# TCF-142 Series

*RS-232/422/485 to fiber converters*

### Features and Benefits

- Ring and point-to-point transmission

- Extends RS-232/422/485 transmission up to 40 km with single-mode (TCF-142-S) or 5 km with multi-mode (TCF-142-M)

- Decreases signal interference

- Protects against electrical interference and chemical corrosion

- Supports baudrates up to 921.6 kbps

- Wide-temperature models available for -40 to 75°C environments

### Certifications

## Introduction

The TCF-142 media converters are equipped with a multiple interface circuit that can handle RS-232 or RS-422/485 serial interfaces and multi-mode or single-mode fiber. TCF-142 converters are used to extend serial transmission up to 5 km (TCF-142-M with multi-mode fiber) or up to 40 km (TCF-142-S with single-mode fiber). The TCF-142 converters can be configured to convert either RS-232 signals, or RS-422/485 signals, but not both at the same time.

### Automatic Baudrate Detection

The TCF-142 converters can automatically detect the serial baudrate, which is an extremely convenient feature. Even if a device's baudrate is changed, the signal will still be transmitted through the media converter without any data loss.

### Ring Operation

The TCF-142 converters can be used to connect serial devices to a fiber ring. To form the ring, connect the Tx port of one TCF-142 to the Rx port of a neighboring converter. Once the ring is set up, simply use the DIP switches to configure the TCF-142 converters for ring mode. 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. With the TCF-142, you can set up fiber rings that have a total circumference of up to 100 km.
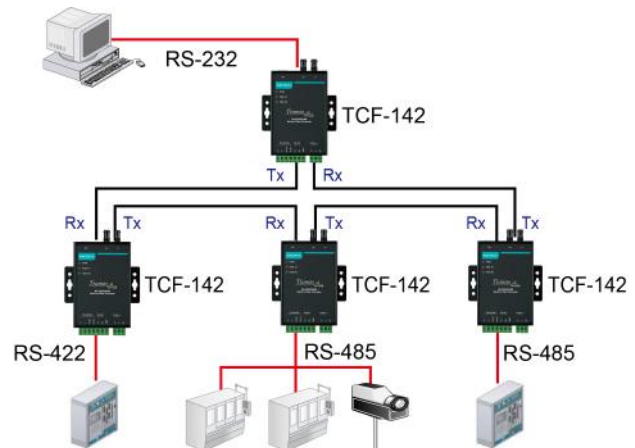
### Automatic Data Direction Control (ADDC®)

ADDC® is a patented hardware data flow solution developed by Moxa to handle RS-485 data direction control. ADDC® senses and controls RS-485 data direction automatically, making it unnecessary to use the handshaking signal.

## Specifications

### Serial Interface

| No. of Ports | 2 |
| --- | --- |
| Serial Standards | RS-232, RS-422, RS-485 |
| Baudrate | 50 bps to 921.6 kbps (supports non-standard baudrates) |

| | |
|---|---|
| Flow Control | ADDC® (automatic data direction control) for RS-485 |

| Optical Fiber | | | |
|---|---|---|---|

| Low-Speed Fiber Module | Multi-Mode | Single-Mode |
|---|---|---|
| Fiber Cable Requirements | 50/125 µm, 800 MHz | G.652 |
| | 62.5/125 µm, 500 MHz | |
| Typical Distance | 5 km | 40 km |

| Wavelength | Typical (nm) | 850 | 1310 |
|---|---|---|---|
| | TX Range (nm) | 840 to 860 | 1290 to 1330 |
| | RX Range (nm) | 800 to 900 | 1100 to 1650 |
| Optical Power | TX Range (dBm) | 0 to -5 | 0 to -5 |
| | RX Range (dBm) | 0 to -20 | 0 to -25 |
| | Link Budget (dB) | 15 | 20 |
| | Dispersion Penalty (dB) | 1 | 1 |

Note: When using a power meter to measure the fiber TX power, set the baudrate to 9,600 bps and send data (00, ..., 0h) to the serial converter's serial port.

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| Pull High/Low Resistor for RS-485 | 1 kilo-ohm, 150 kilo-ohms |
| RS-485 Data Direction Control | ADDC® (automatic data direction control) |
| Terminator for RS-485 | N/A, 120 ohms, 120 kilo-ohms |
| Connector | 7-pin terminal block |
| Latency | 300 ns |

## Serial Signals

| | |
|---|---|
| RS-232 | TxD, RxD, GND |
| RS-422 | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-4w | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-2w | Data+, Data-, GND |

## Power Parameters

| | |
|---|---|
| No. of Power Inputs | 1 |
| Input Current | 140 mA @ 12 VDC |
| Input Voltage | 12 to 48 VDC |
| Overload Current Protection | Supported |
| Power Connector | Terminal block |
| Power Consumption | 140 mA @ 12 VDC |

