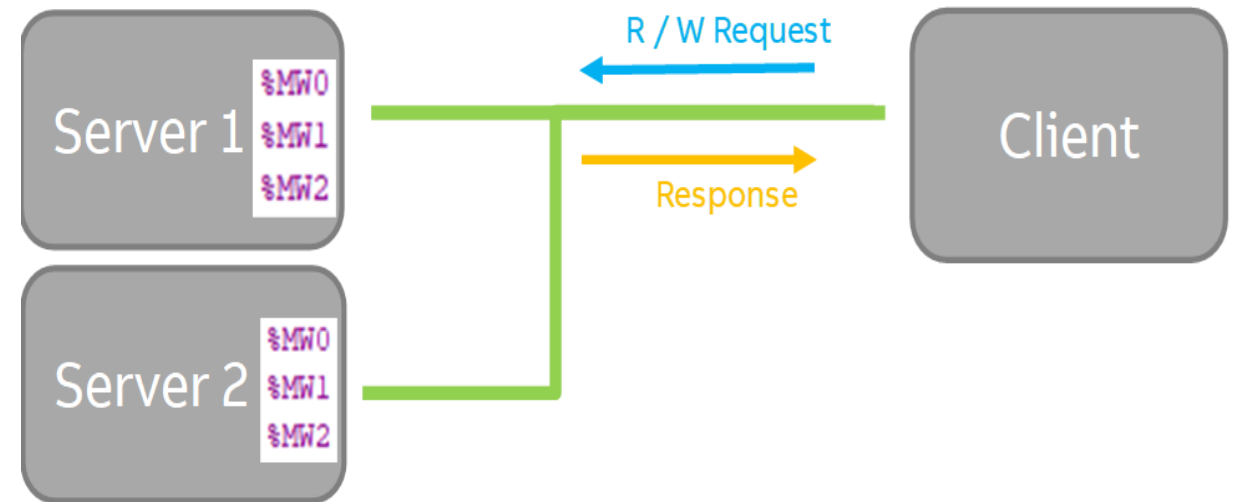
Address registers



Mapping of CI52x

Modbus architecture

- Modbus architecture
 - Client/Server (TCP)
 - Master/Slave (serial)
- Modbus TCP
 - Ethernet TCP/IP layers
- Modbus RTU
 - RS232 serial interface
 - RS485 serial interface



Modbus in AC500 V3

Agenda



Fieldbus structure



Hardware



Address registers



Mapping of CI52x

AC500 connectivity

AC500-eCo V3



PM5012 PM5032 PM5052 PM5072

Number of Modbus TCP clients for one CPU in parallel	8	13	20	30
Register range %M	4kB	16kB	16kB	64kB

AC500 V3



PM5630 PM5650 PM5670 PM5675

Number of Modbus TCP clients for one CPU in parallel	30	50	120	120
Register range %M	128kB	128kB	512kB	512kB



AC500 with remote I/O via Modbus TCP

Communication interface modules CI521 and CI522

- Configure CI52x module via Automation Builder IP Tool
- Modbus server only
- CI522: 8DI + 8DO + 8DC
- CI521: 4AI + 2AO + 8DI + 8DO
- Separate register allocation
- Register addresses %M range: 4096..11007



