PNOZmulti 2 - S7-1200/1500 Modbus Connection

Product

Type:	PNOZ m B1
Name:	PNOZmulti 2 series
Manufacturer:	Pilz GmbH & Co. KG, Safe Automation

Document

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Important Note

Document Revision History

Release	Date	Changes	Chapter
01	2022-07-13	Creation	all

Validity of Application Note

This present Application Note is valid until a new version of the document is published.
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The Pilz newsletter is free of charge and keeps you up-to-date on all the latest issues and trends in safe automation.

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July 2022

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Industrial Security

To secure plants, systems, machines and networks against cyberthreats it is necessary to implement (and continuously maintain) an overall Industrial Security concept that is state of the art.
Perform a risk assessment in accordance with VDI/VDE 2182 or IEC 62443-3-2 and plan the security measures with care. If necessary, seek advice from Pilz Customer Support.

Abbreviations

Abbreviation / term	Description	Source
AN	**A**pplication **N**ote	www.pilz.com > AN content (1002400)
PNOZ	Pilz E-STOP positive-guided (DE: **P**ilz **NO**T-AUS-**Z**wangsgeführt)	www.pilz.com > PNOZ
PSS	Programmable control system (DE: **P**rogrammierbares **S**teuerungs**s**ystem)	www.pilz.com > PSS
PSS u2	**PSSu**niversal, **2**nd generation	www.pilz.com > PSS u2
POU	**P**rogram **O**rganisation **U**nit	
NC	**N**ormally **C**losed	
NO	**N**ormally **O**pen	

Definition of Symbols

- Information that is particularly important is identified as follows:

⚠ **CAUTION!**

This refers to a hazard that can lead to a less serious or minor injury plus material damage, and also provides information on preventive measures that can be taken.

❗ **NOTICE**

This describes a situation in which the product or devices could be damaged and also provides information on preventive measures that can be taken.
It also highlights areas within the text that are of particular importance.

ℹ **INFORMATION**

This gives advice on applications and provides information on special features.

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1 Useful documentation

Reading the documentation listed below is necessary for understanding this Application Note. The availability of the software used and its safe handling are also presupposed for the user.

1.1 Documentation from Pilz GmbH & Co. KG

No.	Description	Item No. /Download
1	Pilz international homepage, download section	www.pilz.com
2	PNOZmulti 2 Communication Interfaces	1002971-EN-XX
3	Technical Catalogue PNOZmulti	1001153-EN-XX
4	Operating Manual PNOZ m B1	1003790-EN-XX

1.2 Documentation from other sources of information

No.	Description	Item No. / Download
1	SIMATIC Industrie Software SIMATIC Safety - Configuring and Programming Programming and Operating Manual	A5E02714439-AL; 05/2021 support.industry.siemens.com > 54110126
2	Application Example: How do you program and parameterize Modbus/TCP communication between S7-1500 CPUs and S7-1200 CPUs?	08/2019 support.industry.siemens.com > 102020340
3		
4		

2 Used hardware and software

2.1 Pilz products

No.	Descriptions	Order number	Version	Number
1	PNOZ m B1	772101		1
2	PNOZ m EF 8DI4DO	772142		1
3	PNOZ m B1 Set4 Spring Terminals	751016		1
4	PNOZ m EF 8DI4DO Set spring terminals	751004		1
5	USB Memory 512MB	779213		1
6	PNOZmulti Configurator		V11.01	

2.2 Third-party products

No.	Descriptions	Order number	Version	Number
1	Siemens S7-1215 DC/DC/RLY		V4.5.2	
2	TIA-Portal		V17 Upd2	

2.3 Structure of the application (schematic)

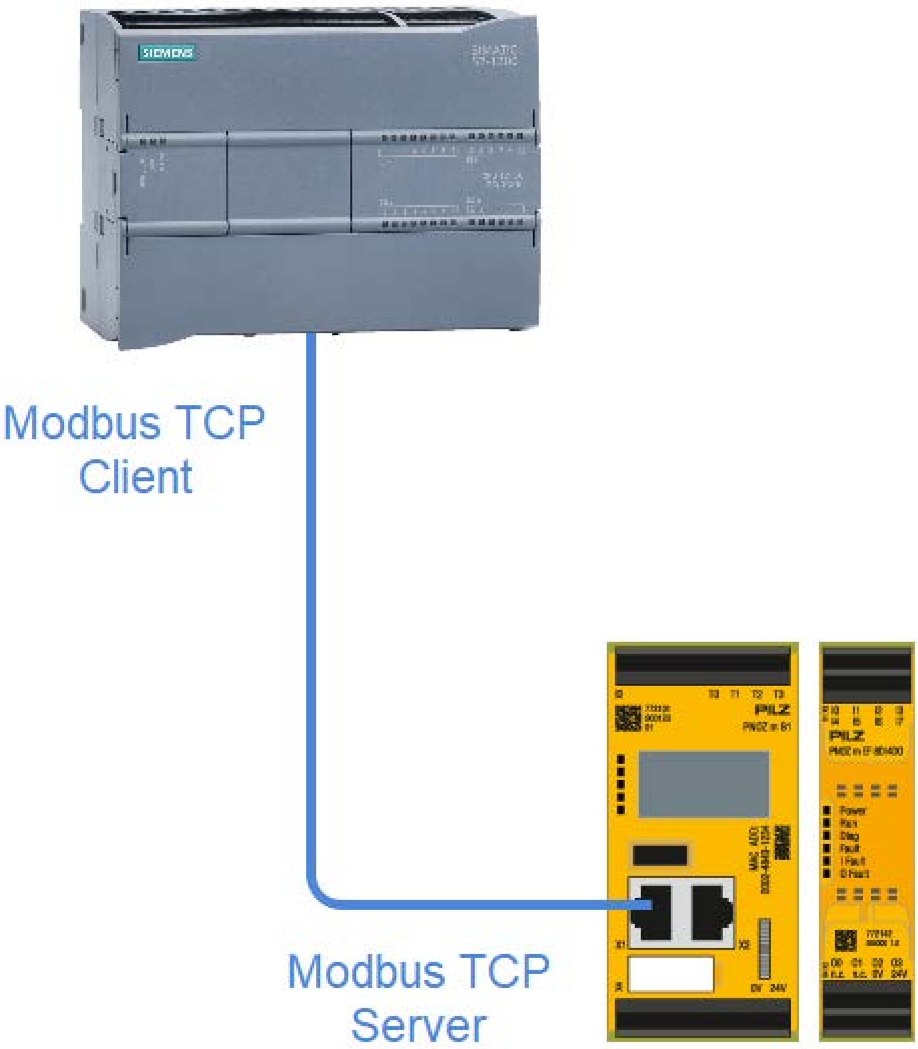


Figure 1: Application – Structure of the hardware (schematic)

3 Application description

This application note describes how to establish a Modbus connection between the PNOZmulti2 and a Simatic S7-1200.
The basics for handling with the PLC and the tool are not part of this document.

Siemens S7-1200: A example project from Siemens is the basis for a Modbus connection.
In the online help of the TIA portal you can find the description of the Modbus block.
There you can also find a description of the error codes.

INFORMATION

The PNOZmulti is Modbus Server, so the PLC has to be configured as Modbus Client.

4 Hardware configuration

4.1 Used hardware

4.1.1 Pilz devices

- The used Pilz modules are listed in the table of the following link:
  - Chapter 2.1 Pilz products [🕮6]
- The relevant important documents are named and linked here:
  - Chapter 1.1 Documentation from Pilz GmbH & Co. KG [🕮5]

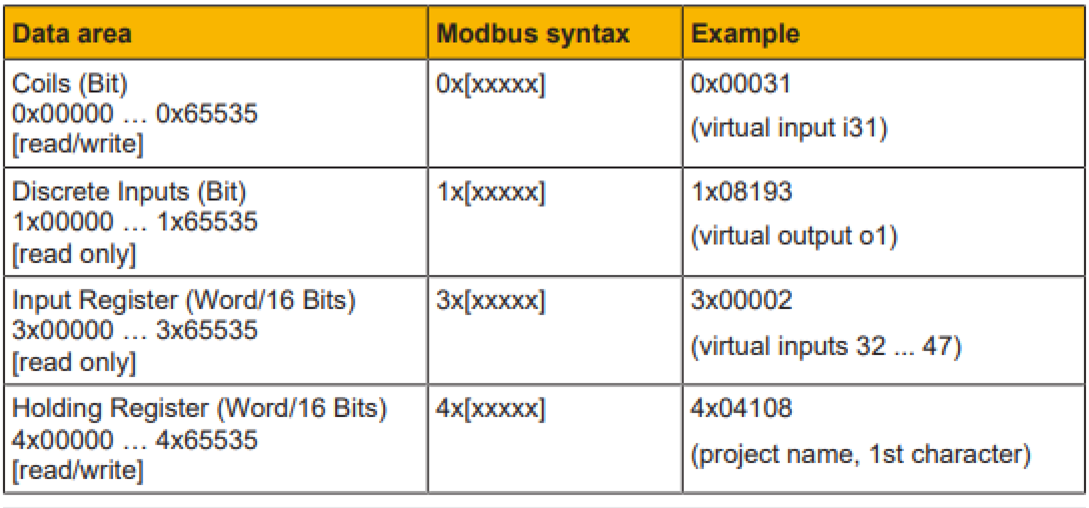
4.1.2 Third-party devices

- The used Third-party devices are listed in the table of the following link:
  - Chapter 2.2 Third-party products [🕮6]
- The relevant important documents are named and linked here:
  - Chapter 1.2 Documentation from other sources of information [🕮6]

