

PSM-ME-RS232/TTY-P

Interface converter for RS-232 to TTY transmission systems

1. Short Description

The PSM-ME-RS232/TTY-P rail-mountable and compact interface converters have been designed especially for industrial use in the switch cabinet or switch box. They convert the RS-232 interface signals bidirectionally to the TTY standard.

The devices are simply snapped onto standard EN mounting rails and supplied with 24 V DC or AC.

The main areas of application are:

- Interface adaptation to TTY devices
- Permanent line for process data evaluation
- Temporary programming connections

The following features of the interface converter are particularly outstanding:

- TTY operating mode, either active, passive or semi-active
- Logical signal position can be inverted via plug-in bridge
- Transmission ranges up to 1000 m
- Transmission rate up to 19.2 kbit/s
- High-quality 3-way isolation (Vcc // RS-232 // TTY)
- Integrated surge voltage protection with transient discharge to the mounting rail
- Supply voltage (24 V DC/AC) to suit the switch cabinet
- Low nominal current consumption (40 mA)
- TTY connection with pluggable COMBICON screw terminal blocks
- RS-232 connection with 9-pos. SUB-D connector
- Diagnostics LEDs



If you have any technical questions, please contact us at:
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Interface converter for TTY transmission systems PSM-ME-RS232/TTY-P

Example application

Interface adaptation between the RS-232 standard and the TTY standard.

- permanent TTY line for visualization and process data acquisition (fig. 2)
- Temporary programming and parameterizing connection (fig. 3)

TTY fundamentals

Nowadays, the TTY current loop interface is also to be found in programmable logic controls (PLC), on visual display units and printers. two shielded and twisted wire pairs are required, one for the transmit and one for the receive line.

Data transmission is carried out using the full duplex procedure with software handshake. Control lines are not provided for.

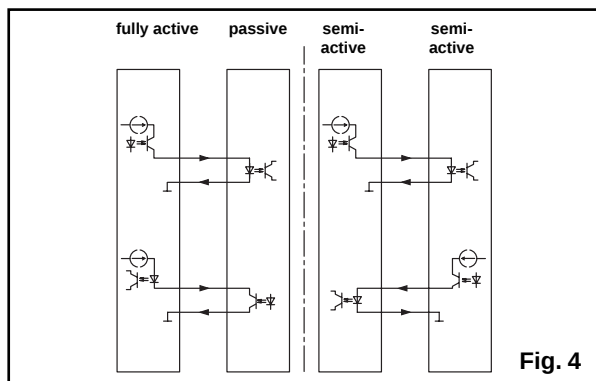
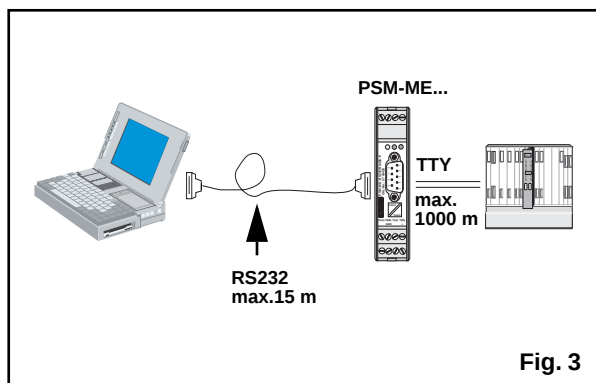
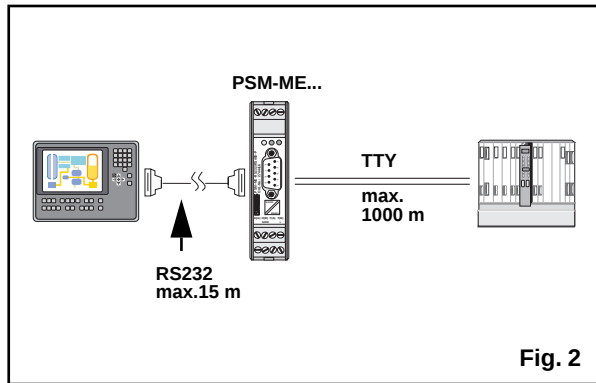
A loop current of 20 mA represents the status logical "1". An interrupted circuit represents the logical value "0". A source current is required in each loop, coupled in on either the transmitting or receiving side. The current sourcing side is described as "active" to the "passive" side is always opposite it.

