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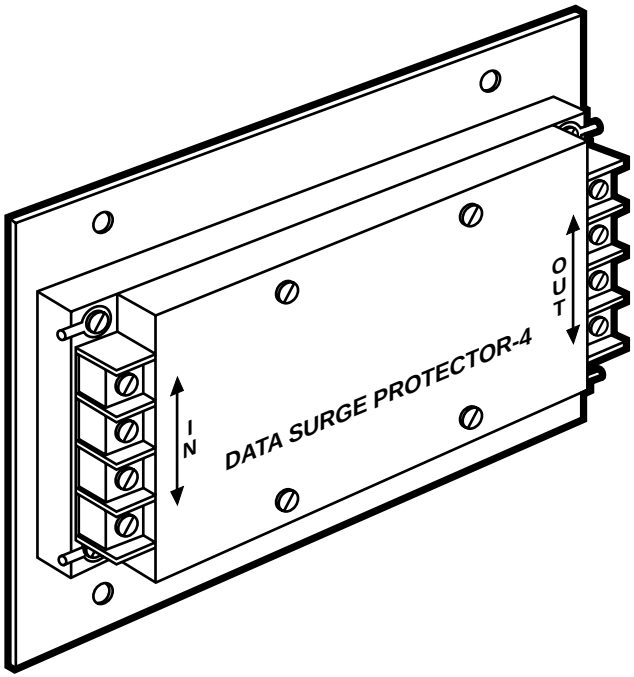
BLACK BOX®
NETWORK SERVICES

JUNE 2000

| | |
|---|---|
| SP260 | SP321A |
| SP300A | SP325A |
| SP305A | SP326A |
| SP310A | SP330A |
| SP315A | SP335A |
| SP320A | SP336A |

# RS-232 Terminal-Strip Surge Protectors
# RS-422 Terminal-Strip Surge Protectors




**CUSTOMER SUPPORT INFORMATION**

Order **toll-free** in the U.S. 24 hours, 7 A.M. Monday to midnight Friday: **877-877-BBOX**
FREE technical support, 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mail order: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
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**TRADEMARKS USED IN THIS MANUAL**

Any trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

# 1. Specifications

| | |
|---|---|
| **Clamping Time —** | <50 nanoseconds |
| **Clamp Voltage —** | RS-232: ±25V; RS-422: ±12V |
| **Series Resistance —** | Less than 2 ohms per line |
| **Maximum Speed —** | 19.2 Kbps |
| **Interface —** | RS-232/RS-422 |
| **Circuits —** | 2, 4, 6, 8, 10, or 32 isolated |
| **Connector —** | Hardwired |
| **Capacitance —** | Approximately 1000 pF |
| **Leakage Current —** | 2 microamps |
| **Steady-State Power —** | 5 watts @ 75°C |
| **Surge Capabilities —** | 200 amps for 1 msec |
| **Operating Temperature —** | -85 to +167°F (-65 to +75°C) |
| **Peak Pulse Power —** | 1500 watts |
| **Standoff Voltage —** | RS-232: 18 volts; RS-422: 8.2 volts |
| **Size and Weight —** | Listed on the next page |

| Part Number | Height | Width | Depth | Weight |
|---|---|---|---|---|
| SP300A, SP305A | 3" (7.62 cm) | 6" (15.2 cm) | 1.5" (3.8 cm) | 6.9 oz. (195.6 g) |
| SP310A, SP315A | 3.75" (9.52 cm) | 6" (15.2 cm) | 1.5" (3.8 cm) | 9.2 oz. (260.8 g) |
| SP320A, SP325A | 4.5" (11.4 cm) | 6" (15.2 cm) | 1.5" (3.8 cm) | 12 oz. (340.2 g) |
| SP321A, SP326A | 5.63" (14.3 cm) | 6" (15.2 cm) | 1.5" (3.8 cm) | 16 oz. (453.6 g) |
| SP330A, SP335A | 6.86" (17.4 cm) | 6" (15.2 cm) | 1.5" (3.8 cm) | 18 oz. (510.3 g) |
| SP260, SP336A | 16" (40.6 cm) | 6" (15.2 cm) | 1.5" (3.8 cm) | 53 oz. (1502.6 g) |

# 2. Description

The Terminal-Strip Surge Protectors suppress transient power surges caused by induced voltages on data lines. They protect the equipment to which they are attached. For optimum performance, the Surge Protector must be as close to the protected equipment as possible and share a common electrical ground with the equipment. Use the Surge Protectors in pairs to protect both ends of the data line connected to your equipment.