5 PNOZmulti 2

5.1 Modbus Data

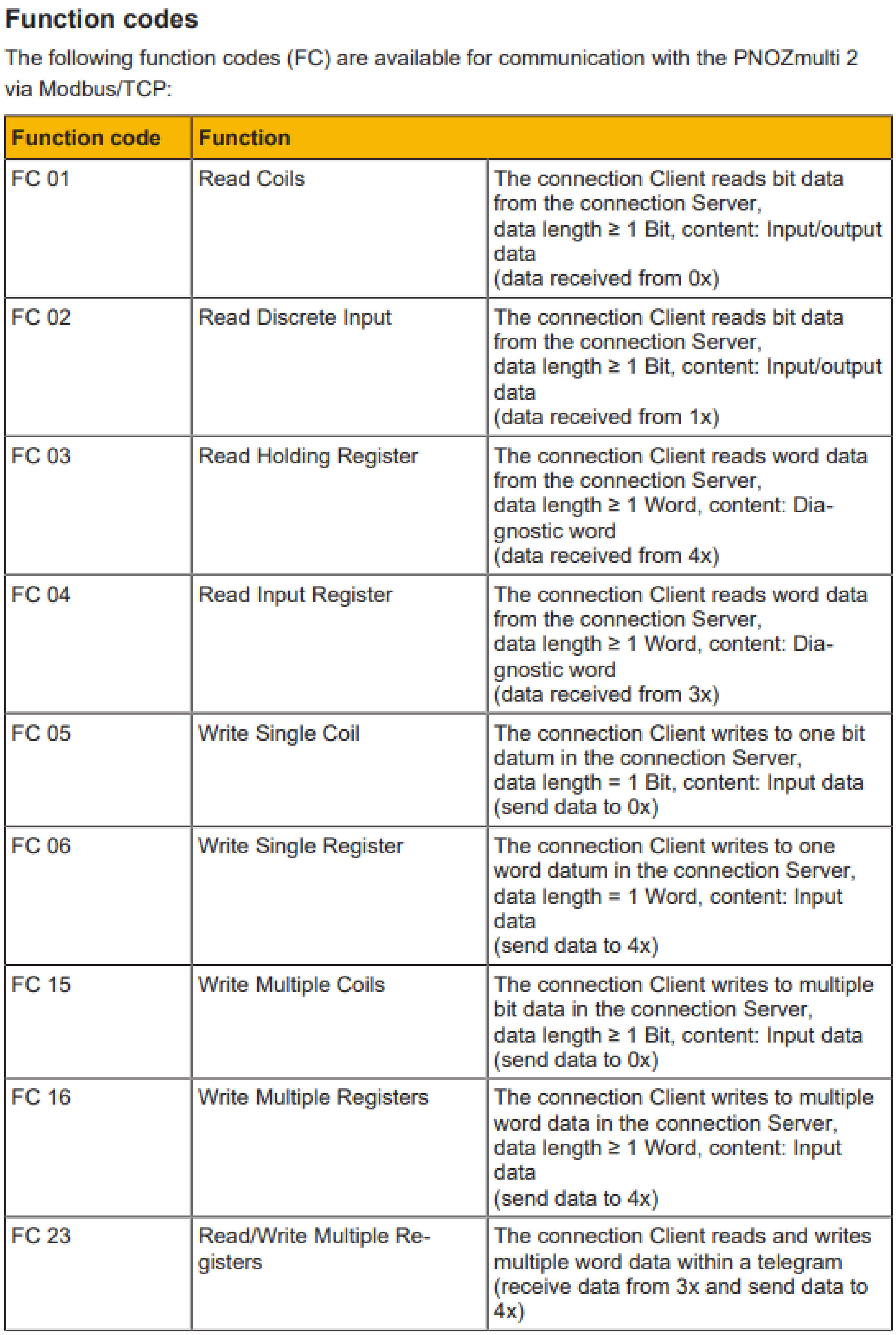
In this example, holding registers (function code 23) are read and written.
As shown in the table below, the data can also be retrieved via Coil Bits, Discrete Inputs and Input Register.
The respective Modbus addresses are listed in the document "Communication Interfaces", see Chapter 1.1, Documentation from Pilz GmbH & Co. KG.



Data area	Modbus syntax	Example
Coils (Bit) 0x00000 … 0x65535 [read/write]	0x[xxxxx]	0x00031 (virtual input i31)
Discrete Inputs (Bit) 1x00000 … 1x65535 [read only]	1x[xxxxx]	1x08193 (virtual output o1)
Input Register (Word/16 Bits) 3x00000 … 3x65535 [read only]	3x[xxxxx]	3x00002 (virtual inputs 32 ... 47)
Holding Register (Word/16 Bits) 4x00000 … 4x65535 [read/write]	4x[xxxxx]	4x04108 (project name, 1st character)

Figure 2: PNOZmulti 2 – Modbus Data area

The PNOZmulti 2 support a lot of Function codes, in this example we only use the function code 23 to read and write the Modbus Registers.

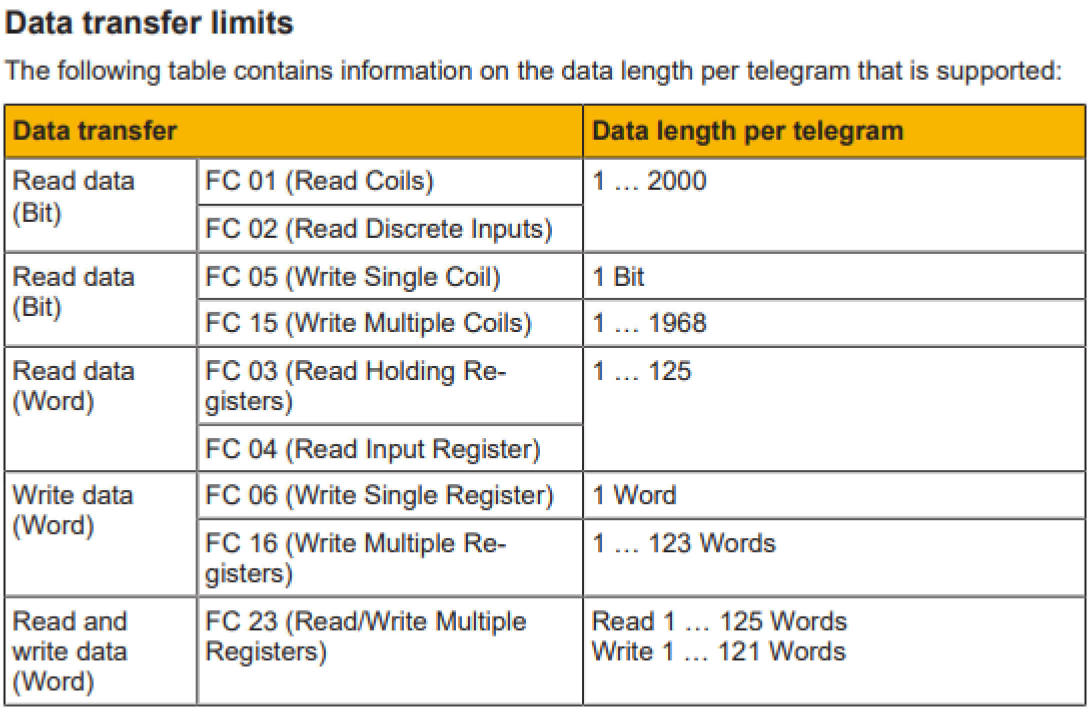


Function codes

The following function codes (FC) are available for communication with the PNOZmulti 2 via Modbus/TCP:

Function code	Function	
FC 01	Read Coils	The connection Client reads bit data from the connection Server, data length ≥ 1 Bit, content: Input/output data (data received from 0x)
FC 02	Read Discrete Input	The connection Client reads bit data from the connection Server, data length ≥ 1 Bit, content: Input/output data (data received from 1x)
FC 03	Read Holding Register	The connection Client reads word data from the connection Server, data length ≥ 1 Word, content: Diagnostic word (data received from 4x)
FC 04	Read Input Register	The connection Client reads word data from the connection Server, data length ≥ 1 Word, content: Diagnostic word (data received from 3x)
FC 05	Write Single Coil	The connection Client writes to one bit datum in the connection Server, data length = 1 Bit, content: Input data (send data to 0x)
FC 06	Write Single Register	The connection Client writes to one word datum in the connection Server, data length = 1 Word, content: Input data (send data to 4x)
FC 15	Write Multiple Coils	The connection Client writes to multiple bit data in the connection Server, data length ≥ 1 Bit, content: Input data (send data to 0x)
FC 16	Write Multiple Registers	The connection Client writes to multiple word data in the connection Server, data length ≥ 1 Word, content: Input data (send data to 4x)
FC 23	Read/Write Multiple Registers	The connection Client reads and writes multiple word data within a telegram (receive data from 3x and send data to 4x)

Figure 3: PNOZmulti 2 – Modbus Function codes



Data transfer limits

The following table contains information on the data length per telegram that is supported:

Data transfer		Data length per telegram
Read data (Bit)	FC 01 (Read Coils)	1 … 2000
	FC 02 (Read Discrete Inputs)	
Read data (Bit)	FC 05 (Write Single Coil)	1 Bit
	FC 15 (Write Multiple Coils)	1 … 1968
Read data (Word)	FC 03 (Read Holding Registers)	1 … 125
	FC 04 (Read Input Register)	
Write data (Word)	FC 06 (Write Single Register)	1 Word
	FC 16 (Write Multiple Registers)	1 … 123 Words
Read and write data (Word)	FC 23 (Read/Write Multiple Registers)	Read 1 … 125 Words Write 1 … 121 Words

Figure 4: PNOZmulti 2 – Modbus Data transfer limits

INFORMATION

If a non-existent Modbus address is accessed, the complete Modbus connection is not established.
The reason for this can be an incorrect Modbus address or an incorrect data length.

INFORMATION

Restrictions: The PNOZmulti supports up to 8 Modbus connections.
Please also note the limits of the Siemens "ModbusClient" block. This supports a maximum of 123 bytes per connection when using "MB_Mode" 116.

6 Siemens S7-1200/1500

6.1 Example project

The Modbus example project can be downloaded from Siemens.
https://support.industry.siemens.com/cs/document/102020340/how-do-you-program-and-parameterize-modbus-tcp-communication-between-s7-1500-cpus-and-s7-1200-cpus-?dti=0&lc=en-DE

The example project contains two different devices. The S7-1200 and the S7-1500 hardware. For the Application Note the example project with the suitable hardware was used.

INFORMATION

There are Modbus Client and Modbus Server blocks. Because the PNOZmulti is a Modbus server, the Modbus client block must be used on the PLC side.

A few adjustments need to be made in the example project.
This is described on the following pages.

INFORMATION

In the Siemens sample project, one connection (FB1 "Modbus Client") is created, for this example we need two connections, therefore FB1 is called twice on the following pages.

Two connections (FB1 ModbusClient) are created:
Connection 1: Write Data to PNOZmulti (write virtual Inputs of PNOZmulti)
Connection 2: Read Data to PNOZmulti (read virtual Inputs of PNOZmulti)

Connection 1 write Data to PNOZmulti:

- Connection number = 2
- Port = 502
- Modbus TCP Server IP address = 192.168.0.3 (PNOZmulti)
- modbusMode = 116
- modebusDataAddress = 0
- modbusDataLen = 8

Connection 2 read Data from PNOZmulti:

- Connection number = 3
- Port = 502
- Modbus TCP Server IP address = 192.168.0.3 (PNOZmulti)
- modbusMode = 103
- modebusDataAddress = 512
- modbusDataLen = 10

6.2 FB1 “ModbusClient”

The function block FB1 "ModbusClient" is called cyclically in OB1.

The FB1 "ModbusClient" calls the "MB_CLIENT" instruction internally to establish the Modbus/TCP connection and read/write the holding register from the Modbus TCP server (PNOZmulti).
The communication request to read the holding register is controlled via the "ModbusData".clientData.request tag at the "request" input.