We distinguish between three interface configurations (fig. 4):

- 1. Fully active TTY interfaces** with current sources in both the transmitter and receiver branch.
- 2. Passive TTY interfaces** without the relevant constant- current sources.
- 3. Semi-active TTY interfaces** with current sources only on the transmitter side (TD). The receiver (RD) is designed as passive.

To make a TTY transmission path, it is necessary to be familiar with the type of interface. The transmission path is a connection between two semi-active devices or between an active and a passive one. Such transmission can bridge distances of up to 1000 m.

The conductor pairs should be twisted in pairs for both the transmit and receive loop. In the latest recommendations, the maximum transmission speed was increased from 9600 bit/s to 19200 bit/s.



Standards: DIN 66 258-1
DIN 66 348-1

Transmission rate: 19.2 kbit/s
Transmission length: 1000 m
Procedure: current loop
Principle: full duplex,
point-to-point

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2. Order data

Interface converter, for the conversion of RS-232 to TTY standard, 3-way isolation, rail-mountable

2.1. Accessories

Power supply , primary switched-mode, 24 V DC, 650 mA, rail-mountable	230 V AC 120 V AC
RS-232 cable, 2m , to connect the PSM-ME-RS-232 converter to a 9-pos. device interface	SUB-D9/SUB-D9 (socket/socket)
RS-232 cable, 2m , to connect the PSM-ME-RS-232 converter to a 25-pos. device interface	SUB-D9/SUB-D25 (socket/socket)
SUB-D plug , 9-pos., with screw connection and one cable entry	socket pin

Type	Order No.	Pcs. Pkt.
PSM-ME-RS232/TTY-P	27 44 45 8	1
MCR-PS 230 AC/24 DC/650 MCR-PS 120 AC/24 DC/650	28 11 95 4 28 11 96 7	1 1
PSM-KA-9SUB 9/BB/2METER	27 99 47 4	1
PSM-KA-9SUB 25/BB/2METER	27 61 06 2	1
SUBCON 9/F-SH SUBCON 9/M-SH	27 61 49 9 27 61 50 9	1 1

2.2. Technical Data

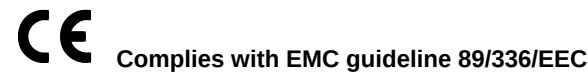
Supply voltage Frequency Rated current consumption Connection LED operational availability	24 V AC/DC $\pm 20\%$ DC-60 Hz typ. 75 mA pluggable COMBICON screw terminal block LED green
RS-232 interface Type of transmission Coding option Control lines Data indicator Transmission length Connection	acc. to DIN 66 259 T1, CCITT V.28 protocol transparent DTE/DCE switchover via DIP switch RTS/CTS and DTR/DSR permanently bridged internally LED green (RD) RS-232 receive data (dynamic) LED yellow (TD) RS-232 transmit data (dynamic) 0...15 m shielded 9-pos. SUB-D pin strip
TTY interface Loop current Load Transmission rates Transmission length Transmission method Connection Coding option Output impedance/transmitter Input impedance/receiver Bit distortion Bit delay	acc. to CL 2 and DIN 66 348 T1 2 x 20 mA $\pm 10\%$ $\leq 500\ \Omega$ up to 19.2 kbit/s 0-1000 m twisted pair, shielded 4-wire, full duplex pluggable COMBICON screw terminal block /shield connector passive, semi-active or active operation via insertion bridges max. 117 Ω 126 Ω $\leq 3\%$ $\leq 3\ \mu\text{s}$

