

# TCC-80I

## Isolated Serial Port Powered RS-232 to RS-422/485 Converter



### Features

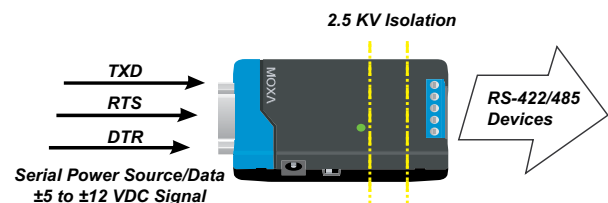
- Self-powered or selectable external power source
- High-speed transmission up to 115.2 Kbps
- 2.5 KV isolation
- Compact size
- Selectable 2/4-wire RS-485 and RS-422 conversion
- RS-485 automatic data direction control
- Surge protection, 15 KV ESD
- Built-in 120  $\Omega$  termination resistors
- Patented LED port power indicator



### Introduction

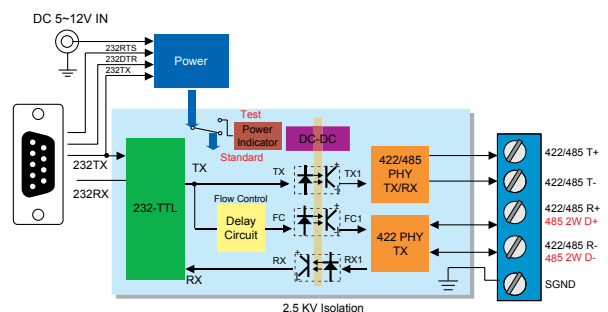
The TCC-80I is the world's first high-speed, serial port powered converter with 2.5 KV isolation. The TCC-80I draws power from the attached RS-232 device, and provides complete RS-232 to RS-422/485 interface conversion and electrical isolation protection. The TCC-80I converts between the RS-232 Tx/D and Rx/D lines and half duplex 2-wire RS-485, or full duplex 4-wire RS-422/485. The TCC-80I's outputs come with built-in 15 KV ESD surge protection to provide comprehensive protection against current overload. 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 Tx/D output is sensed. This means that no programming effort is required to control the direction of the RS-485 signal.



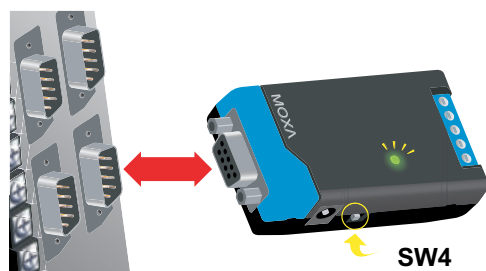
### Serial RS-232 Port Power and Optical Isolation

The RS-232 port of the TCC-80I is designed with a female DB9 socket to connect directly to the host PC, with power drawn from the combination of Tx/D, RTS, and DTR lines. The electrical 2.5 KV isolation of the TCC-80I is achieved by using a photo coupler to transform an electrical signal into light, and then retransform the light back into an electrical signal on the other side. In this way, 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.



### Patented LED Port Power Indicator

Although it is easy enough to use a multimeter to determine whether or not the attached serial port is able to provide enough electricity, a better method is to use the built-in "LED Port Power Indicator" designed especially for the TCC-80I. To do this, connect the TCC-80I to the target RS-232 port, and then turn the SW4 switch to the right to Test mode. If the LED lights up, the TCC-80I is receiving enough power. If the LED does NOT light up, you will need to attach the external power cord to the TCC-80I.



Termination is thought to be a critical factor for port-power devices such as TCC-80I. In most circumstances, terminal resistors are used when the RS-422/485 cable length is longer than 100 m. The table to the right indicates the transmission distance of the TCC-80I when using serial port power.

#### Port Powered Transmission Distance

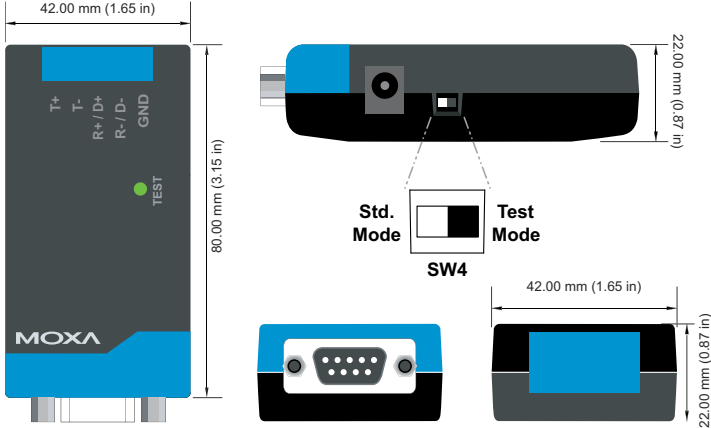
Baudrate (bps)	RS-422/485 Transmit Distance (m)	Embedded Terminator	Ext. Power Required
9600	1200	(ON) 120 Ω	NO
19200	1200	(ON) 120 Ω	NO
38400	600	(ON) 120 Ω	NO
57600	300	(ON) 120 Ω	NO
115200	150	(ON) 120 Ω	NO

## Ordering Information

**TCC-80I:** Serial Port Powered RS-232 to RS-422/485 Converter w/ 15 KV ESD Surge Protection and 2.5 KV Isolation

### Optional Accessories

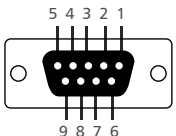
- **Power Adapter:** See Serial Device Networking catalog page 5-6 for more detailed information
- **CBL-USBAP-50:** USB Power Cord (50 cm)
- **CBL-F9M9-20:** Male DB9 to Female DB9 RS-232 Cable (20 cm)



Dimensions: 42.00 mm (1.65 in) x 80.00 mm (3.15 in) x 22.00 mm (0.87 in)


SW4: Std. Mode (left), Test Mode (right)

#### Female DB9 RS-232 port



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

#### DIP Switch Settings



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

## Specifications

### Communications

**Baudrate:** 50 bps to 115.2 Kbps

#### RS-232 Side:

Connector: Female DB9

Signals: TxD, RxD, and GND

Loop back: RTS to CTS, DTR to DSR and DCD

#### RS-422/485 Side:

Connector: Terminal Block

Signals: TxD+, TxD-, RxD+ (Data+), RxD- (Data-), GND

Mode: 4-wire RS-422, 4-wire RS-485,  
2-wire RS-485 (set by DIP switch)

RS-485 Data Direction Control: Auto

Pull high/low: 1K/1K Ω

**Optical Isolation:** 2.5 KV RMS for 1 minute

**Surge Protection:** 15 KV ESD

### Environmental

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

**Storage Temperature:** -20 to 75°C (-4 to 167°F)

**Humidity:** 5 to 95% RH

### Power

#### Input Power Source:

Serial RS-232 Port: TxD, RTS, DTR; Ext Power Input (jack)

**Input Power Voltage:** 5 to 12 VDC

**Power Consumption:** 20 mA @ 5 VDC (termination disabled)

### Mechanical

**Dimensions (W x D x H):** 42 x 80 x 22 mm

**Case:** ABS + PC

**Weight:** 50 ± 5 g

**Regulatory Approvals** CE Class B, FCC Class B

**Warranty:** 2 years



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