Connection 1 write Data to PNOZmulti

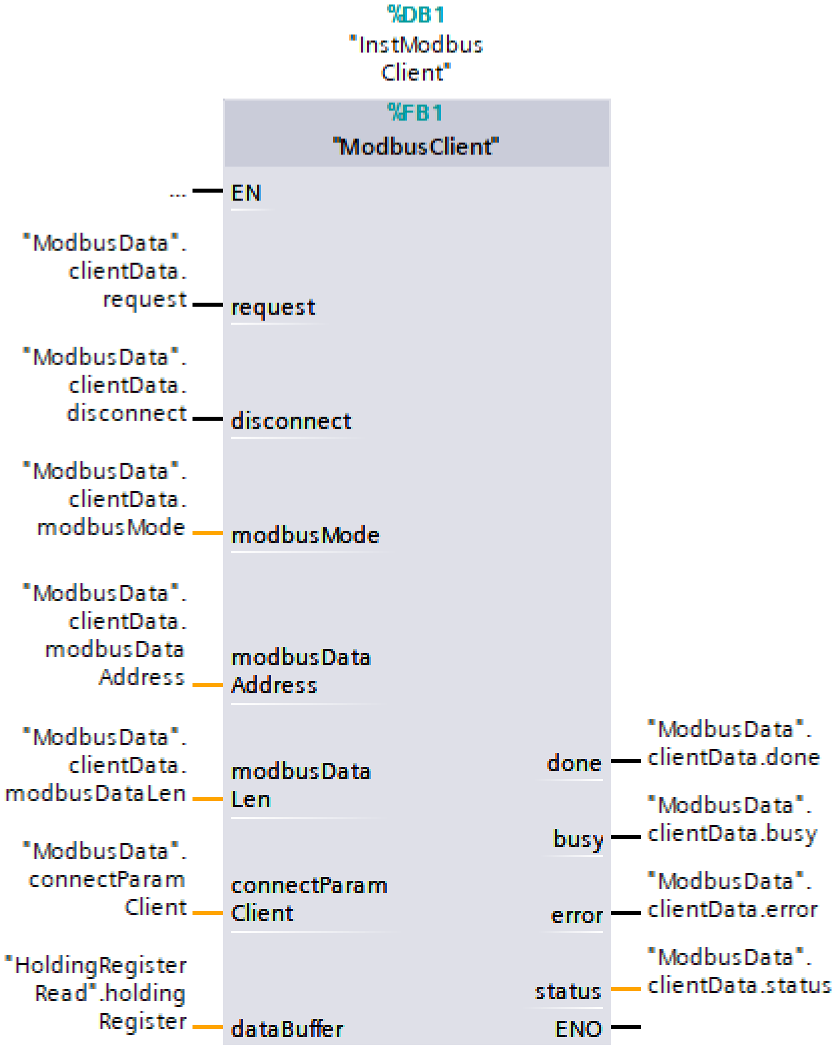

%DB1
"InstModbus Client"
%FB1
"ModbusClient"
... EN
"ModbusData".clientData.request request
"ModbusData".clientData.disconnect disconnect
"ModbusData".clientData.modbusMode modbusMode
"ModbusData".clientData.modbusDataAddress modbusDataAddress
"ModbusData".clientData.modbusDataLen modbusDataLen
"ModbusData".connectParamClient connectParamClient
"HoldingRegisterRead".holdingRegister dataBuffer
done "ModbusData".clientData.done
busy "ModbusData".clientData.busy
error "ModbusData".clientData.error
status "ModbusData".clientData.status
ENO

Figure 5: Simatic S7-1200 / FB1 – Modbus Client [Connection 1]

- **Connection 2 read Data from PNOZmulti**

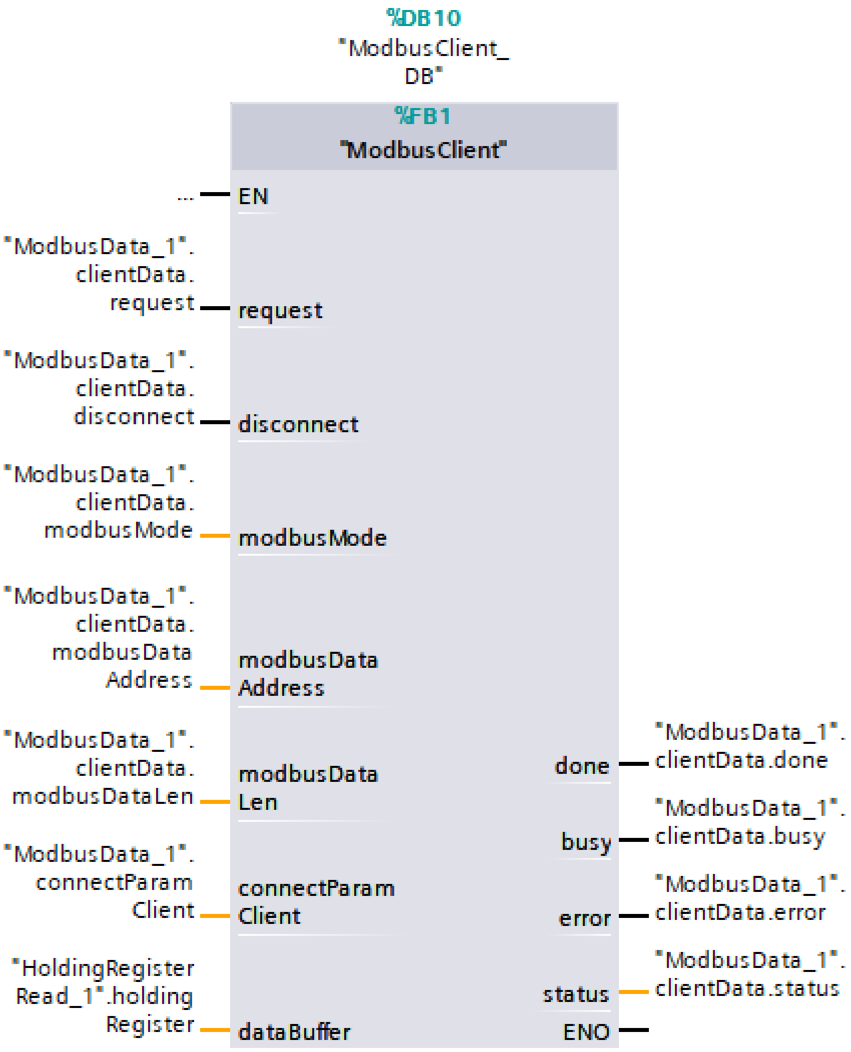

%DB10
"ModbusClient_DB"
%FB1
"ModbusClient"
... EN
"ModbusData_1".clientData.request — request
"ModbusData_1".clientData.disconnect — disconnect
"ModbusData_1".clientData.modbusMode — modbusMode
"ModbusData_1".clientData.modbusDataAddress — modbusDataAddress
"ModbusData_1".clientData.modbusDataLen — modbusDataLen
"ModbusData_1".connectParamClient — connectParamClient
"HoldingRegisterRead_1".holdingRegister — dataBuffer
done — "ModbusData_1".clientData.done
busy — "ModbusData_1".clientData.busy
error — "ModbusData_1".clientData.error
status — "ModbusData_1".clientData.status
ENO

Figure 6: Simatic S7-1200 / FB1 – Modbus Client [Connection 2]

6.2.1 Configuring DB100/101 "connection data"

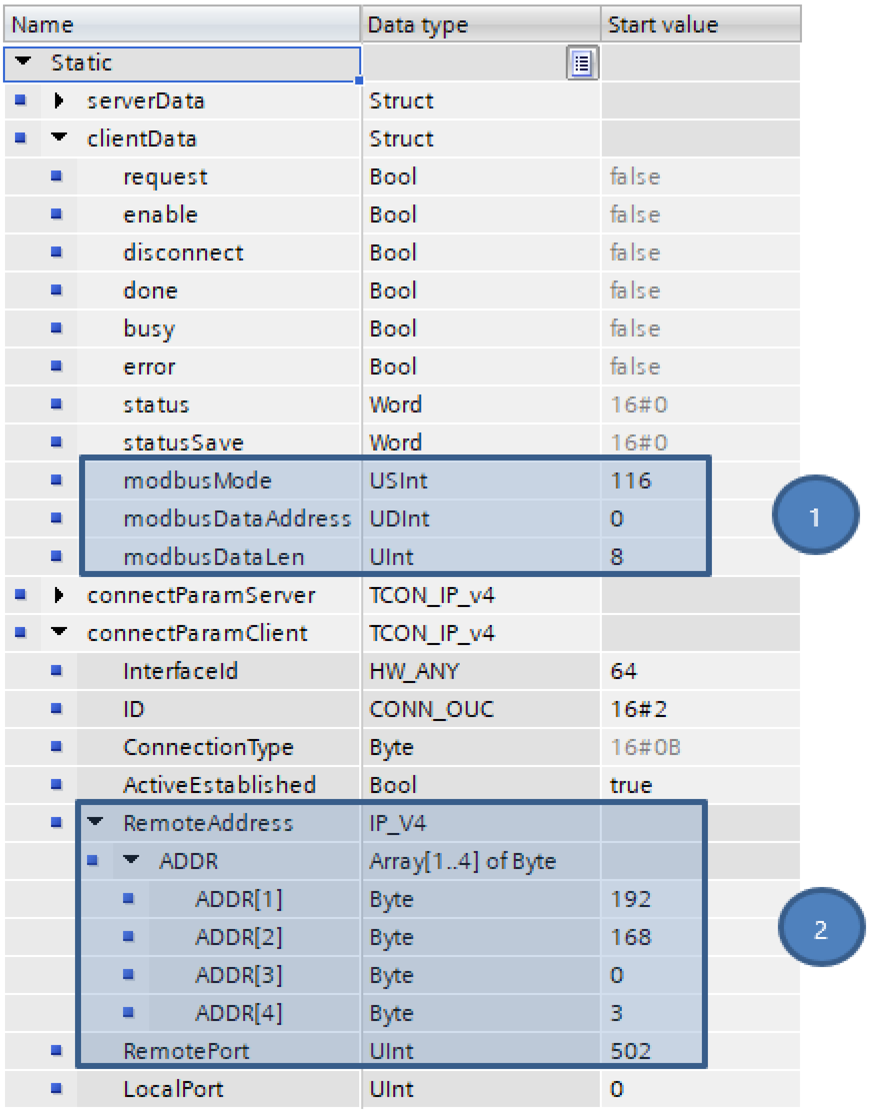
6.2.1.1 Modbus parameter

All Modbus connection parameters are set in the DB100/101.
The following must be adjusted:

- IP address of the connection partner
- RemoteAddress
- modbusMode
- modbusDataAddress
- modbusDataLen

The Modbus registers of the PNOZmulti are described in the document "PNOZmulti 2 Communication Interfaces" [📖 5].

