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5.6 SUCOM1 - PS306/316/416

5.6.1 General Information

The operating terminals allow for a simple connection to the Moeller PLCs PS 306 and PS 316.

The operating terminal is connected to the PU interface of the PLC. The data communication on the interface is handled by the SUCOM1 protocol.

The software components of the system are fully adapted to the parameters and marginal conditions of the SUCOM1 protocol.

This offers the user the following advantages:

- Random write and read access to any data within the PLC. Data of existing PLC programs can be displayed and modified directly in the operating terminal. It is not necessary to adapt the PLC program to the operating terminal in any respect. It is not required that communications data be stored in a specified address area or data type area.
- The operating terminal automatically polls the freely definable data areas for cyclic data.
- No additional configuration required within the PLC.
- Minimal increase of the cycle time of the PLC.
- The protocol provides error control. Transmission errors are detected and, if possible, eliminated by repeating the transmission.
- A noise-immune interface hardware in accordance with the RS485 interface standard permits the application even in a harsh industrial environment.
- The parameters of the interface SER1 are assigned in the programming software in a protocol-specific manner and are stored in the application description. Modifying of the parameters is also possible in the setup mask or each other I/O mask of the terminal at any time.
- The programming system provides a maximum of support to the operator in programming the operating terminal. The definitions (abbreviations) used here are identical with the definitions used within the PLC program.

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5.6.2 Technical Description

The interfacing of the operating terminal to the Moeller PLCs is effected by means of the SUCOM1 programming protocol.

The SUCOM1 protocol allows random read and write access to all PLC data. All data types can also be accessed in bit-mode. The size of the address area depends on the respective PLC.

A read access to the addressed word must occur, before individual bits can be accessed for a write operation. During these accesses, care must be taken to ensure that neither the terminal nor the PLC modify individual bits of the same word.

5.6.3 Protocol Parameters SUCOM1

The parameters of the interface SER1 are set to the following values:

Baud rate: 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 375000, 500000 Baud
Data bits: 5, 6, 7, **8**
Stop bits: 1, 1.5, **2**
Parity: **none**, even, odd
Handshake: **no handshake**, hardware, software

The default values are printed in **bold**.

5.6.4 Data Types

Type	Description	Access
I	Input Bits	Bit Access
Q	Output Bits	Bit Access
M	Flag Bits	Bit Access
IB	Input Bytes	Byte Access
QB	Output Bytes	Byte Access
MB	Flag Bytes	Byte Access
IW	Input Word	Word Access
QW	Output Word	Word Access
MW	Flag Word	Word Access
PS	Process Status Word	Word Access
DS	Diagnostic Word	Word Access
DZ	Diagnostic Counter	Word Access

Table 5.6-1: Data types

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5.6.5 Additional Functions

In addition to the random write and read access to PLC variables, a memory area comprising 12 bytes is specified in the application description as cyclic poll area.

Only marginal conditions regarding this memory area that the PLC must be able to access in bit-mode and the memory area must be contiguous. The start address of this memory area must be specified in the mask definition and must be located on a word boundary.

The variant "byte-structured poll area" is not available with this protocol.

Word-structured Memory Mapping

The data area comprises a maximum of 6 words or 12 bytes.

Cyclic data area on MW1

Word Address	Reference	High Byte	Low Byte
Word Address + 0	MW1	Write Coordination Byte	Reserved
Word Address + 1	MW2	Message Channel High Byte	Message Channel Low Byte
Word Address + 2	MW3	Function Keys LED 1 to 4	Function Keys LED 5 to 8
Word Address + 3	MW4	Function Keys LED 9 to 12	Function Keys LED 13 to 16
Word Address + 4	MW5	Function Keys LED 17 to 20	Function Keys LED 21 to 24
Word Address + 5	MW6	Function Keys LED 25 to 28	Function Keys LED 29 to 32

Table 5.6-2: Word structured poll area

5.6.6 Physical Interfacing

Pin	Designation	Function
1	Shield	Shielding
2	T(A)	Transmit Data, Channel A
3	R(A)	Receive Data, Channel A
4	RTS(A)	Request To Send, Channel A
5	CTS(A)	Clear To Send, Channel A
6	nc	not connected
7	nc	not connected
8	SG	Signal Ground
9	T(B)	Transmit Data, Channel B
10	R(B)	Receive Data, Channel B
11	RTS(B)	Request To Send, Channel B
12	CTS(B)	Clear To Send, Channel B
13	nc	not connected
14	nc	not connected
15	nc	not connected

Table 5.6-3: Pin assignment X2 RS485

Pin	Designation	Function
8	T(A)	Transmit Data, Channel A
9	T(B)	Transmit Data, Channel B
11	SGND	Signal Ground
22	R(A)	Receive Data, Channel A
23	R(B)	Receive Data, Channel B

