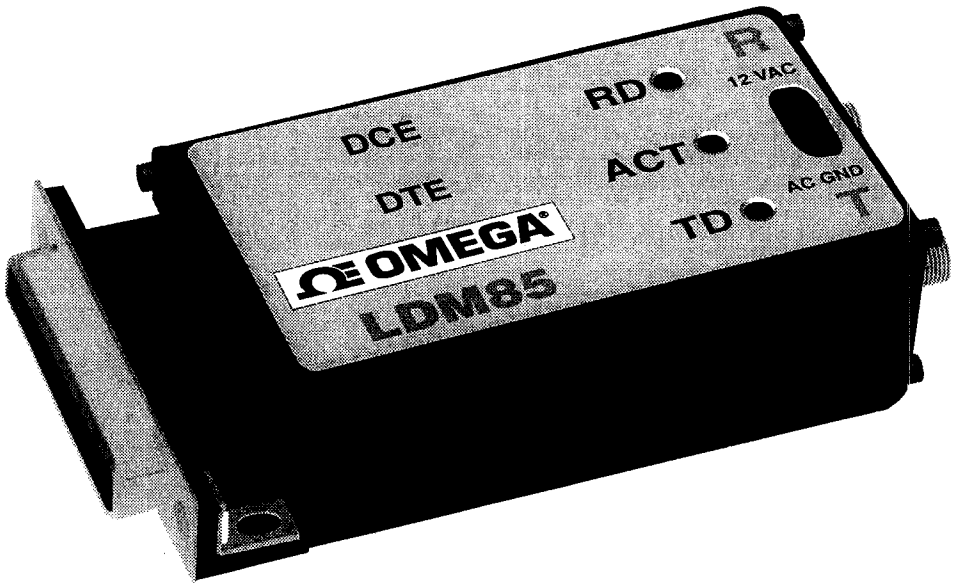
LDM85

Fiber-Optic Modem



OMEGA®

An OMEGA Technologies Company

Operator's Manual

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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):

- LDM85 Modem
- Operator's Manual.

If you have any questions about the shipment, please call the OMEGA Customer Service Department.

When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

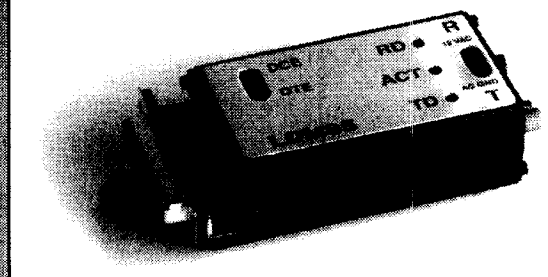
LDM85

Fiber-Optic Modem

Description

The LDM85 is a small, inexpensive fiber-optic transmitter/receiver. It features a complete RS-232 port as well as high speed TTL/RS-422/RS-423 data transmit and receive. It is capable of data rates from DC to 5M baud. 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 RS-232 limit may be extended to 1.2 miles (2 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. A unique multipoint capability allows local area networks to be formed with the isolation and data security of a fiber optic data highway.

The LDM85 is packaged in a rugged aluminum enclosure small enough to mount on the back panel of typical computer equipment, saving valuable desk and floor space. 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. Additional features include a TD/RD reversing switch for connection to DTE (Data Terminal Equipment) or DCE (Data Communication Equipment) ports, three diagnostic LED indicators, and locally connected handshake lines. The TTL port combined with the RS-232 port may be interfaced to RS-422/423 ports.