Modbus in AC500 V3

Agenda



Fieldbus structure



Hardware



Address registers



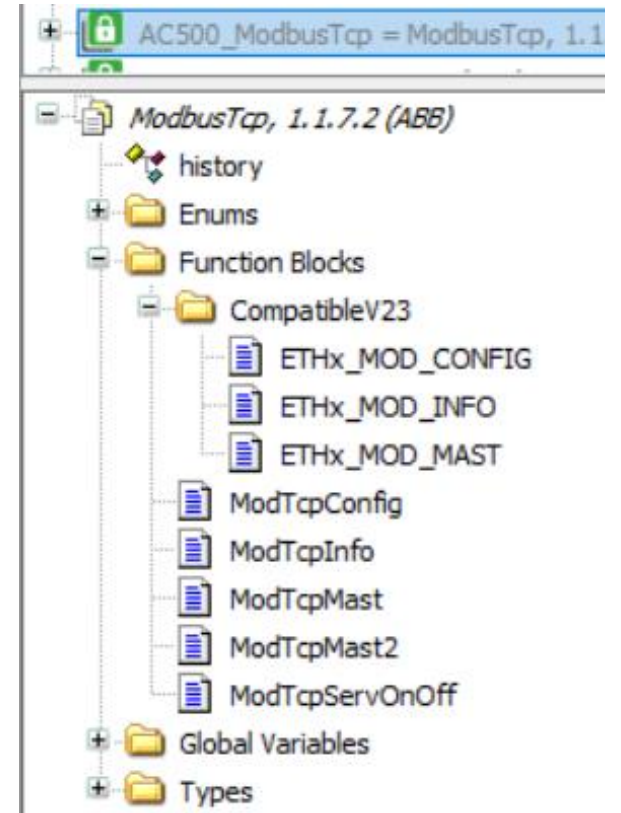
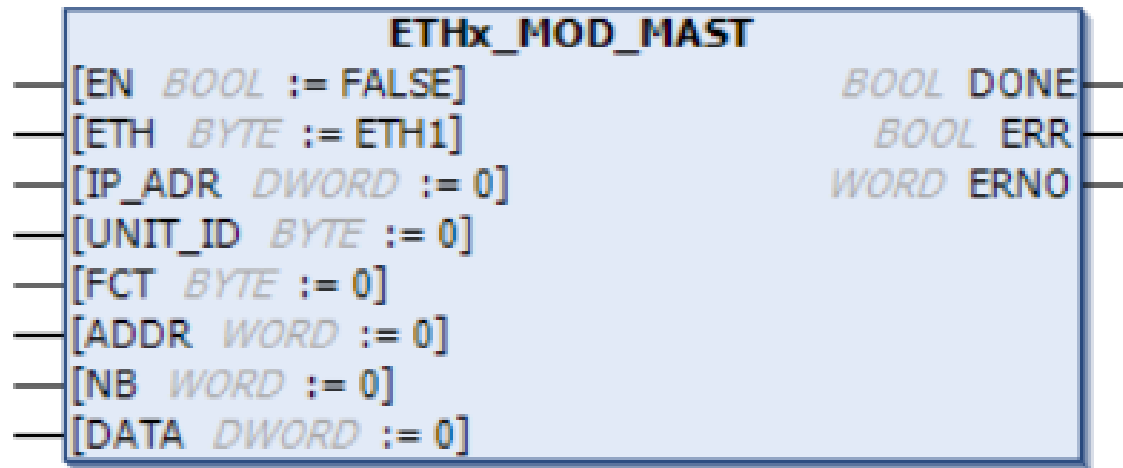
Mapping of CI52x