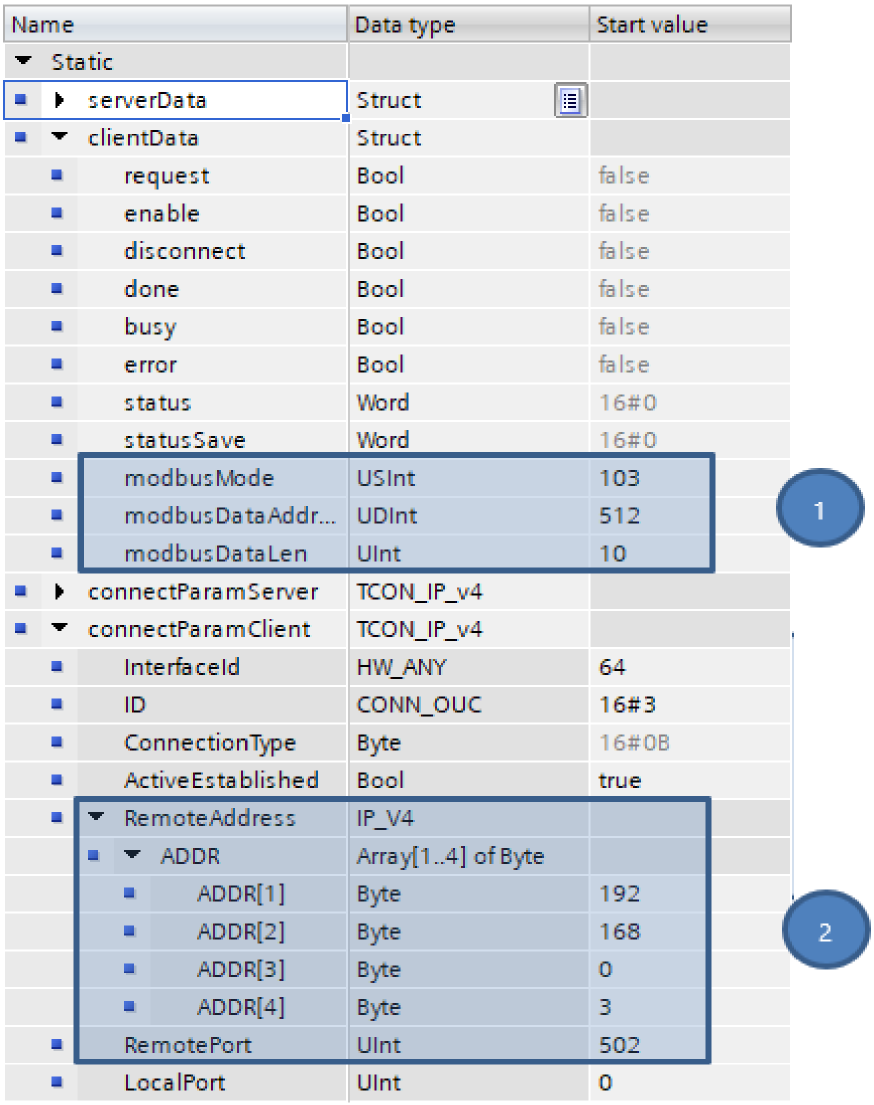
Connection 1 write Data to PNOZmulti



Name	Data type	Start value
Static		
serverData	Struct	
clientData	Struct	
request	Bool	false
enable	Bool	false
disconnect	Bool	false
done	Bool	false
busy	Bool	false
error	Bool	false
status	Word	16#0
statusSave	Word	16#0
modbusMode	USInt	116
modbusDataAddress	UDInt	0
modbusDataLen	UInt	8
connectParamServer	TCON_IP_v4	
connectParamClient	TCON_IP_v4	
InterfaceId	HW_ANY	64
ID	CONN_OUC	16#2
ConnectionType	Byte	16#0B
ActiveEstablished	Bool	true
RemoteAddress	IP_V4	
ADDR	Array[1..4] of Byte	
ADDR[1]	Byte	192
ADDR[2]	Byte	168
ADDR[3]	Byte	0
ADDR[4]	Byte	3
RemotePort	UInt	502
LocalPort	UInt	0

Figure 7: Simatic S7-1200 / DB100 – Connection Data Connection 1

Connection 2 read Data from PNOZmulti



Name	Data type	Start value
Static		
serverData	Struct	
clientData	Struct	
request	Bool	false
enable	Bool	false
disconnect	Bool	false
done	Bool	false
busy	Bool	false
error	Bool	false
status	Word	16#0
statusSave	Word	16#0
modbusMode	USInt	103
modbusDataAddr...	UDInt	512
modbusDataLen	UInt	10
connectParamServer	TCON_IP_v4	
connectParamClient	TCON_IP_v4	
InterfaceId	HW_ANY	64
ID	CONN_OUC	16#3
ConnectionType	Byte	16#0B
ActiveEstablished	Bool	true
RemoteAddress	IP_V4	
ADDR	Array[1..4] of Byte	
ADDR[1]	Byte	192
ADDR[2]	Byte	168
ADDR[3]	Byte	0
ADDR[4]	Byte	3
RemotePort	UInt	502
LocalPort	UInt	0

Figure 8: Simatic S7-1200 / DB100 – Connection Data Connection 2

1

- modbusMode: In the following table [🕮 18] you read the "modbusMode" according to the data you want to read out from the PNOZmulti. In our example we use the modbus mode 116 for connection 1 and modbus mode 103 for connection 2.

- modbusDataAddress: This is the start address of the requested Modbus Register. In our example we use the modbusDataAddress 0 for connection 1 and modbusDataAddress 512 for connection 2.

INFORMATION

On the PNOZmulti, the addressing for Modbus/TCP data areas starts at "1".
On the Simatic PLCs addressing start at "0".

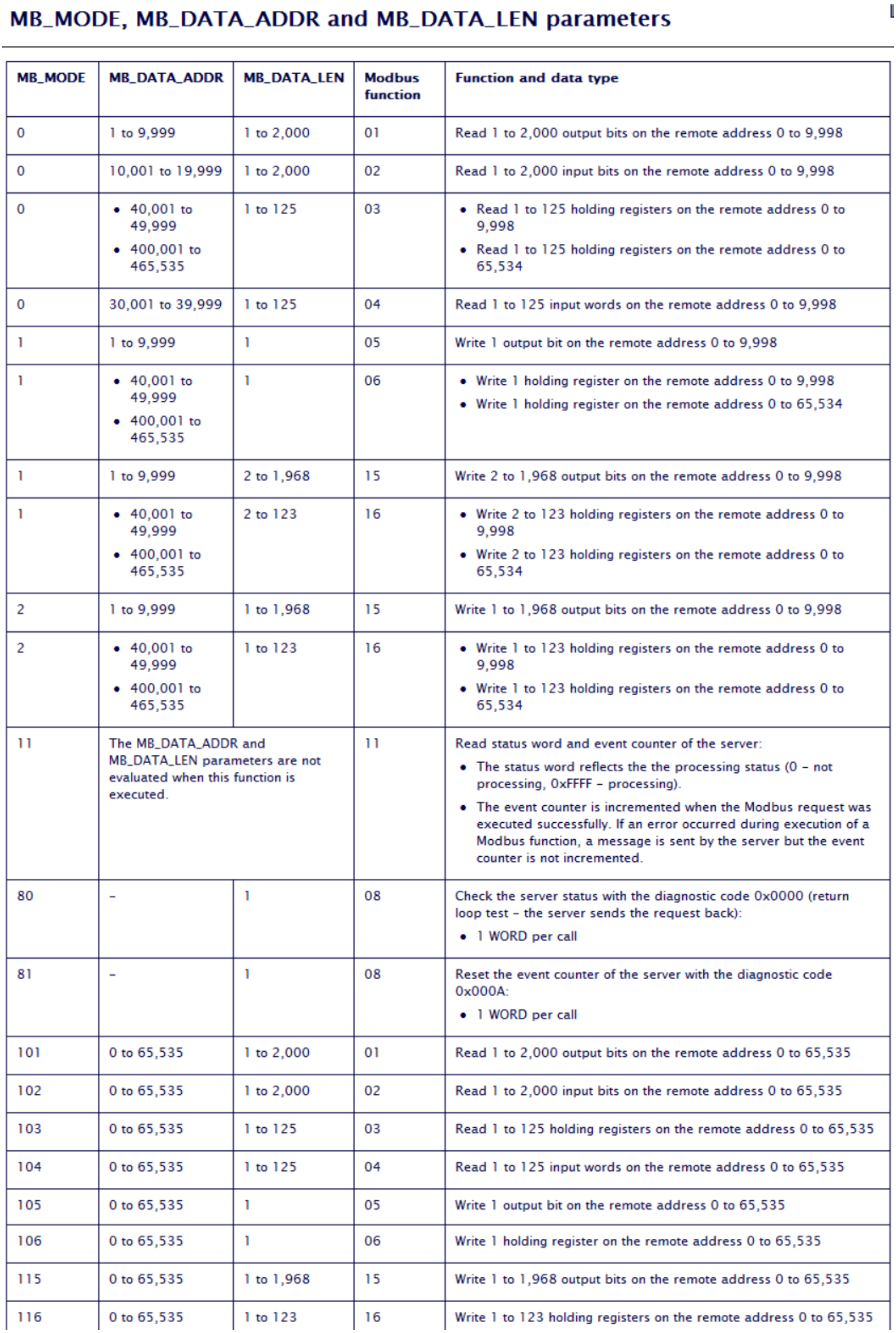
- modbusDataLen: Look in on the PNOZmulti user manual to find out which data you need and enter the required data length. In our example we use the modbusDataLen 8 for connection 1 and modbusDataLen 10 for connection 2.

2

- RemoteAddress:
  - ADDR[1]: 192 dec (16#C0)
  - ADDR[2]: 168 dec (16#A8)
  - ADDR[3]: 0 dec (16#00)
  - ADDR[4]: 3 dec (16#03)

- RemotePort: 502 dec (16#1F6)

6.2.1.2 Simatic S7-1200 / modbusMode



MB_MODE, MB_DATA_ADDR and MB_DATA_LEN parameters

MB_MODE	MB_DATA_ADDR	MB_DATA_LEN	Modbus function	Function and data type
0	1 to 9,999	1 to 2,000	01	Read 1 to 2,000 output bits on the remote address 0 to 9,998
0	10,001 to 19,999	1 to 2,000	02	Read 1 to 2,000 input bits on the remote address 0 to 9,998
0	• 40,001 to 49,999 • 400,001 to 465,535	1 to 125	03	• Read 1 to 125 holding registers on the remote address 0 to 9,998 • Read 1 to 125 holding registers on the remote address 0 to 65,534
0	30,001 to 39,999	1 to 125	04	Read 1 to 125 input words on the remote address 0 to 9,998
1	1 to 9,999	1	05	Write 1 output bit on the remote address 0 to 9,998
1	• 40,001 to 49,999 • 400,001 to 465,535	1	06	• Write 1 holding register on the remote address 0 to 9,998 • Write 1 holding register on the remote address 0 to 65,534
1	1 to 9,999	2 to 1,968	15	Write 2 to 1,968 output bits on the remote address 0 to 9,998
1	• 40,001 to 49,999 • 400,001 to 465,535	2 to 123	16	• Write 2 to 123 holding registers on the remote address 0 to 9,998 • Write 2 to 123 holding registers on the remote address 0 to 65,534
2	1 to 9,999	1 to 1,968	15	Write 1 to 1,968 output bits on the remote address 0 to 9,998
2	• 40,001 to 49,999 • 400,001 to 465,535	1 to 123	16	• Write 1 to 123 holding registers on the remote address 0 to 9,998 • Write 1 to 123 holding registers on the remote address 0 to 65,534
11	The MB_DATA_ADDR and MB_DATA_LEN parameters are not evaluated when this function is executed.		11	Read status word and event counter of the server: • The status word reflects the the processing status (0 – not processing, 0xFFFF – processing). • The event counter is incremented when the Modbus request was executed successfully. If an error occurred during execution of a Modbus function, a message is sent by the server but the event counter is not incremented.
80	-	1	08	Check the server status with the diagnostic code 0x0000 (return loop test – the server sends the request back): • 1 WORD per call
81	-	1	08	Reset the event counter of the server with the diagnostic code 0x000A: • 1 WORD per call
101	0 to 65,535	1 to 2,000	01	Read 1 to 2,000 output bits on the remote address 0 to 65,535
102	0 to 65,535	1 to 2,000	02	Read 1 to 2,000 input bits on the remote address 0 to 65,535
103	0 to 65,535	1 to 125	03	Read 1 to 125 holding registers on the remote address 0 to 65,535
104	0 to 65,535	1 to 125	04	Read 1 to 125 input words on the remote address 0 to 65,535
105	0 to 65,535	1	05	Write 1 output bit on the remote address 0 to 65,535
106	0 to 65,535	1	06	Write 1 holding register on the remote address 0 to 65,535
115	0 to 65,535	1 to 1,968	15	Write 1 to 1,968 output bits on the remote address 0 to 65,535
116	0 to 65,535	1 to 123	16	Write 1 to 123 holding registers on the remote address 0 to 65,535

