

## Model 2356/2356HV High Speed Lightning Protectors

### Features

- Meets UL1459
- Four Stages of Protection
- Reacts in Nanoseconds
- Fused for Major Faults
- Two Mounting Options

**4 Wire  
Leased  
Line**

### Product Description

Model 2356 is a compact lightning protector for 4-wire (dual twisted pair) telecommunications (TELCO) links to 64 KBPS. Connected between lightning-prone data cabling and the equipment being protected, it prevents lightning or surges from causing equipment damage, or personal injury. Model 2356's fast-acting 250 mA fuse opens within 500 ms to provide isolation should a fallen utility power line accidentally contact the telecommunications wiring, a power cross condition.

### Four-Stage Protection

Model 2356 provides four identical stages of protection for each of the four wires, two twisted pairs, in a 64 KBPS communications or ISDN links. The four protection stages are: fuse, gas discharge tube, and

dual avalanche diodes. Access to the protection circuits is via RJ-45 modular connectors.

Lightning induced spikes can rise at 1000 Volts/microsecond. Model 2356's gas discharge tube bears the brunt of lightning transients—it can safely divert a 5,000 Amp lightning bolt to ground. A superfast avalanche diode, supported by a delay circuit, is the next line of defense. This diode clamps lightning spikes that elude the gas discharge tube to a maximum of 18 Volts. A second avalanche diode imposes a 7.5V ceiling on any further transient energy, reducing lightning glitches to voltage levels safe for RS-232 or RS-422 computer ports. A fuse—the fourth protection stage and a requirement for UL1459 compliance—provides isolation against accidental contact between TELCO wiring and utility power lines as occurs in a power cross condition.

The Model 2356 accommodates low voltage signalling of approximately  $\pm 3$  Volts. The 2356HV provides protection at  $\pm 60$  Volts thereby allowing operation on TELCO lines that use -48 Volt signalling to control diagnostic features of the TELCO equipment.



### Specifications

- Capacity:** 4 lines, two twisted pairs
  - Voltage Clamp:** 2356 -  $\pm 7.5$  Volts  
2356HV -  $\pm 60$  Volts
  - Gas Tube Firing Voltage:** 90 Volts (slow rise)
  - Stages of Protection:** Four. Fuse, Gas tube, and dual avalanche diode.
  - Fuse:** 2 AG, 250 mA
  - Ground Connection:** Screw terminal for #12 AWG wire.
  - Signal Input/Output:** RJ-45
  - Size:** 4.6" L (117mm) x 1.7" W (43mm) x 1.3" H (33mm)
  - Mounting Provision:** Screw down tabs or velcro
- Made by Telebyte in the USA

**Model 2356**  
**Model 2356HV**

## Model 29 DB9 Lightning / Surge Suppressor

### Features

- Protects PC Com Ports
- Nanosecond Response
- DB9 Connectors
- Protects All 9 Lines
- Ground Stud & Wire Included

### Product Description

The Model 29 contains nine (9), 600 Watt, avalanche diodes, one for each line. All diodes are returned to a ground stud on the bottom of the unit. The Model 29 is provided with a 2 foot ground wire and has a male and female DB9 connectors.



The 29 supports RS-232 levels while the 29-1 supports RS-422 levels. The Model 29-1 can also be used for EIA-530 and MIL-STD-188-114.

The Model 29 is a low cost solution to the problem of potential equipment damage from induced transients on RS-232 com ports of PC's.

### Specifications

- Interface:** Model 29 = RS-232  
Model 29-1 = RS-422
  - Connectors:** Data = DB25 M and F.  
Surge ground = Stud with two foot wire supplied
  - Lines Protected:** 9
  - Protection Per Line:** 600 Watts
  - Response Time:** 1 Nanosecond
  - Size:** .85"H (21.6mm) x 1.3"W (66mm) x 3"L (76.2mm)
  - Environment:** -10<sup>0</sup> to 60<sup>0</sup>C
- Made by Telebyte in the USA

**Model 29**  
**(RS-232)**  
**Model 29-1**  
**(RS-422)**

Visit Us on the Internet at: <http://telebyteusa.com>