TCC-80/80I Series

Port-powered RS-232 to RS-422/485 converters with optional 2.5 kV isolation

Features and Benefits

- External power source supported but not required
- Compact size
- Converts RS-422, and both 2-wire and 4-wire RS-485
- RS-485 automatic data direction control
- Automatic baudrate detection
- Built-in 120-ohm termination resistors
- 2.5 kV isolation (for TCC-80I only)
- LED port power indicator

Certifications

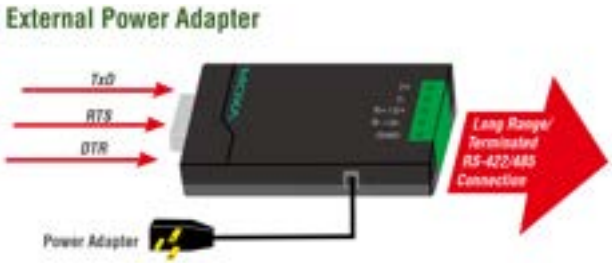
Introduction

The TCC-80/80I media converters provide complete signal conversion between RS-232 and RS-422/485, without requiring an external power source. The converters support both half-duplex 2-wire RS-485 and full-duplex 4-wire RS-422/485, either of which can be converted between RS-232's TxD and RxD lines.

Automatic data direction control is provided for RS-485. In this case, the RS-485 driver is enabled automatically when the circuitry senses the TxD output from the RS-232 signal. This means that no programming effort is required to control the transmission direction of the RS-485 signal.

Port Power Over RS-232

The RS-232 port of the TCC-80/80I is a DB9 female socket that can connect directly to the host PC, with power drawn from TxD, RTS, and DTR lines. Regardless of whether the signal is high or low, the TCC-80/80I can obtain enough power from the data line. However, external power can be used if the handshake line is not available, if the serial cable is too long, or if the RS-232 device is a low-power device. For external power, a five to twelve VDC power supply can be connected using an adapter or a USB power cord.

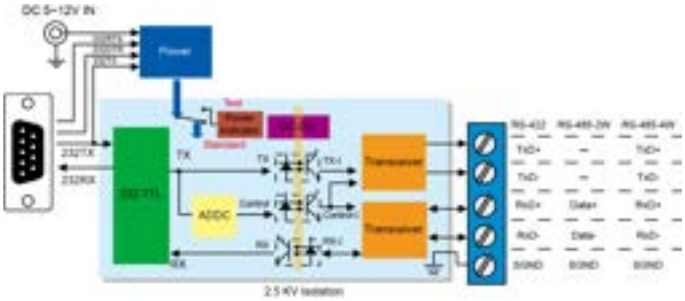


Port Power Dissipation

When installing a TCC-80 or TCC-80I converter, it is important to pay attention to power consumption, RS-232 cable length, and RS-422/485 transmission distance. In general, the TCC-80 and TCC-80I obtain 50 mW of power from the power source. Standard PC COM ports can provide 70 to 90 mW of power if the TxD, RTS, and DTR lines are connected. Moreover, the RS-232 cable should be shorter than 15 m (@ 9600 bps) to ensure that less power is lost from the host/device to the TCC-80. The remainder of the supplied power is used for transmitting the RS-422/485 signal.

Port Power and Optical Isolation

The RS-232 port on the TCC-80/80I is a DB9 female socket that can connect directly to the host PC. Electrical 2.5 kV isolation for the TCC-80I is achieved with a photo coupler that transforms the electrical signal into light, and then re-transforms the light back into an electrical signal on the other side. In this way, the two electrical circuits are completely isolated from each other. This also protects the devices from ground loop currents, reduces damage caused by data loss, and prevents damage to the communication interfaces.



LED Port Power Indicator

It's easy enough to test the serial device with a multimeter to determine that the serial device will provide enough power to the media converter. However, it's even easier to let the TCC-80I test the device for you. Simply connect the TCC-80I to the device's RS-232 port and set the SW4 switch to Test mode. If the port power LED indicator lights up, the TCC-80I is receiving enough power. If the LED does not light up, you will need to attach an external power source to the TCC-80I.