Register types

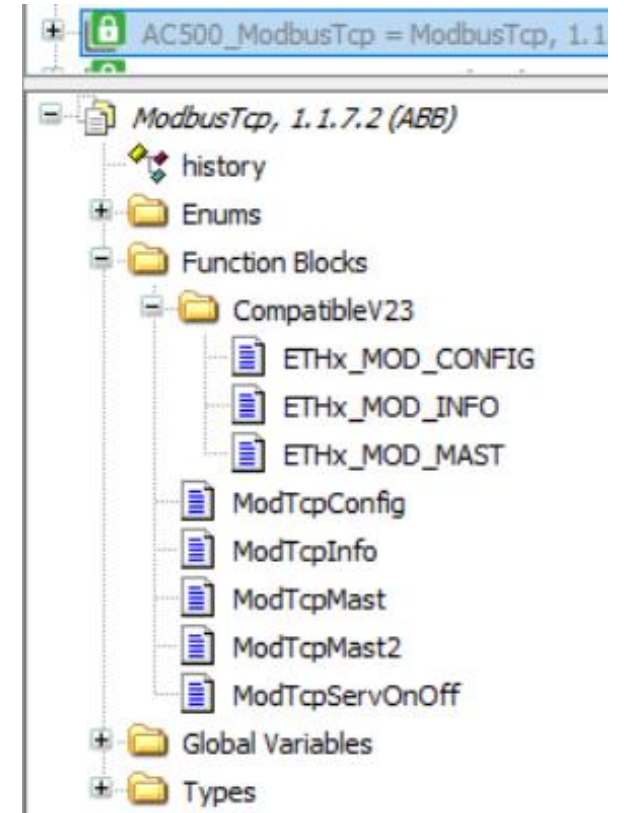
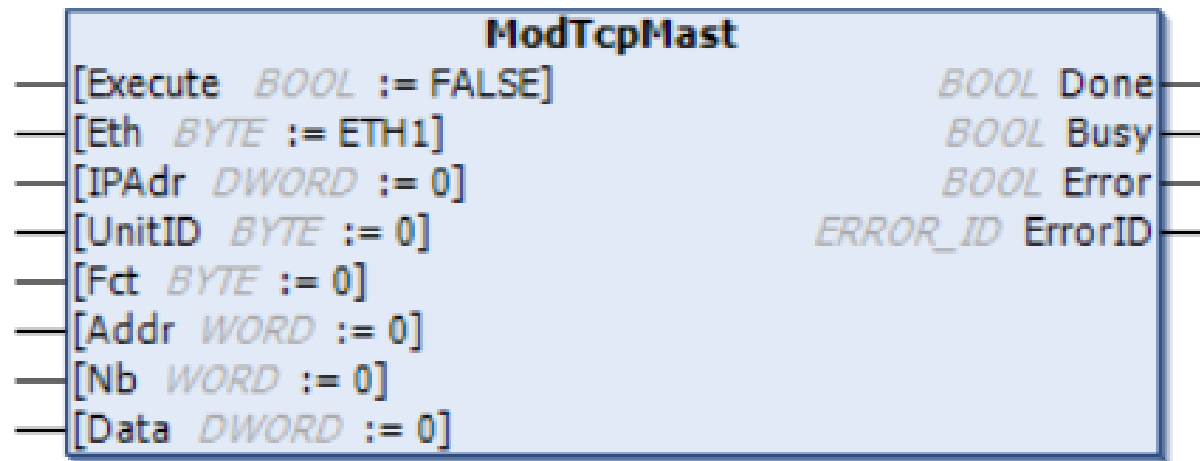
Function Code	Access	Size
01	Read	1 Bit
03	Read	16 Bits
05	Write	1 Bit
16	Write	16 Bits

```
1  VAR_GLOBAL
2      //Analog holding registers
3      ModbusTCP_Word_0 AT %MW0      : WORD;
4      ModbusTCP_Word_1 AT %MW1      : WORD;
5      ModbusTCP_Word_2 AT %MW2      : WORD;
6      ModbusTCP_Word_3 AT %MW3      : WORD;
7      //Single coil
8      ModbusTCP_Bool_08_0 AT %MX8.0  : BOOL;
9      ModbusTCP_Bool_08_1 AT %MX8.1  : BOOL;
10 END_VAR
```

