CesCom

N400
ACA approved

CE-0022D
RS232 – RS485 CONVERTER

Din rail mounted conversion from RS232 to RS485 with ATE

Features

- 24VAC power
- Efficient **switch-mode** regulation
- RS485 **lightning protection**
- 2-wire half-duplex operation
- **ATE** - Automatic Transmit Enable
- Fast and precise 1.5bit RS485 **line turn-around**
- Compact vertical DIN rail mounting
- Pluggable **Combicon** terminal connections
- LED indicators
- +5V @200ma auxiliary output

Overview

Many PCs and controllers are equipped with RS-232 ports which are designed for short-distance point-to-point low-speed communications whereas RS-485 balanced networks are designed to run long distances and permit multi-drop operation and can run at megabit speeds. Typically a simple RS-485 converter may be used to interface the PC to the balanced network.

One side effect of such long line lengths can be harmful transients and ground-loop currents which can introduce errors or disrupt communications or even damage the host. The CE-0022D isolates the RS-232 interface from the RS-485 side through an optical isolation barrier rated at over 3,000 volts. Not only does this prevent harmful voltages being coupled through to the RS-232 side but it also isolates the RS-232 ground from the RS-485 "ground" which otherwise could affect the inherent common-mode voltage rejection, a problem on many balanced networks.

RS-485 networks use only a single twisted pair and so are half-duplex in nature and normally require a transmit enable signal, something akin to the "press to talk" on 2-way radios. Most systems rely on the RTS signal to control the transmit enable but this also requires that the RS-232 software be adapted if possible to do so. Cescom's range of converters feature Automatic Transmit Enable (ATE) processing based upon precise timing synchronized to each character sent so that the transmit enable automatically engages on the reception of a character from the RS-232 side. This transmit enable stays asserted for the length of the character and de-asserts if no other characters have been detected within 1.5 bits after the stop bit. This is unlike many other inferior products which rely upon an imprecise time-out that only begins from the last active data bit sent, our ATE ensures pass-through of all data, no matter how rapid.

This makes the CE-0022D the perfect candidate for RS-485 networks which require a fast line-turnaround without the need for special software.

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Specifications

Supply Voltage	24VAC
Current	100ma (200ma with fully loaded +5V output)
Physical	80mm x 26mm x 100mm (HWD)
Weight	200 grams (approx)
Case Material	Polyamide 6.6
Environment	-40'C to +85'C operating
Standards	IEC 1010; AS/NZS 3548 EMI/EMC; C Tick compliant

RS-232	115.2K baud max
RS-485	115.2K baud max (limited by RS-232 speed)
Control	ATE processor
ATE turnon	1us max
ATE turnoff	1.5 character bits or 1ms
Indicators	RS-232 TxData, RS-232 RxData, Power

OPERATION

RS-232 to RS-485

In the idle condition the RS-485 transmitter is disabled and ready to receive characters from the RS-485 side. When a character is received from the RS-232 side the RS-485 transmitter is turned on with the detection of the start-bit and stays enabled for the length of the character plus 2.5 stop bits. The ATE is able to time the character if the baud-rate is set accordingly via an internal factory jumper on the ATE processor. Once the RS-232 receive input falls idle and the ATE times out the unit will be able to receive data from the RS-485 bus again.

RS-485 to RS-232

As long as the RS-232 receive input is idle and the ATE is timed out then all RS-485 traffic will appear on the RS-232 transmit. Once data is detected on the RS-232 receive then the RS-485 will be locked into a transmit mode for the duration of that data.

CONNECTIONS

1	TxD	RS-232 Transmit data out
2	RXD	RS-232 Receive data in
3	NC	
4	GND	RS-232 ground
5	24VAC	Power supply
6	24VAC	Power-supply
7	NC	
8	+5V	Auxiliary supply output (200ma max)
9	0V	Auxiliary supply common
10	SHIELD	
11	Tx/Rx+	RS-485 Transmit/Receive A [*1]
12	Tx/Rx-	RS-485 Transmit/Receive B [*1]

Notes: [*1] Ensure long lines are terminated (usually 120ohms)

FRONT VIEW CE-0022D

RS485 CONNECTION

HOST RS232 HARDWARE
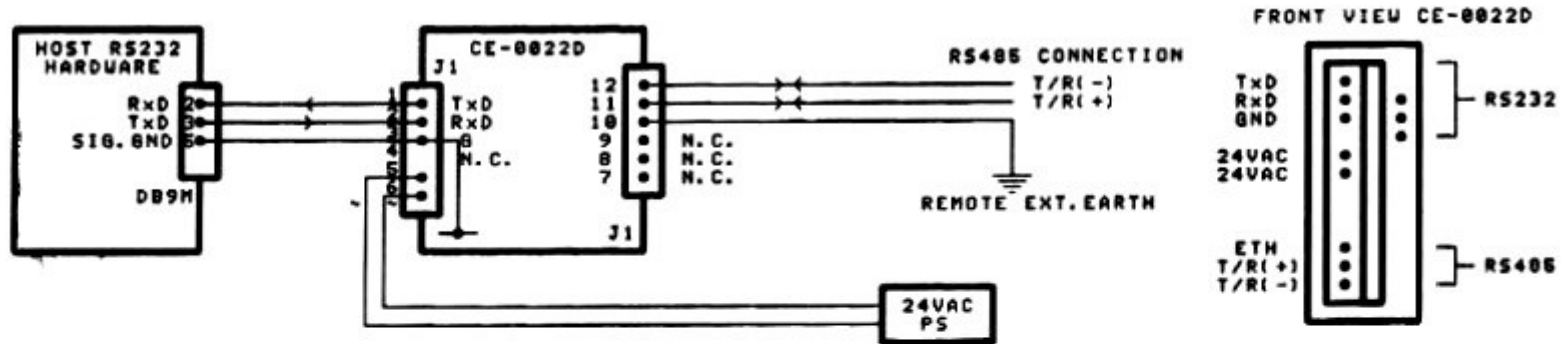
NOTES

1. CONNECT THE CE-0022D TO THE DIN RAIL.

2. CONNECT A 24VAC SUPPLY TO TERMINAL BLOCK J1 PINS 5 AND 6

3. CONNECT PIN 10 OF TERMINAL BLOCK J1 TO AN EXTERNAL EARTH.

4. CONNECT THE RS485 LINES TO THE CE-0022D AS PER THE ABOVE DIAGRAM.
   CONNECT A 120 OHM TERMINATION RESISTOR ACROSS
   PINS 11 AND 12 OF J1 IF THE TRANSMISSION LINE EXCEEDS 100M.

5. CONNECT THE RS232 INPUT TO THE CE-0022D AS PER THE ABOVE DIAGRAM.

6. THE UNIT IS READY FOR OPERATION.