

# TCF-142 Series

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



- > “Ring” and “Point-to-Point” transmission
- > Extends RS-232/422/485 transmission up to:
  - 40 km with single-mode—TCF-142-S
  - 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 range models available (-40 to 75°C)



### 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.

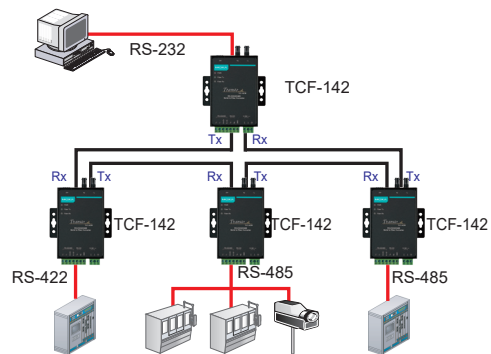
### Automatic Baudrate Detection

The TCF-142 converters can automatically detect the serial baudrate. This 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

### Optical-Fiber Side

**Fiber Connector:** SC or ST

**Fiber Cable Requirements:**

Low-Speed Fiber Module		Multi-Mode	Single-Mode
Fiber Cable Requirements		50/125 $\mu\text{m}$ , 800 MHz	G.652
		62.5/125 $\mu\text{m}$ , 500 MHz	
Typical Distance		5 km	40 km
Wave-length	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.

**Ring Transmission:** Half-duplex

**Point-to-Point Transmission:** Half-duplex or full-duplex

### RS-232/422/485 Side

**Connector:** Terminal Block

**RS-232 Signals:** Tx, Rx, GND

**RS-422 Signals:** TxD+, TxD-, RxD+, RxD-, GND

**RS-485-4w Signals:** TxD+, TxD-, RxD+, RxD-, GND

**RS-485-2w Signals:** Data+, Data-, GND

**Baudrate:** 50 bps to 921.6 kbps

### Physical Characteristics

**Housing:** Metal

**Dimensions:**

Without ears: 67 x 100 x 22 mm (2.64 x 3.94 x 0.87 in)

With ears: 90 x 100 x 22 mm (3.54 x 3.94 x 0.87 in)

**Weight:** 320 g (0.71 lb)

### Environmental Limits

**Operating Temperature:**

Standard Models: 0 to 60°C (32 to 140°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)

**Storage Temperature:** -40 to 75°C (-40 to 167°F)

**Ambient Relative Humidity:** 5 to 95% (non-condensing)

### Power Requirements

**Input Voltage:** 12 to 48 VDC

**Input Current:** 140 mA @ 12 VDC

**Power Line Protection:**

1 kV Burst (EFT), EN61000-4-4

1 kV Surge, EN61000-4-5

**Voltage Reversal Protection:** Protects against V+/V- reversal

**Overcurrent Protection:** 1.1 A (protects against two signals shorted together)

### Standards and Certifications

**Safety:** UL 60950-1

**EMC:** EN 55022/24

**EMI:** CISPR 22, FCC Part 15B Class B

**EMS:**

EN 61000-4-2 (ESD): Contact: 6 kV; Air: 8 kV

EN 61000-4-3 (RS): 80 MHz to 1 GHz: 10 V/m

EN 61000-4-4 (EFT): Power: 1 kV

EN 61000-4-5 (Surge): Power: 1 kV

EN 61000-4-6 (CS): 150 kHz to 80 MHz: 3 V/m

EN 61000-4-8 (PFMF)