AC500 Modbus TCP library

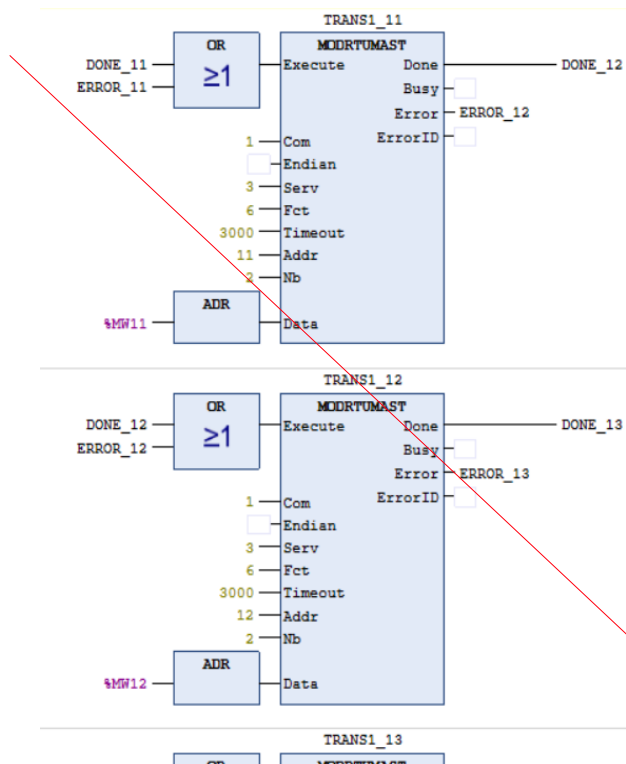


AC500 Modbus TCP library

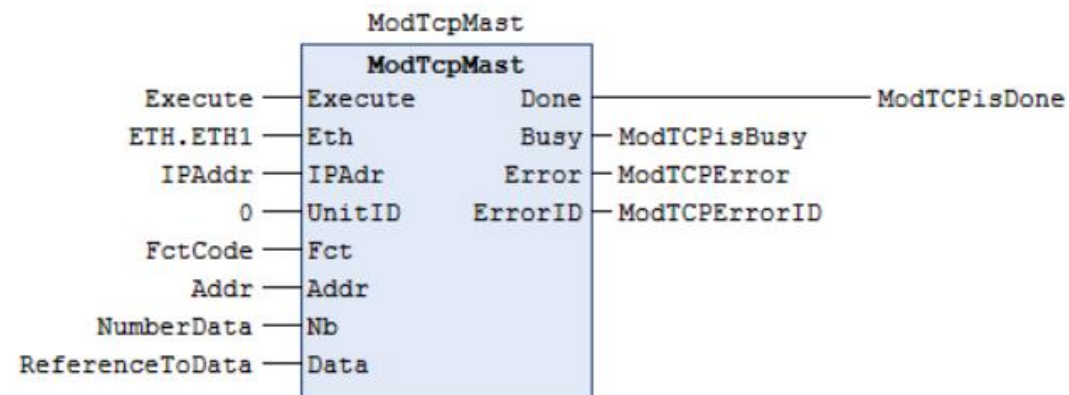


AC500 Modbus TCP library

Only recommended if aware of available sockets



Recommended: one instance



```
2   Execute      :=TRUE;  
3   IPAddr       :=IP_ADR_STRING_TO_DWORD(Target_IP);  
4   iFctCode     := 3;  
5   iAddr        :=16#1000;  
6   NumberData   := 3;  
7   ReferenceToData :=ADR(GVL.DataSendDynamic);  
8   ModTCPisBusy :=GVL.Client1Busy;  
9   ModTCPError  :=GVL.Client1Error;  
10  ModTCPErrorID:=GVL.Client1ErrorID;  
11  ModTCPisDone :=GVL.Client1Done;
```

