

# TCF-142 Series

## RS-232/422/485 to optical fiber media 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
- > Compact size
- > Decreases signal interference
- > Protects against electrical interference and chemical corrosion
- > Supports baudrates of 50 bps to 921.6 Kbps
- > Wide temperature 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.

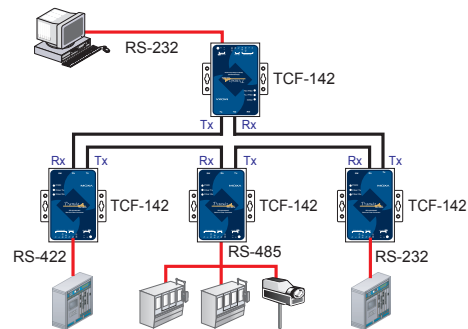
### Automatic Baudrate Detection

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 hand shaking signal.

## Specifications

### Optical Fiber Side

**Fiber Connector:** SC or ST

**Cable Requirements:**

Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125  $\mu\text{m}$

Multi-mode: 50/125, 62.5/125, or 100/140  $\mu\text{m}$

**Transmission Distance:**

Single-mode: 40 km

Multi-mode: 5 km

**Wavelength:**

Single-mode: 1310 nm

Multi-mode: 850 nm

**Tx Output:**

Single-mode: > -5 dBm

Multi-mode: > -5 dBm

**Rx Sensitivity:**

Single-mode: -25 dBm

Multi-mode: -20 dBm

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

**Ring Transmission:** Half-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

**ESD Protection:** 15 KV for all signals

### Physical Characteristics

**Housing:** Aluminum (1 mm)

**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)

### 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)

**Operating Humidity:** 5 to 95% RH

**Storage Temperature:** -20 to 70°C (-4 to 167°F)

### Power Requirements

**Input Voltage:** 12 to 48 VDC

**Power Consumption:** 140 mA @ 12 V

**Power Line Protection:**

2 KV Burst (EFT), EN61000-4-4

2 KV Surge, EN61000-4-5

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

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

