Media converter and protocol gateways

Overview

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</tr>
</tbody>
</table>
Media converter
A smooth transition from copper to fibre-optic cables

If high interference immunity is needed or long transmission distances are involved, then fibre-optic cables are advisable. Another advantage of using fibre-optic cabling is the insensitivity to lightning or voltage surges. The use of fibre-optic based systems is already established in areas such as the process industry, plant engineering, energy distribution and wind energy.

One simple and inexpensive solution is offered by the media converter. This connects the Ethernet via an RJ45 port to an optical fibre-optic cable port with SC or ST glass fibre connections. This retains the collision domain between the two Ethernet participants and means that there is status transparency exchanged between the two Ethernet interfaces and the port status.

Multimode glass fibres allow distances of up to 5,000 m to be bridged without intermediate repeaters. Singlemode fibres can be used over distances of up to 40 km.
Industrial Media Converter (10/100BaseT (X) to 100BaseFX)
- 10/100BaseT(X) auto-negotiation and auto-MDIX/MDI-X
- Link Fault Pass-Through (LFP)
- Power failure, port break alarm by relay output
- Redundant power inputs
- Designed for hazardous locations (Zone 2)

Technical data

<table>
<thead>
<tr>
<th>Technology</th>
<th></th>
</tr>
</thead>
</table>
| Standards  | IEEE 802.3 for 10BaseT  
IEEE 802.3u for 100BaseT (X) and 100BaseFX |
| Interfaces |  |
| Fiber Ports | 100BaseFX (SC/ST-duplex connection)  
10/100BaseFX (X) |
| DIP Switches | 100BaseFX Full/Half duplex selection, Port fault alarm |
| Alarm Contact | One relay output with current carrying capacity of 1 A at 24 V DC |
| Specification optical fiber |  |
| Transceiver Type | 100Base FX |
| Fiber Cable Type | OM1  
OM2  
OM3  
OM4 |
| Typical Distance | 4 km  
800 Mbit/s*km  
5 km  
40 km |
| Wave-length | TX Range (mm)  
RX Range (mm)  
TX Range (dbm)  
RX Range (dbm)  
Link-Budget (db)  
Dispersion Penalty (db) |
| Optical | 1300  
1260 to 1360  
1280 to 1340  
1100 to 1600  
1100 to 1600  
-10 to 20  
-3 to -22  
12 |
| Power | -3 to -24  
29 |
| Note: When connecting a single-mode fiber transceiver over a short distance, we recommend using an attenuator to prevent the transceiver from being damaged by excessive optical power. |

Power Requirements

<table>
<thead>
<tr>
<th>Item</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>24 V DC (12 to 48 V DC), two redundant inputs</td>
</tr>
<tr>
<td>Current consumption</td>
<td>0.16 A at 24 V</td>
</tr>
<tr>
<td>Connection</td>
<td>1 removable 5-pole terminal block</td>
</tr>
<tr>
<td>Overload Current Protection</td>
<td>1.1 A</td>
</tr>
<tr>
<td>Reverse Polarity Protection</td>
<td>Present</td>
</tr>
<tr>
<td>Housing</td>
<td>Metal IP30 protection</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>630 g</td>
</tr>
<tr>
<td>Installation</td>
<td>DIN rail, wall (with optional mounting kit)</td>
</tr>
<tr>
<td>Environmental Limits</td>
<td></td>
</tr>
</tbody>
</table>
| Operating temperature | Standard Models: 0 to 60 °C (32 to 140 °F)  
Wide Temp. Models: -40 to 75 °C (-40 to 167 °F) |
| Operating Humidity | 5 to 95 % (non-condensing) |
| Storage Temperature | -40 to 85 °C (-40 to 185 °F) |

