TCC-80I

Port-powered RS-232 to RS-422/485 converter with isolation protection

> External power source supported but not required
> High-speed transmission up to 115.2 Kbps
> 2.5 KV isolation
> Compact size
> Converts RS-422, and both 2-wire and 4-wire RS-485
> RS-485 automatic data direction control
> 15 KV serial ESD protection
> Built-in 120-ohm termination resistors
> Patented LED port power indicator

The certification logos shown here apply to some or all of the products in this section. Please see the **Specifications** section or Moxa's website for details.

RoHS | Port Power | USB Power | Ext. Power | 2.5KV Isolation | 15 KV ESD | CE FC
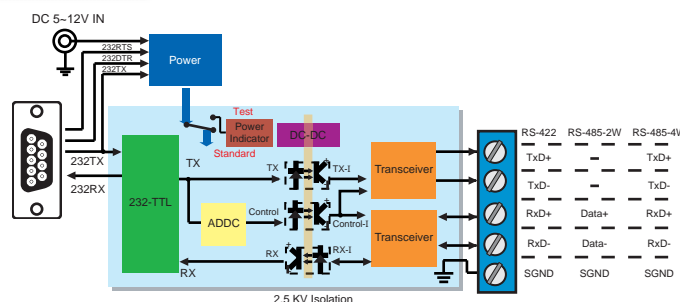
: Introduction

The TCC-80I is the world's first high-speed, port-powered converter with 2.5 KV isolation. It draws power from the attached RS-232 device, and provides complete RS-232 to RS-422/485 interface conversion and electrical isolation protection. The TCC-80I converts between the RS-232 TxD and RxD lines and half duplex 2-wire RS-485, or full duplex 4-wire RS-422/485. In addition, the TCC-80's 15 KV ESD protection guards against damage from electrostatic discharge. The TCC-80I also supports RS-485 automatic data direction control, in which the RS-485 driver is enabled by circuitry when the RS-232 TxD output is sensed. This means that no programming effort is required to control the direction of the RS-485 signal.

2.5 KV Isolation

TXD
RTS
DTR

RS-422/485 Devices
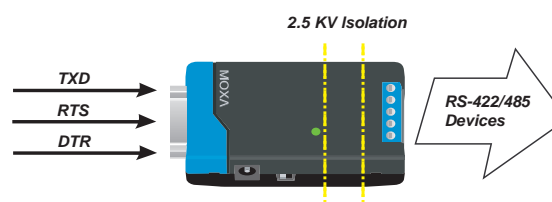
: Port Power and Optical Isolation

The RS-232 port of the TCC-80 is a DB9 female socket that can connect directly to the host PC, with power drawn from the TxD line. Electrical 2.5 KV isolation 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.

DC 5~12V IN

232RTS
232DTR
232TX

Power

232TX
232RX

232-TTL

TX
RX

Test
Power Indicator
Standard

DC-DC

Control

ADDC

TX
TX-I

Control-I

RX
RX-I

Transceiver

Transceiver

	RS-422	RS-485-2W	RS-485-4W
	TxD+	–	TxD+
	TxD-	–	TxD-
	RxD+	Data+	RxD+
	RxD-	Data-	RxD-
	SGND	SGND	SGND

2.5 KV Isolation

: Patented 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 patented 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.

SW4
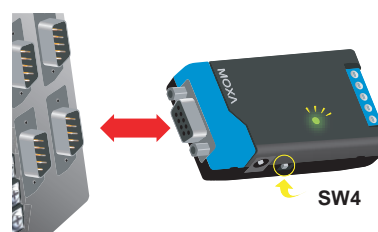
: Port Power Dissipation

Termination is considered a critical factor for port-powered devices such as the TCC-80I. In most circumstances, terminal resistors are used when the RS-422/485 cable is longer than 100 m. Refer to the table at the right to see the transmission distance of the TCC-80I as a function of baudrate.

Port-Powered Transmission Distance

Baudrate (bps)	RS-422/485 Transmit Distance (m)	Embedded Terminator	External Power Required
9600	1200	(ON) 120 W	NO
19200	1200	(ON) 120 W	NO
38400	600	(ON) 120 W	NO
57600	300	(ON) 120 W	NO
115200	150	(ON) 120 W	NO

: Specifications

RS-232 Side

Connector: DB9 female

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

RS-422/485 Side

Connector: Terminal Block or DB9 male

Signals (interface selected by DIP switch):
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w Signals: Data+, Data-, GND

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Serial Transmission

Baudrate: 300 bps to 115.2 Kbps

ESD Protection: 15 KV

Optical Isolation: 2.5 KV rms for 1 minute

Pull High Resistance: 1k ohm

Pull Low Resistance: 150k ohm

Physical Characteristics

Case: ABS + PC

Weight: 50 ± 5 g

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, RTS, DTR) or power input jack

