LDM80

Signal Powered Fiber Optic Modem

Description

The LDM80 is a small, inexpensive fiber optic transmitter/receiver completely powered by the host RS-232 port. The enclosure for the LDM80 is a conductive shell which greatly reduces RF radiation and susceptibility. The rugged metal enclosure is small enough to mount on the back panel of typical computer equipment saving valuable desk and floor space. A pair of these units allows most RS-232C cable links to be replaced and extended with a duplex fiber optic cable. The normal 50-foot (15m) RS-232 limit may be extended to 2.2 miles (3.5 km). Fiber optic data communications provide complete EMI/RFI rejection, isolation, elimination of ground loops, and reduced error rates. Data security is enhanced by almost nonexistent electromagnetic emissions. The RS-232 connection is through male or female EIA 25-pin connectors. The fiber optic connection is either through SMA (905) or ST connectors.

The LDM80 is equivalent to a 3-wire, full duplex, RS-232 circuit. Handshake signals are locally connected as in Figure 1. Indicating LEDs come on during a "SPACE" on transmit or receive data. A TD/RD reversing DIP switch is provided for connection to DTE (Data Terminal Equipment) or DCE (Data Communication Equipment) ports.

▶ Features

- Data Rates to 19.2k Baud at 2.2 Miles (3.5km)
- 17dB Optical Link Power Budget
- Powered by RS-232 Host Port Signals
- Full Duplex Asynchronous Operation
- Indicating LEDs
- DCE/DTE Switch
- Designed for FCC Class A Requirements
- Complies with FCC Class A Requirements
- Connectored Cables Available
- Pinned or Socketed RS-232 Connectors
- CE Compliant

Specifications

Model	LDM80		
Baud Rate Range	0-19.2K		
Distance Over Baud Rate Range			
Fiber Core Diameter (μm)	Max Cable Length		Loss Budget (dB)
100.0 (glass)	2.2 mi	(3.5) (km)	17
50.0 (glass)	1.6	(2.6)	9
62.5 (glass)	1.2	(1.9)	11
85.0 (glass)	2.2	(3.5)	16
200.0 (glass)	2.2	(3.5)	23
1000.0 (plastic)	98 feet	30 (meters)	32
Modes	Asynchronous 2-fiber full duplex, 1-fiber simplex		
Channel Lines(1)	TD, RD		
Control Lines(1)	RTS, CTS, DTR, DSR, RLSD		
Optical Transmitter Output from 1m cable	850 nm wavelength -26dB typ, -27dB min, -18dB max		
Optical Receiver Power Input for 4μs Pulse Distortion	-44dB min		
Optical Connectors	ST, SMA (905) Compatible		
RS-232 Output Voltage with 3kΩ Load	+5V logic 0, -5V logic 1		
DCE/DTE Switch	1		
Diagnostic LEDs	2		
Power			
Port Power	+5.0 to +8.5VDC, no current limit, 5mA		
and/or DC operation	>+8.5 VDC, 10mA current limit		
Environmental:			
Operating Temperature Range	-20°C to +70°C		
Storage Temperature Range	-40°C to +85°C		
Relative Humidity	0-95% non-condensing		
Dimensions	3.57" x 2.1" x 0.74" (90.7mm x 53.3mm x 18.8mm)		
Weight	4.2 oz (119g) max		
MTTF(2)	>100,000 hrs		

Dataforth does not authorize or warrant its products for use in life support/critical applications.

NOTES:
(1) 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.
(2) Ground-benign environmental conditions (no salt atmosphere, <50°C ambient temperature).

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Recommended Cables

The LDM80 optical transmitter may be used with a wide range of fiber sizes. Specifications are for 100/140μm. Other fiber sizes may be used with a resulting different cable loss budget. See **Specifications** on previous page for cable diameter, distance, and loss budget trade-off. Fiber optic cables may be ordered with connectors factory installed.

Model	LDM85CA (1 or 2) Cable
No. of Fibers	One (CA1) or two (CA2)
Fiber Type	Glass
Connector Type	ST, SMA (905)
Core Diameter	100μm
Cladding Diameter	140μm
Outside Cable Diameter	0.12 in (3 mm) each
Max Attenuation Per Channel	2dB plus 6.4dB/mi (4dB/km)
Max. Installation Load Per Channel	67 lb (300 N)
Max. Operational Load Per Channel	33 lb (150 N)
Min. Bend Radius-Unloaded	1.2 in (3 cm)
Temperature	
Operating	-20°C to +70°C
Storage	-40°C to +85°C
Relative Humidity	0-95%, non-condensing

Pin Descriptions		Fiber Optic
Pin 1 Case	Case Ground	
Pin 2 TD	[3] Transmit Data	T
Pin 3 RD	[2] Receive Data	
Pin 4 RTS	[7] Request To Send	
Pin 5 CTS	[8] Clear To Send	R
Pin 6 DSR	[6] Data Set Ready	
Pin 7 SIG GND	[5] Signal Ground	
Pin 8 RLSD	[1] Receive Line Signal Detect	
Pin 20 DTR	[4] Data Terminal Ready	

Pin numbers given are for the 25-pin connector with the 9-pin equivalent in [ ].