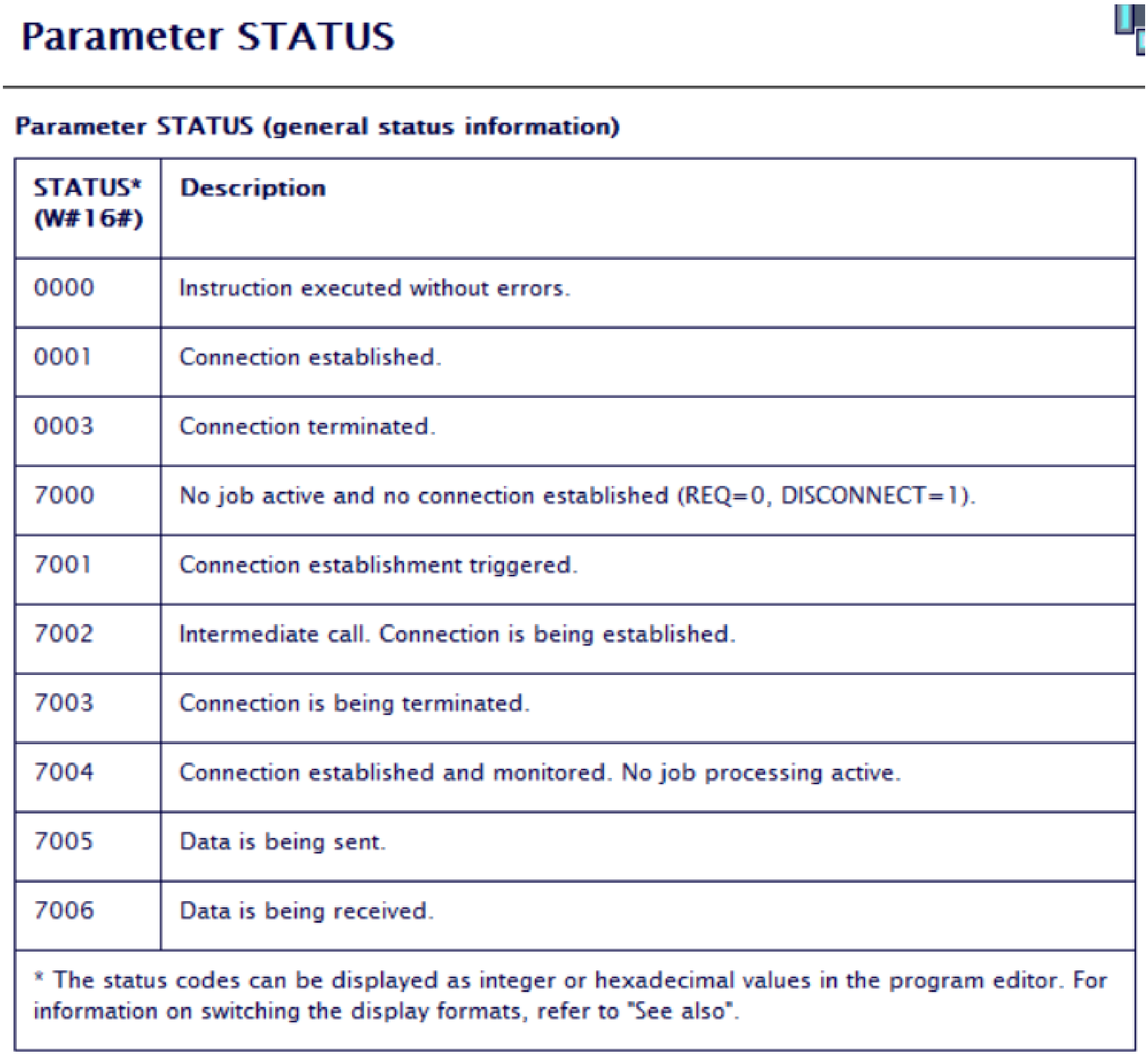
Figure 9: Simatic S7-1200 / modbusMode

6.2.2 Request Modbus Data

To request the Modbus data the bit "request" must change from "false" to "true".

At the output "status" you can see whether the data request is successfully executed.
The error codes can be found in the online help and in the following figure.

6.2.2.1 Output parameter “Status” / Error codes



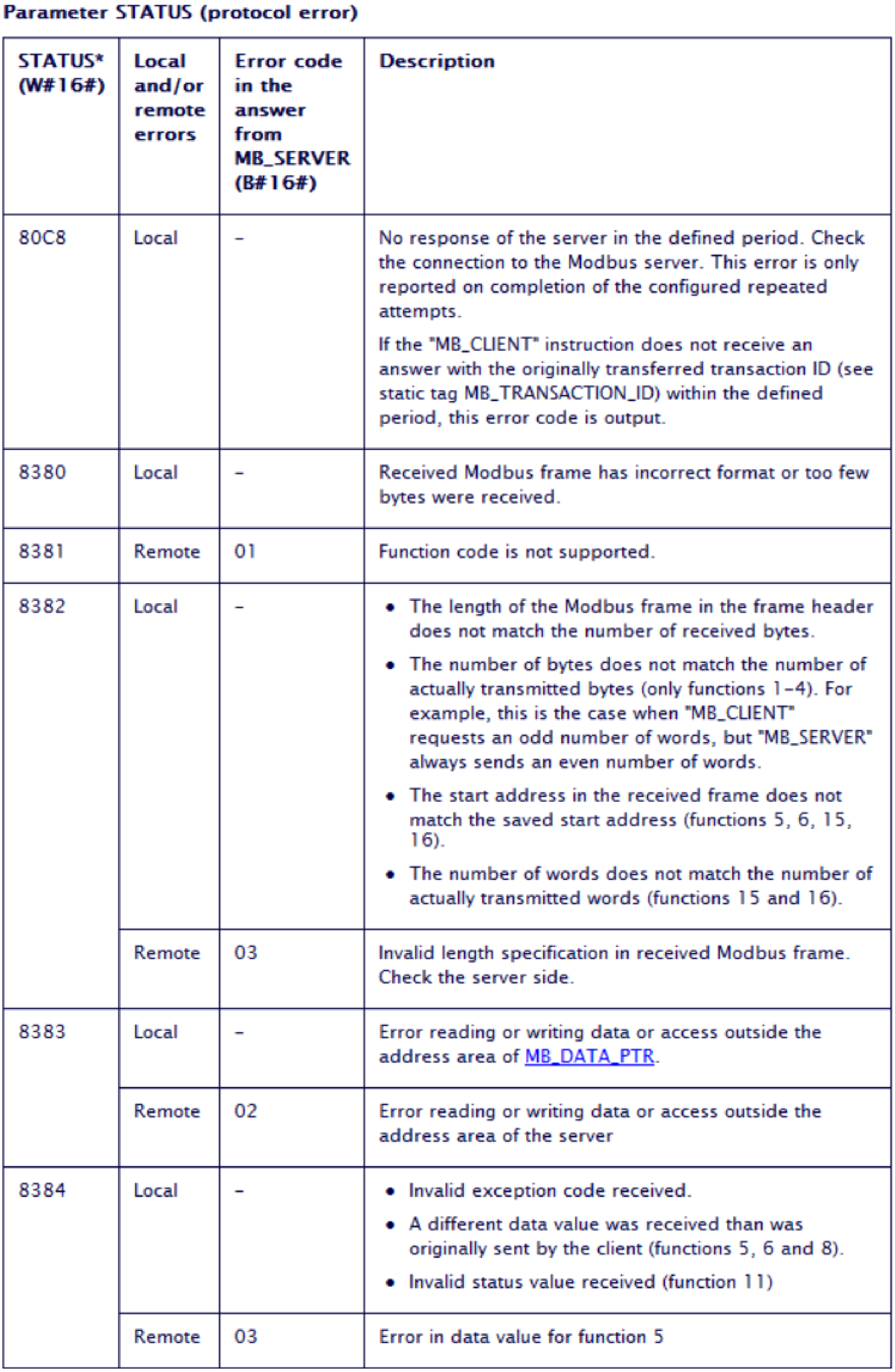
Parameter STATUS

Parameter STATUS (general status information)

STATUS* (W#16#)	Description
0000	Instruction executed without errors.
0001	Connection established.
0003	Connection terminated.
7000	No job active and no connection established (REQ=0, DISCONNECT=1).
7001	Connection establishment triggered.
7002	Intermediate call. Connection is being established.
7003	Connection is being terminated.
7004	Connection established and monitored. No job processing active.
7005	Data is being sent.
7006	Data is being received.

* The status codes can be displayed as integer or hexadecimal values in the program editor. For information on switching the display formats, refer to "See also".

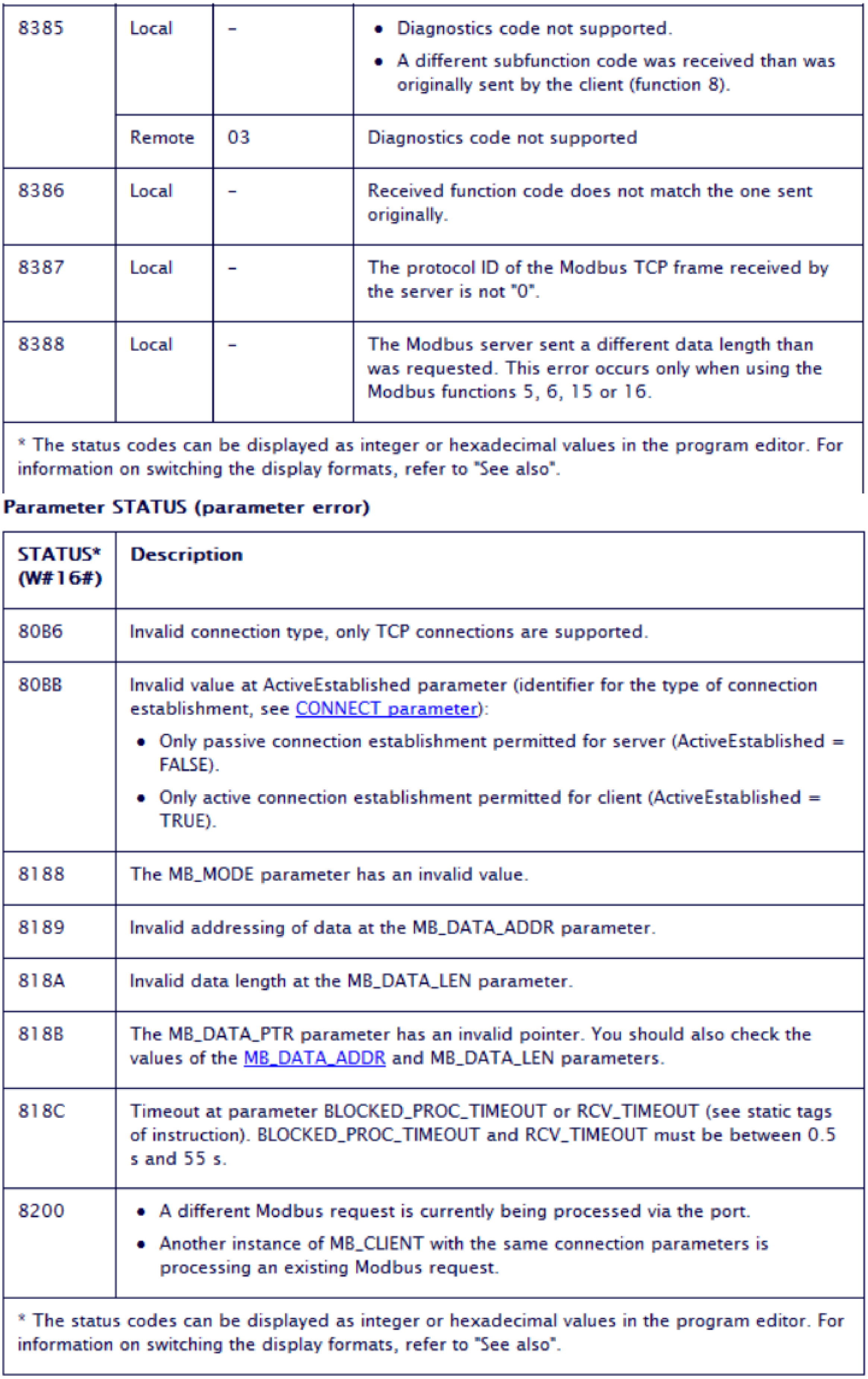
Figure 10: Simatic S7-1200 / Parameter Status (1)