**Green Product:** RoHS, CRoHS, WEEE

**MTBF** (mean time between failures)

**Time:** 780,480 hrs

**Standard:** Telcordia (Bellcore), GB

### Warranty

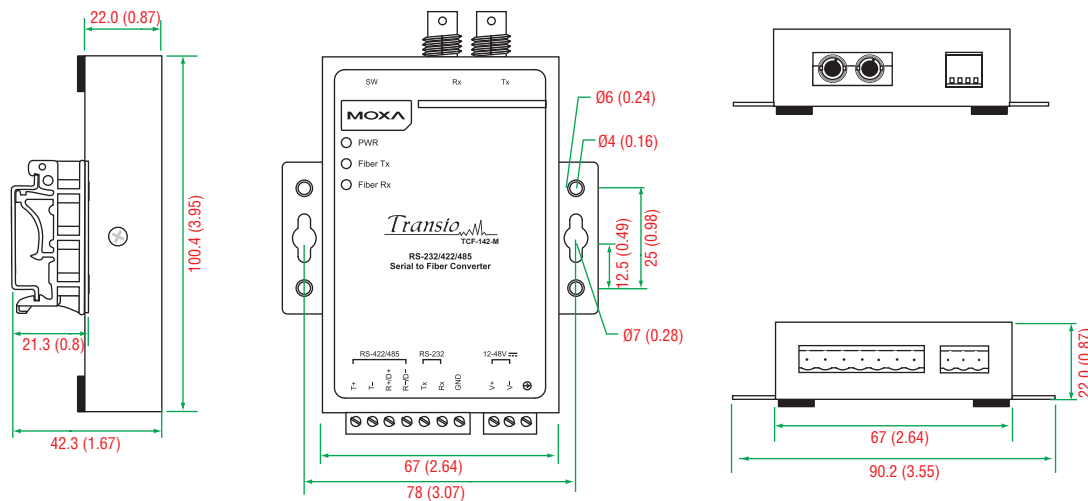
**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Dimensions

### TCF-142-M/S-ST

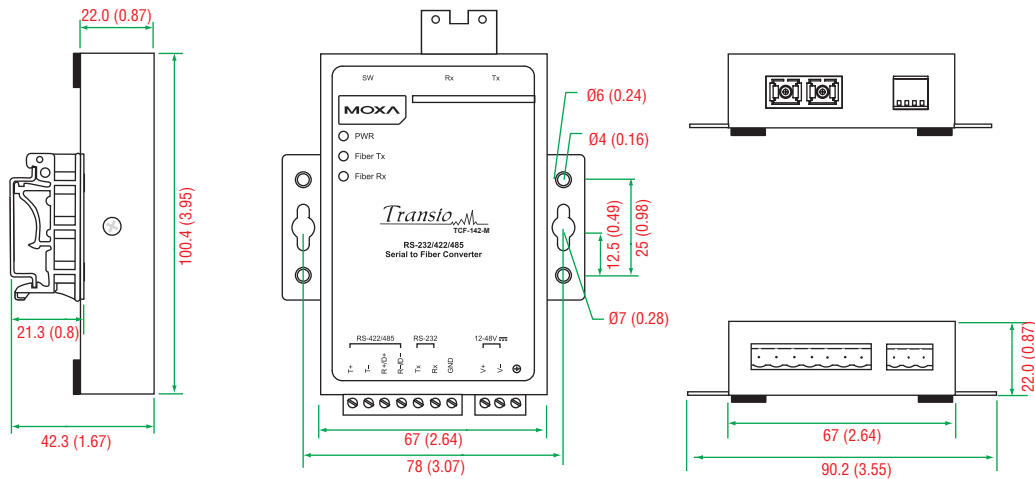
Unit: mm (inch)



## Dimensions

## TCF-142-M/S-SC

Unit: mm (inch)



## : Ordering Information

## Available Models

**TCF-142-M-SC:** RS-232/422/485 to multi-mode optical-fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature

**TCF-142-M-ST:** RS-232/422/485 to multi-mode optical-fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature

**TCF-142-S-SC:** RS-232/422/485 to single-mode optical-fiber media converter with fiber ring support and SC connector, 0 to 60°C operating temperature

**TCF-142-S-ST:** RS-232/422/485 to single-mode optical-fiber media converter with fiber ring support and ST connector, 0 to 60°C operating temperature

**TCF-142-M-SC-T:** RS-232/422/485 to multi-mode optical-fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature

**TCF-142-M-ST-T:** RS-232/422/485 to multi-mode optical-fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature

**TCF-142-S-SC-T:** RS-232/422/485 to single-mode optical-fiber media converter with fiber ring support and SC connector, -40 to 75°C operating temperature

**TCF-142-S-ST-T:** RS-232/422/485 to single-mode optical-fiber media converter with fiber ring support and ST connector, -40 to 75°C operating temperature

## Optional Accessories (can be purchased separately)

**DK35A:** DIN-rail mounting clips, 35 mm, 2 DIN-rail plates with 4 screws

Note: Additional power adapters can be purchased separately. See Appendix A for details.

## Package Checklist

- 1 TCF-142 media converter
- Power wiring: CBL-PJTB-10
- Rubber pad
- Quick installation guide (printed)
- Warranty card