TCF-90 Series
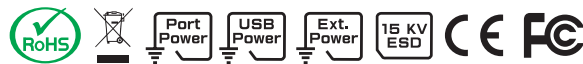
Port-powered RS-232 to optical fiber media converters

> Use either external power or power over serial
> Extends RS-232 transmission up to:
  ▪ 40 km with single-mode—TCF-90-S
  ▪ 5 km with multi-mode—TCF-90-M
> Reduces signal interference
> Protects against electrical interference or chemical corrosion
> 15 KV ESD protection for serial signals
> Baudrates up to 115.2 Kbps
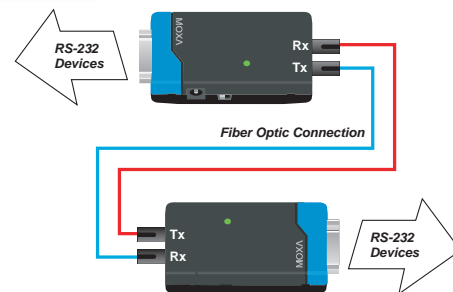> Compact size

Introduction

The TCF-90 is a compact media converter that transmits RS-232 signals over optical fiber. Power is derived from either the serial port or an external power source. The TCF-90 extends RS-232 transmission up to 5 km with multi-mode fiber, or up to 40 km with single-mode fiber. A pair of TCF-90 converters can be used to connect two RS-232 devices with optical fiber in full duplex mode. The optical fiber isolates the data signals from dangerous increases in ground potential, ground loops, and electrical EMI/RFI noise, and enhances data security by eliminating the harmful effects of RF radiation and susceptibility to electromagnetic radiation.

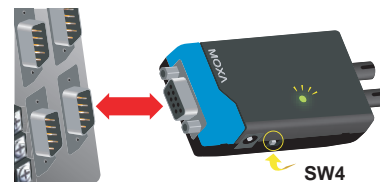## Self-powered RS-232 to Optical Fiber

Connecting RS-232 devices to the TCF-90 is easy. The ST-type optical fiber connector is designed especially for data communication applications that transmit data either between or within buildings. The TCF-90 can be used for industrial applications and for applications that require secure data transfer.

The RS-232 port on the TCF-90 uses a DB9 female socket to connect directly to the host PC, with power drawn from the TxD, RTS, and DTR lines. Although the TCF-90 can obtain enough power from the three data/handshake lines whether the signal is high or low, we strongly recommend setting either the RTS or DTR signal to ON.
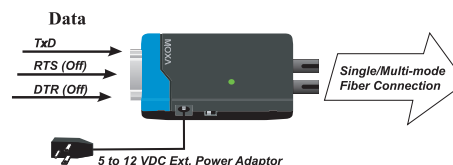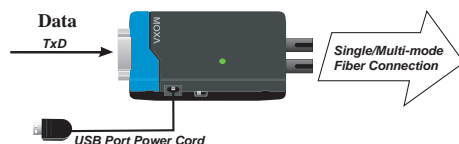

Patented LED Port Power Indicator

It's easy enough to use a multimeter to test if the serial device is supplying the TCF-90 with enough power through the serial connection, but why bother when the TCF-90 can do the testing for you? Connect the TCF-90 to the device's RS-232 port and set the SW4 switch to Test mode. If the patented port power LED indicator lights up, the TCF-90 is receiving enough power. If the LED does NOT light up, you will need to attach an external power source to the TCF-90.

SW4

Optional External Power Source

In most circumstances, the TCF-90 should be able to operate without using an external power source. However, an external USB power cord or DC power supply can be used in situations where the handshake lines are not available, both the RTS/DTR signals are set to OFF, or the attached device's serial interface chip provides less power than required.