Parameter STATUS (protocol error)

STATUS* (W#16#)	Local and/or remote errors	Error code in the answer from MB_SERVER (B#16#)	Description
80C8	Local	-	No response of the server in the defined period. Check the connection to the Modbus server. This error is only reported on completion of the configured repeated attempts. If the "MB_CLIENT" instruction does not receive an answer with the originally transferred transaction ID (see static tag MB_TRANSACTION_ID) within the defined period, this error code is output.
8380	Local	-	Received Modbus frame has incorrect format or too few bytes were received.
8381	Remote	01	Function code is not supported.
8382	Local	-	• The length of the Modbus frame in the frame header does not match the number of received bytes. • The number of bytes does not match the number of actually transmitted bytes (only functions 1-4). For example, this is the case when "MB_CLIENT" requests an odd number of words, but "MB_SERVER" always sends an even number of words. • The start address in the received frame does not match the saved start address (functions 5, 6, 15, 16). • The number of words does not match the number of actually transmitted words (functions 15 and 16).
	Remote	03	Invalid length specification in received Modbus frame. Check the server side.
8383	Local	-	Error reading or writing data or access outside the address area of MB_DATA_PTR.
	Remote	02	Error reading or writing data or access outside the address area of the server
8384	Local	-	• Invalid exception code received. • A different data value was received than was originally sent by the client (functions 5, 6 and 8). • Invalid status value received (function 11)
	Remote	03	Error in data value for function 5

Figure 11: Simatic S7-1200 / Parameter Status (2)

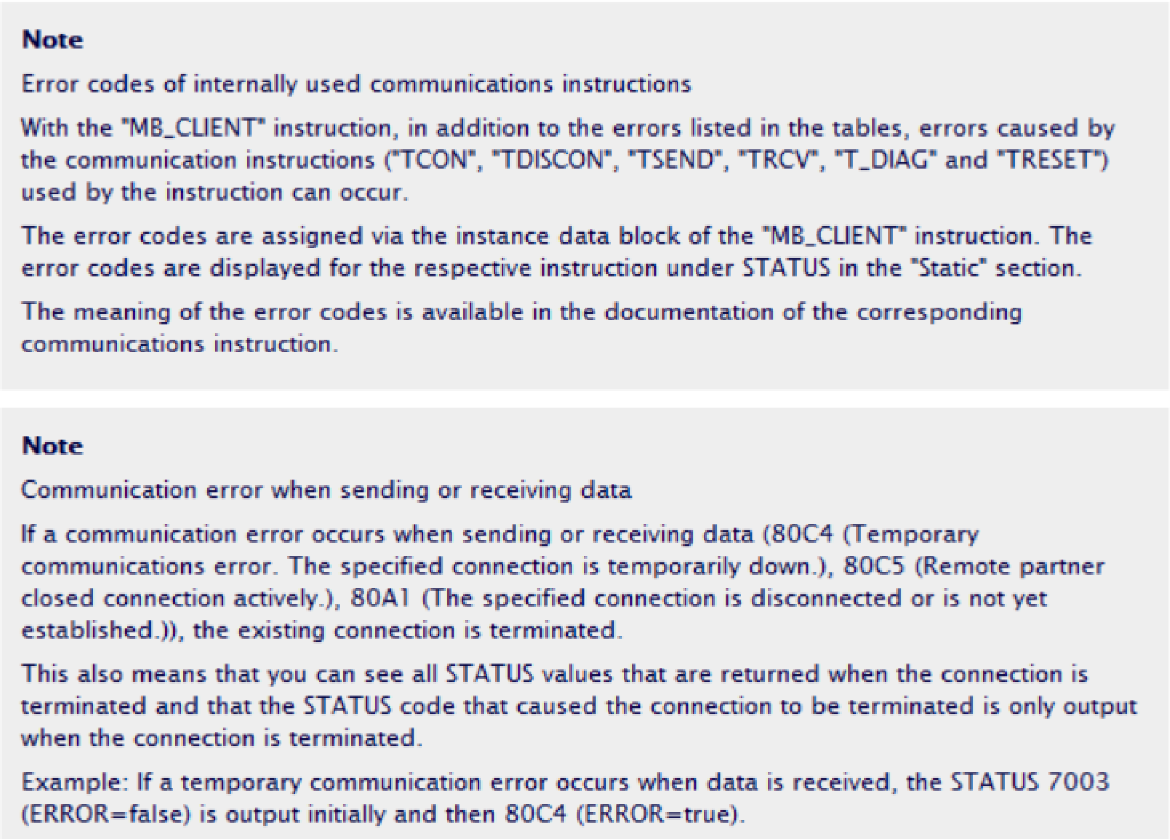


8385	Local	-	• Diagnostics code not supported. • A different subfunction code was received than was originally sent by the client (function 8).
	Remote	03	Diagnostics code not supported
8386	Local	-	Received function code does not match the one sent originally.
8387	Local	-	The protocol ID of the Modbus TCP frame received by the server is not "0".
8388	Local	-	The Modbus server sent a different data length than was requested. This error occurs only when using the Modbus functions 5, 6, 15 or 16.
* The status codes can be displayed as integer or hexadecimal values in the program editor. For information on switching the display formats, refer to "See also".			

Parameter STATUS (parameter error)

STATUS* (W#16#)	Description
80B6	Invalid connection type, only TCP connections are supported.
80BB	Invalid value at ActiveEstablished parameter (identifier for the type of connection establishment, see CONNECT parameter): • Only passive connection establishment permitted for server (ActiveEstablished = FALSE). • Only active connection establishment permitted for client (ActiveEstablished = TRUE).
8188	The MB_MODE parameter has an invalid value.
8189	Invalid addressing of data at the MB_DATA_ADDR parameter.
818A	Invalid data length at the MB_DATA_LEN parameter.
818B	The MB_DATA_PTR parameter has an invalid pointer. You should also check the values of the MB_DATA_ADDR and MB_DATA_LEN parameters.
818C	Timeout at parameter BLOCKED_PROC_TIMEOUT or RCV_TIMEOUT (see static tags of instruction). BLOCKED_PROC_TIMEOUT and RCV_TIMEOUT must be between 0.5 s and 55 s.
8200	• A different Modbus request is currently being processed via the port. • Another instance of MB_CLIENT with the same connection parameters is processing an existing Modbus request.
* The status codes can be displayed as integer or hexadecimal values in the program editor. For information on switching the display formats, refer to "See also".	

Figure 12: Simatic S7-1200 / Parameter Status (3)



Note

Error codes of internally used communications instructions

With the "MB_CLIENT" instruction, in addition to the errors listed in the tables, errors caused by the communication instructions ("TCON", "TDISCON", "TSEND", "TRCV", "T_DIAG" and "TRESET") used by the instruction can occur.

The error codes are assigned via the instance data block of the "MB_CLIENT" instruction. The error codes are displayed for the respective instruction under STATUS in the "Static" section.

The meaning of the error codes is available in the documentation of the corresponding communications instruction.

Note

Communication error when sending or receiving data

If a communication error occurs when sending or receiving data (80C4 (Temporary communications error. The specified connection is temporarily down.), 80C5 (Remote partner closed connection actively.), 80A1 (The specified connection is disconnected or is not yet established.)), the existing connection is terminated.

This also means that you can see all STATUS values that are returned when the connection is terminated and that the STATUS code that caused the connection to be terminated is only output when the connection is terminated.

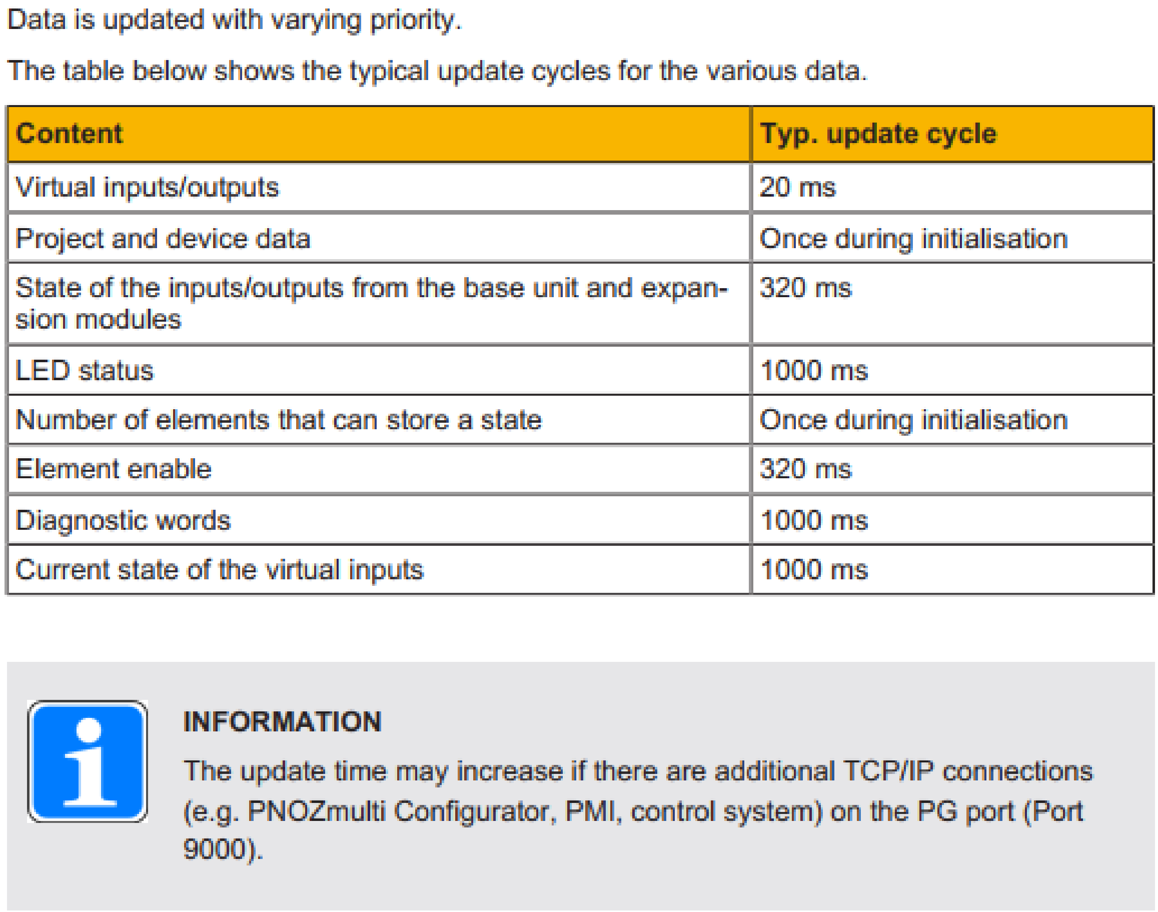
Example: If a temporary communication error occurs when data is received, the STATUS 7003 (ERROR=false) is output initially and then 80C4 (ERROR=true).

