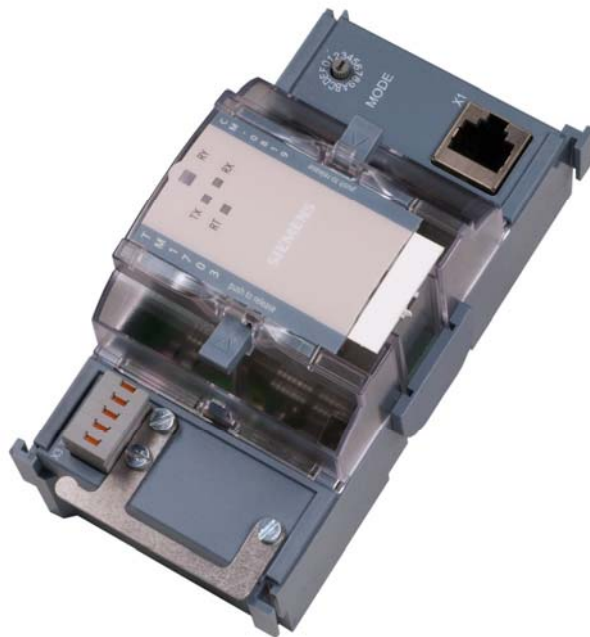


SIEMENS

ACP 1703 Ax 1703

CM-0819

EIA-232/EIA-485 Converter isolated



Converter which provides interfaces to connect devices with different interface characteristics (with galvanical isolation).

The following interfaces are supported:

- EIA-232 ↔ EIA-485
2-wire/4-wire

The module is supplied with 5V via contacts on the side of the module.

Application

Converter which provides interfaces to connect devices with different interface characteristics. The TM1703 Terminal module is mounted on TS35 DIN rail.

Following interfaces are supported:

- EIA-232 ↔ EIA-485 4-wire
- EIA-232 ↔ EIA-485 2-wire

EIA-232 interface and EIA-485 interface are galvanical isolated.

Connection technique:

- RJ45-plug 8-pin for EIA-232 interface
- 5-pole spring type terminal for EIA-485 interface

HEX switch for selection of desired mode (parameter setting).

Power supply:

5V power supply via contacts on the side of the module.

Functions

Transmission mode

The interface converter provides the following transmission modes:

- EIA-232 ↔ EIA-485 4-wire (full duplex)
- EIA-232 ↔ EIA-485 2-wire (half duplex)

The correspondent serial interface protocol defines transmission mode full duplex / half duplex.

EIA-232 interface with RJ45-plug 8-pole (plug X1)

The EIA-232 interface signals are always active in transmitting and receiving direction. Parallel operation of multiple interface converters at the EIA-232 interface is not allowed. An 8-pole RJ45 plug is available to wire the EIA-232 interface signals.

Available Signals for EIA-232 interface:

Pin#	Signal name		Function	Direction
1	SERIN3	CTS	Not available	
2	SEROUT2	RTS	DEE Request to Send	
3	+5V	+5V	Not available	
4	SEROUT1	TXT	DEE transmit data	EIA-232 → EIA-485
5	SERIN1	RXD	DEE receive data	EIA-232 ← EIA-485
6	GND	GND	DEE reference potential	transmit and receive
7	SERIN2	DCD	Not available	
8	SEROUT3	DTR TXC	Not available	

EIA-485 interface with spring type terminal 5-pole (plug X3)

The desired operating mode for EIA-485 interface has to be selected at the HEX switch of the interface converter (see also "Settings").

EIA-485 interface is galvanically isolated from EIA-232 interface, the supply voltage of the EIA-485 interface is also galvanically separated from TM-Bus supply. External power supply is not necessary.

To wire the EIA-485 interface signals, a 5-pole spring type terminal (RM=3,5mm) is available. For each signal point a double connection is possible. The signal cores have to be stripped. Incoming and outgoing conductor pair may be wired in different terminal points, both signal points are parallel connected on the terminal. To loosen the connection, the orange fastening has to be used. This connection technique enables to wire the EIA-485 interface properly – only one core per terminal point.

