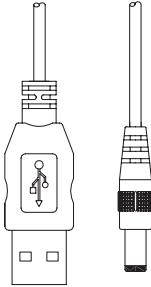
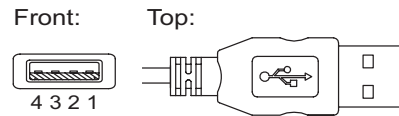


## USB Power Cord

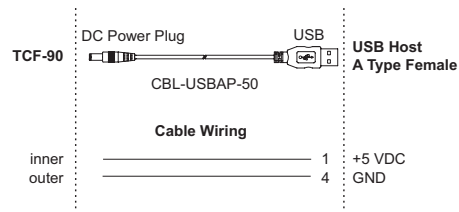
If additional external power is required, TCF-90 can be connected to a standard 5 to 12 VDC Power Supply, or the USB power cord **CBL-USBAP-50** can be used.



### USB "A" Male Connector



TCF-90 USB Connector Connector Pinouts	Signals
1	+5 VDC
2	--
3	--
4	GND

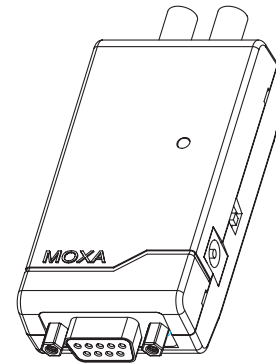


## Transio TCF-90-M/S

*High-speed Self-powered RS-232 to Long Range Optical Fiber Converter with 15 KV ESD Surge Protection.*

### Overview

The TCF-90 is a compact sized, high-speed, RS-232 to optical fiber converter that extends RS-232 transmission from 15 meters to 5 km (TCF-90-M, multi-mode) or 40 km (TCF-90-S, single-mode), without using external power. The TCF-90 is designed to get power from the attached serial port. A pair of TCF-90 converters can be used to connect two RS-232 serial devices to each other in full duplex transmission mode using optical fiber. Moreover, the TCF-90 isolates the devices from dangerous increases in ground potential, ground loops, and electrical EMI/RFI noise. This greatly reduces RF radiation and susceptibility to electromagnetic radiation to enhance data security.



### Package Checklist

- TCF-90
- USB Power Cord
- User's Manual

### Applications

- Point-to-point data communication
- Factory automation
- Remote serial device control
- Building security automation
- Critical industrial control

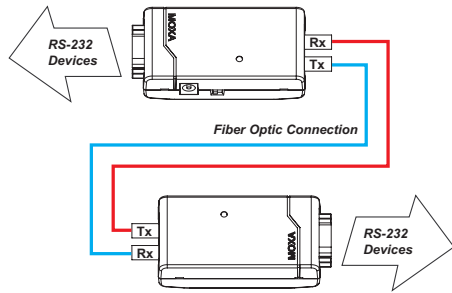
### Features and Specifications

- Serial interface: RS-232
- Optical fiber interfaces: Single/Multi-mode
- Port types: RS-232 (DB9); Female Optical Fiber: ST type
- Supports baudrate up to 115.2 Kbps
- RS-232 Signals: TxD, RxD, GND
- RS-232 loopback: RTS to CTS; DTR to DSR and DCD
- 15 KV ESD for all RS-232 signals
- Optical Fiber Wavelengths:  
TCF-90-S: 1310 nm  
TCF-90-M: 850 nm
- Optical Fiber Transmission Distance:  
TCF-90-S Single-mode: 40 km  
TCF-90-M Multi-mode: 5 km
- Optical Fiber Tx Output: > -5 dBm
- Optical Fiber Rx Sensitivity:  
TCF-90-S: -24 dBm  
TCF-90-M: -20 dBm
- Serial Power Source: TxD, RTS, and DTR (RTS/DTR ON is recommended)
- Ext. Power (jack): DC +5V to +12V adapters or USB power cord (DC +5V)
- Operating temperature: 0 to 60°C (32 to 140°F)
- Dimensions: 42 × 80 × 22 mm
- Case: ABS + PC
- Weight: 50 ± 5 g
- CE, FCC Class B approval
- Power Consumption: 20 mA at +5 VDC
- Warranty: 2 years

## Installation

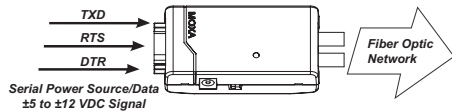
### Typical Applications

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 between or within buildings. The TCF-90 can be used for industrial applications and for applications that require secure data transfer.



