

# TCC-80

## Port-powered RS-232 to RS-422/485 converter



- > 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
- > 15 KV serial ESD protection
- > Built-in 120-ohm termination resistors

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.



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Media Converters > TCC-80

### Introduction

The TCC-80 provides complete signal conversion between RS-232 and RS-422/485, without requiring an external power source. It supports 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. In addition, the TCC-80's 15 KV ESD protection guards against damage from electrostatic discharge.

Automatic data direction control is also provided for RS-485, in which 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 is a DB9 female socket that can connect directly to the host PC, with power drawn from the TxD, RTS, or DTR line. Regardless of whether the signal is high or low, the TCC-80 can obtain enough power from the data/handshake 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 5 to 12 VDC power supply can be connected using an adaptor or a USB power cord.

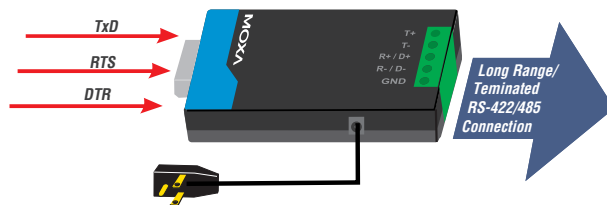


### Optional External Power

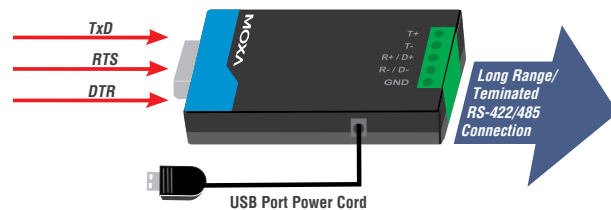
Termination is a critical requirement for port-powered devices such as the TCC-80. In most circumstances, termination resistors are used if the RS-422/485 cable is longer than 100 m. Regardless of how much the data signal is dissipated, the termination resistors absorb more

than 75 mW of power. In other words, if long distance RS-422/485 transmission or termination is required, then an external USB power cord or DC power supply should be used.

#### External Power Adaptor



#### USB Power



### Port Power Dissipation

When installing a TCC-80 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 obtains 50 mW 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.

### 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

**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:** 10 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](http://www.moxa.com/warranty)

### Dimensions

#### TCC-80

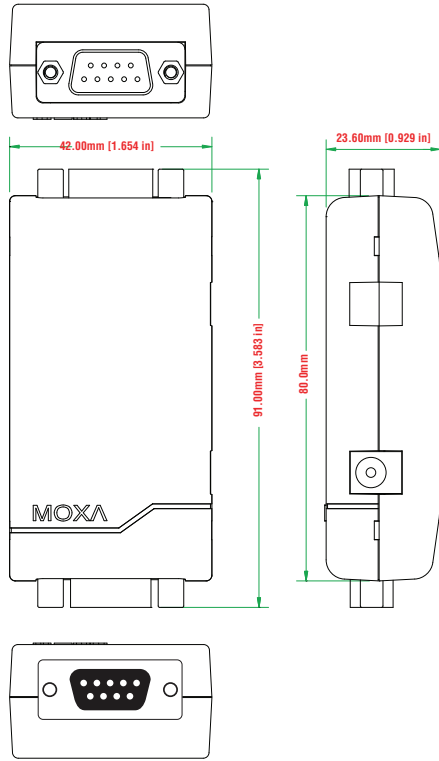
**DB9 female connector**

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

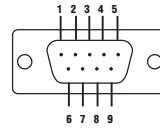
**DIP Switch Settings**

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-80-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	-	-

**Ordering Information**

**Available Models**

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

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

**Optional Accessories** (can be purchased separately)

**Power Adaptor**

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

**Package Checklist**

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