Available Signals for EIA-485 interface:

Pin#	Signal name		Function	Direction
1	TX_A (/RX_A *)		Transmit data (Receive data *)	EIA232 → EIA485 (EIA232 ← EIA485 *)
2	TX_B (/RX_B *)		Transmit data (Receive data *)	EIA232 → EIA485 (EIA232 ← EIA485 *)
3	RX_A		Receive data	EIA232 ← EIA485
4	RX_B		Receive data	EIA232 ← EIA485
5	GND		Reference potential	

*) in 2-wire mode

Switchover 2-wire mode / 4-wire mode

The operating mode for EIA-485 interface has to be selected at the HEX switch.

EIA-485 interface in 4-wire mode

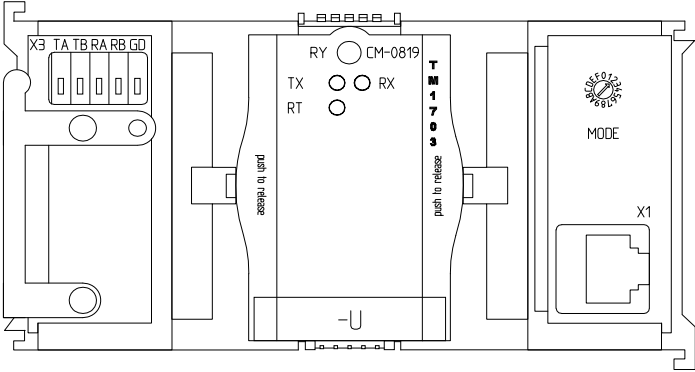
For data transmission one conductor pair in transmit direction (TX_A/TX_B) and one additional conductor pair in receive direction (RX_A/RX_B) are required. In 4-wire mode the terminating resistor at the interface converters at the end of the line has to be parameterized, the interface converters along the line must not have terminating resistors parameterized (see also "Settings").

EIA-485 interface in 2-wire mode

In 2-wire mode only one conductor pair is needed for data transmission in transmit and receive direction (TX_A/TX_B). In 2-wire mode the terminating resistor at the interface converters at the end of the line has to be parameterized, the interface converters along the line must not have terminating resistors parameterized (see also "Settings"). In 2-wire mode, transmit data as well as receive data are controlled over state line RTS. During transmission the receive channel is locked by the state line. If transmission is completed, the transmitter is switched to high-impedance by the state line, and the receiver becomes active. Therefore a listening mode is not possible.

Engineering

Front View



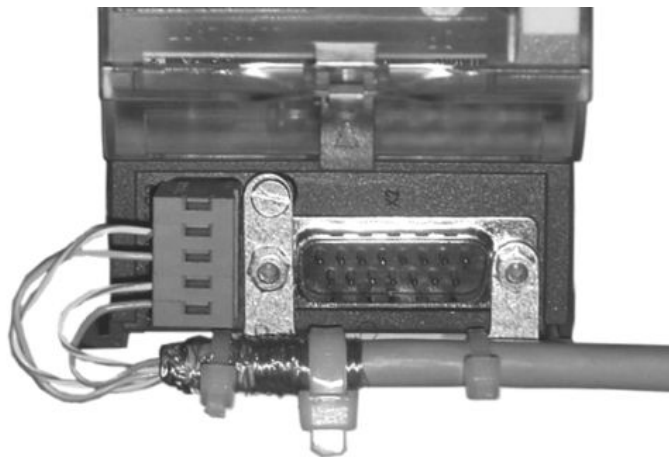
- RY board ready to operate (ready)
- TX on, if a positive Rs-232 level exists on the Rs-232 socket X1-4/6, independently of the adjusted mode of operation.
- RT on, if a positive Rs-232 level exists on the Rs-232 socket X1-2/6, independently of the adjusted mode of operation.
- RX on, if a positive level exists on the Rx0+/Rx0- signal, independently of the adjusted mode of operation.

