Fully Isolated Limited Distance Modem, RS-232/485 Converter

- **Complete Isolation with Optical Couplers and Power DC-to-DC Converter**
- **Industrial Surge Protection Devices**
- **Six LED Diagnostic Indicators**
- **19.2 K Baud at 3 Miles (5 KM), 57.6 K Baud at 0.5 Miles (0.8 KM)**
- **Request-to-Send, Clear-to-Send Handshake**
- **Tri-State Outputs for Multidrop Applications, up to 64 Devices**
- **Selection of Connectors**
- **Wide Operating Temperature Range**
- **Solderless Screw Terminal Field Connections**

SERIAL I/O

1 YEAR WARRANTY

MADE IN USA

$209
Basic Unit

The LDM485 is a compact RS-232 to RS-485 converter which features a complete electrical isolation barrier and heavy duty electrical surge protectors. These devices feature a rugged aluminum enclosure small enough to mount on the back panel of typical computer equipment, saving valuable desk and floor space. Isolation is provided by optical couplers and a DC-to-DC converter. The RS-232 connection is through male or female EIA 25-pin connectors. The RS-485 connections are made through convenient solderless screw terminals.

The LDM485 Series is designed for full duplex operation over two-wire pairs. Outputs are tri-state, allowing multidropping of up to 64 units. Hardware handshake is available over two separate wire pairs. Data rates are DC to 57.6k baud. Six diagnostic LED indicators are provided (see Figure 1) for installation guidance and system troubleshooting. The RS-232 interface supports Request To Send, Clear To Send, Data Set Ready, Received Line Signal Detect, and Data Terminal Ready. A convenient null modem switch is provided for the data lines. Also, a line termination switch connects a line termination resistor and line bias resistors to the RS-485 receive lines. The RS-485 interface supports Request To Send and Clear To Send on separate wire pairs. The LDM485 may be used to convert two sets of send and receive channels by using RTS and CTS circuits as the second data channels. Data rates are the same. The units use 12VAC from a wall-mounted transformer to screw terminals 1 and 2 on the RS-485 connector. Alternately, they can use ±12VDC to pins 9 (+) and 10 (–) of the RS-232 connector.

The LDM485 conforms to EIA RS-232 and RS-485 specifications. Data Terminal Ready must be asserted by the host RS-232 port before the LDM485 can transmit data. When Data Terminal Ready is not asserted, all outputs of the LDM485 are high impedance, allowing up to 64 LDM485 units to be multidropped on a common communications cable.

Request To Send and Clear To Send are carried through the RS-485 port as two separate wire pairs. These may be used for full duplex flow control.

Data Terminal Ready, DTR, must be asserted before the LDM485 can transmit data. This is normally done by the host computer. For situations where the host equipment does not have the capability of supplying a DTR signal, RLSD may be used to automatically assert DTR. On the RS-232 connector P1 of each LDM485, simply connect RLSD pin 8 to DTR pin 20. This connection is not appropriate for multi-drop installations.

Specifications

Model	LDM485					
Baud Rate Range	0 – 57.6K					
Baud Rate **Distance (miles)**[1] **Distance (km)**	57.6K 0.5 0.8	38.4K 1 1.7	19.2K 3 5	9.6K 4 6.7	4.8K 5 8.3	2.4K – 0 8 13.3
Wire Capacitance	Equal to 25pF per foot and up to 32 multidrop units					
Maximum Multidrop Units	64					
Common Mode Isolation	Surge: 1500V Continuous: 1000V					
Differential Mode Surge Protection (9 devices)	(AC input) ANSI/IEEE C37.90.1-1989 (all RS-485 inputs and outputs)					
Modes	Asynchronous 4-wire duplex, 2-wire half-duplex, 2-wire simplex					

Notes: (1) Distances reduced if multidropping more than 32 units; by 30% for 33-48 units, 50% for 49-64.

RS-232 P1 Pin	Descriptions
Pin 1	Case
Pin 2	TD
Pin 3	RD
Pin 4	RTS
Pin 5	CTS
Pin 6	DSR
Pin 7	Sig Gnd
Pin 8	RLSD
Pin 9	+12VDC
Pin 10	–12VDC
Pin 16	Echo Sup
Pin 17	Echo Sup
Pin 20	DTR

RS-485 P2 Pin	Descriptions	
Case Ground	Pin 1	12 Vac
Transmit Data	Pin 2	PWR RTN
Receive Data	Pin 3	RTS A
Request To Send	Pin 4	RTS B
Clear To Send	Pin 5	CTS A'
Data Set Ready	Pin 6	CTS B'
(connected to Data	Pin 7	TD A
Terminal Ready)	Pin 8	TD B
Signal Ground	Pin 9	SIG RTN
Receive Line Signal Detect	Pin 10	RD A'
Positive DC Supply Input	Pin 11	RD B'
Negative DC Supply Input	Pin 12	SIG RTN
Echo Suppression	(tie to pin 17 to enable)	
Echo Suppression	(tie to pin 16 to enable)	
Data Terminal Ready	(connected to Data Set Ready)	

Model	LDM485
Channel Lines[2]	TD, RD, RTS, CTS
Control Lines[2]	RTS, CTS, DTR, DSR, RLSD
Null Modem Switch	1 (Reverses RS-232 pins 2 and 3)
RS-485 Output Drive	60mA max/output
RS-485 Input Impedance	12kΩ min/input
Power: **AC operation**[3] **DC operation**	 12 Vac, ±10%, 10W screw terms 1 & 2 +11.5 to +17 Vdc @ 500 mA on pin 9 -11.5 to -17 Vdc @ 100 mA on pin 10
Operating Environment	0°C to +70°C, 0-95% relative humidity, noncondensing
Dimensions	6.6" x 2.1" x 1.28" (167.6 x 53.3 x 32.5 mm)
Weight **AC Transformer**	7 oz (200 g) max 11.0 oz (311.8 g) max
MTBF[4]	>100,000 hrs

Notes: (2) TD = Transmit Data, RD = Receive Data, RTS = Request To Send, CTS = Clear To Send, DTR = Data Terminal Ready, DSR = Data Set Ready, RLSD = Received Line Signal Detect. (3) 120VAC and 220 VAC power transformers are available. (4) Ground-benign environmental conditions (no salt atmosphere, <50°C ambient temperature).

To Order *(Specify Model No.)*

Model Number	Price	RS232 Connector	Power Source
LDM485-P	**$209**	25 Pin male	Host-powered
LDM485-S	**209**	25 Pin female	Host-powered
LDM485-PT	**223**	25 Pin male	Transformer
LDM485-ST	**223**	25 Pin female	Transformer

Includes operator's manual. Transformer powered units also include 120 Vac wall mount transformer.

Ordering Example: *LDM485-ST converter:* ***$223****.*