TCF-90 Series

Port-powered RS-232 to fiber converters

Features and Benefits

- Uses either external power or power over serial

- Extends RS-232 transmission up to 40 km with single-mode (TCF-90-S) or 5 km with multi-mode (TCF-90-M)

- Reduces signal interference

- Protects against electrical interference and chemical corrosion

- Compact size

Certifications

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 it 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.
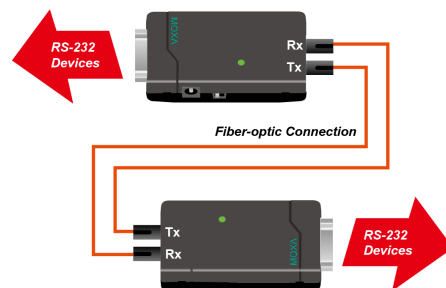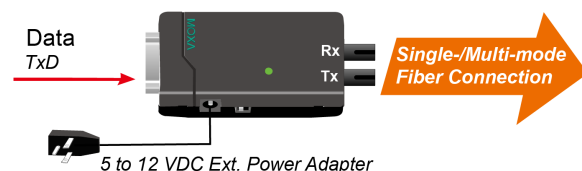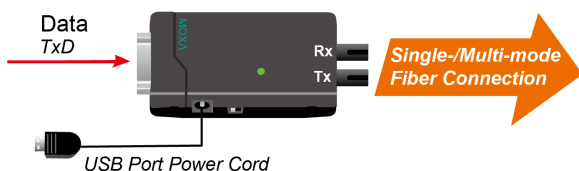

LED Port Power Indicator

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 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 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.
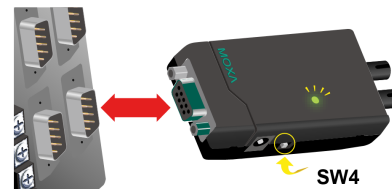
Optional External Power Source

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.

Datasheet

Specifications

Serial Interface

No. of Ports	2
Serial Standards	RS-232
Baudrate	50 bps to 921.6 kbps (supports non-standard baudrates)
Flow Control	ADDC® (automatic data direction control) for RS-485
Optical Fiber	TCF-90-M-ST: 100BaseFX ports (multi-mode ST connector) TCF-90-S-ST: 100BaseFX ports (single-mode ST connector)

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.

Serial Signals

RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Power Parameters

Input Current	20 mA @ 12 VDC
Input Voltage	5 to 12 VDC
No. of Power Inputs	1
Overload Current Protection	Supported
Power Consumption	20 mA @ 12 VDC
Source of Input Power	Power input jack

Physical Characteristics

Housing	Plastic
IP Rating	IP30
Dimensions	42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in)
Weight	150 g (0.33 lb)
Installation	Desktop

Environmental Limits

Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature (package included)	-20 to 75°C (-4 to 167°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: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 0.5 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 150 kHz to 80 MHz: 3 V/m; Signal: 3 V/m IEC 61000-4-8 PFMF
Environmental Testing	IEC 60068-2-1 IEC 60068-2-14 IEC 60068-2-2 IEC 60068-2-3
Safety	EN 60950-1, IEC 60950-1
Vibration	IEC 60068-2-6

MTBF

Time	2,272,562 hrs
Standards	Telcordia (Bellcore), GB

Warranty

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

Package Contents

Device	1 x TCF-90 Series converter
Cable	1 x USB power cord, 50 cm
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)
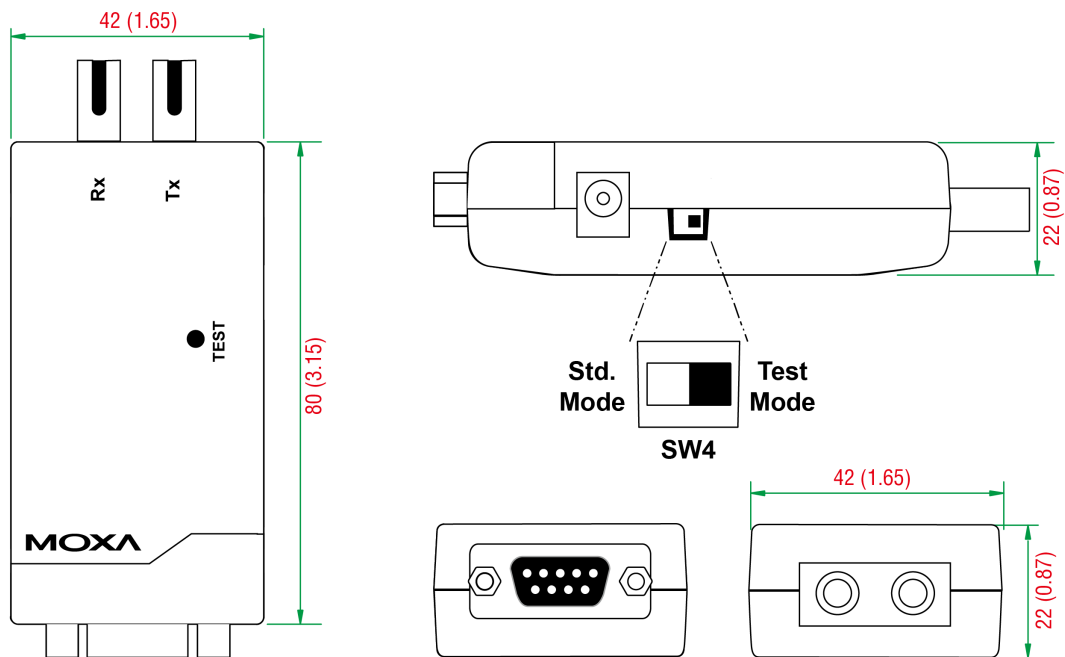
Ordering Information

Model Name	Fiber Module Type
TCF-90-M-ST	Multi-mode ST
TCF-90-S-ST	Single-mode ST

Accessories (sold separately)

DIN-Rail Mounting Kits

DK35A	DIN-rail mounting kit, 35 mm

Power Cords

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