Table 5.6-4: Pin assignment universal interface SER1 RS485

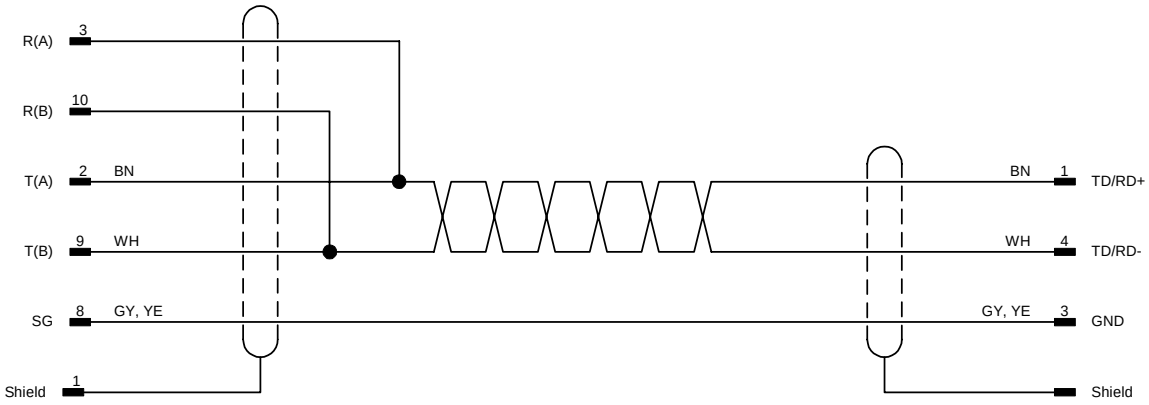
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5.6.6.1 Connecting Cable RS485 - SUCOM1 PS306

The following wiring diagram does not apply to terminals with universal interface.

TesiMod
Operating Terminal

Moeller PLC
SUCOcontrol PS306



D-Subminiature
Male Connector
15-pin

DIN 41524 elbow plug
Male Connector
5-pin

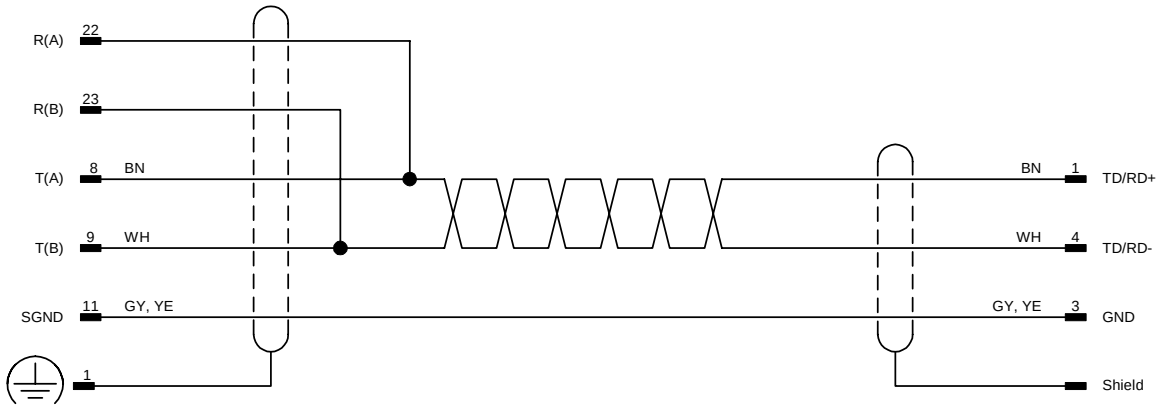
Each end of the shield is connected to the metallic enclosure.

5.6.6.2 Connecting Cable Universal Interface SER1 RS485 - SUCOM1 PS306

The following wiring diagram applies to terminals with universal interface only.

TesiMod
Operating Terminal

Moeller PLC
SUCOcontrol PS306



D-Subminiature
Male Connector
25-pin

DIN 41524 elbow plug
Male Connector
5-pin

Each end of the shield is connected to the metallic enclosure.

