

Lightning / Surge Protectors



Lightning / Surge Protectors Tutorial

■ What are Lightning and Surge Protectors?

Lightning and surge protectors are devices whose purpose is to eliminate transients on a conductor which are induced by nearby lightning activity. They are used to prevent damage to valuable electronic equipment from these high-voltage surges and spikes.

■ How are Lightning and Surge Protectors used?

A lightning and surge protector is used inline between devices such as antennas and amplifiers and radios or between connections on Ethernet switches and routers. They are connected via copper cabling (Coaxial, UTP etc.).

■ Where are Lightning and Surge Protectors used?

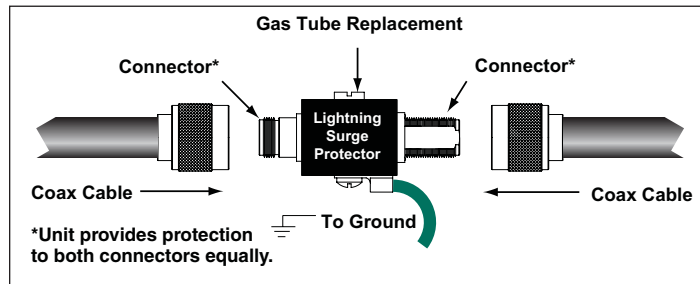
Lightning and surge protectors are used in many different applications including outdoor wireless networks, indoor Ethernet network installations and in any instance where the potential for a power surge could damage or destroy communications equipment. They can also be used to protect video equipment which utilizes outdoor mounted PoE cameras.

Coaxial Lightning and Surge Protectors

L-com's HyperLink® coaxial lightning and surge protectors are available in two types, Quarter Wave and Gas Discharge models.

Quarter Wave coaxial protectors are designed to pass the desired frequency while suppressing lightning surges, much like a signal filter. Lightning strike electrical surges which operate at low frequencies are diverted through the protector's short-circuit to the ground.

Gas Discharge coaxial protectors are a type of lightning arrester which employs a replaceable gas discharge tube, which is a component containing a small amount of gas. The gas tube dumps extremely high amounts of surge energy directly to the ground of the protector. HyperLink® coaxial lightning protectors are available for 0-3 GHz operation or 0-6 GHz operation.



Data line Lightning and Surge Protectors

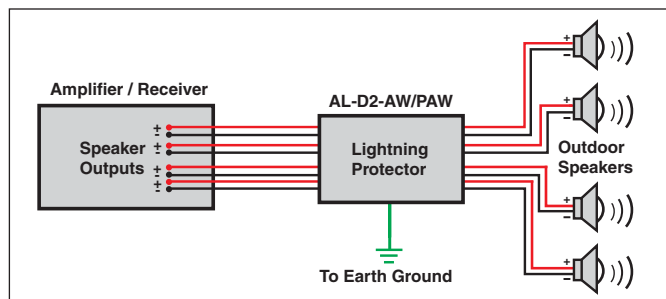
The use of surge protectors to protect sensitive equipment from lightning strikes and surges on Ethernet data lines has become more important than ever with the advent of faster standards like 100 and 1000 Base-T Ethernet. The faster data speeds have required equipment manufacturers to use fragile high speed components.

Designed for CAT5, CAT5e and CAT6 applications, L-com's HyperLink® data line protectors are available in different power levels. From low power models for typical hub or client installations to high-power 3-stage protectors designed for maximum surge protection.

In addition to our data line protectors, we offer protectors for Telephone, DSL, T1, RS422/485, RS232 applications.

