Serial/Fiber Converter

IE-MCT-1RS232/485-1SC
IE-MCT-1RS232/485-1ST

Hardware Installation Guide

Second Edition, April 2016
1398730000/01/04.16

Please note:
This document and any further product information - if available - can be downloaded at the internet link:

http://www.weidmueller.com/ie

Weidmüller

Overview

Introduction

Weidmüller Serial/Fiber converters are equipped with a multiple interface circuit that can handle RS-232, RS-422, and RS-485 serial interfaces, as well as a multi-mode fiber. Serial/Fiber converters are used to extend serial transmission distance up to 5km.The Serial/Fiber converter must be configured to transmit a particular serial interface. You cannot transmit both RS-232 and RS-485 signals at the same time.

Why Convert Serial to Fiber?

Fiber communication not only extends the communication distance, but also provides many advantageous features.

IMMUNITY FROM ELECTRICAL INTERFERENCE: Fiber is not affected by electromagnetic interference or radio frequency interference. It provides a clean communication path and is immune to cross-talk.

INSULATION: Optical fiber is an insulator; the glass fiber eliminates the need for using electric currents as the communication medium.

SECURITY: Fiber cannot be tapped by conventional electric means and is very difficult to tap into optically.

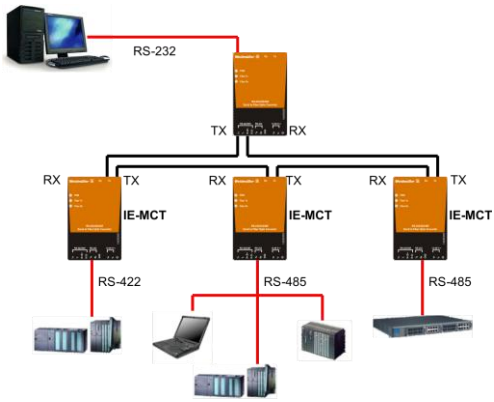
RELIABILITY & MAINTENANCE: Fiber is immune to adverse temperature and moisture conditions, does not corrode or lose its signal, and is not affected by short circuits, power surges, or static electricity.

Reverse Power Protection

The Reverse Power Protection feature provides extra protection against accidentally connecting the power cables to the wrong terminal. The converter automatically detects which power wire is positive and which is negative.

Ring Mode

To allow one half-duplex serial device to communicate with multiple half-duplex devices connected to a fiber ring, you should configure the Serial/Fiber Converter for “ring mode” by setting DIP switch “SW4” to the “On” position. The Tx port of a particular Serial/Fiber Converter unit connects to the neighboring converter’s Rx port on the ring. Note that when one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signal. Users should ensure that the total fiber ring length is less than 100 km.



ATTENTION

For Fiber Ring Users:

To avoid problems when setting up a fiber ring, each Serial/Fiber Converter unit making up the ring must be powered down and set to "Ring mode." Next, make sure all cables are connected properly, and then power up all devices connected to the ring.

NOTE "Ring Mode" can only be used with half-duplex applications (i.e., RS-485 multi-drop communication).

DIP Switch Selectable Terminator

The Serial/Fiber Converter's termination resistor is set with a DIP switch located on the outside of the converter's casing.

No Configuration Required for Baudrate Settings

The Serial/Fiber Converter is compatible with any baudrate from 50 bps to 921.6 Kbps. The Serial/Fiber Converter automatically converts the signal back and forth between serial (RS-232, RS-422, or RS-485) and fiber, and does not need to interpret the signal or the baudrate of the transmitting device.

Features

- "Ring" or "Point to Point" transmission
- Extend RS-232/422/485 transmission distance up to 5km
- Compact size
- Decrease signal interference
- Protect against electronic degradation and chemical corrosion
- Supports baudrates up to 921.6 Kbps
- Extended operating temperature from -40 to 75°C

Package Checklist

Before installing the Serial/Fiber Converter, verify that the package contains the following items:

- 1 IE-MCT-1RS232/485-1SC/ST media converter
- Power jack to 3-pin terminal block adaptor
- Stick-on pads
- Hardware installation guide (printed)

If any of these items are missing or damaged, please contact your Weidmüller customer service for assistance.

