

INTERCONNECTING PRODUCTS AND CABLES

485Fi

ISOLATED RS-232 TO RS-422/RS-485 CONVERTER

Description

The Model 485Fi Converter is a compact plug-in unit that converts RS-232 single-ended signals to isolated RS-422/RS-485 differential signals. Signal conversion is completely bidirectional - outgoing RS-232 signals are converted to RS-485 levels and incoming RS-485 differential pairs are converted into single ended RS-232 signals. Once equipped with the Model 485Fi Converter, a RS-232 device can communicate with other RS-422 or RS-485 devices without damage from ground loops and with increased noise immunity.

Isolation

The Model 485Fi Converter provides complete electrical isolation between the signals connected to the RS-422/RS-485 serial port and the host computer. The optical isolation eliminates signal contamination and component damage that may be caused by external noise and ground loops. The 485Fi is rated at 2500 Volts of isolation between the two ports. Tests run at 19,600 baud with a difference of 1000 Vdc show no signal errors.

Applications

The Model 485Fi converter can be used in several applications. The most common application is to isolate the RS-422 or RS-485 signals from the PC's COM port as shown in Figure 1. Figure 2 shows how one or two 485Fis can be used to extend the distance



between two RS-232 serial devices and increase signal noise immunity while isolating the two devices. Their differential signals provide greatly increased common mode noise rejection while transmitting data at rates over 100 Kbaud with distances up to 4000 feet.

Converter Device Type

The Model 485Fi has a female 25-pin connector and is supplied configured as a DCE device for direct plug-in connection to a PC. PC COM ports normally have their signal-pin assignments configured for operation as a terminal while DCE devices have their signal-pin assignments configured for operation as a modem. The 485Fi's device type can be easily reconfigured in the field by the user for connection with DCE devices.

- Converts single ended RS-232 signals to RS-485 (RS-422) differential signals. *Bidirectional data transfer.*
- Plugs directly into a 25-pin PC COM port or RS-232 device. *Easy attachment*
- Provides up to 2500 V isolation. *Prevents ground loops and common mode noise.*
- Extends RS-232 distance to 1.2 Km. *Overcomes RS-232's 50 foot cable limit.*
- Increased common mode noise rejection provides greater noise immunity against EMI/RFI signal interference. *Reduces data errors.*
- Adds multi-drop capability to an RS-232 signal. *Drives multiple loads.*
- Screw terminal strip for RS-485 and power connections. *Easy signal connections.*
- Manufactured to ISO 9000 and meets new European Electromagnetic compatibility requirements. *Improved quality product.*

 Approved

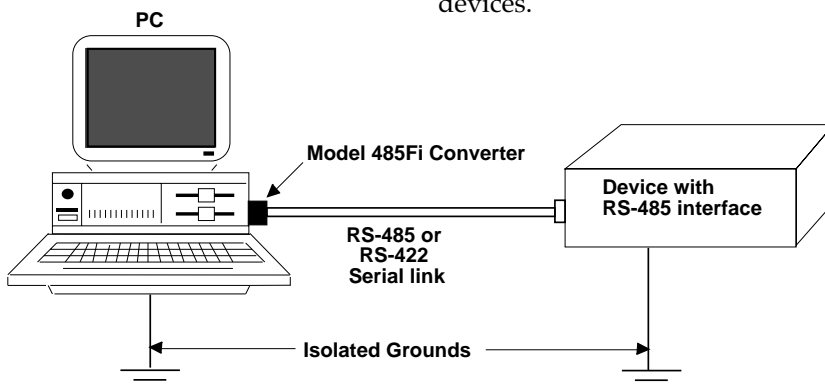


Figure 1 Model 485Fi Converter Isolates PC from serial devices

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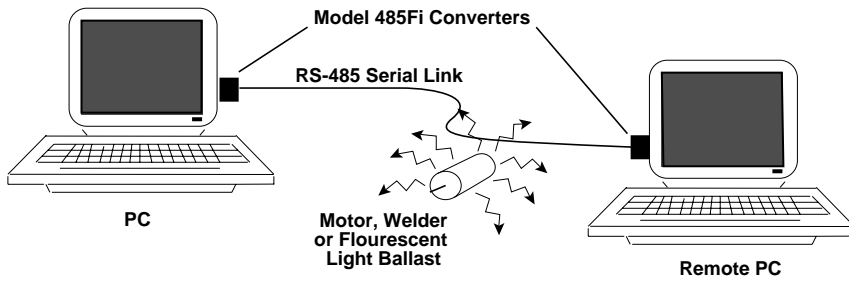