L- J401252MG

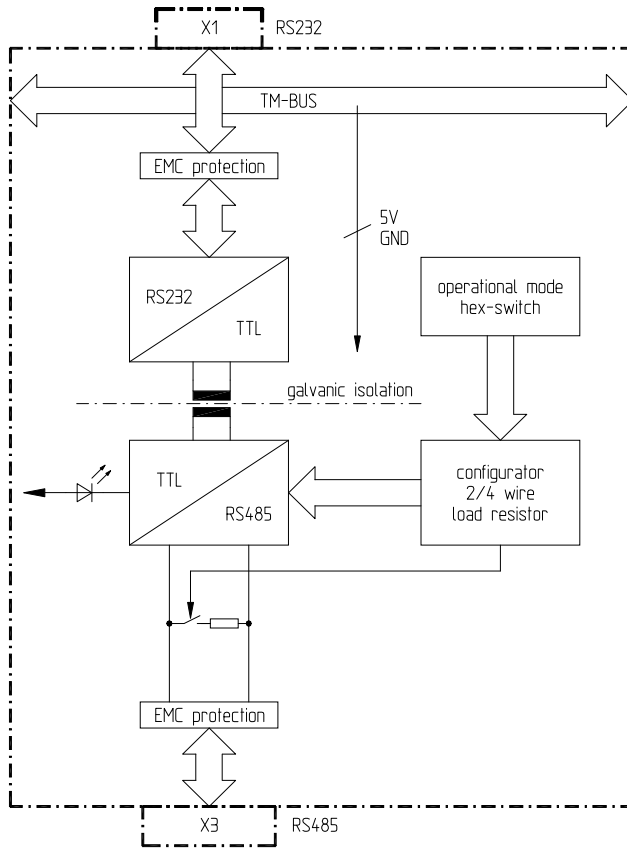
LED	Active Signal	
	EIA-232 interface	EIA-485 interface
TX, RT, RX		
on	$\geq +3.0\text{ V}$	$A-B \geq +0.3\text{ V}$
off	$\leq -3.0\text{ V}$	$A-B \leq -0.3\text{ V}$

Grounding and cable relief

Metal holder for grounding and cable relief of the EIA-485 interface



Block Diagram



4A01025.DWG

Technical Specification

Interfaces										
EIA-232 Interface	<ul style="list-style-type: none"> • Signal level according to V.28 • Interface signals: <table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 20px;">TXD</td> <td style="padding-right: 20px;">RXD</td> <td>RTS</td> </tr> </table> • Signals are not galvanically insulated • no parallel connection possible • EMV-Protection by Transzorbdiode • Cable shield connected to system ground • Terminating resistor integrated • Line lengths <table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 40px;">≤ 25 m</td> <td>max. 19.2 kbps</td> </tr> <tr> <td>≤ 10 m</td> <td>max. 76.8 kbps</td> </tr> <tr> <td>≤ 5 m</td> <td>max. 115.2 kbps</td> </tr> </table> 	TXD	RXD	RTS	≤ 25 m	max. 19.2 kbps	≤ 10 m	max. 76.8 kbps	≤ 5 m	max. 115.2 kbps
	TXD	RXD	RTS							
≤ 25 m	max. 19.2 kbps									
≤ 10 m	max. 76.8 kbps									
≤ 5 m	max. 115.2 kbps									
	<p>– Transmitter:</p> <p>Output signal level:</p> <table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 20px;">$\geq +5$ V at resistive load 3 kΩ</td> </tr> <tr> <td>≤ -5 V at resistive load 3 kΩ</td> </tr> </table> <p>Short-circuit current</p> <table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 20px;">(typ. +/- 17 mA)</td> <td>min. +/- 9 mA;</td> </tr> </table> <p>– Receiver:</p> <p>Input signal level, LOW Thresholds (Vout TTL = High)</p> <table border="0" style="margin-left: 20px;"> <tr> <td>≤ 0.8V</td> </tr> </table> <p>Input signal level, HIGH Thresholds (Vout TTL = Low)</p> <table border="0" style="margin-left: 20px;"> <tr> <td>≥ 2.4V</td> </tr> </table> <p>Hysteresis</p> <table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 20px;">(typ. 400 mV)</td> <td>max. 1 V</td> </tr> </table> <p>Input impedance</p> <table border="0" style="margin-left: 20px;"> <tr> <td>> 3 kΩ < 7 kΩ</td> </tr> </table> <p>Terminating resistor:</p> <p>Terminating resistor for EIA-232 Interface is integrated.</p>	$\geq +5$ V at resistive load 3 k Ω	≤ -5 V at resistive load 3 k Ω	(typ. +/- 17 mA)	min. +/- 9 mA;	≤ 0.8 V	≥ 2.4 V	(typ. 400 mV)	max. 1 V	> 3 k Ω < 7 k Ω
$\geq +5$ V at resistive load 3 k Ω										
≤ -5 V at resistive load 3 k Ω										
(typ. +/- 17 mA)	min. +/- 9 mA;									
≤ 0.8 V										
≥ 2.4 V										
(typ. 400 mV)	max. 1 V									
> 3 k Ω < 7 k Ω										