Approvals

| Security | UL 568 |
| EMC | EN 55032/34  
CISPR 32, IEC 1000-4-2 ES: Contact: 6 kV; Air: 8 kV  
IEC 1000-4-3 RG: 80 Mbit/s to 1 Gbit/s: 3 V/m  
IEC 1000-4-4 EFT: Power: 2 kV; Signal: 2 kV  
IEC 1000-4-5 Surge: Power: 1 kV; Signal: 1 kV  
IEC 1000-4-6 CS: 3 V  
IEC 1000-4-8 |
| Maritime | DNV GL |
| Freefall | IEC 60950-2-32 |
| Shock | IEC 60068-2-23 |
| Vibration | IEC 60950-2-26 |
| MTBF (mean time between failures) | 401,000 hrs |
| Time Database | MIL-R-6174F, GB 25 °C |
| Warranty | Warranty Period 5 years |

Ordering data

<table>
<thead>
<tr>
<th>Version</th>
<th>Type</th>
<th>Operating Temperature</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| 1 * R45, 1 * SC-Multimode | IE-MC-VT-1T-X-1SC  
IE-MC-VT-1T-K-1SC | 0 to +60 °C  
-40 to +75 °C | 1241400000  
1286880000 |
| 1 * R45, 1 * ST-Multimode | IE-MC-VT-1T1-1SC  
IE-MC-VT-1T-K-1ST | 0 to +60 °C  
-40 to +75 °C | 1241410000  
1286890000 |
| 1 * R45, 1 * SC-Singlemode | IE-MC-VT-1T-1SCS  
IE-MC-VT-1T-K-1SCS | 0 to +60 °C  
-40 to +75 °C | 1241420000  
1286900000 |

Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
</tr>
</thead>
</table>
| 19" Rack Mounting Kit | RM/47  
Wall mounting kit | IWALLMOUNT-KIT-405MM |

2596860000

Media converter and protocol gateways

Weidmüller D.3
Serial/Ethernet converter
Simple integration of end devices into Ethernet networks

Serial interfaces such as RS232, RS422 or RS485 are widespread today in automation systems. To integrate these devices into modern Industrial Ethernets, Serial/Ethernet converters are used which offer investment protection for existing automation components. These devices include control systems, sensors, meters, drives, bar code readers and operator displays.

Weidmüller’s Serial/Ethernet converters connect these devices simply and easily to existing Ethernet network structures. The configuration of the serial port and Ethernet port parameters is done using an internet browser. On the Ethernet side, these devices support several operating modes: including TCP server, TCP client, UDP, Real COM, RFC 2217, Reverse Telnet, Pair Connection and Ethernet modem. These modes ensure compatibility for the network software.

There are two Ethernet ports on the device which can be used as Ethernet switch ports. This helps to reduce your cabling costs since you no longer need to connect each device with a separate Ethernet switch.
1 and 2- port Serial/Ethernet Converter for industrial automation

- High surge protection for the serial ports, LAN ports and power supply connection
- Rugged screw-type terminal blocks for power and serial connectors
- Cascading Ethernet ports for easy wiring
- Redundant DC power inputs
- Warning by relay output and email
- Low power consumption

Technical data

Ethernet Interface
- Number of Ports: 2
- Speed: 10/100 Mbit/s, auto MDI/MDX
- Connection: B-pin RJ45
- Magnetic Isolation Protection: 1.5 kV built-in
- Ethernet Line Protection: 1 kV (level 2) surge protection

Serial Interface
- Number of ports that can be used simultaneously: IE-CS-T;-5S
- Serial Standards: 5S
- Connection: IE-CS-T;-5S D% for 5S, terminal block for 5S, IE-CS-T;-5S D%
- Serial Line Protection: 9 high surge protection for the serial ports, /$1 ports and power supply connection
- RS 485 Data Direction Control: AUTC (automatic data direction control)

Serial Communication Parameters
- Data Bits: 5, 6, 7, 8
- Parity: None, Even, Odd, Space, Mark
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS/CTS and DTR/DSR (RS 232 only), XON/XOFF
- Basal rate: 50 bps to 921.6 Kbps