Features

- DATA RATES TO 5M BAUD
- RS-232, RS-422, TTL SYSTEM INTERFACES
- MULTIPOINT CAPABILITY
- LED INDICATORS
- DCE/DTE SWITCH
- SMALL SIZE
- LOW COST
- SMA- OR ST-COMPATIBLE OPTIC CONNECTORS
- 120/220VAC, +5VDC OR 8 TO 20VAC/DC POWER

Specifications

Model	LDM85
Baud Rate Range TTL Baud Rate Range RS-232	0 -- 5M, 0 – 2.5M NRZ 0 -- 100K
Distance (miles)	Up to 1.2 depending on cable
Distance (km)	Up to 2 depending on cable
Channel Lines[1]	TD, RD, TTL TD, TTL RD
Control Lines[1]	RTS, CTS, DSR, DTR, RLSD
Modes	Asynchronous 2-fiber full duplex, 1-fiber simplex
Optical Transmitter	820 nm wavelength -11.5 dBm typical output from 1 m cable, -16 dBm minimum output (-40°C to +85°C)
Transmitter Numerical Aperture	0.49
Transmitter Optical Port Diameter	290 µm
Optical Receiver	-25 dBm to -12 dBm dynamic range for logic 1, -24 dBm minimum input logic 1 (-40°C to +85°C), -40 dBm maximum input logic 0
Receiver Equivalent Numerical Aperture	0.50

Model	LDM85
Receiver Optical Port Diameter	400 µm
Power Budget	8 dB (-40°C to +85°C), 10 dB (-20°C to +55°C)
Optical Connectors	SMA (905), ST
DCE/DTE Switch	1
Diagnostic LEDs	3
Power: AC operation[2] DC operation	 120 VAC or 220 VAC (3W wall transformer) or 10 VAC to 20 VAC (3W transformer rating) +8 VDC to +24 VDC @ 130 mA or +5 VDC ±0.25 VDC @ 130 mA
Operating Environment	-40°C to +85°C, 0 to 95% relative humidity non-condensing
Dimensions	3.75 in x 2.1 in x 1 in (95.3 mm x 53.3 mm x 25.4 mm)
Weight PT3, PT3E	3.7 oz (105 g) max 11.0 oz (311.8 g)
MTBF[3]	>120,000 hrs

Notes: (1) TD = Transmit Data, RD = Receive Data, TTL TD and TTL RD are DCE referenced TTL signals, RTS = Request To Send, CTS = Clear To Send. DTR = Data Terminal Ready, DSR = Data Set Ready, RLSD = Received Line Signal Detect. (2) 120VAC and 220VAC power transformers are available. (3) Ground-benign environmental conditions (no salt atmosphere, <50°C ambient temperature).