Modbus in AC500 V3

Agenda



Fieldbus structure



Hardware



Address registers



Mapping of CI52x

Register types for CI52x

– Variable registers begin at 0x1000

Register addr.: 0x1000

Register addr.: 0x1001

Register addr.: 0x1002

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Register addr.: 0x2AFD

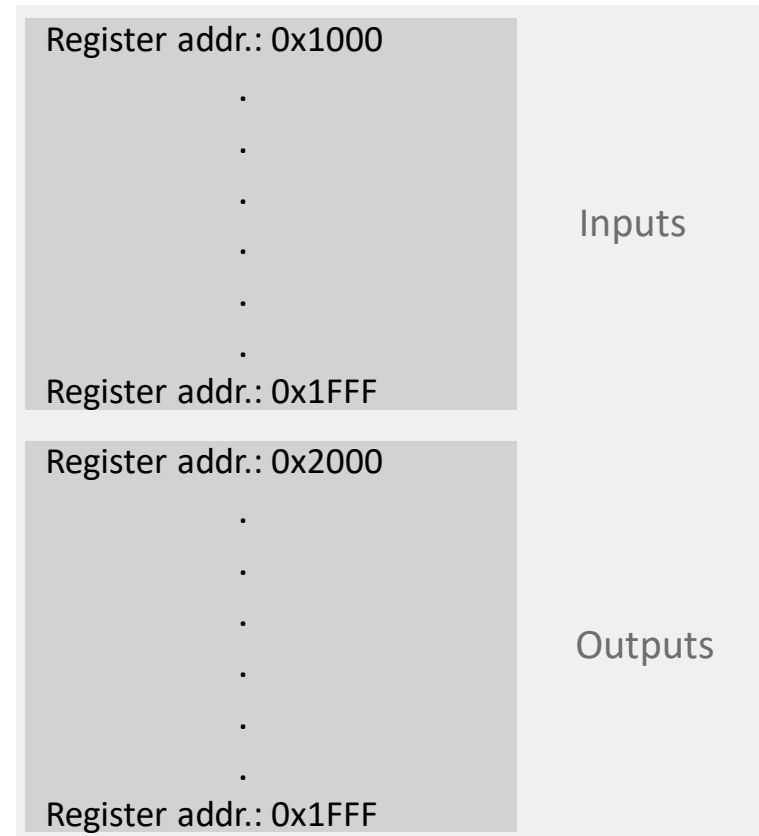
Register addr.: 0x2AFE

Register addr.: 0x2AFF

– Variable registers end at 0x2AFF

Register types for CI52x

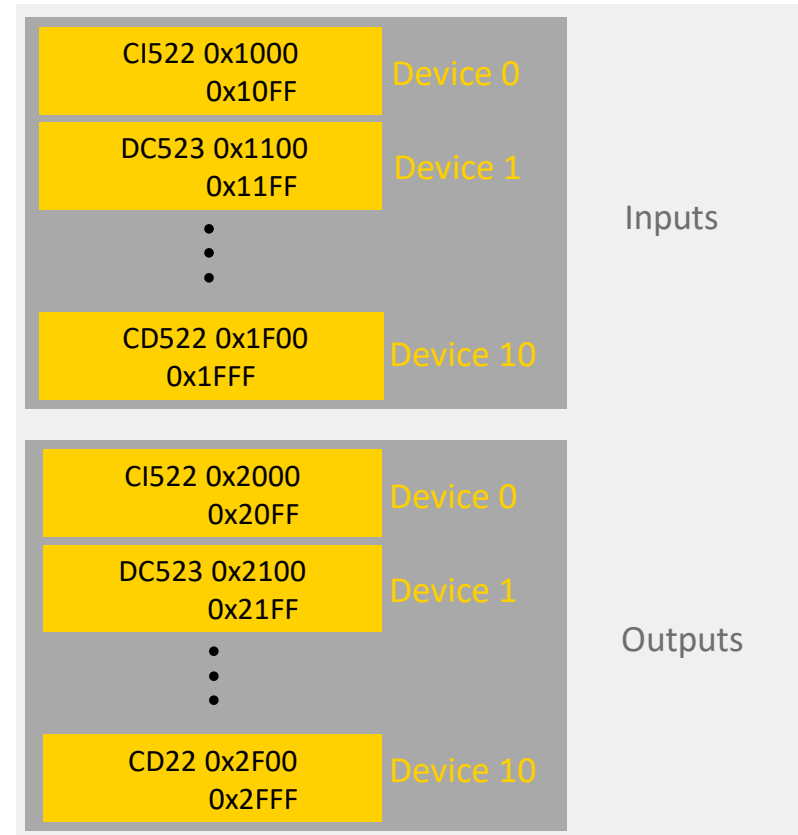
- Inputs start at address 0x1000
- Inputs end at address 0x1FFF
- Outputs start at address 0x2000
- Outputs ends at address 0x2AFF



Register types for CI52x

Fixed mapping

- Every device takes 0x100 registers for Inputs
- Every device takes 0x100 registers for Outputs
- You can connect up to 10 devices



ABB