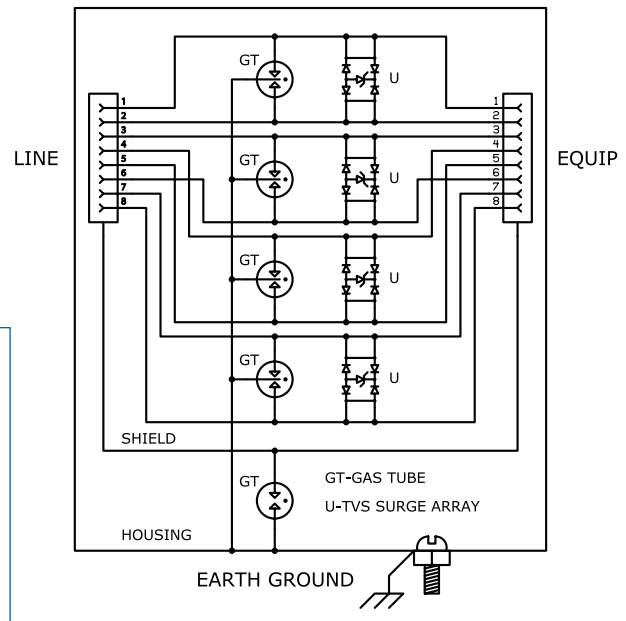
Outdoor Audio System Lightning and Surge Protectors

Lightning strikes on outdoor speakers can damage expensive home audio systems and public address systems. To reduce the risk of damage to these systems, we recommend one of our audio system protectors. These devices are placed between the audio amplifier and the outdoor speakers.



CAT6 High Power Lightning Protector Schematic

AL-CAT6HPJW, HGLN-CAT6-HP



Grounding Note:

Proper grounding of lightning and surge protectors is required to ensure proper operation. Connecting the ground lug on the protectors to an earth ground is the recommended method. Please refer to the National Electric Code (or your local codes) for additional information or contact a licensed electrician for assistance.



| Item # | Description | 1-9 | 10-24 | 25-99 | 100-249 | 250-499 |
|--------|-------------|-----|-------|-------|---------|---------|
|--------|-------------|-----|-------|-------|---------|---------|

HyperLink® Data Line Lightning and Surge Protectors

L-com's HyperLink® CAT5/5E/6 lightning protectors are designed to protect expensive wired and wireless 10/100 and 10/100/1000 Base-T Ethernet systems. These robust lightning protectors are also great to use in Power-over-Ethernet (PoE) camera installations.

RoHS Category 5 Data Line Protectors

| | | | | | | |
|--------------|---|--------|--------|--------|--------|--------|
| HGLN-CAT5-2 | Indoor, 10/100 Base-T, Shielded, RJ45 | 37.99 | 34.19 | 30.39 | 26.59 | 22.79 |
| HGLN-CAT5J | Indoor, 10/100 Base-T, Medium Power, Shielded, RJ45 | 34.99 | 31.49 | 27.99 | 24.49 | 20.99 |
| HGLN-CAT5-HP | Indoor, 10/100 Base-T, 3-Stage, RJ45 | 59.99 | 53.99 | 47.99 | 41.99 | 35.99 |
| AL-CAT5HPJW | Weather Resistant, 10/100 Base-T, 3-Stage, RJ45 | 49.99 | 47.99 | 45.99 | 42.49 | 37.49 |
| AL-CAT5VW | Weather Resistant, 10/100 Base-T, RJ45 | 35.99 | 32.39 | 28.79 | 25.19 | 21.59 |
| AL-CAT5JW | Weather Resistant, 10/100 Base-T, RJ45 | 29.99 | 28.79 | 27.59 | 25.49 | 22.49 |
| AL-CAT5PW | Weather Resistant, 10/100 Base-T, Punch Down Block | 29.99 | 28.79 | 27.59 | 25.49 | 22.49 |
| AL-CAT5SW | Weather Resistant, 10/100 Base-T, Screw Terminal | 29.99 | 28.79 | 27.59 | 25.49 | 22.49 |
| AL-CAT5W | Weatherproof, 10/100 Base-T, RJ45 and Screw Terminal | 44.99 | 43.19 | 41.39 | 38.24 | 33.74 |
| AL-CAT5HPW | Weatherproof, 10/100 Base-T, 3-Stage, RJ45 and Terminal Block | 69.99 | 67.19 | 64.39 | 59.49 | 52.49 |
| AL-CAT5HPW-4 | Weatherproof, 10/100 Base-T, 3-Stage, Multi-Port, RJ45 and Terminal Block | 179.99 | 161.99 | 143.99 | 125.99 | 107.99 |