Figure 13: Simatic S7-1200 / Parameter Status (4)

6.2.3 DB4 HoldingRegisterRead

The data (send/receive) by the PNOZmulti is stored in the DB4 “HoldingRegisterRead”.

6.2.4 Updating the data areas



Data is updated with varying priority.

The table below shows the typical update cycles for the various data.

Content	Typ. update cycle
Virtual inputs/outputs	20 ms
Project and device data	Once during initialisation
State of the inputs/outputs from the base unit and expansion modules	320 ms
LED status	1000 ms
Number of elements that can store a state	Once during initialisation
Element enable	320 ms
Diagnostic words	1000 ms
Current state of the virtual inputs	1000 ms

INFORMATION

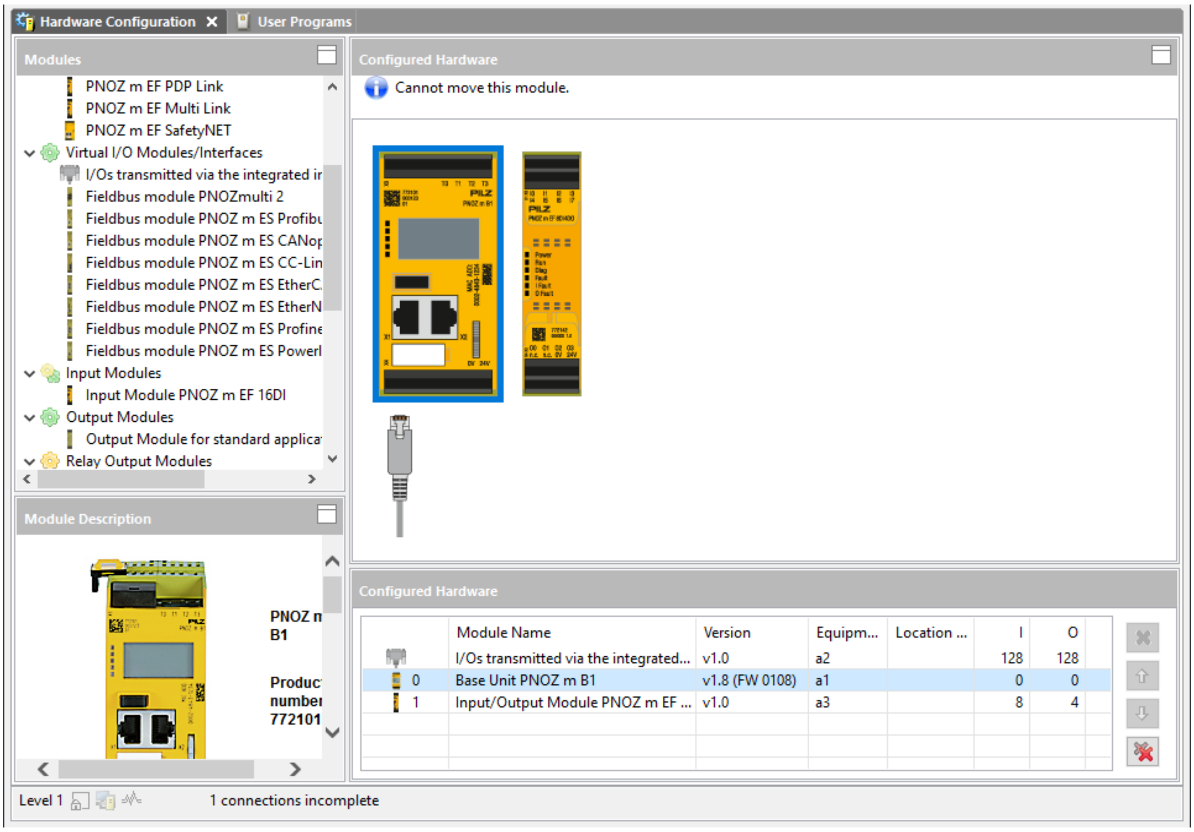
The update time may increase if there are additional TCP/IP connections (e.g. PNOZmulti Configurator, PMI, control system) on the PG port (Port 9000).

Figure 14: Updating the data areas

6.3 PNOZmulti

6.3.1 PNOZmulti Configuration

- Create a new project
- Select Modules
- Select the used Hardware
- Select “I/O transmitted via integrated interface” (figure 15, Equipment ID “a2”)



PNOZ m EF PDP Link
PNOZ m EF Multi Link
PNOZ m EF SafetyNET
Virtual I/O Modules/Interfaces
I/Os transmitted via the integrated ir
Fieldbus module PNOZmulti 2
Fieldbus module PNOZ m ES Profibu
Fieldbus module PNOZ m ES CANop
Fieldbus module PNOZ m ES CC-Lin
Fieldbus module PNOZ m ES EtherC.
Fieldbus module PNOZ m ES EtherN
Fieldbus module PNOZ m ES Profine
Fieldbus module PNOZ m ES Powerl
Input Modules
Input Module PNOZ m EF 16DI
Output Modules
Output Module for standard applica
Relay Output Modules

Cannot move this module.

PNOZ m B1

Product number 772101

	Module Name	Version	Equipm...	Location ...	I	O
	I/Os transmitted via the integrated...	v1.0	a2		128	128
0	Base Unit PNOZ m B1	v1.8 (FW 0108)	a1		0	0
1	Input/Output Module PNOZ m EF ...	v1.0	a3		8	4

Level 1

1 connections incomplete

Figure 15: PNOZmulti Configurator – Select the used Hardware

INFORMATION

To test the communication between the PNOZmulti and the Modbus Connection you need at least one safety function in the PNOZmulti program.

- Insert a safety function, e.x. E-STOP

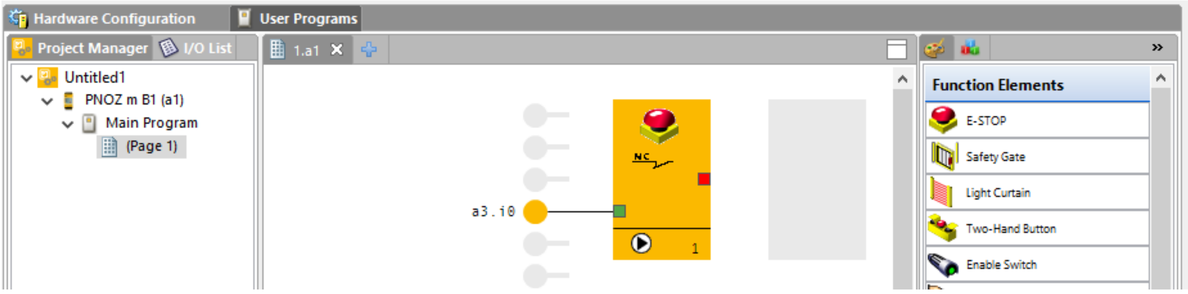


Figure 16: PNOZmulti Configurator – Insert E-Stop

- Insert an output and connect it with the E-STOP

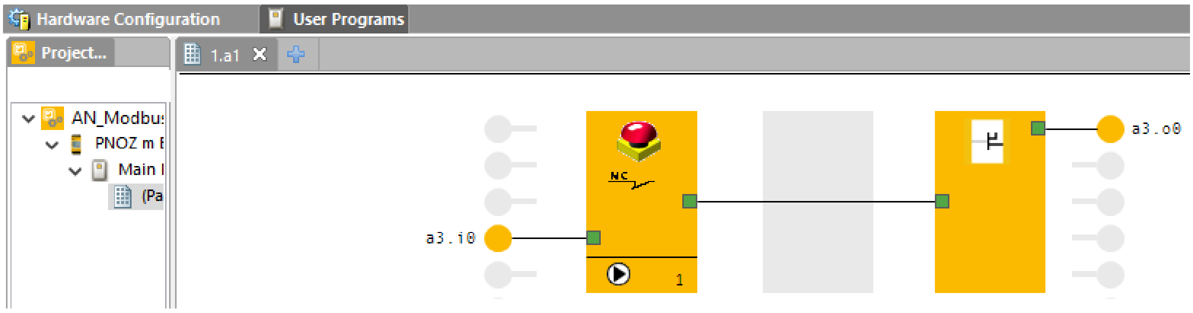
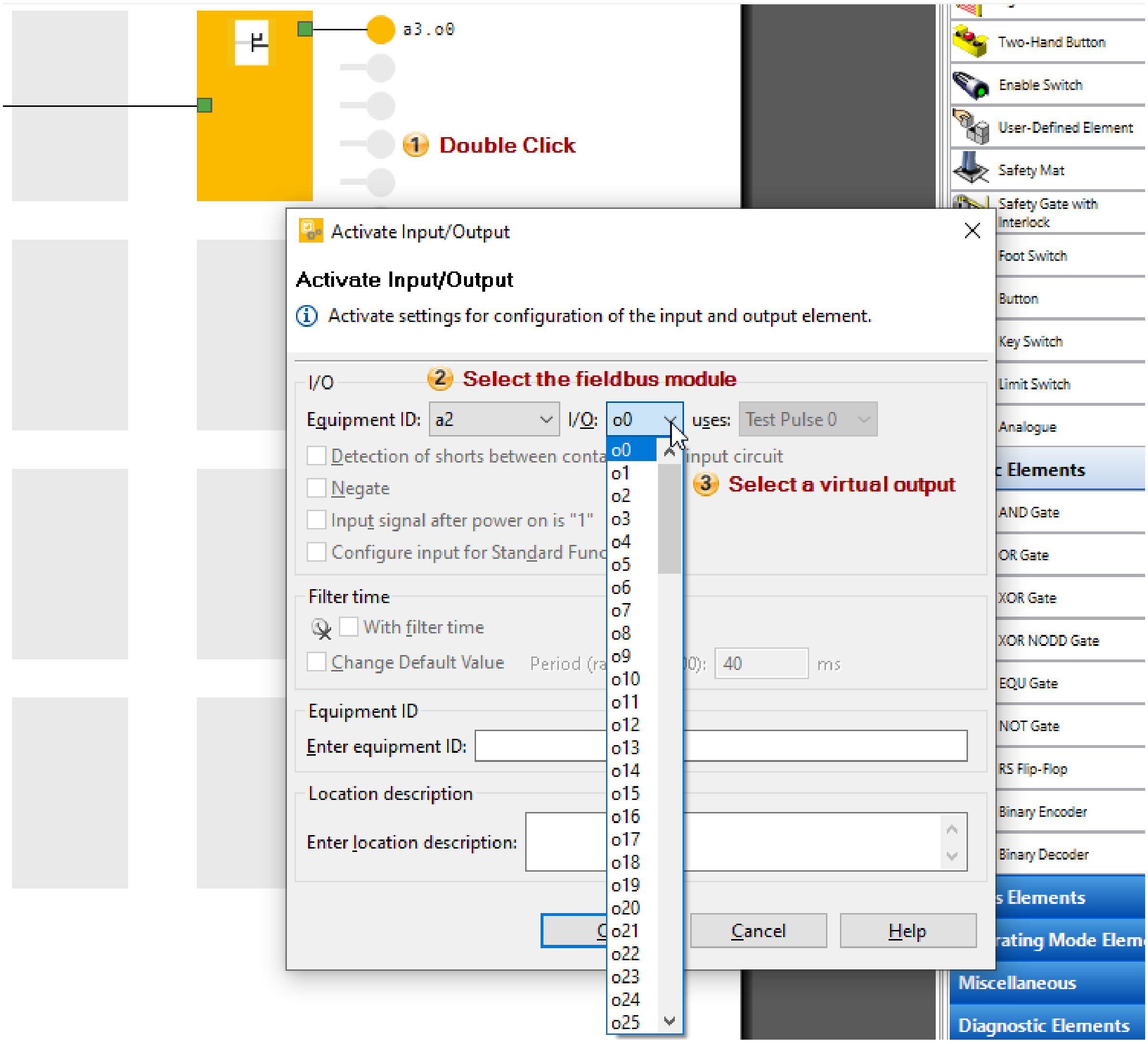