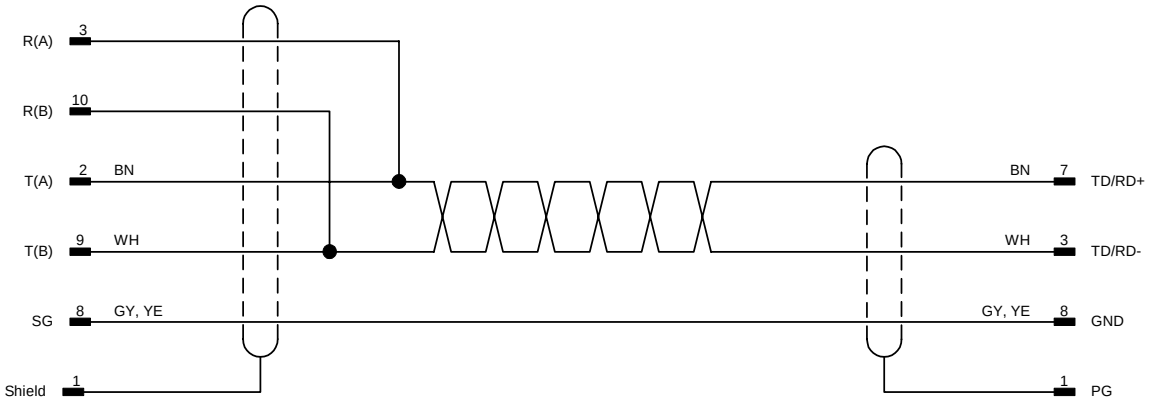
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5.6.6.3 Connecting Cable RS485 - SUCOM1 PS316/416

The following wiring diagram does not apply to terminals with universal interface.

TesiMod
Operating Terminal

Moeller PLC
SUCOcontrol PS316/416



D-Subminiature
Male Connector
15-pin

D-Subminiature
Male Connector
9-pin

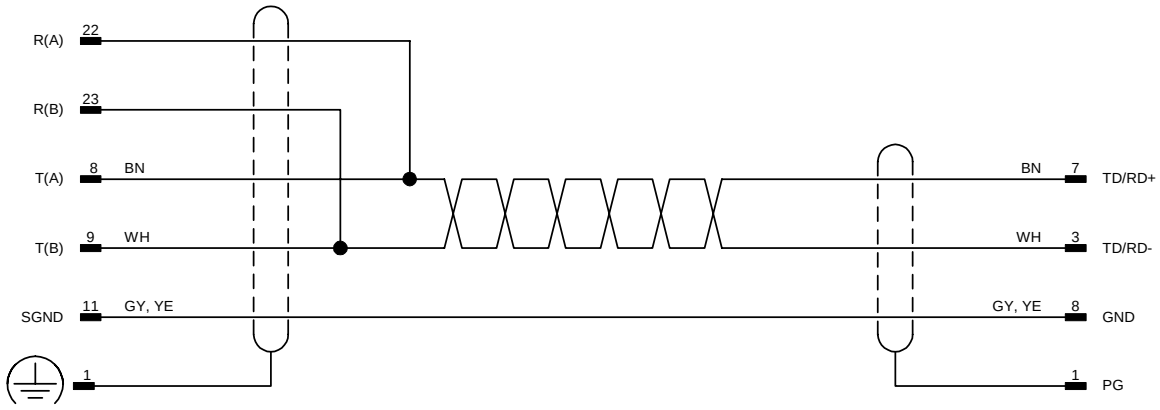
Each end of the shield is connected to the metallic enclosure.

5.6.6.4 Connecting Cable Universal Interface SER1 RS485 - SUCOM1 PS316/416

The following wiring diagram applies to terminals with universal interface only.

TesiMod
Operating Terminal

Moeller PLC
SUCOcontrol PS316/416



D-Subminiature
Male Connector
25-pin

D-Subminiature
Male Connector
9-pin

Each end of the shield is connected to the metallic enclosure.

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5.6.7 Error Messages

Code	1	E_SLAVE_NOT_READY	Slave not ready or incorrect CPU-ID
	2	E_PROTOKOL	Sequence of the packets
	3	E_FRAME	Character frame error
	4	E_TIMEOUT	Timeout error
	5	E_CRC_BCC	CRC error
	6	E_PARITY	Parity error
	7	E_SEND_ABORT	Abort send process
	8	E_REC_ABORT	Abort receive process
	9	E_BUF_SIZE	Insufficient cyclic buffer
	10	E_NO_DEFINE	No cyclic data defined
	12	E_DEFINE	Cyclic data already defined
	15	E_NO_PROTOCOL	Selected protocol is not supported
	16	E_OVERRUN	Receive buffer overrun
	17	E_NAK	NAK from the PLC
	40	E_SYS_ADDRESS	Undefined system variable

SUCOM1 Specific Error Messages

50	E_QUITTUNG_COMM	No acknowledge signal during the communications setup
51	E_QUITTUNG_DATA	No acknowledge signal has been received after sending an information block
52	E_NO_DATA	No data upon request

Errors in the Data Section

53	E_RECEIVE_COUNT	Number of bytes received does not correspond to the number of bytes requested

Possible errors:

- A variable with odd number of bytes is read from a word or double word address within the mask, were the error appears.