

## Fully Isolated Limited Distance Modem, RS232/422 Converter

### LDM485



LDM485-P shown smaller than actual size

- ✓ Complete Isolation with Optical Couplers and Power DC-to-DC Converter
- ✓ Industrial Surge Protection Devices
- ✓ Six LED Diagnostic Indicators
- ✓ 19.2K Baud at 3 Miles (5KM), 57.6K Baud at 0.5 Miles (0.8KM)
- ✓ 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

The LDM485 is a compact RS232 to RS485 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 RS232 connection is through male or female EIA 25-pin connectors. The RS485 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 RS485 receive lines. The RS485 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 12 Vac from a wall-mounted transformer to screw terminals 1 and 2 on the RS485 connector. Alternately, they can use  $\pm 12$  Vdc to pins 9 (+) and 10 (-) of the RS232 connector.

The LDM485 conforms to EIA RS232 and RS485 specifications. Data Terminal Ready must be asserted by the host RS232 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. See Figures 1 and 3 for details.

Request To Send and Clear To Send are carried through the RS485 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 RS232 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					
<b>Baud Rate Range</b>	0 – 57.6K					
<b>Baud Rate</b>	57.6K	38.4K	19.2K	9.6K	4.8K	2.4K – 0
<b>Distance (miles)<sup>(1)</sup></b>	0.5	1	3	4	5	8
<b>Distance (km)</b>	0.8	1.7	5	6.7	8.3	13.3
<b>Wire Capacitance</b>	Equal to 25pF per foot and up to 32 multidrop units					
<b>Maximum Multidrop Units</b>	64					
<b>Common Mode Isolation</b>	Surge: 1500V Continuous: 1000V					
<b>Differential Mode Surge Protection (9 devices)</b>	(AC input) ANSI/IEEE C37.90.1-1989 (all RS-485 inputs and outputs)					
<b>Modes</b>	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.



RS232 P1 Pin	Descriptions	RS485 P2 Pin Descriptions
Pin 1	Case	Case Ground Pin 1
Pin 2	TD	12VAC PWR RTN
Pin 3	RD	Transmit Data Pin 2
Pin 4	RTS	Receive Data Pin 3
Pin 5	CTS	RTS A
Pin 6	DSR	Request To Send Pin 4
Pin 7	Sig Gnd	RTS B
Pin 8	RLSD	Clear To Send Pin 5
Pin 9	+12 Vdc	Pin 5 CTS A'
Pin 10	-12 Vdc	Data Set Ready Pin 6
Pin 16	Echo Sup	Pin 6 CTS B'
Pin 17	Echo Sup	Pin 7 TD A
Pin 20	DTR	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 <sup>(2)</sup>	TD, RD, RTS, CTS
Control Lines <sup>(2)</sup>	RTS, CTS, DTR, DSR, RLSD
Null Modem Switch	1 (Reverses RS-232 pins 2 and 3)
RS-485 Output Drive	60mA maximum/output
RS-485 Input Impedance	12kΩ min/input
Power:	
AC operation <sup>(3)</sup>	12 Vac, ±10%, 10 W screw terms 1 and 2
DC operation	11.5 to 17 Vdc @ 500mA on pin 9 -11.5 to -17 Vdc @ 100mA on pin 10
Operating Environment	0 to +70°C, 0-95% relative humidity, noncondensing
Dimensions	53.3 H x 167.6 W x 32.5 mm D (2.1 x 6.6 x 1.28")
Weight	200 g (7 oz) maximum
AC Transformer	311.8 g (11.0 oz) maximum
MTBF <sup>(4)</sup>	>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).



OMEGACARE<sup>SM</sup> extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARE<sup>SM</sup> covers parts, labor and equivalent loaners.

To Order		
Model No.	RS232 Connector	Power Source
LDM485-P	25 Pin male	Host-powered
LDM485-S	25 Pin female	Host-powered
LDM485-PT	25 Pin male	Transformer
LDM485-ST	25 Pin female	Transformer

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

Ordering Example: LDM485-ST converter.