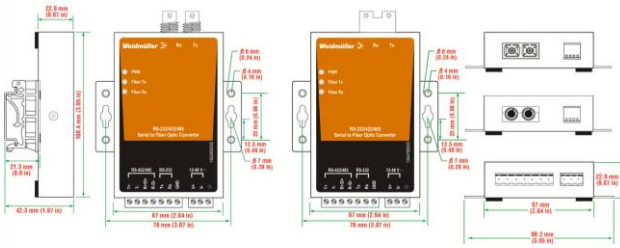
Dimensions and Appearance

Weidmüller Serial/Fiber Converters are easy to set up and use. The serial terminal block of one of the converters connects to your computer, the serial terminal block of the other converter connects to your serial device, and the two converters are connected by fiber cable.

NOTE **Electrostatic Discharge Warning!**

To protect the product from damage due to electrostatic discharge, we recommend wearing a grounding device when handling your Serial/Fiber Converter.

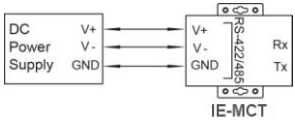
IE-MCT-1RS232/485-1ST **IE-MCT-1RS232/485-1SC**



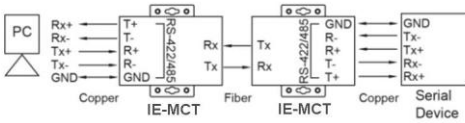
Wiring Examples

Connecting the Power Supply

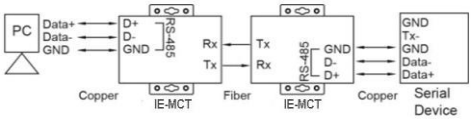
Before using the Serial/Fiber Converter, first connect the DC power supply to the power supply terminal block located on the Serial/Fiber Converter's bottom panel.



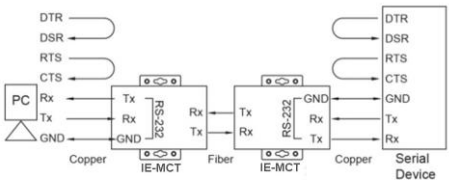
Connecting RS-422 and 4-wire RS-485 Serial Devices



Connecting 2-wire RS-485 Serial Devices



Connecting an RS-232 Serial Device to a PC



DIP Switch Settings

Serial Connection	SW1	SW2	Built-in 120 Ω Terminator	SW3	SW4
RS-232	ON	OFF	Enable	ON	–
RS-422	ON	ON	Disable	OFF	–
RS-485 4-wire	OFF	OFF	Ring mode	–	ON
RS-485 2-wire	OFF	ON	Point to Point mode	–	OFF

The S1 DIP Switch is located inside the Serial/Fiber Converter. When the Serial/Fiber Converter is in RS-485 mode, use this DIP switch to configure RS-485 data direction control, data format, and baudrate. When the Serial/Fiber Converter is in RS-232/422 mode, the S1 DIP switch cannot affect RS-232/422 communication.

RS-485 Data Direction Control Settings

RS-485 Data Direction Control	S1 Pin 1
Auto Baudrate (default setting)	OFF
Fixed Baudrate	ON

NOTE DIP Switch S1 is only present at models with hardware revision 3.3.0 or later. We recommend users to use Auto Baudrate and setting S1 Pin 1 to OFF. The default setting is OFF.

Data Format Settings

Data Format	S1 Pin 2	S1 Pin 3	S1 Pin 4
7 Bits	OFF	ON	ON
8 Bits	ON	OFF	ON
9 Bits	OFF	OFF	ON
10 Bits	ON	ON	OFF
11 Bits	OFF	ON	OFF
12 Bits	ON	OFF	OFF

Baudrate Settings

Baudrate	S1 Pin 5	S1 Pin 6	S1 Pin 7	S1 Pin 8	S1 Pin 9
50	OFF	ON	ON	ON	ON
75	ON	OFF	ON	ON	ON
110	OFF	OFF	ON	ON	ON
134.5	ON	ON	OFF	ON	ON
150	OFF	ON	OFF	ON	ON
300	ON	OFF	OFF	ON	ON
600	OFF	OFF	OFF	ON	ON
1200	ON	ON	ON	OFF	ON
1800	OFF	ON	ON	OFF	ON
2400	ON	OFF	ON	OFF	ON
4800	OFF	OFF	ON	OFF	ON
7200	ON	ON	OFF	OFF	ON
9600	OFF	ON	OFF	OFF	ON
19200	ON	OFF	OFF	OFF	ON
38400	OFF	OFF	OFF	OFF	ON
57600	ON	ON	ON	ON	OFF
115200	OFF	ON	ON	ON	OFF
230400	ON	OFF	ON	ON	OFF
460800	OFF	OFF	ON	ON	OFF
921600	ON	ON	OFF	ON	OFF