### Serial (RS-232) Port Power

The RS-232 port of the TCF-90 is designed with a female DB9 socket to connect directly to the host PC, with power drawn from the TxD, RTS, and DTR lines. Although the TCF-90 is able to obtain enough power from the combination of the three data/handshake lines, regardless of whether the signal is high or low, we highly recommended setting either the RTS or DTR signal to **ON**. For those applications that do not use the handshake lines, a DC jack is provided for connecting a 5 to 12 VDC power supply via a USB power cord or external power adapter.



### Port Power Dissipation

When installing an RS-232 port-powered TCF-90 converter, pay attention to the power consumption, RS-232 cable length, and the power provided by the serial port. In general, the TCF-90 gets 70 mW from the power source; a standard COM port on a host PC can provide 70 to 90 mW of power if the TxD, RTS, and DTR lines are connected. Moreover, the RS-232 cable length should be shorter than 15 m (@ 9600 bps) to ensure that less power is lost as the host/device supplies power to the TCF-90. The rest of the supplied power is used for transmitting the optical fiber signal.

### Serial Port Power Compatibility

Serial ports can use any of a number of diverse interface chips, but the power provided by the different types of ports is not always the same. In fact, some ports do not supply enough power to activate the TCF-90.

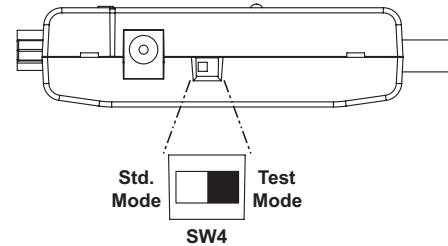
The on-board COM1 and COM2 ports seldom have problems. The table shows the MOXA serial cards and serial-to-Ethernet device servers that can be used as a good power source to drive the TCF-90 when their RTS/DTR signals are connected and in the **ON** state.

Multiport Serial Board	Serial Device Server
<u>MOXA Smartio</u> CP-118U CP-168U V2 CP-104U V2 CP-102U	<u>MOXA NPort</u> 5110/5210 V2.1 5410 V2.2 5610 V3.0 (or later)
<u>MOXA Smartio</u> CP-118EL Series CP-168EL Series CP-104EL Series	<u>MOXA USB</u> NPort U1110
	<u>MOXA USB to Serial</u> UPort 1410/1610

### LED Port Power Indicator

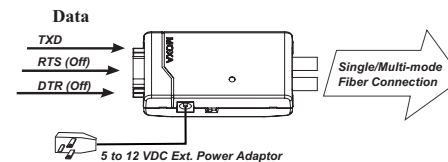
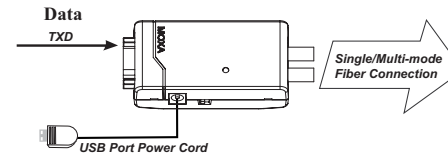
The best way to ensure that the attached serial port is providing the TCF-90 with enough electrical power is to check the power indicator LED on the front panel. Attach the TCF-90 to the target RS-232 port, turn the SW4 switch to the right to **Test** mode, and then check to see if the LED is on or off. **ON** means enough power is being supplied. **OFF** means that you will need to connect the TCF-90 to an external power source.

**Note:** Be sure to turn the SW4 switch back to **Std.** mode (the default) when you finish testing. When in **Test** mode, the TCF-90 **WILL NOT** transmit data.



### Optional External Power

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 should be used with applications for which the handshake lines are not available, both the RTS/DTR signals are set to **OFF**, or the interface chip of the attached serial port provides less power than required.

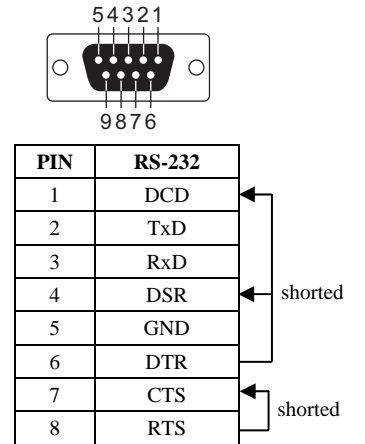


### Ext. Power supply

If additional external power is required, the TCF-90 can be connected to a standard 5 to 12 VDC power adapter.

### RS-232 Pinouts

The female DB9 port for the RS-232 signal is shown in the following figure.



**Note:** To free users from the hardware flow control cable wiring problem, the RTS and CTS signals are shorted together, and the DTR, DSR, and DCD signals are shorted together.