## Physical Characteristics

| | |
|---|---|
| IP Rating | IP30 |
| Housing | Metal |
| Dimensions (with ears) | 90 x 100 x 22 mm (3.54 x 3.94 x 0.87 in) |
| Dimensions (without ears) | 67 x 100 x 22 mm (2.64 x 3.94 x 0.87 in) |

| Weight | 320 g (0.71 lb) |
|---|---|
| Installation | Wall mounting |

## Environmental Limits

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|---|---|
| Operating Temperature | Standard Models: 0 to 60°C (32 to 140°F)<br>Wide Temp. Models: -40 to 75°C (-40 to 167°F) |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |

## Standards and Certifications

| | |
|---|---|
| EMC | EN 55032/24 |
| EMI | CISPR 32, FCC Part 15B Class A |
| EMS | IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV<br>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m<br>IEC 61000-4-4 EFT: Power: 1 kV<br>IEC 61000-4-5 Surge: Power: 1 kV<br>IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m<br>IEC 61000-4-8 PFMF |
| Environmental Testing | IEC 60068-2-1<br>IEC 60068-2-2<br>IEC 60068-2-3 |
| Safety | EN 60950-1, IEC 60950-1 |
| Vibration | IEC 60068-2-6 |

## MTBF

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|---|---|
| Time | 780,480 hrs |
| Standards | Telcordia (Bellcore), GB |

## Warranty

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|---|---|
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |

## Package Contents

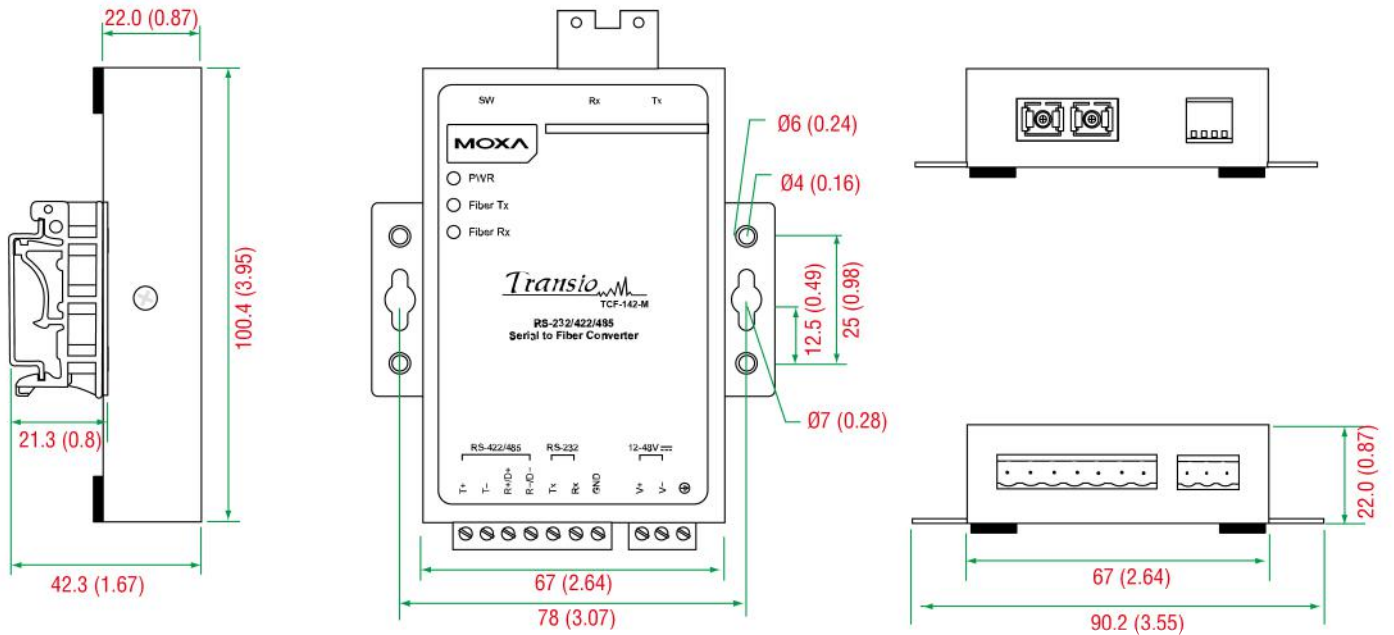| | |
|---|---|
| Device | 1 x TCF-142 Series converter |
| Installation Kit | 1 x rubber stand |
| Documentation | 1 x quick installation guide<br>1 x warranty card |