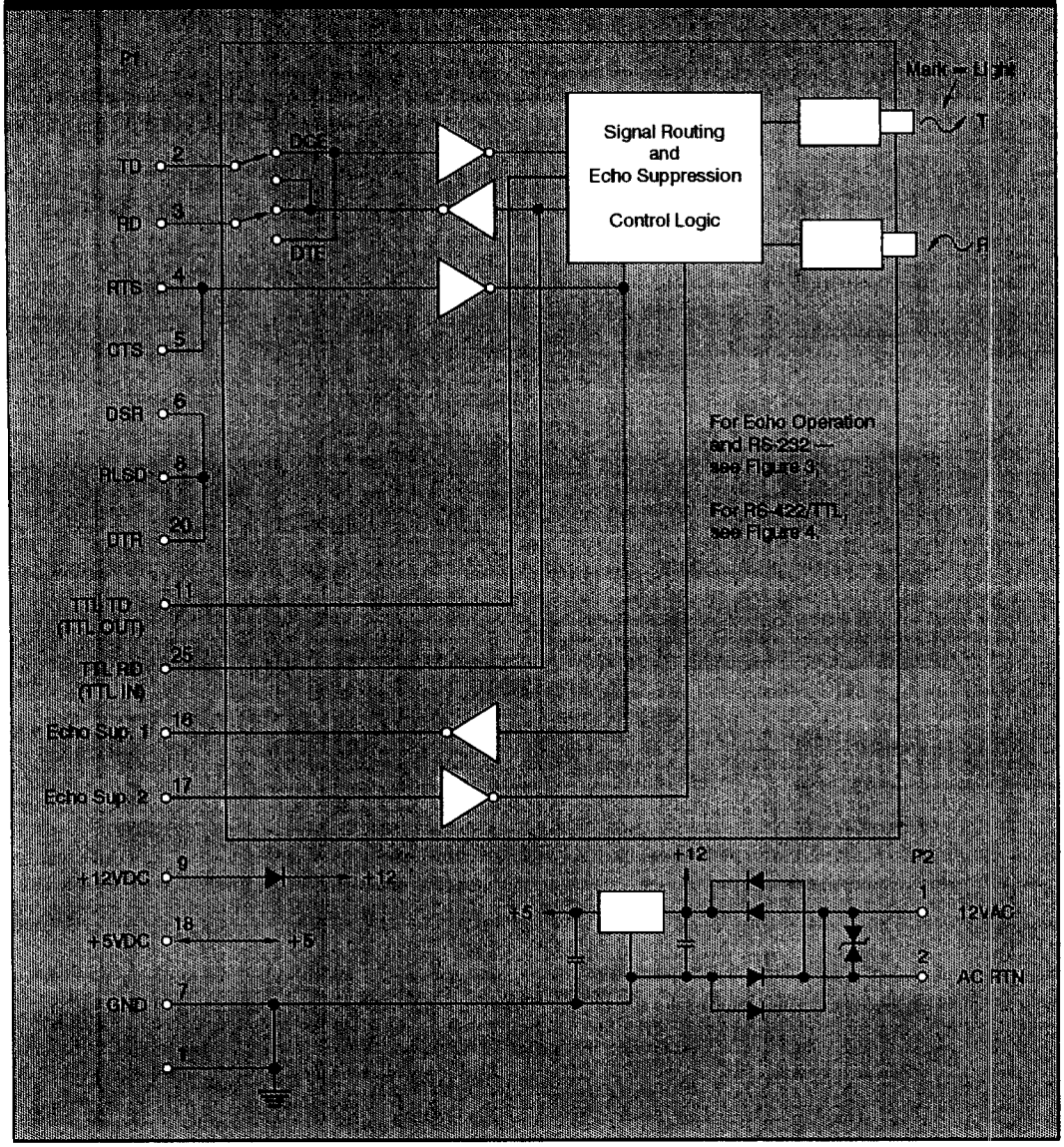
Recommended Cables

The LDM85 optical transmitter is optimized for launching power into fiber sizes 85/125, 100/140, and 200 μm plastic coated silica (PCS). Due to a lensed optical system, receiver response does not vary with fiber size.

Multipoint Operation

Local area networks are easily implemented with LDM85. When a talker unit raises Request To Send (RTS), its data is communicated to all other devices on a common loop. Data returns to the sending unit, verifying physical integrity of the loop. Alternately, if pin 16 is strapped to pin 17, echo will be inhibited. Units may be ordered with this connection made internally. For multipoint installations, it is important that power be applied to all LDM85s. For small networks, it will likely be acceptable to power each unit from a local source. Larger networks may benefit from routing a common low-voltage power bus along with the fiber-optic cable. An AC bus with isolation transformers at each unit will preserve system resistance to electrical disturbances. The wide low-voltage AC and DC tolerance makes voltage drop on this bus easily accommodated.

Figure 1. LDM85 Block Diagram



P1 Pin Descriptions

Pin 1	SHIELD	Case Ground
Pin 2	TD	Transmit Data
Pin 3	RD	Receive Data
Pin 4	RTS	Request To Send
Pin 5	CTS	Clear To Send
Pin 6	DSR	Data Set Ready
Pin 7	GND	Signal Ground
Pin 8	RLSD	Receive Line Signal Detect
Pin 9	+12 VDC	+12 VDC Power In
Pin 11	TTL TD	TTL TD Inverse of TD Was TTL OUT
Pin 16	Echo Sup 1	Echo Suppress Control Out
Pin 17	Echo Sup 2	Echo Suppress Control In
Pin 18	+5 VDC	+5 VDC Power In or Pull Up Power Out
Pin 20	DTR	Data Terminal Ready
Pin 25	TTL RD	TTL RD Inverse of RD Was TTL IN