Figure 17: PNOZmulti Configurator – Insert Output

- Insert a virtual Output



Activate Input/Output

Activate Input/Output

ⓘ Activate settings for configuration of the input and output element.

I/O — 2 Select the fieldbus module

Equipment ID: a2 I/O: o0 uses: Test Pulse 0

3 Select a virtual output

o0, o1, o2, o3, o4, o5, o6, o7, o8, o9, o10, o11, o12, o13, o14, o15, o16, o17, o18, o19, o20, o21, o22, o23, o24, o25

□ Detection of shorts between conta… input circuit

□ Negate

□ Input signal after power on is "1"

□ Configure input for Standard Func…

Filter time

□ With filter time

□ Change Default Value Period (ra…0): 40 ms

Equipment ID

Enter equipment ID:

Location description

Enter location description:

Figure 18: PNOZmulti Configurator – Insert a virtual Output

- Connect the virtual Output with the E-STOP to get the status of the E-STOP

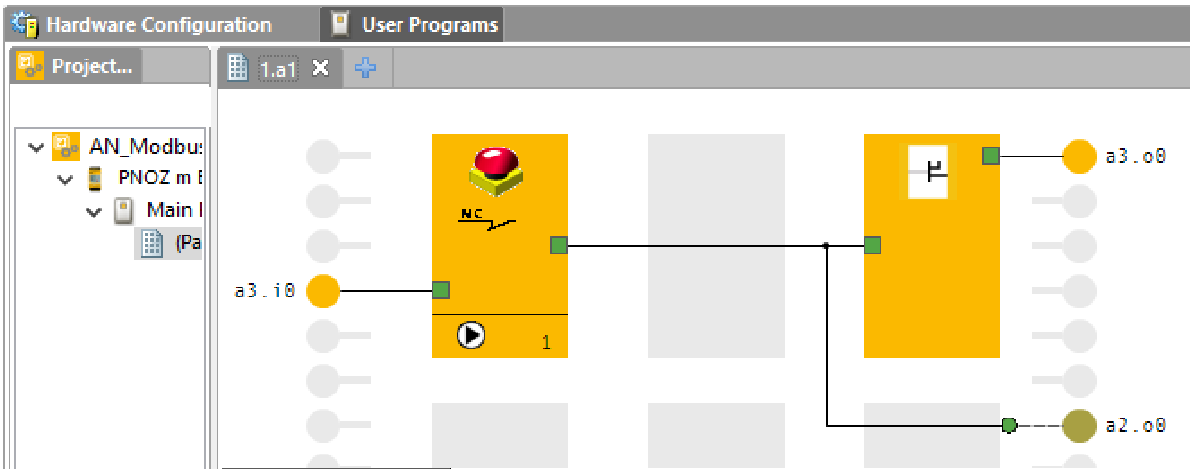
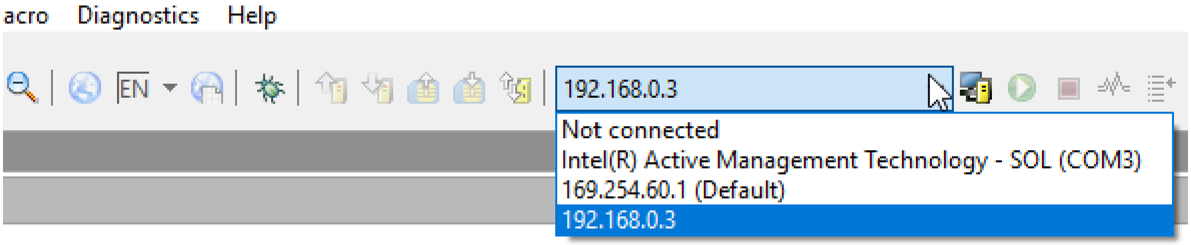


Figure 19: PNOZmulti Configurator – virtual Output is connected with E-Stop

6.3.2 PNOZmulti Download

- Select Interface



192.168.0.3

Not connected
Intel(R) Active Management Technology - SOL (COM3)
169.254.60.1 (Default)
192.168.0.3

Figure 20: PNOZmulti Configurator – Select the Interface

- (1) Go Online
- (2) Select the project Manager

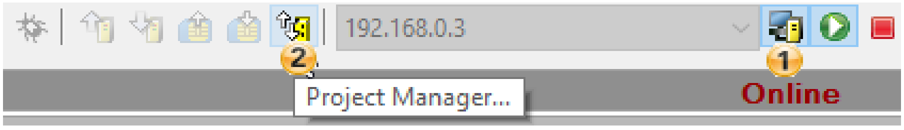
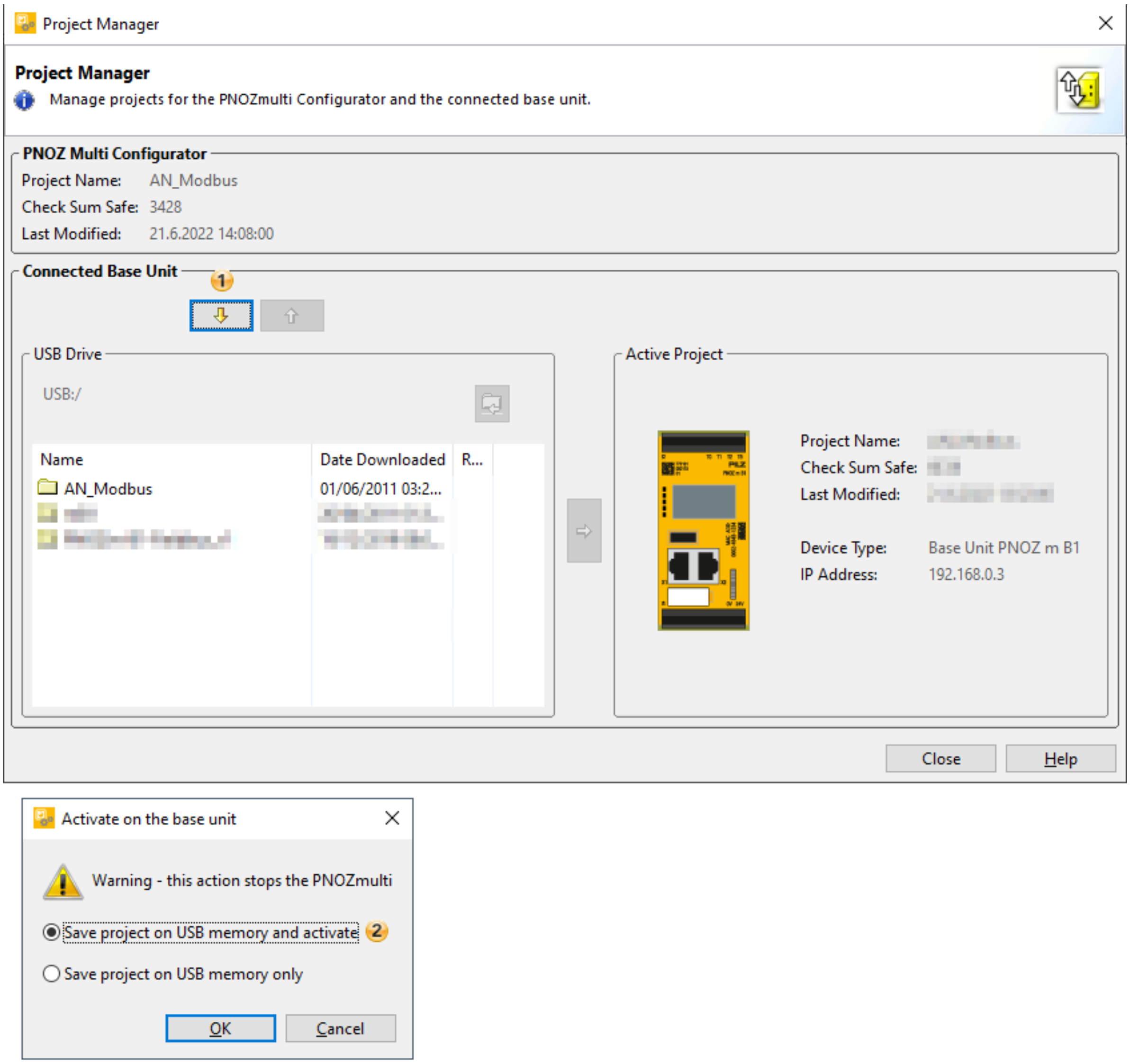


Figure 21: PNOZmulti Configurator – Download to PNOZmulti (1)

- (1) Select the Download button
- (2) Select “Save project on USB memory and activate”
- (3) A restart is necessary after the download



Project Manager

Project Manager

Manage projects for the PNOZmulti Configurator and the connected base unit.

PNOZ Multi Configurator

Project Name: AN_Modbus

Check Sum Safe: 3428

Last Modified: 21.6.2022 14:08:00

Connected Base Unit

USB Drive

USB:/

Name	Date Downloaded	R...
AN_Modbus	01/06/2011 03:2...	
[redacted]	[redacted]	
[redacted]	[redacted]	

Active Project

Project Name: [redacted]

Check Sum Safe: [redacted]

Last Modified: [redacted]

Device Type: Base Unit PNOZ m B1

IP Address: 192.168.0.3

Activate on the base unit

Warning - this action stops the PNOZmulti

● Save project on USB memory and activate

○ Save project on USB memory only

Figure 22: PNOZmulti Configurator – Download to PNOZmulti (2)

INFORMATION

More information about the PNOZmulti can be found in the online help for the PNOZmulti Configurator.

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