3. General data

Protection circuit	Y-capacitors, suppressor diodes, gas-filled surge arresters via metal foot on EN mounting rail power supply // RS-232 // TTY 2 kVrms, 50 Hz, 1 min. 5 g in acc. with IEC 68-2-6 0 °C to + 55 °C IP 20 PA-V0 (99 / 22.5/ 118.6) mm
Transient discharge Electrical 3-way isolation Test voltage Resistance to vibration Ambient temperature range Protection type Housing:	
	Material Dimensions (W / H / D)
Connection data (conductor cross section) - COMBICON plug connectors Weight Approval	0.2 - 2.5 mm ² (AWG 24-12) approx. 115 g 

1) NRZ: Non Return To Zero

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EMC (electromagnetic compatibility)

Immunity to interference in acc. with EN 50082-2

• Electrostatic discharge (ESD)	EN 61000-4-2	Criterion B 8 kV discharge in air 6 kV contact discharge
• Electromagnetic HF field: Amplitude modulation: Pulse modulation:	EN 61000-4-3	Criterion A 10 V/m 10 V/m
• Fast transients (Burst) Signal: Supply:	EN 61000-4-4	Criterion B 2 kV/5 kHz 4kV/5 kHz
• Surge voltage capacities (Surge) Signal: Supply:	EN 61000-4-5	Criterion B 2 kV/42 Ω 0.5 kV/2 Ω
• Conducted disturbance	EN 61000-4-6	Criterion A 10 V
Noise emission in acc. with EN 50081-2	EN 55011	Class A

EN 61000 corresponds to IEC 1000
EN 55011 corresponds to CISPR11

Criterion A: Normal operating behavior within the defined limits.
Criterion B: Temporary impairment of operational behavior that the device corrects itself.

Class A: Area of application: industry, without special installation measures.

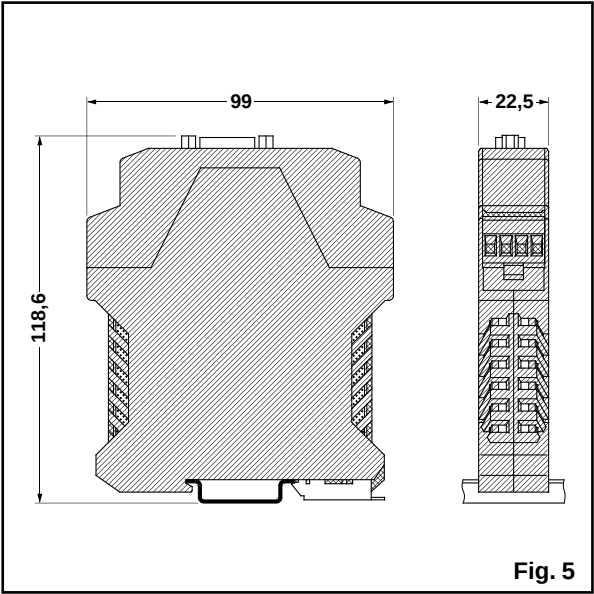


Fig. 5

Interface converter for TTY transmission systems PSM-ME-RS232/TTY-P

Function elements (fig. 6)

- ① Supply voltage 24 V AC/DC
- ② LED supply voltage (VCC)
- ③ LED-RS232 receive data (RD)
- ④ LED-RS232 transmit data (TD)
- ⑤ RS-232 interface connection (SUB-D 9-pos.)
- ⑥ TTY interface connection
- ⑦ Shield connector
- ⑧ Snap-on foot for mounting rails in acc. with DIN EN 50 022