Input Voltage: 5 to 12 VDC

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

Surge Protection: Embedded 15 KV ESD Surge Protection

Regulatory Approvals
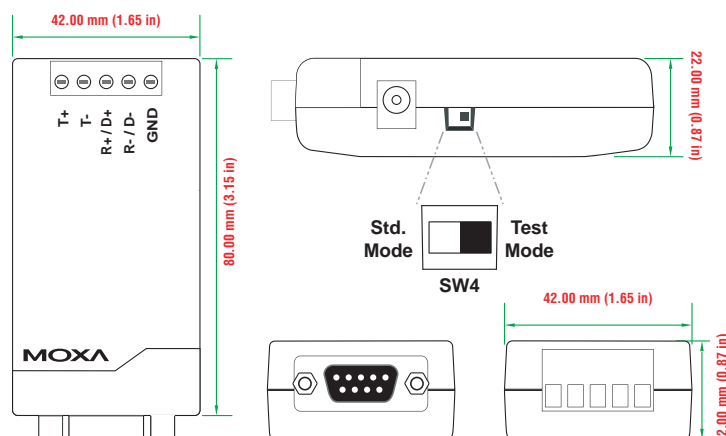
CE: Class B

FCC: Class B

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

12

Media Converters > TCC-80I

Dimensions

TCC80I

42.00 mm (1.65 in)

80.00 mm (3.15 in)

22.00 mm (0.87 in)

T+ T- R+ / D+ R- / D- GND

Std. Mode   Test Mode

SW4

42.00 mm (1.65 in)

22.00 mm (0.87 in)

MOXA

DB9 female connector

5 4 3 2 1
9 8 7 6
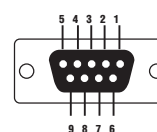
PIN	RS-232
1	DCD
2	TxD
3	RxD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

DIP Switch Settings

ON
1 2 3

DIP Switch Settings			
RS-422 with Terminator	SW1	SW2	SW3
	OFF	OFF	ON
RS-422	SW1	SW2	SW3
	OFF	OFF	OFF
4-wire RS-485 with Terminator	SW1	SW2	SW3
	ON	OFF	ON
4-wire RS-485	SW1	SW2	SW3
	ON	OFF	OFF
2-wire RS-485 with Terminator	SW1	SW2	SW3
	ON	ON	ON
2-wire RS-485	SW1	SW2	SW3
	ON	ON	OFF

TCC-80I-DB9
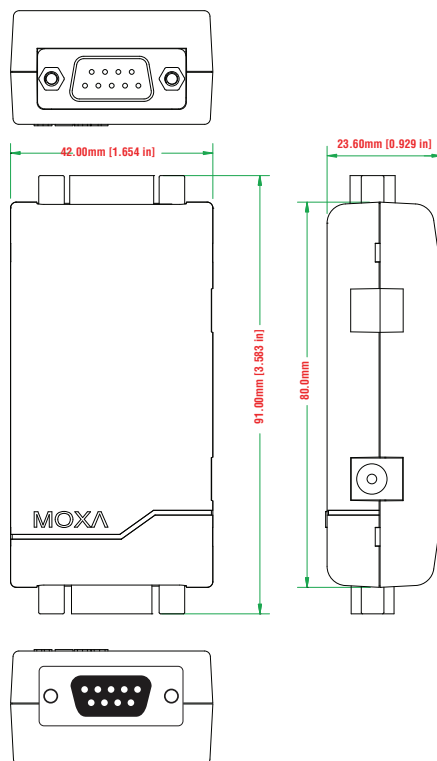
DB9 male RS-422/485 port
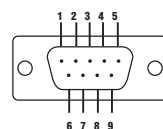
PIN	RS-422/RS-485-4w	RS-485-2w
1	TxD-(A)	-
2	TxD+(B)	-
3	RxD+(B)	Data+(B)
4	RxD-(A)	Data-(B)
5	GND	GND
6	-	-
7	-	-
8	-	-

42.00mm [1.654 in]　　23.60mm [0.929 in]

91.00mm [3.583 in]　　80.0mm

⋮ Ordering Information

Available Models

TCC-80I: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection, terminal block on the RS-422/485 side, and 2.5 KV optical isolation

TCC-80I-DB9: Port-powered RS-232 to RS-422/485 converter with 15 KV serial ESD protection, DB9 male connector on the RS-422/485 side, and 2.5 KV optical isolation

Optional Accessories (can be purchased separately)
Power Adaptor

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

Package Checklist
- TCC-80I media converter
- USB power cord (50 cm)
- Quick Installation Guide (printed)
- Warranty Card