Serial Signals
- RS 232: Tx, Rx, RTS, CTS, DTR, DSR, DCD, GND
- RS 422: Tx+, Tx-, Rx+, Rx-, RS
- RS 485-4w: Data+, Data-, RS
- RS 485-2w: Data+, Data-, GND

Software
- Network Protocols: ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, Rlogin, DNS, SNMP, HTTP, SMTP, NTP, ICMP
- Configuration Options: Web Console, Serial Console, Telnet Console, Windows Utility

Technical data

- Housing: Metal, IP30 protection
- Weight: IEC627-2/TX132/32/48: 476 g
- Dimensions (W x H x D): 36 x 105 x 140 mm (1.42 x 4.13 x 5.51 in)
- Environmental Limits: Standard Models: 0 to 60 °C (32 to 140 °F)
- Operating temperature: Wide Temp. Models: 40 to 75 °C (104 to 167 °F)
- Ambient Relative Humidity: 5 to 95 % RH
- Storage Temperature: -40 to 85 °C (-40 to 185 °F)
- Power Requirements: Input Voltage: 12 to 48 V DC
- Current consumption: IEC627-2/TX32/32/48: 0.22 A at 12 V
- Approvals: EN 55032/24
- EMC: IEC 60950-1
- FCC Part 15 Class A
- CE: EN 55022/24
- IEC 60950-1
- CE: 1000-4-2 ESD: Contact: 6 kV Air: 8 kV
- CE: 1000-4-3: RS: 80 Mhz to 1 GHz: 10 kV
- CE: 1000-4-4: EFT: Power: 4 kV Signal: 2 kV

Ordering data

- Version: 2 * RJ45, 1 * serial (RS232: Sub-DB9), IP: 2 * RJ45, 1 * serial (RS232: Sub-DB9)
- Type: IEC627-2/TX132/32/48: 0 to +60 °C
- Operating temperature: Wide Temp. Models: -40 to +75 °C
- Accessories: 18" Rack Mounting Kit: RM KIT

Warranty
- Warranty Period: 5 years

Approvals
- EMC: IEC 61000-4-5: Surge: Power: 2 kV Signal: 1 kV
- IEC 61000-4-6: CS 10 V
- IEC 61000-4-8
- Security: UL 508
- Hazardous Location: UL/ULC Class 1 Groups A, B, C and D
- ATEX Zone 2 Ex e n A IEC T3 Gc
- Shock: IEC60068-2-27
- Freefall: IEC60068-2-32
- Vibration: IEC60068-2-6

MTBF (mean time between failures)
- Time: 282,805 hrs
- Database: Telenetia (Belconn), GB
Serial/fibre-optic converter
Transmitting serial signals via fibre-optic cables

Serial/fibre-optic converter

If high interference immunity is needed or long transmission distances are involved, then fibre-optic transmission is advisable. Another benefit of using fibre-optic transmission is that it is not sensitive to electromagnetic influences.

One simple and inexpensive solution is media converters, which can convert serial signals from a RS232/422/485 port on a fibre optic port with an SC or ST glass fibre connection. Fibre-optics with multimode technology make it possible to transmit over distances of up to 5000 m without additional power boosters.

Ring operation

The converter is able to connect several serial devices to form a glass fibre ring. This simply involves connecting the TX port of one converter with the Rx port of a neighbouring converter. Ring mode can then be activated using the DIP switch on the device. A signal which is transmitted by a node is then forwarded in the ring until it is gets back to the sender, where it is blocked. In this way, glass fibre rings can be configured with an spread of up to 100 km.