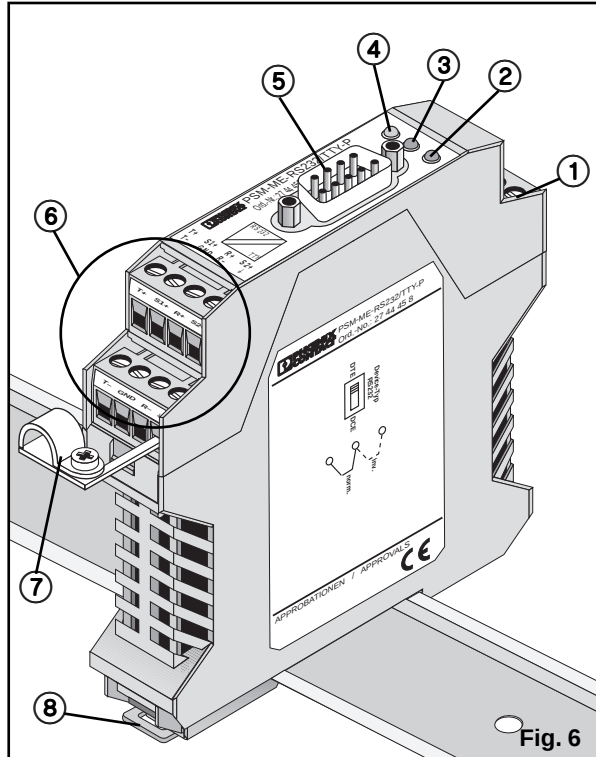


Fig. 6

4. Operational Diagram

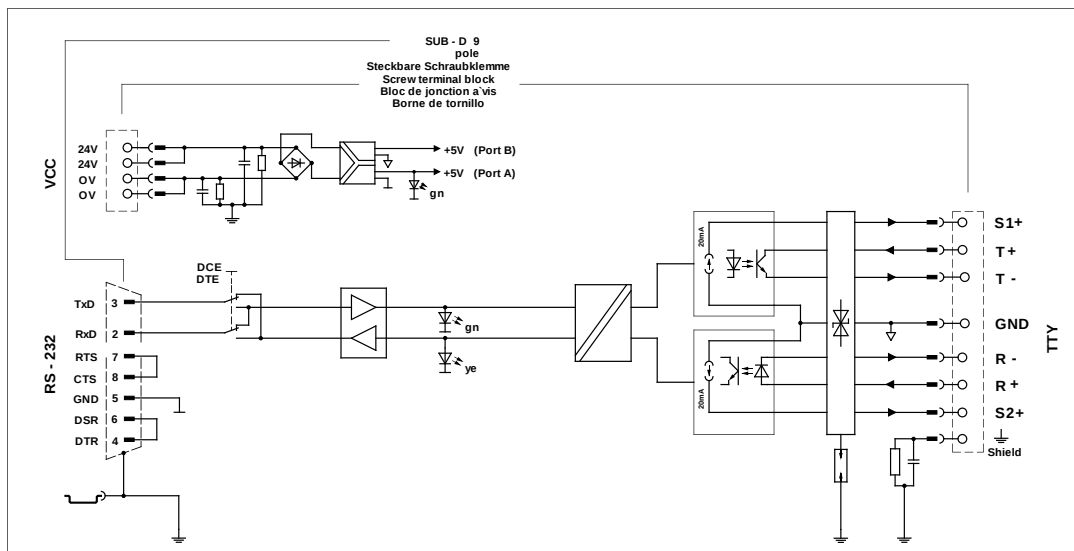


Fig. 7

Interface converter for TTY transmission systems PSM-ME-RS232/TTY-P

5. Notes on connection

5.1. Connections (fig. 8)

- ① **Plug connector power supply**
Connect 24 V AC/DC $\pm 20\%$ via the COMBICON plug connector (PIN 1 and 3). Operational availability is signaled via the VCC LED ②.
- ③ **RS-232 interface**
9-pos. SUB-D pin strip
- ④ **TTY interface**
pluggable COMBICON screw terminal block