The S2 DIP switch is located inside the Serial/Fiber Converter. This switch is used to configure the pull high/low resistors. Note that S2 Pin 1 and Pin 2 must both be configured to ON or both must be configured to OFF.

Pull High/Low Resistor	S2 Pin 1	S2 Pin 2
150K	OFF	OFF
1K (default setting)	ON	ON

NOTE We recommend setting S2 Pin 1 and Pin 2 to the 1K option (ON/ON) when termination is enabled.

LED Description

There are 3 LEDs on the front panel of the Serial/Fiber Converter.

LED	Color	Function
PWR	Red	Steady ON: Power is ON
Fiber Tx	Green	Blinking when fiber is transmitting data
Fiber Rx	Orange	Blinking when fiber is receiving data

Specifications

Model Names	IE-MCT-1RS232/485-1SC IE-MCT-1RS232/485-1ST
Serial Communication	
Signals for RS-232	TxD, RxD, SGND
Signals for RS-422	TxD+, TxD-, RxD+, RxD-, SGND
Signals for 4-wire RS-485	TxD+, TxD-, RxD+, RxD-, SGND
Signals for 2-wire RS-485	Data+, Data-, SGND
Baudrate	50 bps to 921.6 Kbps
Surge protection	15 KV ESD
Fiber Communication	
Connector type	ST or SC
Distance	Multi mode fiber for up to 5 km
Cable Specifications	50/125, 62.5/125, or 100/140 µm
Wavelength	850 nm
TX Output	-5 dBm
RX Sensitivity	-20 dBm
Point-to-Point Transmission	Half or Full duplex
Ring Transmission	Half duplex
Environmental Limits	
Operating Temperature	-40 to 75°C (-40 to 167°F), 5 to 95 % RH
Storage Temperature	-40 to 75°C (-40 to 167°F), 5 to 95 % RH
Power	
Input Power Voltage	12 to 48 VDC
Power Line Protection	1 KV Burst (EFT), EN61000-4-4 1 KV Surge, EN61000-4-5
Reverse Power Protection	Protects against V+/V- reversal
Over Current Protection	Protects against 2 signals shorted together: 1.1A
Power Consumption	140 mA at 12 VDC
Physical Characteristics	
Dimensions	67 x 100 x 22 mm 90 x 100 x 22 mm (including ears)
Material	Aluminum (1 mm), IP 30 protection
Gross Weight	320 g

Regulatory Approvals	
EMC	CE, FCC (Class A)
LVD	EN 60950-1
Safety	UL 60950-1
EMI	FCC Part 15 Subpart B Class B, EN 55022 Class B
EMS	EN61000-4-2 (ESD), Criteria B, Level 2 EN61000-4-3 (RS), Criteria B, Level 2 EN61000-4-4 (EFT), Criteria B, Level 2 EN61000-4-5 (Surge), Criteria B, Level 3 EN61000-4-6 (CS), Criteria B, Level 2
MTBF	Time: 2,681,816 hrs Database: Telcordia (Bellcore), GB
Warranty	5 years

Weidmüller gives a 5 year warranty on this product in accordance with the warranty terms as described in the general conditions of sale of the Weidmüller company which has sold the products to you. Weidmüller warrants to you that such products the defects of which have already existed at the time when the risk passed will be repaired by Weidmüller free of charge or that Weidmüller will provide a new, functionally equivalent product to replace the defective one. Safe where expressly described otherwise in writing in this catalogue/product description, Weidmüller gives no warranty or guarantee as to the interoperability in specific systems or as to the fitness for any particular purpose. To the extent permitted by law, any claims for damages and reimbursement of expenses, based on whatever legal reason, including contract or tort, shall be excluded. Where not expressly stated otherwise in this warranty, the general conditions of purchase and the expressive liability commitments therein of the respective Weidmüller company which has sold the products to you shall be applicable.

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