P2 Pin Descriptions

Pin 1	12 VAC
Pin 2	AC RTN (GND)

Fiber Optic

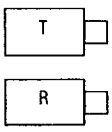


Figure 2. Alternate RS-422/423 Connections

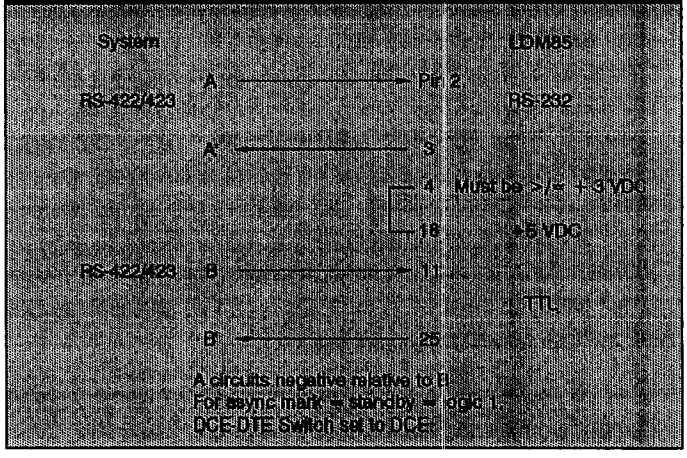
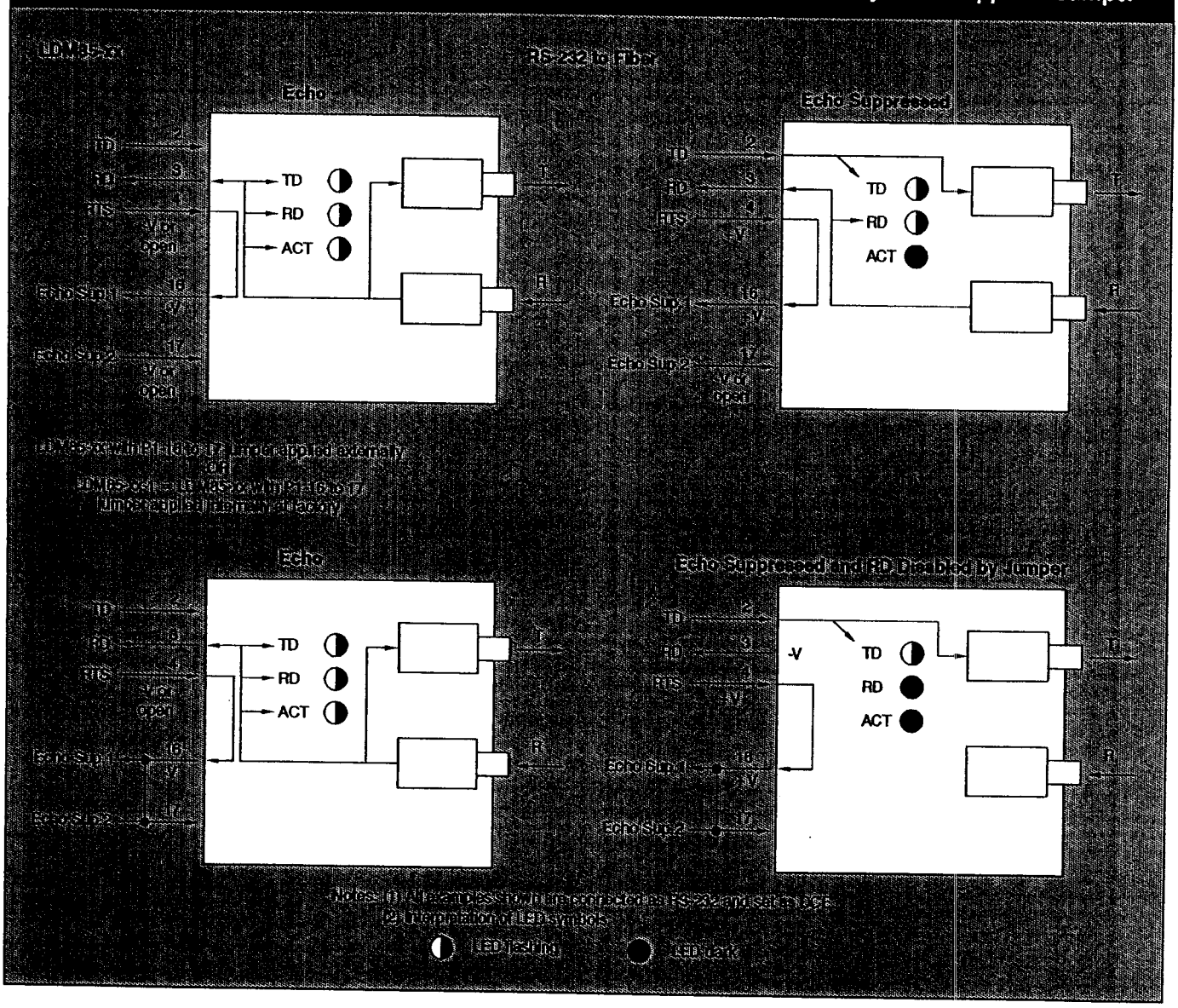