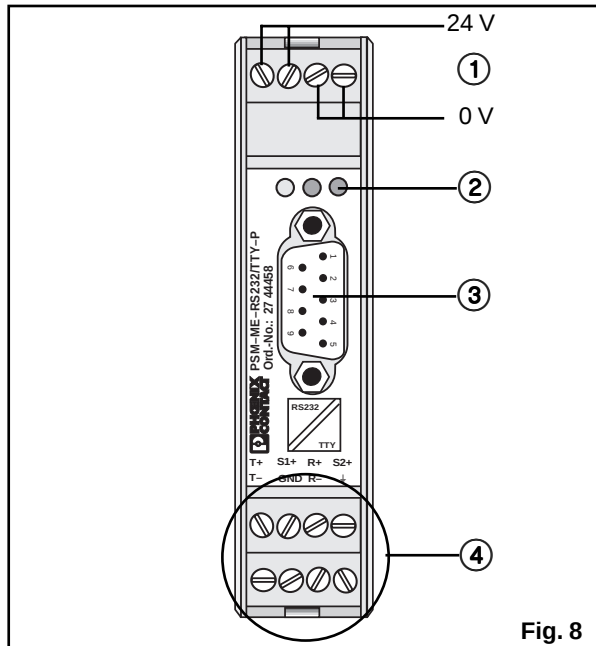


Fig. 8

5.2. Mounting in the switch cabinet (fig. 9)

Mounting (on 35 mm mounting rails in acc. with DIN EN 50 022):

Hinge the device into the upper edge of the mounting rail and snap it in with a downward motion.



Note: The mounting rail must be connected to ground potential. This is the only way to guarantee that the integrated surge voltage protection functions and that the shield of the bus conductor makes contact effectively.

Dismantling:

Pull back the metal disassembling lever ① with the aid of a screwdriver and remove the device.

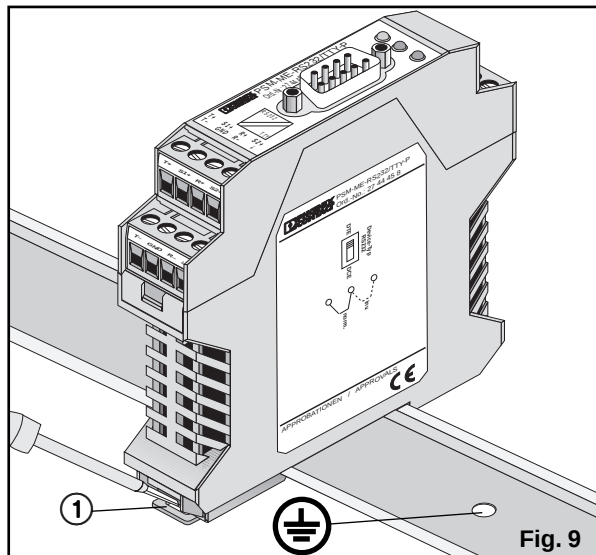


Fig. 9

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6. The RS-232 interface

Designation SUB-D 9-pos. (pin)

Transmit data	TXD	PIN 3
Receive data	RXD	PIN 2
Clear to send	CTS	PIN 8
Request to send	RTS	PIN 7
Functional ground	GND	PIN 5
DEE data terminal ready	DTR	PIN 4
Data set ready	DSR	PIN 6
Ground	⏏	Shield

6.1. Interface coupling

Make a 1-to-1 connection between the PSM module and the peripheral device as shown in Fig. 10.

Note: For a minimum configuration, you need to connect TXD, RXD and GND (software handshake)!
Connect the 9-pin SUB-D plug to the module.

6.2. Data indicator

Two diagnostic LEDs indicate the RS-232 interface modes

- Yellow: Transmit data (TD), dynamic
- Green: Receive data (RD), dynamic

6.3. Configuration

For configuration, release the top of the housing on both sides ①. Pull the p.c.b. out of the housing as far as possible ② (fig. 11).



Static charges can damage electronic devices.

