

RS-232 TO RS-422/RS-485 CONVERTERS

Description

The MAGIC 485 Converters are RS-232 to RS-485 Converters that automatically tristate the transmitter signals when not transmitting. This eliminates the need to program the RTS (Request-to-Send) signal in your program and makes it easier to communicate with two-wire RS-485 devices. The MAGIC 485 Converters are compact devices with 25 or 9-pin connectors that can plug directly into a PC's COM port. RS-485 and power connections are made on a plug-in terminal strips for easy connections. 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 a Model MA485 Converter, a RS-232 device can communicate with other RS-422 or RS-485 devices without any program changes.

RS-485 Communication

In 2-wire RS-485 systems, the computer's transmitter must be turned off (tristated) when not transmitting to leave the line free to receive signals from the remote device. With other converters, this is done by programming the COM port's RTS signal to enable the transmitter at the start of the message and then back off after the message has been sent. With modern computers, it is hard to establish exactly when the message has been sent so it is difficult to know when to turn off the transmitter. If the transmitter is turned off too late it will interfere with the response from the remote device(s). If it is turned off too early, it will cut off part of the message.



The MAGIC Converter Solution

ICS's MAGIC 485 Converters overcome the need to program the RTS signal by automatically enabling the transmitter when a valid start bit is detected on the RS-232 transmit line. The turn-off time delay can be set by internal jumpers to match the baud rate. MAGIC Converters can convert any PC's COM port into RS-422 or RS-485 signals without any program changes.

Converter Device Type

The Model MA485F25 has a female 25-pin connector for direct plug-in connection to a PC 25-pin COM port. The Model MA485F9 has a female 9-pin connector for direct plug-in connection to a PC 9-pin COM port. Both converters have their signal-pin assignments configured for operation as DCE devices. The MA485's device type can be easily reconfigured in the field by the user for connection to DCE devices.

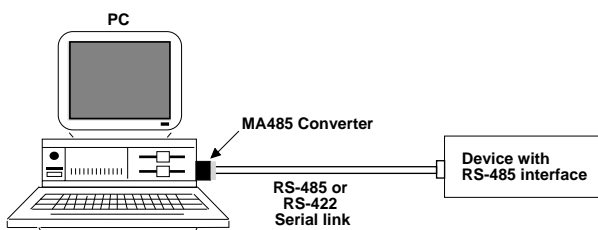
Signal Connections

All of the MA485's differential RS-422/RS-485 signals and power lines are on a miniature plug-in terminal strip. The terminal strip unplugs from the converter body to make it easier to work on the cable wiring. Signal connections require only a small screwdriver. The Model MA485 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.

- Converts single ended RS-232 signals to RS-485 (RS-422) differential signals. *Bidirectional data transfer.*
- Automatically tristates transmitter when not transmitting. *Overcomes the need to program the RTS signal.*
- Available with 25-pin and 9-pin connectors *Plugs into any PC COM port.*
- 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

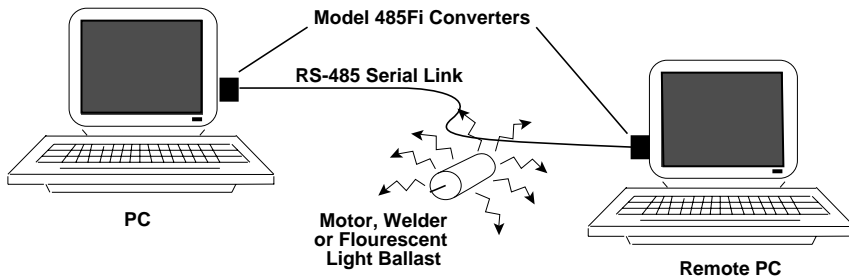


Connecting a PC to an RS-485 device

ICS DataCom
division of Systems West Inc.

7034 Commerce Circle
Pleasanton, CA 94588
Phone: 925.416.1000
Fax: 925.416.0105
www.icsdatacom.com

**TABLE 1
TURN-OFF DELAYS**



A Pair of MA485 Converters can be used to extend RS-232 serial transmission distance up to 4000 feet through noisy electrical environments.

Jumpers			Delay	Notes
Off	Off	Off	4 μsec	
On	Off	Off	8 μsec	
Off	On	Off	16 μsec	
On	On	Off	32 μsec	
Off	Off	On	64 μsec	
On	Off	On	128 μsec	
Off	On	On	256 μsec	
On	On	On	512 μsec	Default

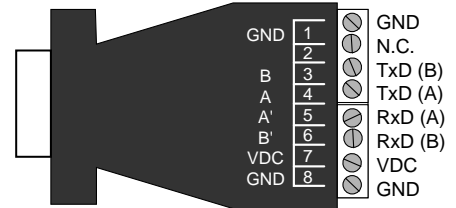
Full-Duplex/Half-Duplex

The MAGIC 485 Converters may be used for full or half-duplex operation. Full-duplex operation uses TX and RX signal pairs that connect directly to four terminals on the Converter's plug-in terminal strip. Half-duplex operation may be done with a two or four wire connection. In a half-duplex four-wire connection, the computer's TX pair goes to all remote devices and the remote devices transmit on the RX pair. In a two wire

connection, the TX and RX pairs are jumpered together and a single wire pair connects to the remote devices. 5 Vdc and GND terminals can be used to drive pullup and pulldown resistor to bias the lines into the mark state when they are tristated.

Application Support

For more information about serial communication or how to use converters, download Application Notes from our website at www.icsdatacom.com



Model MA485F9 Terminal Connections

SPECIFICATIONS

RS-232 Specifications

Connections DB 25 or DE 9 pin female connector

RS-232 Specifications

Signals Tx, Rx, DSR, DCD and DTE
 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

Signals TX and RX pair
 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

Power Requirements

Voltage +5.0 to +12 Vdc
 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

Supplied Accessories

115 Vac Power Adapter US plug std.
 230 Vac Power Adapter with optional -E, -b and -A plugs

ORDERING INFORMATION

RS-232 to RS-485 Converter with 25-pin female connector. Includes 115 Vac Power Supply Adapter Part Number
MA48F25

RS-232 to RS-485 Converter with 9-pin female connector. Includes 115 Vac Power Supply Adapter MA48F9

Add suffix to specify export plug style and 230 Vac Adapter: -E (Europe), -B(UK), -A(Australia)