

Datasheet

RS-485 Serial Industrial Profi Line Converter



Description

MICROSENS has developed the RS-485 Profi Line serial converter for extremely demanding applications in industrial environments. This converter is used for the coupling of devices, switchgear or machine controls, which are connected to each other via fiber optics.

The RS-485 converter is compatible with various industrial field bus systems such as Profibus, Bitbus, Interbus etc. The conversion is transparent so that no adjustment to the data rate to be transmitted is necessary. Depending on the cable type, transmission via fiber optics is possible over a distance of up to 80 km, in special configurations even up to 125 km. The serial converters are always used in pairs.

The connection of the respective terminal device can be made either via SUB-D9 or additionally via parallel connected terminals.

In addition to the RS-485 converter, the product family includes converters for

- RS-422
- RS-232

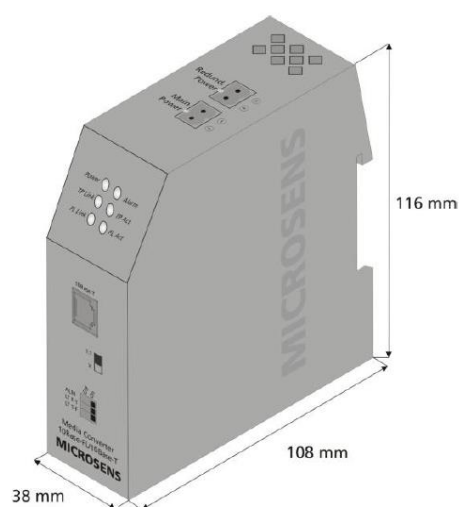
Optical Parameter

	typ. Distance (km)	opt. power (dBm)	Sensitivity (dBm)	Wavelength (nm)
Multimode	2	-19	-31	1310
Single mode	15	-15	-31	1310
	40	-5	-34	1310
	80	-5	-34	1550

Technical Details

Type	RS-485 / FO converter for industrial use	
Fiber type	Multimode 50 or 62,5/125µm duplex Single mode 9/125µm duplex	
Cable type	with SUB-D9 pin plug or Fieldbus installation via 4-pin screw/clamp connector	
Data rate	max. 1,5 Mbit/s	
LED Displays	<i>Power</i>	Ready for operation
	<i>FO-Xmt</i>	Sending Data FO
	<i>FX-Rcv</i>	Receiving Data FO
	<i>TXD</i>	Sending Data TP
	<i>RXD</i>	Receiving Data TP
	<i>Alarm</i>	Link interrupted
Mounting	DIN-Rail 35mm, EN 50022	
Power supply	Redundant 18-36 VDC, max. 500mA	
Operating temp.	-20..+60 °C	
Storage temp.	-20..+80 °C	
Humidity	5% bis 90 % non condensing	
Dimensions	38 x 116 x 108 mm (W x H x D)	