Discharge the electrical charge from your body before opening and configuring the device.

To do so, touch a grounded surface, e.g. the metal housing of the switch cabinet.

6.4. DTE/DCE switchover (fig. 12)

The DTE/DCE switches can be used to cross the cables TXD and RXD internally so that an adaptation can be performed easily.

For the connection to:

- Data terminal equipment (DTE) → switch to position DTE (up).
(Standard setting for most applications)
- Data communication equipment (DCE) → switch to position DCE (down).

If the connected interface type is unknown, you can determine the right configuration by **trial and error** (DTE/DCE switch).

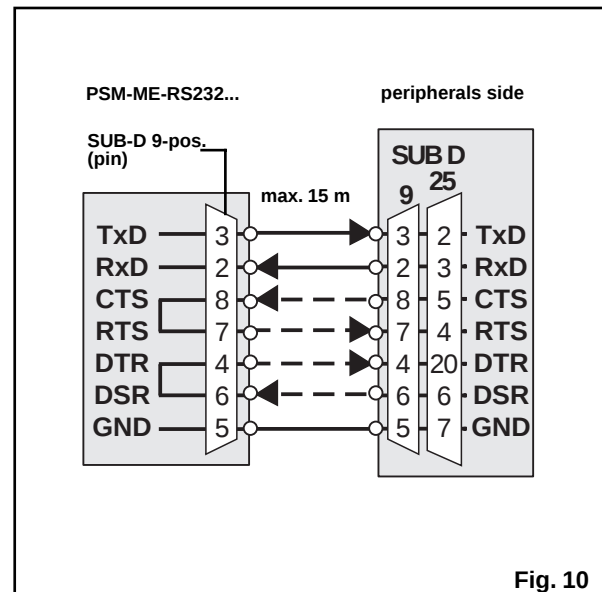


Fig. 10

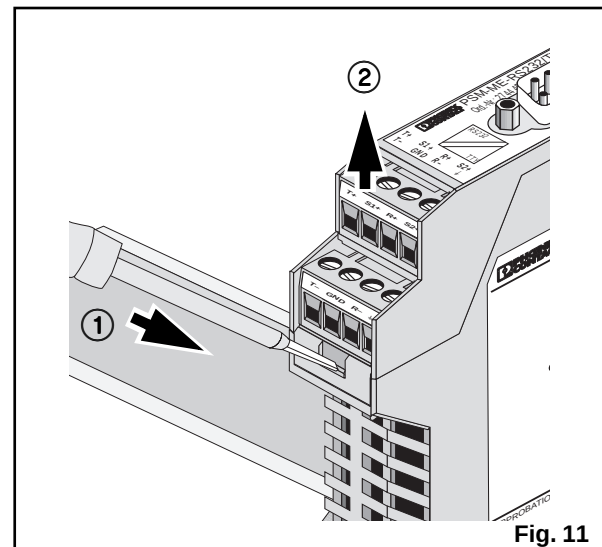


Fig. 11

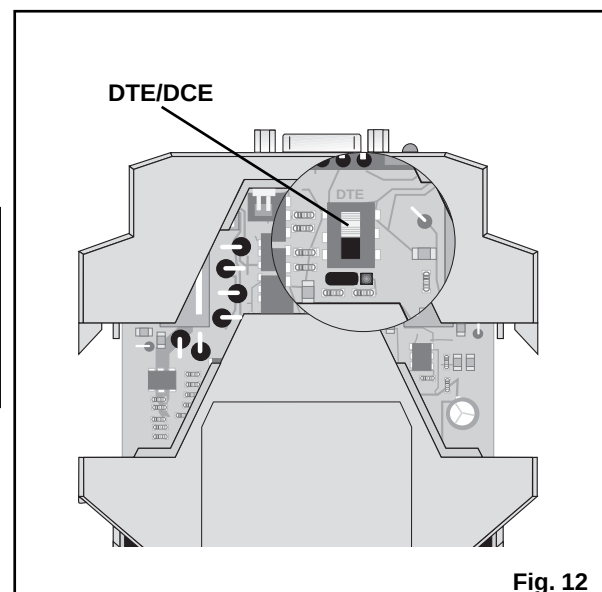


Fig. 12

7. The TTY interface

7.1. Pin configurations

Designation		COMBI- CON (fr. right)
Current source 1		
neg. polarity	GND	PIN 6
pos. polarity	S1+	PIN 2
Current source 2		
neg. polarity	GND	PIN 6
pos. polarity	S2+	PIN 4
Transmit data		
neg. polarity	T-	PIN 5
pos. polarity	T+	PIN 1
Receive data		
neg. polarity	R-	PIN 7
pos. polarity	R+	PIN 3
Ground connection	⊥	shield 8

7.2. Operating modes