Figure 3. LDM85 Echo Operation Illustrated by Signal Paths and as Modified by Echo Suppress Jumper



Installation

For installation and check-out, it is recommended that a short fiber optic cable be connected from transmit to receive on a locally connected device. Then the computer, or alternately a computer terminal, may send characters to itself. During data transmission, the transmit (TD) and receive (RD) LEDs will come on during data spaces. The activity (ACT) LED is on when RTS is disabled and the optic receiver is spacing (no light). This indicates activity from a remote unit. The DCE/DTE switch is provided as a convenience to allow easy hookup to either terminal or communications equipment—it reverses pins 2 and 3 on the RS-232 connector. TD LED operation as above will indicate correct setting of the switch.

AC or DC power may be applied to the screw terminals or to pin 9 of the 25-pin connector. Alternatively the unit may be powered by +5 VDC on pin 18.

WARNING! *Observing the transmitter output power under magnification may cause injury to the eye. Observing the output under magnification may exceed the limits recommended in ANSI Z136.1 — 1981.*

Figure 4. LDM85 Echo Operation Illustrated by Signal Paths and as Modified by Echo Suppress Jumper

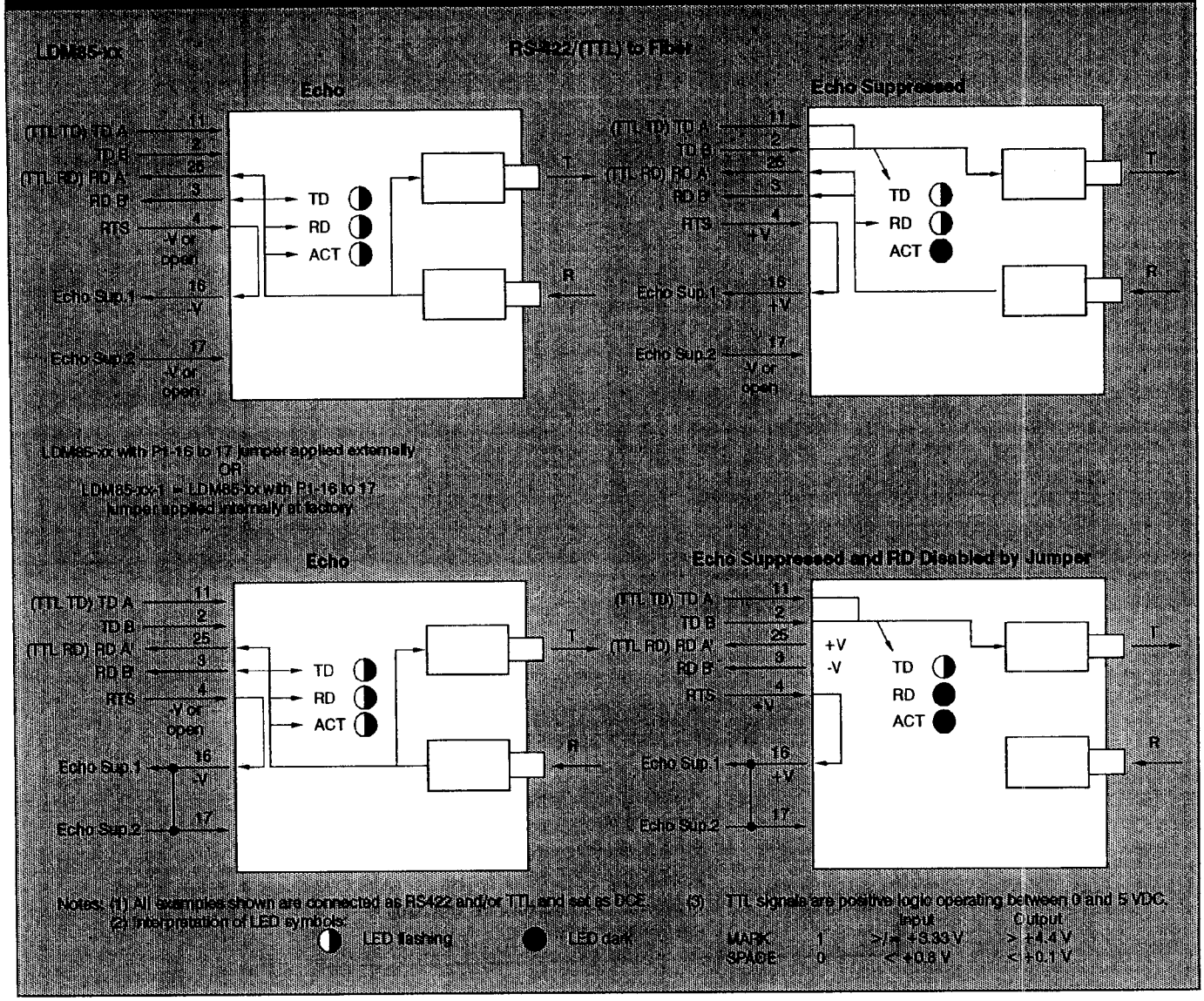


Figure 5. Single-Drop Connection

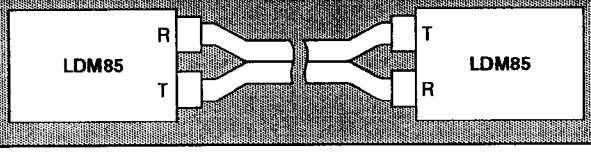


Figure 6. Multipoint Connection

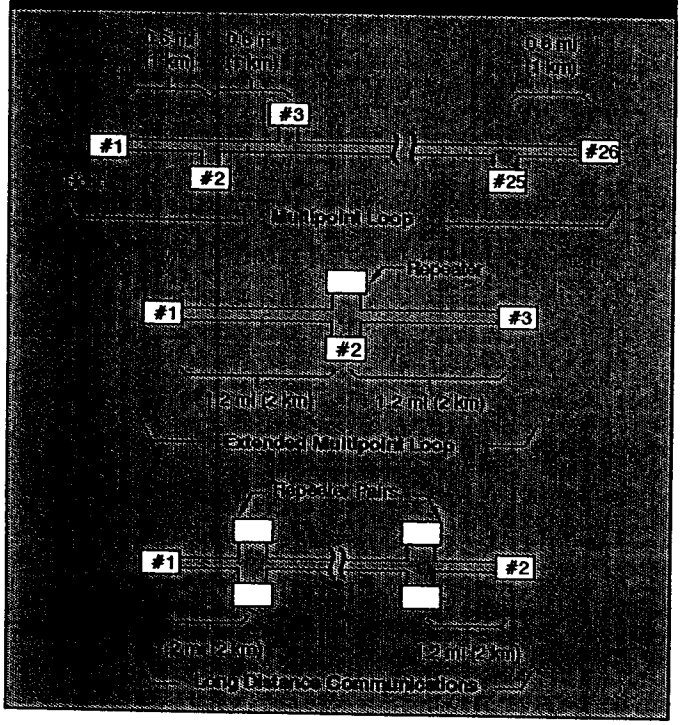
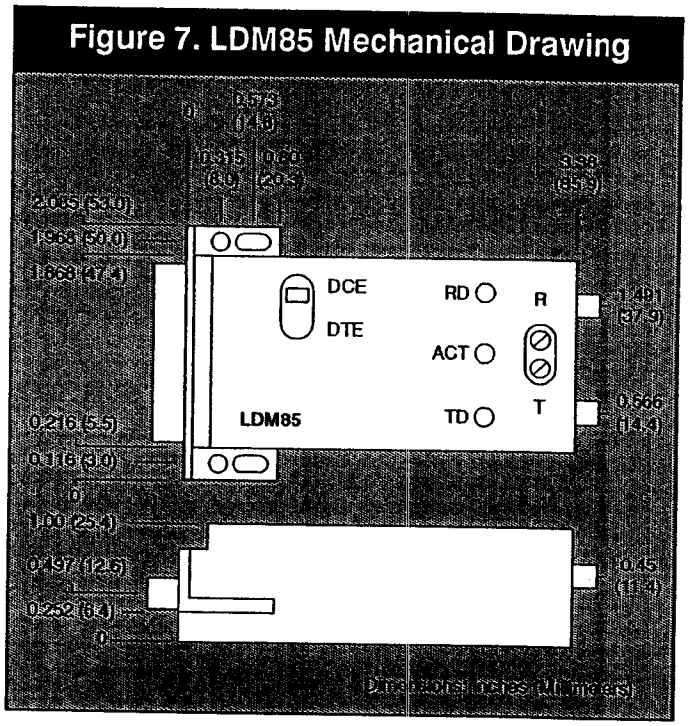


Figure 7. LDM85 Mechanical Drawing



Models

Model	Description
LDM85-P[1][3]	Pinned RS-232 connector, 5 VDC
LDM85-S[1][3]	Socketed RS-232 connector, 5 VDC
LDM85-PT[1][3]	Pinned RS-232 connector, U.S. wall transformer, 120 VAC
LDM85-ST[1][3]	Socketed RS-232 connector, U.S. wall transformer, 120 VAC

MADE IN USA

WARRANTY/DISCLAIMER

