

HIGH SPEED ETHERNET DATA LINE PROTECTOR

APPLICATIONS

- ✓ Ethernet - 10/100 Base T
- ✓ Category 5 Systems
- ✓ RS-485 Serial Communication Lines
- ✓ ISDN Equipment/Systems
- ✓ Video Transmission Systems

IEC COMPATIBILITY (EN61000-4)

- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns
- ✓ 61000-4-5 (Surge): 8/20 μ s - 95A, L4(Line-Gnd) & 48A, L4(Line-Line)

FEATURES

- ✓ **Low Capacitance - 25pF**
- ✓ Designed for EIA Standard RS-485 Data Lines
- ✓ Permanent Two-Stage 2 Line Pair Protection
- ✓ Subnanosecond Response Time
- ✓ Common & Differential Mode Protection
- ✓ Automatic Reset - Does Not Interrupt Service
- ✓ Effective Against Lightning, Inductive Switching and ESD

MECHANICAL CHARACTERISTICS

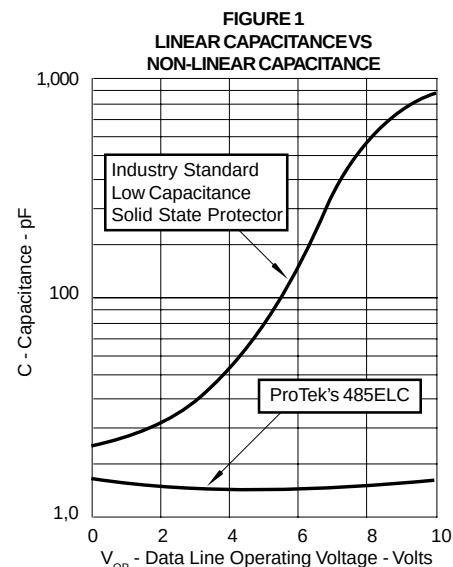
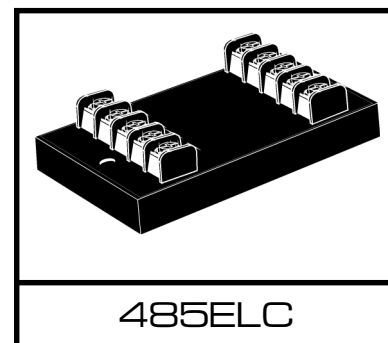
- ✓ Weight: 485ELC - 142 grams(Approximate)
- ✓ Flammability Rating UL 94V-0
- ✓ Device Marking: Logo, Part Number & Terminal Designations

DESCRIPTION

The 485ELC is low capacitance, two-stage transient voltage protector that provides primary and secondary protection against lightning, inductive switching and electrostatic discharge (ESD) transient threats. The first stage diverts the transient current through the ground terminal return path and the second stage clamps the voltage to a safe level without interruption of service.

The 485ELC is designed to protect data lines, transmission lines, timing and control interface circuits from common-mode (line-to-ground) or differential (line-line) transients. Terminals 1 & 2 and 3 & 4 are designed as line pairs. A transient voltage suppressor is connected across each line pair for differential mode protection.

Capacitance over the operating voltage range is important. If capacitance is non-linear, distortion, loss of data or access to the I/O port can occur (See Figure 1).



MAXIMUM RATINGS @ 25°C		ELECTRICAL CHARACTERISTICS @ 25°C			
Peak Operating Line Voltage (V _{OP})	±7V	MAXIMUM CLAMPING VOLTAGE (8/20 μ s) @ 500A V _C VOLTS	MAXIMUM LINE THRUPTUT RESISTANCE R OHMS	MAXIMUM LEAKAGE CURRENT @ 7V _{OP} I _d μ A	MAXIMUM CAPACITANCE @ 0-7V, 1MHz C pF
Operating Line Current (I _O)	250mA				
Maximum Transient Voltage	20kV				
Maximum Transient Current (8/20 μ s waveform)	10kA/Wire				
Operating & Storage Temperature	40kA/Protector				
Response Time	-55°C to 100°C				
	< 1 nanosecond	20	12	10	25

INSTALLATION INSTRUCTIONS

This product should be located as close as possible to the equipment being protected. A low impedance grounding system is important to maintain a low clamping voltage between the line-to-ground connection.

