

## HIGH SPEED ETHERNET DATA LINE PROTECTOR



### 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).

### APPLICATIONS

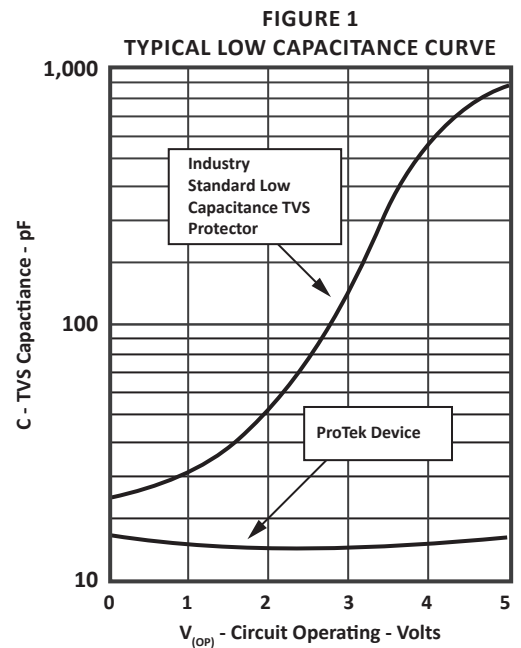
- Ethernet & Category 5 Systems
- RS-485 Serial Communication Lines
- ISDN Equipment/Systems
- Video Transmission Systems
- Smoke Detector & Fire Alarm Systems

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 95A, 8/20 $\mu$ s, Level 4 (Line-Gnd) & 48A, Level 4 (Line-Line)
- Low Capacitance - 25pF
- Designed for EIA Standard RS-485 Data Lines
- Permanent Two-Stage 2 Line Pair Protector
- Subnanosecond Response Time
- Common & Differential Mode Protection
- Automatic Reset - Does Not Interrupt Service
- Effective Against Lightning, Inductive Switching and ESD

### MECHANICAL CHARACTERISTICS

- Approximate Weight: 142 grams
- Flammability Rating UL 94V-0



**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

PARAMETER	SYMBOL	VALUE	UNITS
Peak Operating Line Voltage	$V_{OP}$	±7	Volts
Operating Line Current	$I_O$	250	mA
Transient Voltage	-	20	kV/Wire
Transient Current - 8/20μs waveform	-	10	kA/Wire
Transient Current - 8/20μs waveform	-	40	kA/Wire
Operating Temperature	$T_A$	-55 to 100	°C
Storage Temperature	$T_{STG}$	-55 to 100	°C
Response Time	-	< 1	ns

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

PART NUMBER	MAXIMUM CLAMPING VOLTAGE (8/20μs) LINE-LINE/LINE-GND @ 500A $V_C$ ±VOLTS	MAXIMUM LINE THRUPUT RESISTANCE R OHMS	MAXIMUM LEAKAGE CURRENT @ 7V <sub>OP</sub> $I_D$ μA	MAXIMUM CAPACITANCE @ 0-7V, 1MHz C pF
485ELC	20.0	12	10	25

## PACKAGE INFORMATION

### INSTALLATION INSTRUCTIONS & DIAGRAM

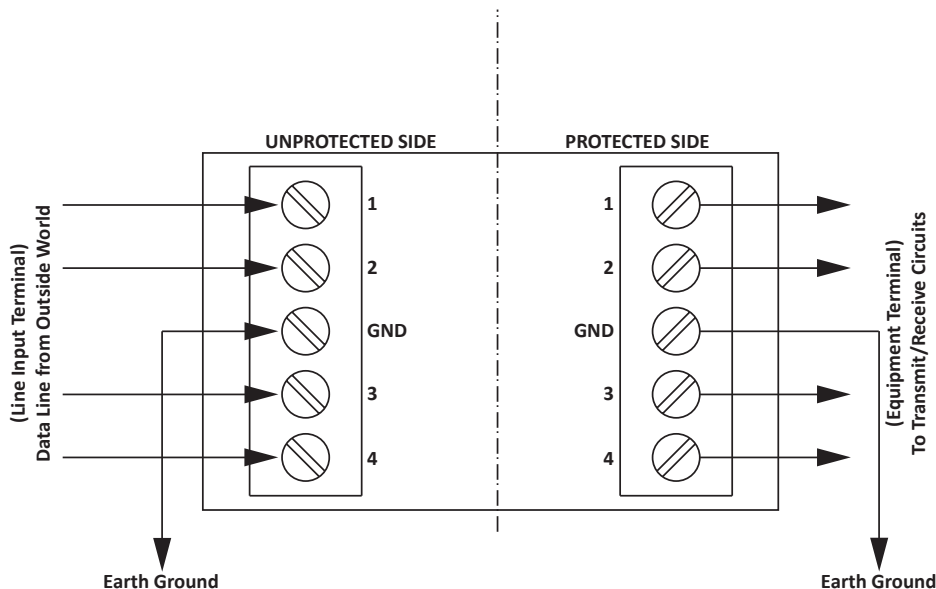
This product should be located as close as possible to the equipment being protected. A low impedance grounding system is important to maintain a low clamping voltage between the line-to-ground connection.

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 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, fusible 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.

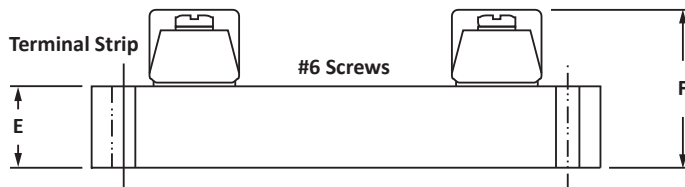
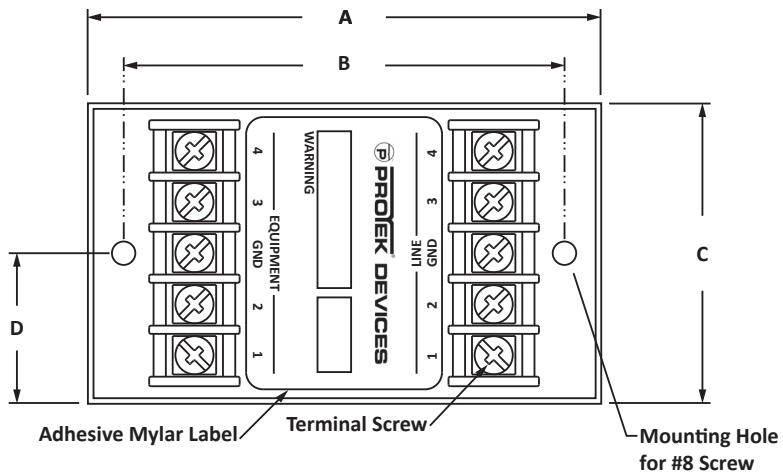


**Note:** Both ground terminals are common. Use second ground wire to reduce impedance on long runs to earth ground connections.

## PACKAGE INFORMATION

### OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	95.5	-	3.8
B	82.22	82.98	3.235	3.265
C	-	57.2	-	2.25
D	-	30.2	-	1.125
E	-	15.5	-	0.61
F	-	30.2	-	1.19



### ORDERING INFORMATION

BASE PART NUMBER	MARKING
485ELC	Logo, Date Code, Terminal Designations and Part Number

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

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