Automatic baud rate detection

The serial/fibre-optic converter can automatically detect the serial baud rate of connected devices. This ensures that signals can be forwarded by the media converter without any data loss even if the baud rate of a connected device changes.
Serial/fibre-optic converters

- “Ring” and “point-to-point” modes of transmission
- Extension of RS232/422/485 transmission to up to 5 km
- Supports baud rates of 50 bps to 921.6 Kbps
- Extended temperature range of 40 to 75 °C
- Compact design

Technical data

**Specification of fibre-optic ports**
- Connection type: SC or ST connector, multimode
- Wavelength: 850 nm
- Tx Transmit Power: > 5 dBm
- Rx Sensitivity: 20 dBm
- Typical Distance: 5 km (50/125, 62.5/125, 100/140 µm multimode cable)
- Transmission mode: “Point-to-point” Full/duplex
- Transmission mode: “Ring” Half duplex

**Serial Interface**
- Serial Standards: RS232/422/485
- Connector: terminal block
- Serial Line Protection: 15 kV ESD protection for all signals
- RS 485 Data Direction Control: A/D (automatic data direction control)

**Serial Signals**
- RS 232: TxD, RxD, GND
- RS 422: TxD+, TxD-, RxD+, RxD-, GND
- RS 485-4w: TxD+, TxD-, RxD+, RxD-, GND
- RS 485-3w: Data+, Data-, GND

**Technical data**
- Housing: Aluminium, IP30 protection
- Weight: 320 g
- Dimensions W x H x D: with wall mounting: 67 x 100 x 22 mm (2.64 x 3.94 x 0.87 in)
  without wall mounting: 90 x 100 x 22 mm (3.54 x 3.94 x 0.87 in)
- Installation: Wall, DIN-Rail (with optional mounting kit)

**Environmental Limits**
- Operating temperature: -40 to 75 °C (40 to 167 °F)
- Storage temperature: -40 to 75 °C (40 to 167 °F)
- Operating Humidity: 5 to 95 % (non-condensing)

**Power Requirements**
- Input voltage: 12 to 48 V DC
- Power consumption: 0.14 A at 24 V
- Reverse Polarity Protection: Present
- Overload Current Protection: 1.1 A

**Approvals**
- Safety: UL 60950-1
- EMC: EN 55032/24
  - CISPR 32, FCC Part 15B Class B
  - IEC 61000-4-2 ESD: Contact: 6 kV, Air: 8 kV
  - IEC 61000-4-3 RS: 80 Mbit to 1 Gbit: 10 V/m
  - IEC 61000-4-4 EFT: Power: 1 kV
  - IEC 61000-4-5 Surge: Power: 1 kV
  - IEC 61000-4-6 CS: 3 V/m
  - IEC 61000-4-8

**MTBF (mean time between failures)**
- Time: 2,681,816 hrs
- Database: Telcordia (Bellcore), GB

**Warranty**
- Warranty Period: 5 years

Ordering data

<table>
<thead>
<tr>
<th>Version</th>
<th>Type</th>
<th>Operating temperature</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 * Serial</td>
<td>IE-MCT-IR5232/485-ST</td>
<td>-40 to +75 °C</td>
<td>1362950000</td>
</tr>
<tr>
<td>1 * Serial</td>
<td>IE-MCT-IR5232/485-ST</td>
<td>-40 to +75 °C</td>
<td>1362950000</td>
</tr>
<tr>
<td>1 * multimode</td>
<td>IE-MCT-IR5232/485-ST</td>
<td>-40 to +75 °C</td>
<td>1362950000</td>
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</table>

Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
</tr>
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<tbody>
<tr>
<td>DIN-rail mounting kit</td>
<td>1504430000</td>
</tr>
</tbody>
</table>

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### Technical data

**Ethernet Interface**
- **Number of Ports**: 2
- **Speed**: 10/100 Mbps, Auto-MDIX/MDIX
- **Connection**: RJ45
- **Magnetic Isolation Protection**: 1.5 kV built-in

**Serial Interface**
- **Number of Ports**: 1
- **Serial Standards**: RS 232/422/485
- **Connection**: DB9 for RS 232, terminal block for RS422/485
- **Line Protection**: 15 kV ESD protection for all signals
- **High/low-resistor for RS 485**: 1 kΩ, 150 kΩ

**Serial Communication Parameters**
- **Data Bits**: 7, 8
- **Parity**: None, Even, Odd, Space, Mark
- **Flow Control**: RTS/CTS and DTR/DSR (RS 232)
- **Baud rate**: 50 bps to 921.6 kbps