There are five (5) terminals on both the **line** and **equipment** side of the 485ELC - four data line terminals and two ground terminals. Both ground terminals, as shown on the label, are connected internally. A single ground connection is sufficient. However, it is recommended that both ground connections be used for a lower impedance path to earth. This connection can be made through the green AC power ground wire or a known earth ground. The ground wire should be #14 stranded wire.

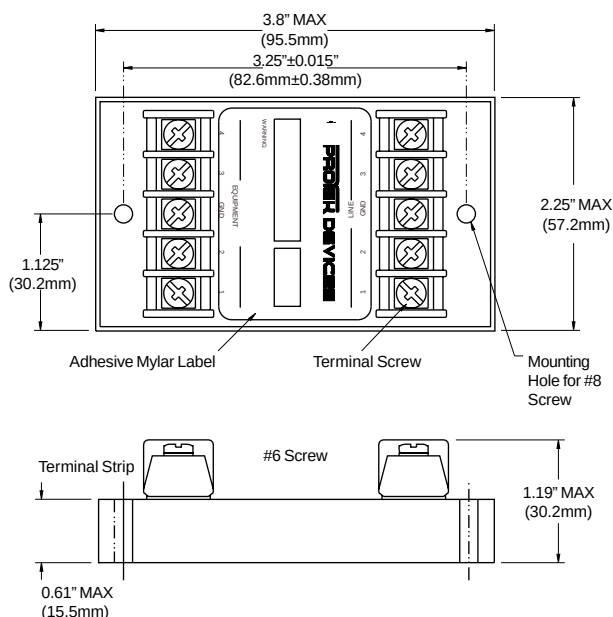
Incoming data lines are to cut or disconnected from the equipment to insert the 485ELC product. The **line** side of the terminals are to be connected to data lines from the outside world or lines that carry the transient threats into the equipment to be protected. The **equipment** side of the terminals are to be connected to the equipment to be

protected. The location of the product should be such that these wires are as short as possible. A #18 or 20 gauge wire can be used for these connections.

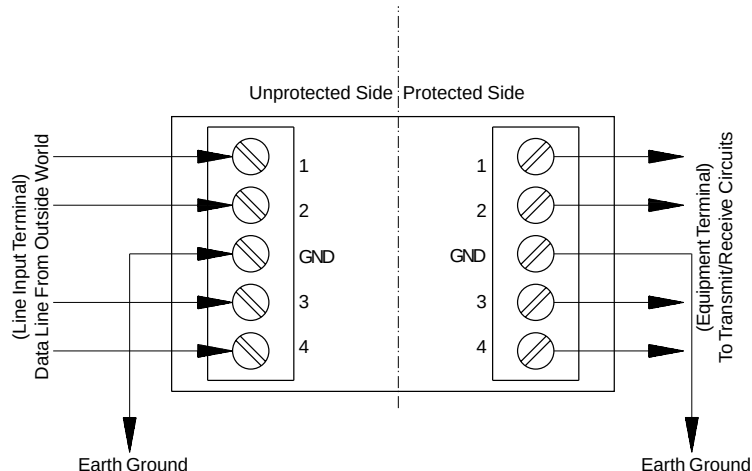
ProTek's data line protector is designed with a short circuit failure mode to give maximum protection. A fuse, fusable link, or circuit breaker is recommended for each data/signal line on the input (line) side of the protector for those applications that require an open circuit failure mode.

Caution: A low DC resistance ground may not be indicative of a good lightning ground. Lightning contains a broad spectrum of frequencies - up to 1 MHz. A low impedance path to ground at the transient frequencies is necessary. A ground strap is recommended or a #6 AWG stranded wire. For wire lengths over 1.5 meters, there may be some excessive line to earth potential under severe thunderstorm conditions. For these applications, an additional protector may be necessary at the equipment interface.

485ELC Case Outline



INSTALLATION DIAGRAM



Note: Both ground terminals are common. Use second ground wire to reduce impedance on long runs to earth ground connections

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