### Regulatory Approvals

**FCC:** Part 15 Subclass B

**UL/CUL:** UL60950-1

**EMI:** EN55022 1998, Class B

**EMS:**

EN61000-4-2 (ESD), Criteria A, Level 3

EN61000-4-3 (RS), Criteria A, Level 2

EN61000-4-4 (EFT), Criteria A, Level 2

EN61000-4-5 (Surge), Criteria A, Level 3

EN61000-4-6 (CS), Criteria A, Level 2

EN61000-4-8 (SFMF), Criteria A, Level 1

**TÜV:** EN60950-1

### Warranty

**Warranty Period:** 5 years

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

### Dimensions

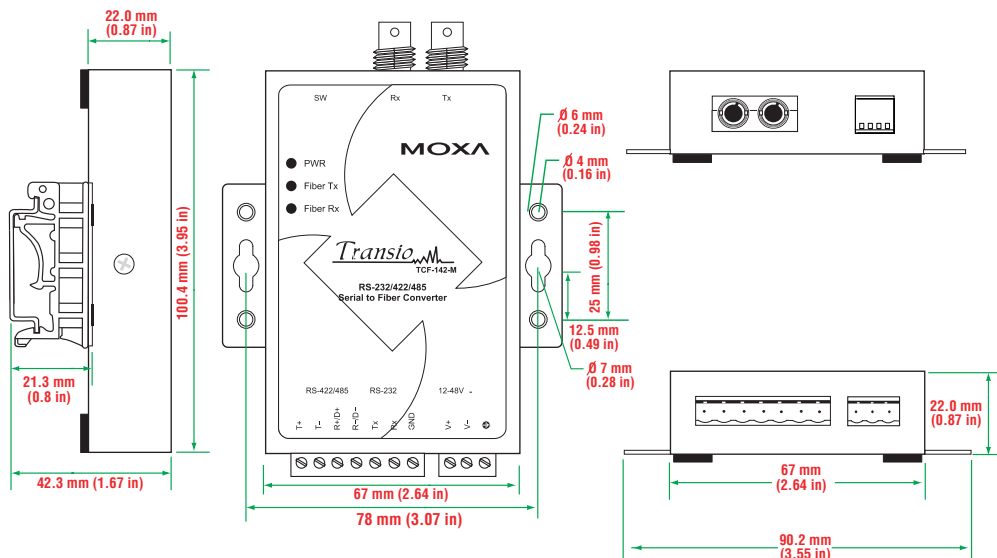
#### DIP Switch Settings

| Serial Connection | SW1 | SW2 |
|-------------------|-----|-----|
| RS-232            | ON  | OFF |
| RS-422            | OFF | OFF |
| RS-485-4w         | OFF | OFF |
| RS-485-2w         | OFF | ON  |

| Built-in 120-ohm Terminator | SW3 |
|-----------------------------|-----|
| Enable                      | ON  |
| Disable                     | OFF |

| Fiber Mode          | SW4 |
|---------------------|-----|
| Ring mode           | ON  |
| Point-to-Point mode | OFF |

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



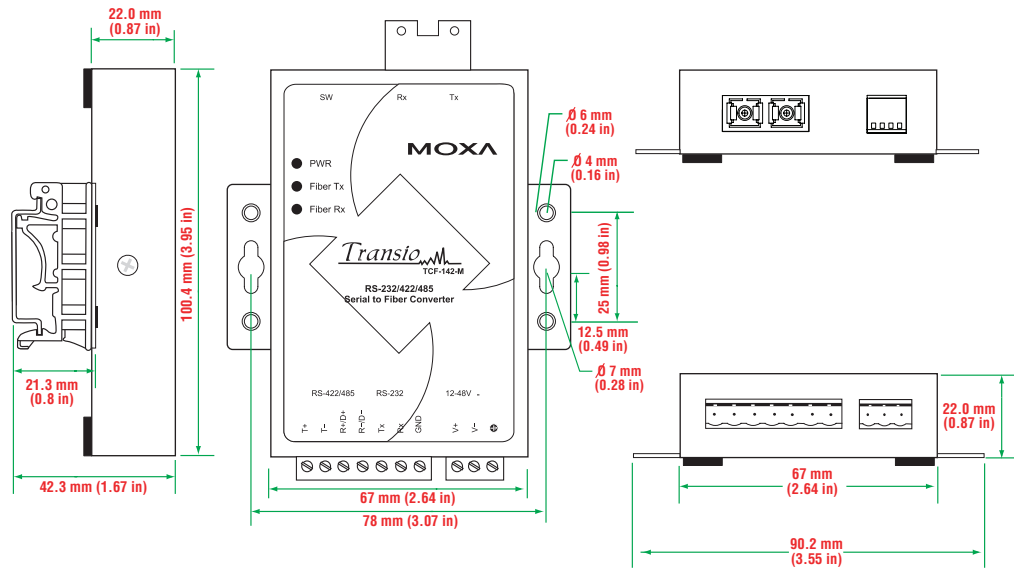
## DIP Switch Settings

| Serial Connection | SW1 | SW2 |
|-------------------|-----|-----|
| RS-232            | ON  | OFF |
| RS-422            | OFF | OFF |
| RS-485-4w         | OFF | OFF |
| RS-485-2w         | OFF | ON  |

| Built-in 120-ohm Terminator | SW3 |
|-----------------------------|-----|
| Enable                      | ON  |
| Disable                     | OFF |

| Fiber Mode          | SW4 |
|---------------------|-----|
| Ring mode           | ON  |
| Point-to-Point mode | OFF |

## TCF-142-M/S-SC



## 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

### Package Checklist

- TCF-142 media converter
- Power jack to 3-pin terminal block adaptor
- Quick Installation Guide (printed)
- Warranty Card