Data
TxD

Single/Multi-mode Fiber Connection

USB Port Power Cord

Data
TxD
RTS (Off)
DTR (Off)

Single/Multi-mode Fiber Connection

5 to 12 VDC Ext. Power Adaptor

: Specifications

Serial Communication

Connector: DB9 female

RS-232 Signals: Tx, Rx, GND
(Loop-back wiring: RTS to CTS, DTR to DSR and DCD)

Baudrate: 300 bps to 115.2 Kbps

Optical Fiber Side

Fiber Connector: ST

Cable Requirements:
Single-mode: 8.3/125, 8.7/125, 9/125, or 10/125 μm
Multi-mode: 50/125, 62.5/125, or 100/140 μm

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: -24 dBm
Multi-mode: -20 dBm

Physical Characteristics

Case: ABS + PC

Dimensions: 42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)

Environmental Limits

Operating Temperature: 0 to 60°C (32 to 140°F)

Operating Humidity: 5 to 95% RH

Storage Temperature: -20 to 75°C (-14 to 167°F)

Power Requirements

Source of Input Power: RS-232 port (TxD signal) or power input jack

Input Voltage: 12 to 48 VDC

Power Consumption: 20 mA @ 5 V (with termination disabled)
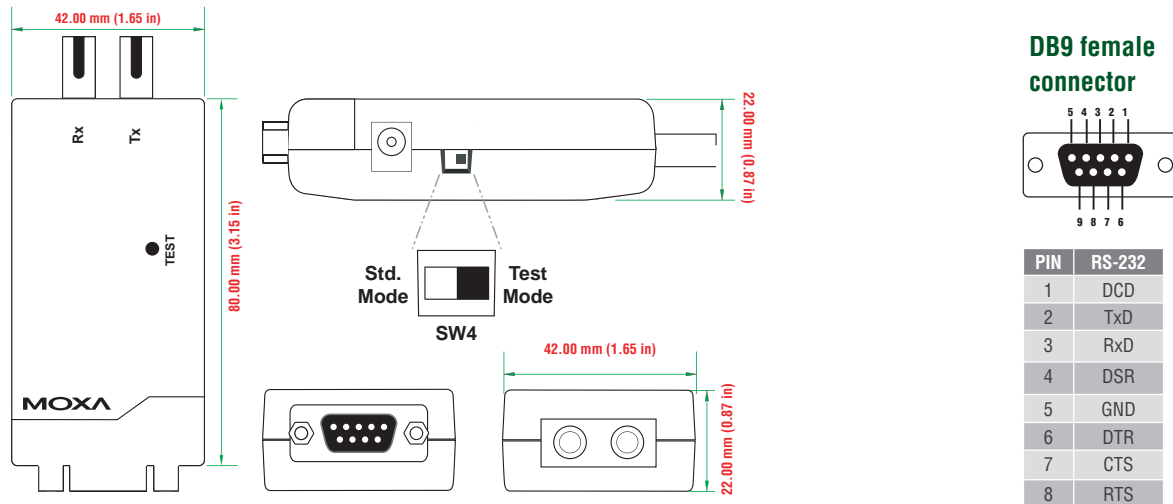
Regulatory Approvals

CE: Class B

FCC: Class B

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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Media Converters > TCF-90 Series

Dimensions

DB9 female connector

PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

: Ordering Information

Available Models

TCF-90-M: Port-powered RS-232 to multi-mode optical fiber converter with ST connector for 5 km transmission

TCF-90-S: Port-powered RS-232 to single-mode optical fiber converter with ST connector for 40 km transmission

Note: Models with SC/FC connectors or a 60 km range are available by request.

Optional Accessories (can be purchased separately)

Power Adaptor

CBL-F9M9-20: DB9 male to DB9 female RS-232 cable (20 cm)

Multimode Optical Fiber Patch Cords: SC to SC, ST to ST, and SC to ST cords (see page A-14 for details)

Package Checklist

- TCF-90 media converter
- USB power cord (50 cm)
- Quick Installation Guide
- Warranty Card