The Surge Protector works by sensing any voltage above its threshold (25V for RS-232 models or 12V for RS-422 models). When it senses the voltage, the Surge Protector begins to clamp all electrical impulses to ground.

| Code | # of Lines Protected | Clamping Voltage | Interface |
|---|---|---|---|
| SP260 | 32 | 25V | RS-232 |
| SP300A | 2 | 25V | RS-232 |
| SP305A | 2 | 12V | RS-422 |
| SP310A | 4 | 25V | RS-232 |
| SP315A | 4 | 12V | RS-422 |
| SP320A | 6 | 25V | RS-232 |
| SP321A | 8 | 25V | RS-232 |
| SP325A | 6 | 12V | RS-422 |
| SP326A | 8 | 12V | RS-422 |
| SP330A | 10 | 25V | RS-232 |
| SP335A | 10 | 12V | RS-422 |
| SP336A | 32 | 12V | RS-422 |

# 3. Installation

Connect the Surge Protector in series to the data lines you wish to protect. The unit isolates each of the data-line conductors. (See Figure 3-1.) Install the Surge Protectors in pairs, one at each end of a data line, as close as possible to the equipment you want to protect. Follow the instructions below to install your Surge Protectors:

Step 1: Cut the RS-232 or RS-422 cable at the point on the data line where you will connect the Surge Protector, which should be as close as possible to the device you are protecting.

Step 2: Strip back the individual conductors to expose ¾" to 1" of bare copper wire.

Step 3: Attach the individual conductors to the screw locks on the Terminal-Strip Surge Protector. Attach the side of the protector marked “IN” to the RS-232 line and attach the side of the protector marked “OUT” to the equipment you want to protect (the load). See Figure 3-1.

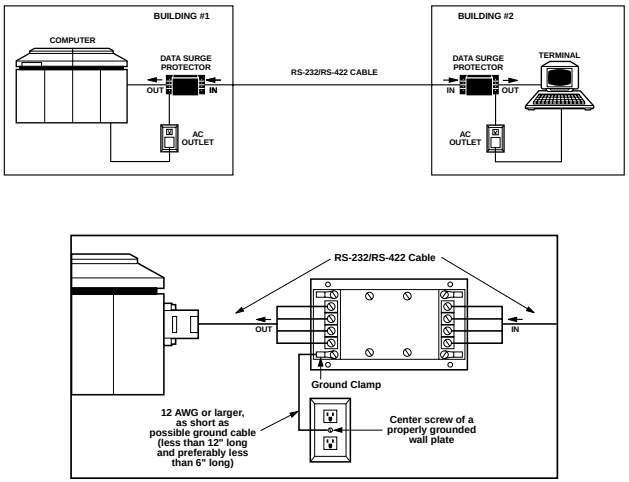


**Figure 3-1. Terminal-Strip Surge Protector installation.**

Step 4: Repeat steps 1 through 3 for the other end of the cable.

Step 5: Attach one end of a 12 AWG grounding wire, *less than 12 inches (30 cm) long and preferably less than 6 inches (15 cm) long,* to any grounding clamp on the Terminal-Strip Surge Protector.

Step 6: Attach the other end of the grounding wire to an electrical ground common with the protected equipment.

## NOTE

**A good electrical ground is very important. Connect the ground of the Surge Protector to the same grounding point as the protected equipment with as short a length of 12 AWG cable as possible (less than 12 inches long and preferably less than 6 inches long). Copper piping, building frames, or any other metal surface may not provide adequate grounding locations. If you have questions, have a registered electrician examine your building wire or contact Technical Support.**

# 4. Operation

The Terminal-Strip Surge Protectors *automatically* detect voltage spikes or transient energies of positive or negative polarity that strike the data line. When no spikes are present on the line, the Surge Protector operates in *standby mode* and data signals flow unimpeded. When the protector recognizes a transient spike, it clamps the voltage to ground. The unit can handle surge currents up to a maximum of 200 amps. A very small amount of time (less than 50 nanoseconds) elapses between the time the Surge Protector detects a spike and the time it clamps the voltage. (This is known as the *response time*.) As soon as the transient spike energy dissipates, the unit automatically resets to standby mode.

# NOTES