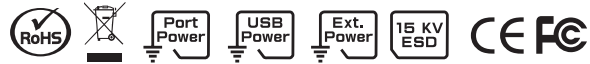# TCC-80

Port Powered RS-232 to RS-422/485 Converter

Features

> External power source supported but not required
> Compact size
> Converts both 2 and 4 wire RS-422/485
> RS-485 automatic data direction control
> Automatic baudrate detection
> 15 KV ESD surge protection
> Built-in 120 Ω termination resistors
> Patented LED port power indicator
> 2.5 KV isolation

RoHS | Port Power | USB Power | Ext. Power | 15 KV ESD | CE FC

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 provides comprehensive protection against current overload with built-in

15 KV ESD surge protection. 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 female DB9 socket that can connect directly to the host PC, with power drawn from the TxD, RTS, and DTR lines. Regardless of whether the signal is high or low, the TCC-80 can able to obtain enough power from the three data/handshake lines combined. However, external power is an option if handshake lines are not available, if the serial cable is too long, or if the RS-232 device is a low powered device. For external power, a 5 to 12 VDC power supply can be connected using an adapter or a USB power cord.
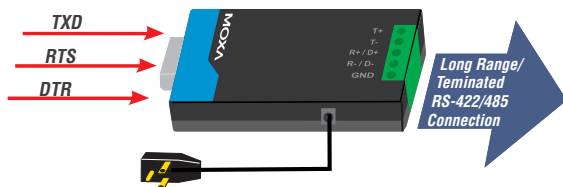

TXD
RTS
DTR

±5 V to ±12 VDC Serial Signal
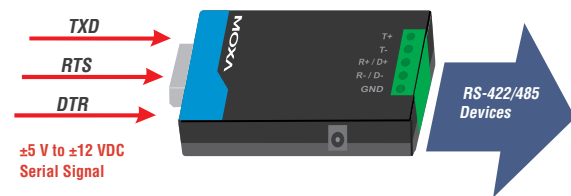
RS-422/485 Devices
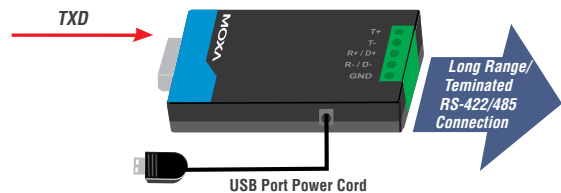
Optional External Power

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. No matter how much of 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.

Ext. Power Adaptor

TXD
RTS
DTR

Long Range/ Teminated RS-422/485 Connection

USB Power

TXD

Long Range/ Teminated RS-422/485 Connection

USB Port Power Cord

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. In the end, the rest of the supplied power is used for transmitting the RS-422/485 signal.

Ordering Information

TCC-80: Port powered RS-232 to RS-485 converter w/ 15 KV ESD surge protection

Optional Accessories

• **Power Adapter:** See Total Solutions for Industrial Device Networking Catalog / Chap 10 - Accessories / Power Adapters

• **CBL-USBAP-50:** USB power cord (50 cm)

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

Dimensions (unit = mm)

42.00 mm (1.65 in)
22.00 mm (0.87 in)
42.00 mm (1.65 in)
22.00 mm (0.87 in)
80.00 mm (3.15 in)

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

MOXA

DB9 (Female) RS-232 Port

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

Specifications

Communication

Baudrate: 300 bps to 115.2 Kbps
RS-232 Side:
Connector: DB9 (Female)
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
Surge Protection: 15 KV ESD

Environment

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:
RS-232 port (TxD, RTS, DTR); 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: 5 years

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Media Converters