Interfaces

EIA-485 Interface

- Signal level according to V.11
Interface signals:
TX_A/TX_B RX_A/RX_B
- Signals are not galvanically insulated
- Operating mode
2-wire/4-wire (parameter-settable)
- parallel connection is possible (depends on operating mode)
- EMV-protection by Transzorbdiode
- Terminating resistor
100 Ω (depends on operating mode)
- Line lengths (in buildings)
max. 1200 m max. 115.2 kbps

Comment:

For balanced transmission each conductor pair must be terminated at the begin and the end of the line. The HEX-switch activates or deactivates terminating resistor, depending on adjusted operating mode. For each signal pair, the terminating resistor must be activated at begin and end of the lines by adjusting the operation mode. Devices along the line have to be configured without terminal resistor.

– Transmitter:

Output signal level:

$\geq +2 \text{ V}$ at 50 Ω resistive load
 $\leq -2 \text{ V}$ at 50 Ω resistive load

Short-circuit current

(typ. +/- 100 mA) max. +/- 250mA

– Receiver:

Differential voltage RX_A – RX_B

$\leq +0.2 \text{ V}$ (TTL-Out = HIGH)

Differential voltage RX_A – RX_B

$\leq -0.2 \text{ V}$ (TTL-Out = LOW)

Input hysteresis 70 mV

Input impedance $\geq 12 \text{ k}\Omega$

Signal propagation delay

EIA-232 input to
EIA-485 output

ca. 0.9 μs

Power supply	
Operating voltage	4.75...5.5 VDC: Voltage is supplied via contacts on the side of the module. Pin 3: +5 V Pin 6: GND
Power consumption	auxiliary ≤ 150 mW
Power consumption EIA-485 Driver at 100 Ω terminating resistor	EIA-485 ≤ 400 mW
Engineering and wiring	
Connection facilities	<ul style="list-style-type: none"> • RJ45-plug 8-pole for EIA-232 interface • Spring type terminal 5-pole for EIA-485 interface
Rotary switch	HEX-switch, 16 positions
Mechanical design	127 x 63 x 72 mm (without DIN rail)
weight	ca. 200 g

Settings

Hex-switch

To adjust the wanted operation mode, Interface converter CM-0819 is equipped with an HEX-switch (rotary switch). Out of 16 possible positions, four positions can be used to adjust the operation mode.

Position	Operation mode
0	EIA-485 2-wire with bus terminator (100 R)
1	EIA-485 2-wire without bus terminator
2	EIA-485 4-wire with bus terminator (100 R)
3	EIA-485 4-wire without bus terminator
4	not used
5	not used
6	not used
7	not used
8	not used
9	not used
A	not used
B	not used
C	not used
D	not used
E	not used
F	not used