RoHS Category 5E Data Line Protectors

| | | | | | | |
|--------------|--|-------|-------|-------|-------|-------|
| HGLN-CAT5EJW | Indoor, 10/100 Base-T, Shielded RJ45 | 44.99 | 42.29 | 39.59 | 36.89 | CALL |
| AL-CAT5EJW | Weather Resistant, 10/100 Base-T, RJ45 | 39.99 | 38.39 | 36.79 | 33.99 | 29.99 |
| AL-CAT5EPW | Weather Resistant, 10/100 Base-T, Punch Down Block | 39.99 | 38.39 | 36.79 | 33.99 | 29.99 |
| AL-CAT5EW | Weatherproof, 10/100 Base-T, Screw Terminal | 39.99 | 38.39 | 36.79 | 33.99 | 29.99 |

RoHS Category 6 Data Line Protectors

| | | | | | | |
|--------------|---|-------|-------|-------|-------|-------|
| HGLN-CAT6 | Indoor, 10/100/1000 Base-T, Shielded, RJ45 | 39.99 | 35.99 | 31.99 | 27.99 | 23.99 |
| HGLN-CAT6J | Indoor, 10/100/1000 Base-T, Medium Power, Shielded, RJ45 | 39.99 | 36.79 | 33.59 | 30.39 | 27.19 |
| AL-CAT6JW | Weather Resistant, 10/100/1000 Base-T, RJ45 | 31.99 | 30.71 | 29.43 | 27.19 | 23.99 |
| AL-CAT6PW | Weather Resistant, 10/100/1000 Base-T, Punch Down Block | 31.99 | 30.71 | 29.43 | 27.19 | 23.99 |
| AL-CAT6W | Weatherproof, 10/100/1000 Base-T, Screw Terminal | 49.99 | 47.99 | 45.99 | 43.99 | 41.99 |
| HGLN-CAT6-HP | Indoor 10/100/1000 Base-T, Hi-Pwr, Shielded RJ45 | 61.99 | 55.79 | 49.59 | 43.39 | CALL |
| AL-CAT6HPJW | Weather Resistant, 10/100/1000 Base-T, Hi-Pwr Shielded RJ45 | 51.99 | 49.91 | 47.83 | 44.19 | 38.99 |
| AL-CAT6HPW | Weatherproof, 10/100/1000 Base-T, Hi-Pwr, Shielded RJ45 | 67.99 | 63.91 | 59.83 | 55.75 | 51.67 |

RoHS Telephone/DSL/T1 Protectors

L-com's HyperLink® Telephone, DSL and T1 lightning and surge protectors are perfect for indoor and outdoor installations. There are multiple styles to choose from including screw terminal, punch down and RJ11.