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID, if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. Nevertheless, OMEGA only warrants that the parts manufactured by it will be as specified and free of defects.

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Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
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FOR **NON-WARRANTY** REPAIRS OR **CALIBRATION,** consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:

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2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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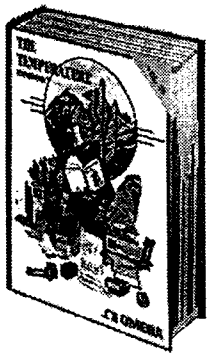

TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
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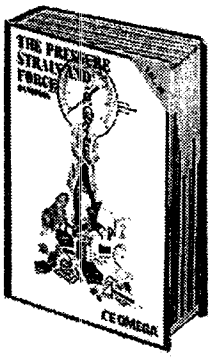

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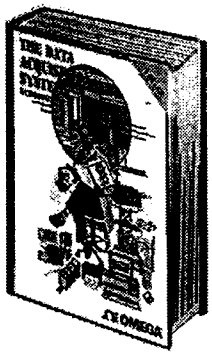

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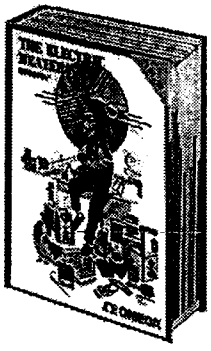

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