The desired operating mode **active**, **passive** (fig. 13a) or **semi-active** (fig. 13b) is set using external insertion bridges ① is determined scheme of wiring (bridges are included in the scope of supply).

Note: Only one fully active interface may be connected to a passive interface, or two semi-active interfaces to one another!

We recommend shielded twisted pair cables (2 x 2 cores twisted) as connecting cable.

7.3. Inverting the signal position

The logical signal position is configured at delivery for normal operation (log. 1 ≙ TTY current flow 20 mA).

The logical signal position can be inverted by switching a jumper below the DTE/DCE change-over switch (fig. 14)

7.4. Shielding the data cables



**Use shielded twisted pair cables.
Connect the cable shield to both sides of
the transmission path!**

The data cables are shielded using a shield connector that is fixed in the ⊥ terminal block (fig. 15). The ⊥ terminal block is connected capacitively to the mounting rail contact on the underside of the device.

The shield connector is included in the scope of supply.

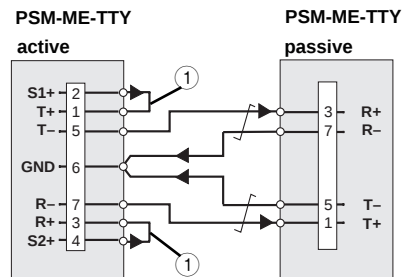


Fig. 13a

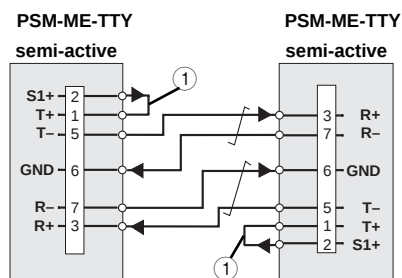


Fig. 13b

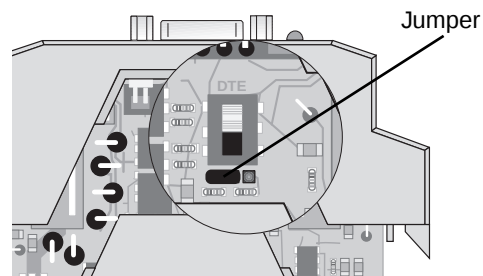


Fig. 14

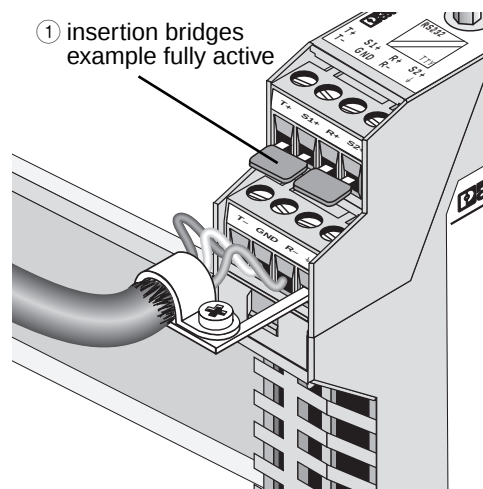


Fig. 15