

## Surge Protectors



The protection you need  
for your data lines.

## FEATURES

- Protect against surges, damage caused by induced lightning, electrostatic discharges, noise, and ground loops.
- Surge protectors are available for various network types.
- Protectors are also available for various communication lines.
- We even carry surge protectors for special equipment, such as CATV, keyboards, and more!

## OVERVIEW

Here's why you need a surge protector:

In an ideal world, the flow of electrical current in your computer systems would be equal at all times. No outside power disturbances would disrupt the balance of power in your electronic devices.

In the real world, however, several forms of power disturbances can wreak havoc on your electrical devices. These power disturbances come in the forms of induced transients (which include lightning, electrostatic discharge [ESD], and noise), ground-loop currents, and surges.

Although only a lightning arrestor can protect against direct lightning hits, a surge protector can guard your equipment against damage caused by induced lightning. To understand the need for this protection, consider the enormous magnitude of energy that a lightning strike generates. As this large current flows through conductors, the expanding magnetic field causes induced current to flow in nearby conductors that could then carry damaging impulses to computers.

A surge protector can also guard against the second type of induced transient, electrostatic discharge (ESD). What we commonly think of as static is that zap we get when we grab something metallic after walking across a carpet during the winter. This static is actually called triboelectricity, from the Greek word *tribo*, which means rubbing. When two unlike materials rub together, the electrons from one and the electrons from the other produce a negative charge (or electrostatic discharge), causing a potential difference between the two surfaces. The excess electrons look for a discharge path, which they find in any good conductor. The excess energy can damage your equipment.

A third type of induced transient, noise, can also damage your equipment. Noise is a signal appearing in a circuit other than the desired signal. It can result from lightning or ESD, but more commonly results from other events happening in the

environment. Low-magnitude noise does not bother a PC, but high-magnitude noise or impulses can interfere with data processing or damage internal components. Noise as it appears on power lines comes in two varieties: normal-mode and common-mode noise. Turning large loads off or on, or shunting utility power-factor correcting capacitors across the line, creates normal-mode noise. Lightning, tripping and reclosing utility breakers, poor grounding techniques, ground faults, radio transmitters, time clocks, and machine tools can cause common-mode noise.

Another hazardous form of power disturbance is called a ground loop. A ground loop is formed when a potential difference exists between any two places that are, by definition, at ground potential. A ground loop may form in a circuit when the circuit contains two or more different ground connections. This circuit may also be formed between boards inside a PC or in a local area network. Whenever there is some impedance existing between two points, voltage can appear across these points and current can flow. Ground loops can also develop because of a circuit wire's length.

The final type of power disturbance which the protectors guard against is, quite obviously, surges. A surge is a short-term voltage increase that exceeds established upper limits for less than 2.5 seconds. Each type of electrical interface contained in your data communications equipment has an acceptable operating voltage range. Voltages above the range of the particular device's interface can damage the device in two ways. First, a massive voltage (called a spike) can immediately damage your equipment. Second, multiple smaller out-of-range voltages can gradually damage your equipment over time.

Our surge protectors provide an immediate path to ground, so power disturbances go straight to ground instead of to your equipment.

## Technically Speaking

Choose the model to suit your application from our complete line of in-line surge protectors described below.

- **100BASE-TX Hub Surge Protectors (SP530A-R2–SP532A-R2)**—These models protect 4, 8, or 12 RJ-45 ports on a 100BASE-TX hub.
- **10BASE-T/100BASE-T Hub Surge Protector (SP512A-R3)**—This model protects a 10BASE-T/100BASE-T interface that uses an RJ-45 connector.
- **ARCNET® Surge Protector (SP502A)**—This model protects your ARCNET devices that use a coax, straight connection.
- **CATV Surge Protector (SP517A)**—This model protects CATV (cable TV) F59 interfaces.
- **Centronics® Surge Protector (SP516A)**—This model protects 36-pin Centronics parallel interfaces.
- **DDS Surge Protector (SP527A)**—This model protects the four active leads on a standard DDS line.
- **Thin Protector ST® (SP350A-R2)**—This model protects your 10BASE2 ThinNet coaxial devices that use a straight connection.
- **AUI Surge Protector (SP362)**—This model protects your DB15 AUI interface.
- **Thin Protector T (SP501A)**—This model protects your devices that use a T-style connector for 10BASE2 ThinNet.
- **ThickNet Protectors (SP505A–SP506A)**—These models protect your 10BASE5 interfaces that require N-series connectors.
- **ISDN Data Line Surge Protectors (SP050A-R2, SP060A-R2)**—These models protect terminal adapters, NTUs, and other ISDN equipment. SP050A-R2 is for the U interface; SP060A-R2 is for the S/T interface (8-pin).
- **Keyboard Surge Protector for AT® (SP518A-R2)**—This model protects 5-pin DIN interfaces.
- **Keyboard Surge Protector for PS/2® (SP519A-R2)**—This model protects 6-pin mini-DIN interfaces.
- **RS-232 Surge Protector for DB25 4-Wire Serial (SP141A)**—This model protects Pins 2, 3, 7, and 20 of your RS-232 interface.
- **RS-232 Surge Protector for All Wires (SP360A)**—This model protects all 25 pins on your RS-232 interface.
- **RS-232 Surge Protector for DB9 (SP361A-R2)**—This model protects RS-232 ports that use a DB9 connector.
- **RS-232 Surge Protector for DB15 (SP507A)**—This model protects your RS-232 ports that use DB15 connectors.
- **RS-232 Surge Protector for 4-Wire Serial RJ-11 (SP515A-R2)**—This model protects 4-wire interfaces that use RJ-11 connectors.
- **RS-422 Surge Protector (SP508A)**—This model protects your RS-422 or X.21 ports that use DB15 connectors.
- **T1 Non-Span Surge Protectors (SP513A-R2, SP526A)**—These models protect T1 interfaces that use RJ-45 connectors.
- **Telco Surge Protector (SP365A-R2)**—This model protects dialup telco interfaces.
- **Token Ring Surge Protector (SP522A-R2)**—This model protects 8-wire RJ-45 interfaces.
- **Twinax Surge Protectors (SP525A)**—This model protects twinax interfaces.
- **100BASE-TX Surge Protectors (SP250A-R2–SP251A-R2)**—These models protect a CAT5 100BASE-TX interface. The SP250A-R2 is designed to be installed at the building entrance, and the SP251A-R2 is made for point-of-use installation.





