



**RECOMMENDED POWER SUPPLY**  
12V OR 24V / 40W, DIN-RAIL, SLIM  
MODEL: CF-MDR-40-12 OR CF-MDR-40-24

## Industrial Externally-Powered RS-232 ⇔ RS-485/422 High-speed Opto-isolated Converter (Part Number: CVT-485\_422-4)

CE FCC



[Http://www.CommFront.com](http://www.CommFront.com)

### Industrial RS-232/485/422 Isolated Converter

Part Number: CVT-485\_422-4 (DIN-Rail/Wall-Mount)



#### ■ INTRODUCTION

The CVT-485\_422-4 is a rugged, industrial-grade, high-speed (300 to 115,200bps), optically-isolated RS-232 to RS-485 / RS-232 to RS-422 converter, which can be used to convert any standard RS-232C port into a two-wire half-duplex RS-485 port or a four-wire full-duplex RS-422 port and vice versa. This product features opto-isolation circuitry, which effectively protects your RS-232 devices from ground loops, noise problems, transient surges, remote lightning and spikes. The unit supports serial data rates up to 115,200bps and features data format auto-sensing and self-adjusting, and, therefore, no DIP switch or jumpers are required.

#### ■ FEATURES

- Industrial grade enclosed in a rugged, rustless ABS housing.
- Direct DIN-Rail or wall / panel mounting without using any unsecured brackets or adapters.
- External 9-30VDC powered, no port power from the RS-232 port is required.
- Optical isolation effectively protects RS-232 devices from ground loops, transient surges, remote lightning and spikes. It also eliminates ground loop and noise problems.
- Supports high-speed serial data rates: 300 to 115,200bps.
- Supports up to 128 nodes of RS-485/422 devices.
- Operating temperature: -40°F to 185°F (-40°C to 85°C).
- RS-485/RS-422 auto-detection, no jumper setting is required.
- Data direction auto-turnaround, no software drivers or flow control is required.
- Plug and play (hot-pluggable, data format auto-sensing and self-adjusting).
- Built-in 600W surge protection, 15kV static protection and circuit protection.
- Built-in selectable 120Ω end-of-line terminator for system reliability and easy installation.
- Surface Mount Technology manufactured to RoHS and ISO-9001 standards.
- Safety: Strictly certified by TUV (Cert No. SG-CE-100005; SG-FCC-100002).
- 5-year manufacturer's warranty.

#### ■ SPECIFICATIONS

Compatibility:	EIA/TIA RS-232C standard and RS-485/RS-422 standard
Power Source:	9 to 30VDC (External AC to DC power adapter included)
External AC/DC Power Adapter:	9VDC/500mA (Input: 100~240VAC 50/60Hz, US type A plug)
Current Consumption:	Less than 30mA
Optical Isolation:	2500Vrms (AC, 1 min)
Data Rates:	300 to 115,200bps (auto-sensing and self-adjusting)
Distances:	RS-232 side: 16ft (5m); RS-485/RS-422 side: up to 4000ft (1.2km) at 19,200bps
Connectors:	RS-232: DB-9 Female; RS-485/422: 10-way Terminal Block
Number of Maximum Nodes:	RS-485/422: 128 nodes
End-of-Line Terminator:	120Ω (built-in, selectable)
Surge Protection:	600W
Static Protection (ESD):	Up to 15kV
Dimensions (H x W x D):	4.7 x 3.6 x 0.9 in (120 x 73 x 33 mm)
Weight:	4.6 oz (130 g) (with termination board)
Operating Temperature:	-40°F to 185°F (-40°C to 85°C)
Operating Humidity:	Up to 90% RH (no condensation)

#### ■ PIN ASSIGNMENT

RS-232 Side (DB-9 Female Connector / DCE):

Pin:	1	4	6	7	8	2	3	5
Function/Internal Wiring:	Tied together			Tied together		TX	RX	GND

RS-485/RS-422 Side (Terminal Block):

Pin:	TX+/A+	TX-/B-	GND2	RX+	RX-	J1	J2	J3	J4	9~30V	GND1
RS-485:	485+	485-	RS-485 GND	-	-	-		Tie to ON 120Ω		DC +	DC/RS-232 GND
RS-422:	TX+	TX-	RS-422 GND	RX+	RX-	Tie to ON 120Ω		-		DC +	DC/RS-232 GND

The diagram illustrates an RS-422 differential signaling system. On the left, a PC or DTE is connected to a CVT-485\_422-4 converter. The converter has four pins: 2 (RX), 3 (TX), 4 (TX), and 5 (GND). It is powered by a 9~30V supply. The converter's output is connected to a 2500V ISOLATION block, which is further connected to a (T. BLOCK). The (T. BLOCK) is connected to a 4000FT (1.2KM) cable. The cable has three twisted pairs: RX+, RX-, TX+, and TX-. The cable is terminated at both ends with 120 OHM (1/4 W) resistors. The cable is connected to RS-422 DEVICES. The first device is labeled 1, the second is labeled 2, and the third is labeled UP TO 128. The RS-422 DEVICES are connected to the cable as follows: Device 1: RX+ to TX+, RX- to TX-, TX+ to RX-, TX- to RX+. Device 2: RX+ to TX-, RX- to TX+, TX+ to RX-, TX- to RX-. Device UP TO 128: RX+ to TX+, RX- to TX-, TX+ to RX-, TX- to RX+.

The diagram illustrates a 4000FT (1.2KM) transmission system. It consists of two identical modules, each labeled CVT-485\_422-4, connected by a long cable. Each module has a 2500V ISOLATION section and a 9~30V power supply input. The modules are connected to a PC or DTE (Data Terminal Equipment) and a POWER SUPPLY. The connections are as follows:

- Left Module:**
  - TX (2) and RX (3) are connected to the PC or DTE.
  - GND (5) is connected to the POWER SUPPLY.
  - TX+ (1) and RX- (4) are connected to the 2500V ISOLATION section.
  - GND1 and GND2 are connected to the 9~30V power supply input.
  - J1 and J2 are connected to the 2500V ISOLATION section.
- Right Module:**
  - TX (2) and RX (3) are connected to the PC or DTE.
  - GND (5) is connected to the POWER SUPPLY.
  - TX+ (1) and RX- (4) are connected to the 2500V ISOLATION section.
  - GND1 and GND2 are connected to the 9~30V power supply input.
  - J1 and J2 are connected to the 2500V ISOLATION section.

The cable connecting the two modules is labeled 4000FT (1.2KM). The modules are also labeled (DB-9) and (T. BLOCK).

- PWR Indicator**  
Steady: Power on.  
Off: Power off.
- DOWN Indicator**  
Flashing: Receiving data from RS-232 port.
- UP Indicator**  
Flashing: Receiving data from RS-485/422 port.

Page 3 of 4

Technical drawing of a wall panel assembly. The drawing shows a cross-section of the panel on the left and a front view on the right. The cross-section indicates a panel thickness of 3.46 in (88 mm). The front view shows a panel with a width of 1.57 in (40 mm) and four holes with a diameter of 4 x Ø0.16 in (4 mm). The panel is labeled "Wall / Panel surface".

- Make sure the power is connected and turned on.
- Check the connections according to the above "CONNECTIONS" diagrams.
- Perform a loopback test by using CommFront's 232Analyzer software: Connect TX+ to RX+ and TX- to RX-, then send commands from the 232Analyzer software. You should receive an echo of the commands sent. By performing a simple loopback test like this, you can test both the transmitter and receiver of the converter. This is very helpful when you are in doubt about the performance of your converter.