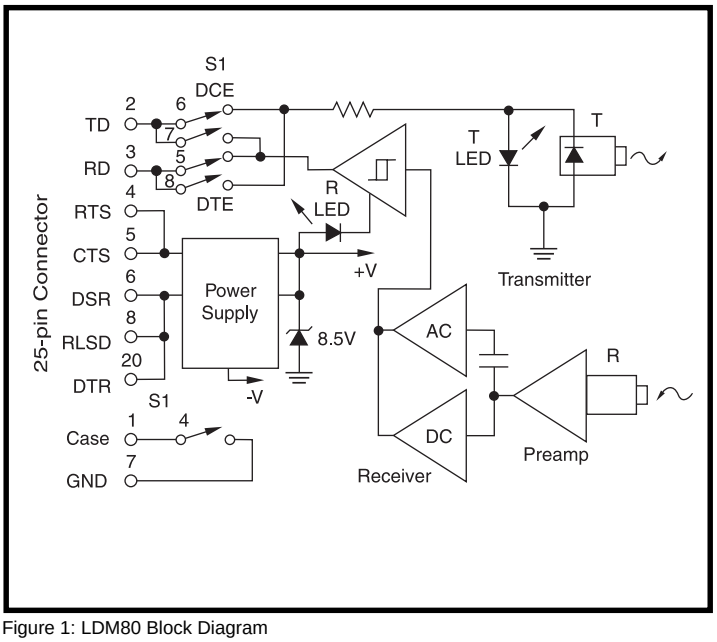


Figure 1: LDM80 Block Diagram

Installation

Power is supplied through a high RS-232 signal, normally current limited, applied to any of pins 4, 5, 6, 8 or 20. If the LDM80 is powered by a voltage source, V > +8.5VDC, the current must be limited to 10mA. Voltage sources, V < = +8.5VDC, will need no current limit. Voltage sources, V < +8.0VDC, will lower transmission distances. The minimum operating supply voltage for the LDM80 is +5.0VDC and correct operation below this voltage is not guaranteed.

WARNING! *Voltage sources greater than +8.5VDC without current limit will damage the LDM80!*

For installation check-out it is recommended that a short fiber optic cable be connected from transmit to receive on a locally connected device. See Figure 2 for a typical installation.

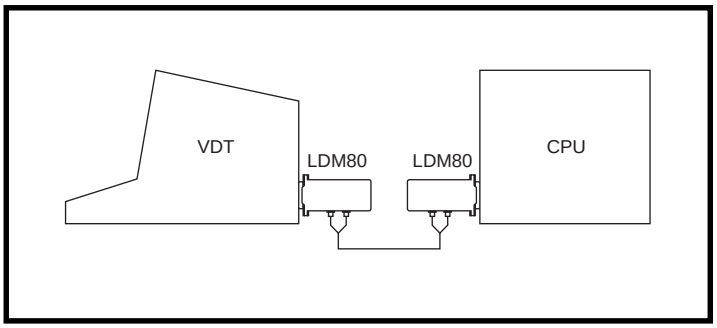


Figure 2: Typical LDM80 Installation

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Ordering Information

Model	Description
LDM80-P	Pinned RS-232 connector, SMA (905) fiber optic connector
LDM80-S	Socketed RS-232 connector, SMA (905) fiber optic connector
LDM80-P-025	Pinned RS-232 connector, ST fiber optic connector
LDM80-S-025	Socketed RS-232 connector, ST fiber optic connector
LDM85CA1-XXXX(1)	Single-channel optical cable,SMA
LDM85CA2-XXXX(1)	Dual-channel optical cable, SMA
LDM86CA1-XXXX(1)	Single-channel optical cable, ST
LDM86CA2-XXXX(1)	Dual-channel optical cable, ST

NOTES:
(1) Specify length to the nearest meter. Example: LDM85CA2-0550 for 550 meters dual cable. Maximum length available is 1000 meters.

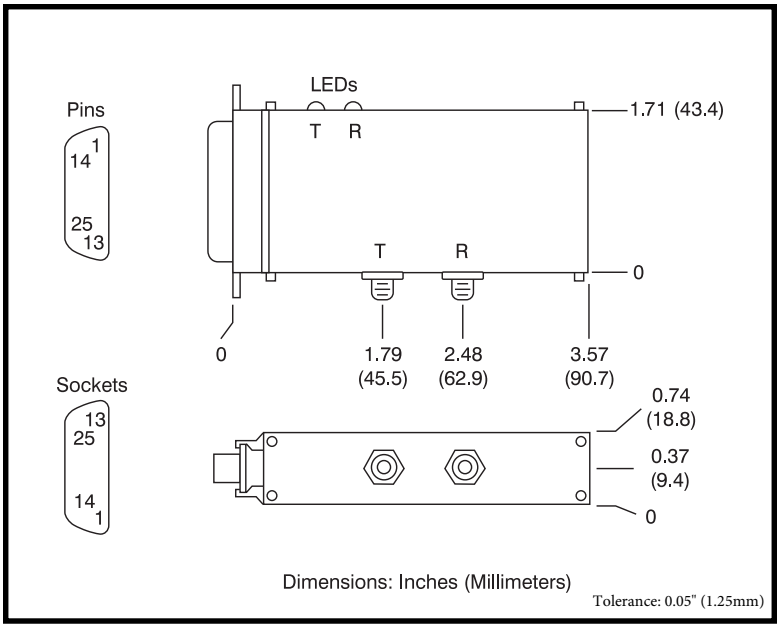


Figure 3: LDM80 Dimensions

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