Dimensions



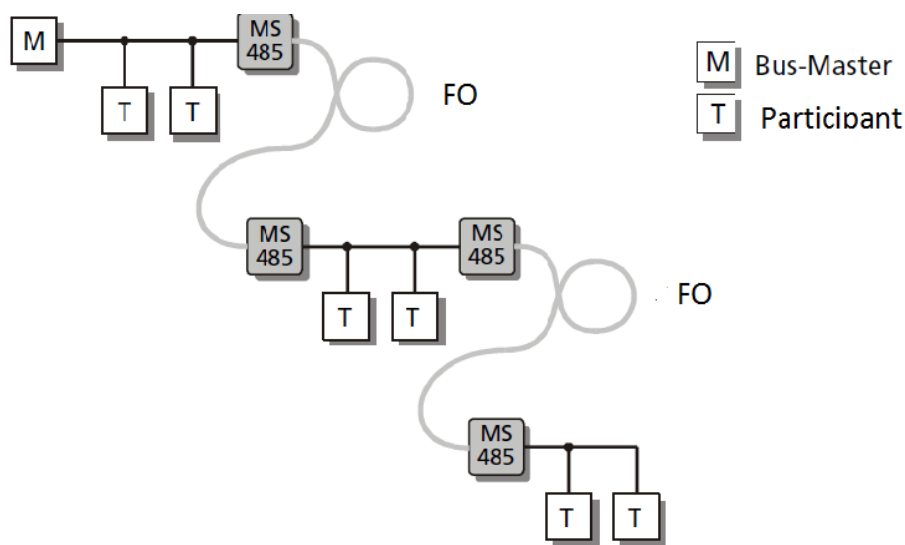
Method

Data is transmitted via the RS-485 bus in half-duplex mode. As soon as data is sent on the copper side, the data is transmitted to the other device via the optical fiber.

There, a change of signal in the data is detected and the RS-485 driver is activated for the duration of the set Hold time.

If further signal changes occur in data within the Hold time, the Hold time is extended accordingly.

The Hold time should not be set too long, otherwise the bus will be blocked for a long time. This can lead to partial interference of the response because the transceiver may not have switched to receive yet.



Quality – Made in Germany

In order to guarantee a consistently high quality of the Profi Line Converter, all versions are manufactured in Hamm, Germany.

Here, all devices are subjected to a so-called burn-in test, which guarantees the reliability of the switch in long-term operation. For this purpose, the switches are tested for a longer period of time in permanent operation (approx. 48 h) under high load to check their functionality. In this way, we are able to detect early failures even before delivery.

Configuration

When converting the RS-485 standards to fiber optic cables, the recognition of the data direction on the bus must be guaranteed. This depends on the protocol used or the transmission rate used.

The configuration of the transceiver can be adapted to the bus systems of different manufacturers via several switches. A maximum of flexibility is ensured by 16 different setting options.

Switch				Bitrate (b/s)	Hold Time (µs)
DIP1	DIP2	DIP3	DIP4		
off	off	off	off	1.500.000	7,6
off	off	off	on	750.000	15,2
off	off	on	off	500.000	22,4
off	off	on	on	375.000	30,0
off	on	off	off	187.500	60,4
off	on	off	on	93.750	120,4
off	on	on	off	75.000	150,0
off	on	on	on	-	-
on	off	off	off	115.200	106
on	off	off	on	57.600	211
on	off	on	off	38.400	315
on	off	on	on	19.200	628
on	on	off	off	9.600	1252
on	on	off	on	4.800	2512
on	on	on	off	-	-
on	on	on	on	-	-

The bit rate is based on a data block length of 11 bits.
(1 start bit + 8 data bits + 1 parity + 1 stop bit).

Mounting

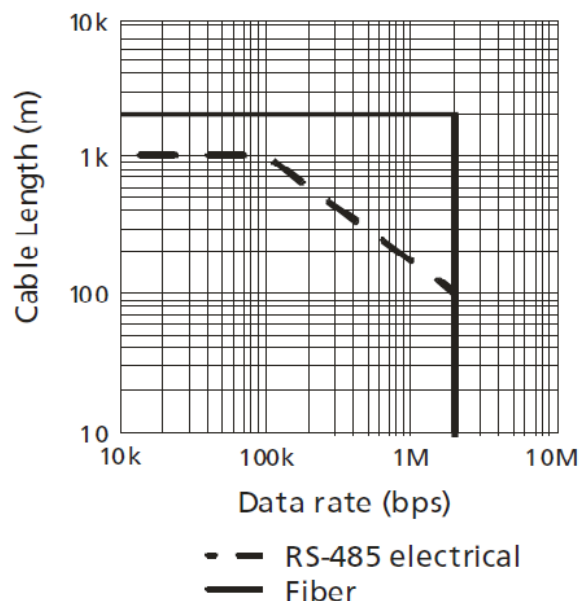
The converter has a solid stainless steel housing with integrated mounting on top-hat rails. Standardized 35 mm device mounting rails to DIN EN 50 022 can be used for mounting.