SP250A-R2

SP251A-R2

## TECH SPECS

### Clamping Voltage —

SP530A-R2-SP532A-R2, SP527A, SP050A-R2, SP508A: 7.5 V;  
 SP512A-R3, SP517A, SP516A, SP350A-R2, SP501A, SP505A-SP506A, SP518A-R2-SP519A-R2: 8 V;  
 SP502A: 30 V;  
 SP060A-R2, SP513A-R2, SP526A: 60 V (Pins 1, 2, 4, 5 only for SP060A-R2 and SP526A);  
 SP362A: 9 V;  
 SP141A, SP361A-R2, SP507A, SP522A-R2: 18 V;  
 SP360A: 19 V;  
 SP515A-R2: 27 V;  
 SP365A-R2: 240 V;  
 SP525A: 10 V;  
 SP250A-R2: 13 V;  
 SP251A-R2: 15 V

### Response Time —

SP050A-R2, SP060A-R2: 500 ns;  
 All others: < 10 ns

### Series Resistance —

SP050A-R2, SP060A-R2: 0.34 ohms;  
 All others: None

### Connectors —

SP530A-R2: (8) RJ-45 F;  
 SP531A-R2: (16) RJ-45 F;  
 SP532A-R2: (24) RJ-45 F;

### Connectors (Continued) —

SP512A-R3, SP527A, SP050A-R2, SP060A-R2, SP526A, SP522A-R2, SP250A-R2-SP251A-R2: (2) RJ-45 F;  
 SP502A, SP350A-R2: (1) BNC M, (1) BNC F;  
 SP517A: (2) CATV F;  
 SP516A: (1) 36-pin Centronics M, (1) 36-pin Centronics F;  
 SP362, SP507A, SP508A: (1) DB15 M, (1) DB15 F;  
 SP501A: (1) BNC M, (2) BNC F;  
 SP505A: (2) coax ("N" series) F;  
 SP506A: (1) coax ("N" series) M, (1) coax ("N" series) F;  
 SP518A-R2: (1) 5-pin DIN M, (1) 5-pin DIN F;  
 SP519A-R2: (1) 6-pin-mini-DIN M, (1) 6-pin mini-DIN F;  
 SP141A, SP360A: (1) DB25 M, (1) DB25 F;  
 SP361A-R2: (1) DB9 M, (1) DB9 F;  
 SP515A-R2: (1) RJ-11 6-wire M on 3" (7.6-cm) pigtail, (1) RJ-11 6-wire F;  
 SP513A-R2: (1) RJ-45 M on 3" (7.6-cm) pigtail, (1) RJ-45 F;  
 SP365A-R2: (1) RJ-11 4-wire M on 3" (7.6-cm) pigtail, (2) RJ-45 F;  
 SP525A: (2) Twinax F

Item	Code
100BASE-TX Hub Surge Protectors (RJ-45) 4-Port	<b>SP530A-R2</b>
8-Port	<b>SP531A-R2</b>
12-Port	<b>SP532A-R2</b>
10BASE-T/100BASE-T Hub Surge Protector (RJ-45) 1-Port	<b>SP512A-R3</b>
ARCNET Surge Protector (ST In-Line)	<b>SP502A</b>
CATV Surge Protector	<b>SP517A</b>
Centronics Surge Protector	<b>SP516A</b>
DDS Surge Protector (RJ-45)	<b>SP527A</b>
Ethernet Surge Protectors	
Thin Protector (ST In-Line)	<b>SP350A-R2</b>
AUI	<b>SP362</b>
Thin Protector T	<b>SP501A</b>
ThickNet Protectors Female/Female	<b>SP505A</b>
Male/Female	<b>SP506A</b>
ISDN Data Line Surge Protectors (RJ-45) U Interface	<b>SP050A-R2</b>
S/T Interface (8-Pin)	<b>SP060A-R2</b>
Keyboard Surge Protectors	
AT	<b>SP518A-R2</b>
PS/2	<b>SP519A-R2</b>
RS-232 Surge Protectors	
DB25	
4-Wire Serial	<b>SP141A</b>
All Wires	<b>SP360A</b>
DB9	<b>SP361A-R2</b>
DB15	<b>SP507A</b>
RJ-11 (4-Wire Serial)	<b>SP515A-R2</b>
RS-422 Surge Protector (DB15)	<b>SP508A</b>
T1 Non-Span Surge Protectors (RJ-45) 8-Wire	<b>SP513A-R2</b>
4-Wire	<b>SP526A</b>
Telco Surge Protector (RJ-11)	<b>SP365A-R2</b>
Token Ring Surge Protector (RJ-45 UTP)	<b>SP522A-R2</b>
Twinax Surge Protectors (AS/400®, S/3X) Female/Female	<b>SP525A</b>
CAT5 100BASE-TX Surge Protectors	
Primary (to 2.0 kV)	<b>SP250A-R2</b>
Secondary (to 0.5 kV)	<b>SP251A-R2</b>