**Serial Signals**
- **RS 232**: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
- **RS 422**: TxA, TxB, RXA, RXB, GND
- **RS 485**: Data+, Data-, GND

**Software**
- **Operating modes**: RTU Slave, RTU Master, ASCII Slave, ASCII Master
- **Configuration Options**: Web Console, Serial Console, Telnet Console, Windows Utility
- **Configuration tool**: Modbus Gateway Administrator for Windows 98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/64

**Additional features**
- **Serial Redirection, Priority Control**

**Technical data**
- **Media converter and protocol gateways**
- **Ordering data**
- **Accessories**

### Approvals
- **EMC**: CE (EN55022 Class A, EN55024), FCC Part 15 Subpart B Class A
- **Security**: UL 508
- **Hazardous Location**: UL/UL Class 1 Division 2 Groups A, B, C and D
- **EMS**: EN61000-4-2 (ESD), level 3
- **ESD**: EN61000-4-3 (RSD), level 3
- **Surge**: EN61000-4-6 (CS), level 3
- **Inrush**: EN61000-4-8
- **EFT**: EN61000-4-11
- **Shock**: IEC60068-2-27
- **Freefall**: IEC60068-2-32
- **Vibration**: IEC60068-2-6
- **MTBF (mean time between failures)**
- **Time**: 210,794 hrs
- **Database**: Telcordia/Standards, 68
- **Warranty**: 5 years

### Pin assignment

<table>
<thead>
<tr>
<th>Pin assignment</th>
<th>P/N</th>
<th>RS 232</th>
<th>RS 422</th>
<th>RS 485-4w</th>
<th>RS 485-2w</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TxD</td>
<td>TxA</td>
<td>Data+</td>
<td>Data-</td>
<td>Data-</td>
</tr>
<tr>
<td>2</td>
<td>RxD</td>
<td>RXA</td>
<td>Data-</td>
<td>Data+</td>
<td>Data+</td>
</tr>
<tr>
<td>3</td>
<td>RTS</td>
<td>RXB</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>CTS</td>
<td>GND</td>
<td>-</td>
<td>-</td>
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<tr>
<td>5</td>
<td>DTR</td>
<td>DSR</td>
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<tr>
<td>6</td>
<td>DCD</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>8</td>
<td>-</td>
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### Ordering data

<table>
<thead>
<tr>
<th>Version</th>
<th>Type</th>
<th>Operating Temperature</th>
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<tbody>
<tr>
<td>RS 232</td>
<td>RS 232</td>
<td>-</td>
<td>1504460000</td>
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</table>

### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18&quot; Rack Mounting Kit</td>
<td>1241440000</td>
</tr>
</tbody>
</table>

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**Modbus TCP/RTU Gateway**

- Slave mode to support 16 TCP masters and up to 31 serial slaves simultaneously
- Master mode to support 32 TCP slaves simultaneously
- Integrated Modbus protocol analysis
- Redundant DC voltage supply inputs
- Cascaded Ethernet ports for easy cabling

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**Technical data**

<table>
<thead>
<tr>
<th>Dimension (W x H x D)</th>
<th>29 x 89.2 x 124.5 mm (1.14 x 3.51 x 4.90 in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>Standard Models: 0 to 60 °C (32 to 140 °F), Wide Temp. Models: 40 to 75 °C (-40 to 167 °F)</td>
</tr>
</tbody>
</table>

**Ambient Relative Humidity**
- 5 to 95 % RH

**Storage Temperature**
- 40 to 85 °C (40 to 185 °F)

**Power Requirements**
- **Input Voltage**: 12 to 48 V DC
- **Current consumption**: Max. 435 mA at 12 V DC, Max. 130 mA at 48 V DC
- **Connection type**: 1 removable 7-pin Terminal block
- **Alarm output**: 1 relay output with a current capacity of 1 A at 30 V DC