Specifications

Serial Interface

Connector	TCC-80-DB9/80I-DB9: DB9 male TCC-80/80I: Terminal block
No. of Ports	2
Serial Standards	RS-232 RS-422 RS-485
Isolation	TCC-80I/80I-DB9: 2 kV
RS-485 Data Direction Control	ADDC (automatic data direction control)
Terminator for RS-485	N/A, 120 ohms, 120 kilo-ohms
Baudrate	300 bps to 115.2 kbps

Serial Signals

RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
RS-232	TxD, RxD, GND[1]

Power Parameters

Input Current	TCC-80: 30 mA @ 5 to 12 VDC TCC-80-DB9: 30 mA @ 5 to 12 VDC TCC-80I: 20 mA @ 5 to 12 VDC TCC-80I-DB9: 20 mA @ 5 to 12 VDC
Input Voltage	5 to 12 VDC
No. of Power Inputs	1

1. The DTR, DSR, DCD, CTS, and RTS pins are internally shorted.

Overload Current Protection	Supported
Source of Input Power	Power input jack

Physical Characteristics

Housing	Plastic top cover, metal bottom plate
IP Rating	IP30
Dimensions	TCC-80/80I: 42 x 80 x 22 mm (1.65 x 3.15 x 0.87 in) TCC-80-DB9/80I-DB9: 42 x 91 x 23.6 mm (1.65 x 3.58 x 0.93 in)
Weight	50 g (0.11 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 55032/35
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: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 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 60068-2-3
Safety	UL 60950-1
Vibration	IEC 60068-2-6

MTBF

Time	2,781,161 hrs
Standards	Telcordia (Bellcore), GB

Warranty

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

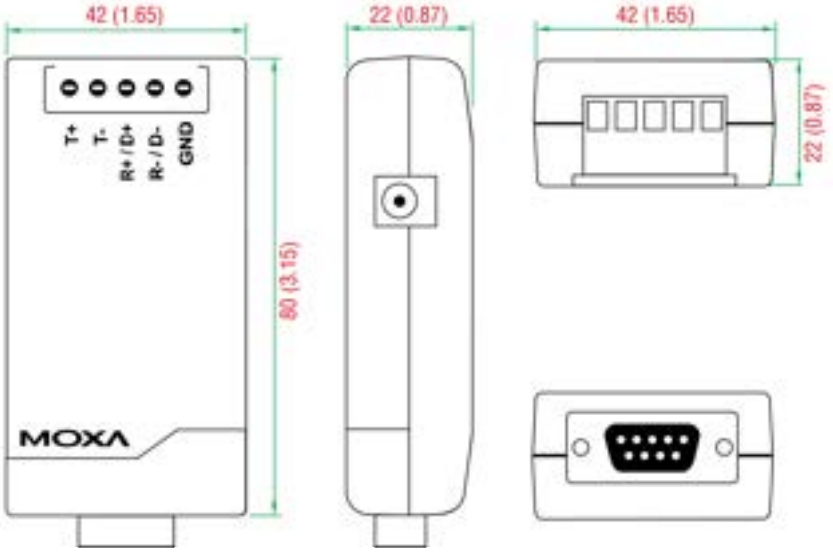
Package Contents

Device	1 x TCC-80/80I Series converter
Cable	1 x USB power cord, 50 cm
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