Figure 2 A Pair of 485Fi Converters extends serial transmission distance up to 4000 feet, isolates grounds and increases noise resistance

Signal Connections

All of the 485Fi's RS-232 signals are on the 25-pin female DB type connector. The RS-422/RS-485 signal pairs and power lines are on a miniature terminal strip on the other end of the converter. The terminal strip unplugs from the converter body to make it easier to work on the cable wiring.

Model 485Fi Converters use a small amount of DC power to operate the isolated RS-485 drivers and receivers. The DC power is supplied by a wall mounted, 9 Vdc power module that is included with each Converter.

Full-Duplex/Half-Duplex

The 485Fi may be used for full or half-duplex operation. The 485Fi is factory set for full-duplex operation and does not require any additional signal connections. For two-wire, half-duplex operation, jumper the TX and RX terminals together on the terminal strip. The 485Fi's RS-485 transmitter may be controlled by an external enable signal (TXEN) or by the RS-232 RTS signal. In half-duplex operation, the 485Fi's transmitter must be disabled to allow the other unit to transmit. To disable the transmitter, connect an isolated control line to the /TXEN input or use the RS-232 RTS signal to disable the transmitter.

TABLE 1

SHIPPED CONFIGURATION

Setting	Default	Option
Transmit Enable	TXEN	RTS
Rcvr termination	In	Out
Xtmr termination	Out	In
Mode	Full	Half
Power	Duplex	Duplex
	Term	-
	Strip	-

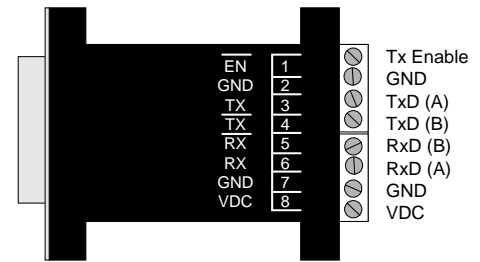


Figure 3 Model 485Fi Terminal Connections

Software Support

The 485Fi Converters operate with many commercially available communications packages that support RS-422 or RS-485 communication and use the RTS signal to control the RS-485 transmitter. A COMBIOS software toolkit is available for creating DOS and Windows applications.

SPECIFICATIONS

RS-232 Specifications

Connections	DB 25 pin male or female connector
Input Voltage	
Space or On	+2.4 to +30 V
Mark or Off	-30 to + 0.8 V
Input Resistance	5 K ohm (typ.)
Output Voltage	+9 V or -9 V
Output resistance	300 ohm (typ)

RS-485 Specifications

Connections	8 screw terminals
Output Drive	1.5 V min. fully loaded
Output Load	27 ohms (32 receivers)
Rcvr Termination	120 ohms when 'In'
Data Rate	120 K baud over 1200 meters
Isolation	2500 Vdc
CMR	100 V/μsec
Vcm	50 V

Power Requirements

Voltage	+5.0 to +12 Vdc or +5 Vdc on RS-232 connector.
Current	50 ma minimum 100 ma max

Physical

Size	67 mm L x 43 mm W x 20 mm L (2.63" L x 1.7" W x 0.8" H)
Temperature	
Operating	0 to + 60 °C
Storage	-20 to + 70 °C

ORDERING INFORMATION

Part Number

RS-232 to RS-485 Isolated Converter with female connector. Includes 115 Vac Power Supply Adapter

485Fi

RS-232 to RS-485 Isolated Converter and 230 Vac Adapter. Specify plug style: -E (Europe), -B(UK), -A(Australia)