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# Dimensions

## TCF-142-M/S-ST

Unit: mm (inch)
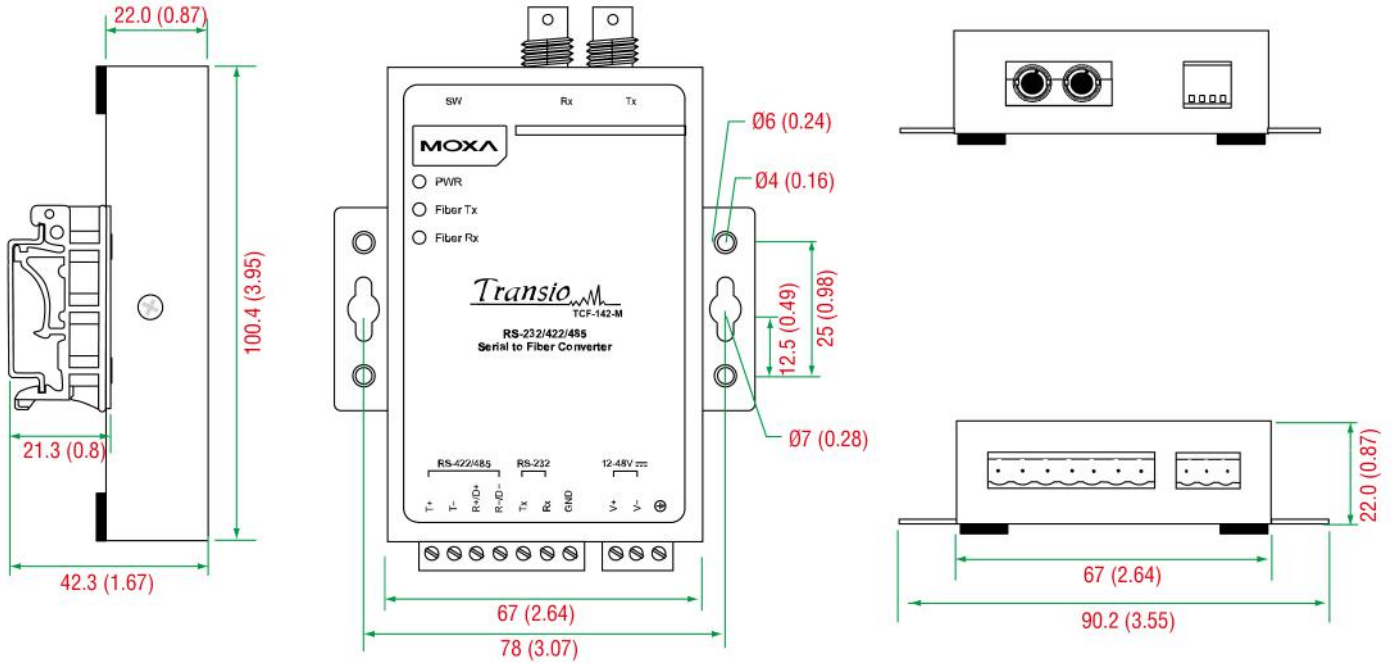


## TCF-142-M/S-SC

Unit: mm (inch)



# Ordering Information

| Model Name | Operating Temp. | Fiber Module Type |
|---|---|---|
| TCF-142-M-ST | 0 to 60°C | Multi-mode ST |
| TCF-142-M-SC | 0 to 60°C | Multi-mode SC |
| TCF-142-S-SC | 0 to 60°C | Single-mode ST |
| TCF-142-S-ST | 0 to 60°C | Single-mode SC |

| Model Name | Operating Temp. | Fiber Module Type |
|---|---|---|
| TCF-142-M-ST-T | -40 to 75°C | Multi-mode ST |
| TCF-142-M-SC-T | -40 to 75°C | Multi-mode SC |
| TCF-142-S-SC-T | -40 to 75°C | Single-mode ST |
| TCF-142-S-ST-T | -40 to 75°C | Single-mode SC |

## Accessories (sold separately)

### DIN-Rail Mounting Kits

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|---|---|
| DK35A | DIN-rail mounting kit, 35 mm |

### Power Adapters

| | |
|---|---|
| PWR-12125-USJP-S1 | Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, United States/Japan (US/JP) plug, 0 to 40°C operating temperature |
| PWR-12125-WPAU-S1 | Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, Australia (AU) plug, 0 to 40°C operating temperature |
| PWR-12125-WPCN-S1 | Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, China (CN) plug, 0 to 40°C operating temperature |
| PWR-12125-WPEU-S1 | Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, Continental Europe (EU) plug, 0 to 40°C operating temperature |
| PWR-12125-WPUK-S1 | Non-locking barrel plug, 12 VDC, 1.25 A, 100-240 VAC, United Kingdom (UK) plug, 0 to 40°C operating temperature |

### Power Cords

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|---|---|
| CBL-PJTB-10 | Non-locking barrel plug to bare-wire cable |

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