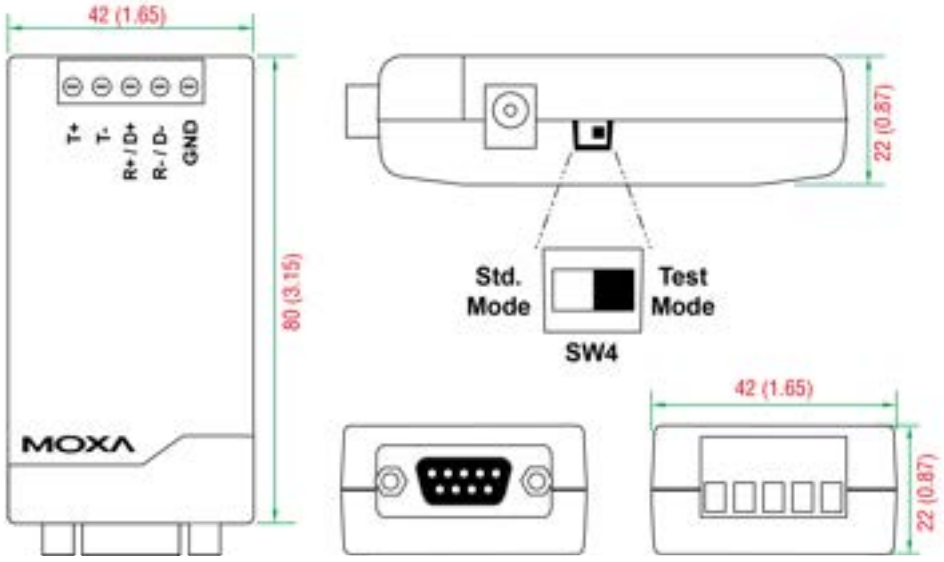
TCC-80

Unit: mm (inch)



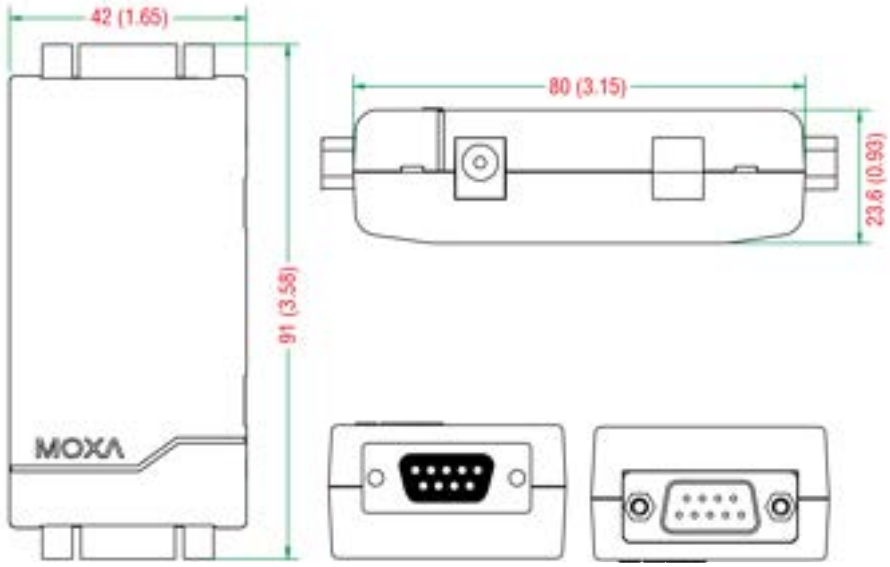
TCC-80I

Unit: mm (inch)



TCC-80-DB9, TCC-80I-DB9

Unit: mm (inch)



Ordering Information

Model Name	Isolation	Serial Connector
TCC-80	–	Terminal Block
TCC-80I	✓	Terminal Block
TCC-80-DB9	–	DB9
TCC-80I-DB9	✓	DB9

Accessories (sold separately)

Cables

CBL-USBAP-50	USB A male/2.1 mm DC Jack cable, 50 cm

Connectors

ADP-RJ458P-DB9F	DB9 female to RJ45 connector
Mini DB9F-to-TB	DB9 female to terminal block connector

Power Adapters

PWR-12050-USJP-S2	Unlocking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC, US/JP plug, 0 to 40°C operating temperature
PWR-12050-EU-S2	Unlocking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC, EU plug, 0 to 40°C operating temperature
PWR-12050-CN-S2	Unlocking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC, CN plug, 0 to 40°C operating temperature
PWR-12050-UK-S2	Unlocking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC, UK plug, 0 to 40°C operating temperature
PWR-12050-AU-S2	Unlocking barrel plug, 12 VDC, 0.5 A, 100 to 240 VAC, AU plug, 0 to 40°C operating temperature

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