The MICROSENS device is snapped into place using the corresponding snap-on mounting on the back of the device. It can be released using an eyelet on the bottom. The optimized heat dissipation allows several units to be connected in a row without any problems.

Transmission lines

In addition to the above mentioned advantages of optical transmission, the MICROSENS RS-485 transceiver allows the network extension beyond the limits set by the RS-485 standard.

Whereas with conventional electrical cabling the maximum route length decreases with increasing data rate, with optical fibers the transmission length remains constant and is only limited by the attenuation of the optical fiber.



Alarm Contact

Connection

The three-pin, potential-free alarm contact enables monitoring of the operating status via a connected external signal transmitter.

The contact of the alarm relay is positioned in the form of a clamp underneath the device.

Assignment

The switch contact can be assigned as needed:

- NO = Normal Open
- NC = Normal Closed

The signal status is confirmed by LED indicators (alarm LED).

Important!

The status of the fiber link can be verified by checking the alarm LED.

For link tests it is possible to switch a simple loop (connection between transmitter and receiver).

Pin Assignment

The electrical RS-485 connection can be done either via a standardized SUB-D9 socket or a 4-pin screw Clamp.

The SUB-D9 socket is assigned as follows:

	PIN	Signal	Description
	1		Not used
	2		Not used
	3	Rx+/Tx+	Receive-/Transmit data positiv
	4		Not used
	5	GND	Grounding
	6		Not used
	7		Not used
	8	Rx-/Tx-	Receive-/Transmit data negativ
	9	VCC	+5V(for active termination))

Assignment 4-pin screw clamp:

RS-485

1	RX+/TX+
2	RX-/TX-
3	RX+/TX+
4	RX-/TX-

Safety Instructions

DANGER! Optical components can emit laser light.

Attention: Infrared light, which is used for data transmission in a fiber optic network, is not visible to the human eye, but can still cause damage.

To avoid damage to the eyes:

- Never look directly with the eye into the outputs of optical components or fiber optics. Risk of blindness!
- Cover all unused optical connections with caps.
- Do not put the transmission line into operation until all connections have been made

The active laser technology used in this product complies with **Laser-Class 1**

Order Information

Description	Art.-No.
Profi Line Converter RS-485/FO 1x RS-485, 1x FO 1310nm Multimode SC duplex, DIN-Rail, RC	MS650343
Profi Line Converter RS-485/FO 1x RS-485, 1x FO 1310nm Multimode ST duplex, DIN-Rail, RC	MS650342
Profi Line Converter RS-485/FO 1x RS-485, 1x FO 1310nm SingleMode SC duplex 15km, DIN-Rail, RC	MS650347
Profi Line Converter RS-485/FO 1x RS-485, 1x FO 1310nm SingleMode ST duplex 15km, DIN-Rail, RC	MS650345
Profi Line Converter RS-485/FO 1x RS-485, 1x FO 1310nm SingleMode SC duplex 40km, DIN-Rail, RC	MS650346
Profi Line Converter RS-485/FO 1x RS-485, 1x FO 1310nm SingleMode ST duplex 40km, DIN-Rail, RC	MS650340
Profi Line Converter RS-485/FO 1x RS-485, 1x FO 1550nm SingleMode SC duplex 80km, DIN-Rail, RC	MS650348

Accessories

	Description	Art.-No.
	external power supplies for industrial use 24 VDC	
	Industrial DIN-Rail Power supply 24VDC/1,25A (30W) Input 100..240VAC/120..375VDC, Out: 24..28VDC, -20..+70°C	MS700440

Service

	Description	Art.-No.
	Warranty extension after 24-month manufacturer's warranty **	
	Warranty extension by 1 year	MSGV01
	Warranty extension by 2 years	MSGV02
	Warranty extension by 3 years	MSGV03

** The manufacturer's warranty is defined in the general terms and conditions [AGB \(§9\)](#) of MICROSENS GmbH & Co. KG.

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