| | | | | | | |
|------------|--|-------|-------|-------|-------|-------|
| HGLN-DT | Indoor, Hi-Power Single Line Phone/DSL, RJ11 | 39.99 | 38.79 | 37.59 | 36.39 | CALL |
| HGLN-DSL | Indoor, Phone/DSL, 3-Stage, RJ11 | 49.99 | 45.99 | 41.99 | 37.99 | 33.99 |
| HGLN-D1-DT | Indoor, Hi-Power Single Line Phone/DSL, Screw Terminal | 39.99 | 38.79 | 37.59 | 36.39 | CALL |
| HGLN-D2-DT | Indoor, Phone/DSL, 3-Stage, Screw Terminal | 49.99 | 46.99 | 43.99 | 40.99 | 37.99 |
| AL-DSLJW | Weather Resistant, Phone/DSL, 3-Stage, RJ11 | 49.99 | 44.99 | 39.99 | 34.99 | 29.99 |
| AL-DSLJW | Weather Resistant, Phone/DSL, 3-Stage, Screw Terminal | 49.99 | 45.99 | 41.99 | 37.99 | 33.99 |
| AL-D3W-DT | Weather Resistant, Phone/DSL, 3-Stage, Screw Terminal | 59.99 | 57.59 | 55.19 | 52.79 | 50.39 |
| AL-D4W-DT | Weather Resistant, Phone/DSL, T1/E1/J1, Screw Terminal | 39.99 | 38.39 | 36.79 | 33.99 | 29.99 |
| AL-D4W-DP | Weather Resistant, Phone/DSL, T1/E1/J1, Punch Down Terminal | 39.99 | 38.39 | 36.79 | 33.99 | 29.99 |
| AL-D2VW-2 | Weather Resistant, DSL, 230V Phone, ISDN, T1/E1/J1, Screw Terminal | 9.99 | 9.59 | 9.19 | 8.49 | 7.49 |
| AL-D0VW-2 | 230V Replacement Suppression Module for AL-D2VW | 4.99 | 4.79 | 4.59 | 4.24 | 3.74 |

RoHS RS422/RS485/RS232/AISG Protectors

L-com's HyperLink® lightning and surge protectors in this section are ideal for protecting RS422, RS485, RS232 lines as well as providing protection for sensors, control lines and AISG lines.

| | | | | | | |
|------------|---|-------|-------|-------|-------|-------|
| HGLN-D1-05 | Indoor, RS485, 3-Stage | 34.99 | 33.59 | 32.19 | 30.79 | 29.39 |
| HGLN-D2-05 | Indoor, RS422/485, RTDs, T1/E1/J1, 3-Stage, Screw Terminal | 49.99 | 47.99 | 45.99 | 42.49 | 37.49 |
| HGLN-D2-12 | Indoor, RS232, Control Lines, Sensors, 3-Stage, Screw Terminal | 49.99 | 47.99 | 45.99 | 42.49 | 37.49 |
| AL-D2W-05 | Weather Resistant, RS422/485, RTDs, T1/E1/J1, 3-Stage, Screw Terminal | 49.99 | 47.99 | 45.99 | 42.49 | 37.49 |
| AL-D2W-12 | Weather Resistant, RS232, Control Lines, Sensors, 3-Stage, Screw Terminal | 49.99 | 47.99 | 45.99 | 42.49 | 37.49 |
| AL-D3W-05 | Weather Resistant, RS/485, Screw Terminal | 59.99 | 57.59 | 55.19 | 52.79 | 50.39 |
| AL-D4W-05 | Weather Resistant, RS422/485, Screw Terminal | 39.99 | 38.39 | 36.79 | 33.99 | 29.99 |
| AL-D8W-12 | Weather Resistant, RS232, Screw Terminal | 39.99 | 38.39 | 36.79 | 33.99 | 29.99 |

RoHS Audio System Protectors

L-com's HyperLink® outdoor speaker and public address system lightning protectors offer protection of valuable PA equipment at an affordable price.

| | | | | | | |
|-----------|---|-------|-------|-------|-------|------|
| AL-D2-AW | Weatherproof, 4/8 Ohm Audio Systems, Screw Terminal | 49.99 | 48.49 | 46.99 | 45.49 | CALL |
| AL-D2-PAW | Weatherproof, 70.7/100V Public Address Systems, Screw Terminals | 49.99 | 48.49 | 46.99 | 45.49 | CALL |

RoHS AC and DC Control Line Protectors

L-com offers a full line of AC and DC Control Line lightning and surge protectors. Available in 12V, 24V and 48V in either AC or DC models.

| | | | | | | |
|------------|--|-------|-------|-------|-------|------|
| AL-D8-12AC | 8 Wire 12 VAC Control Line Lightning and Surge Protector | 59.99 | 58.19 | 56.39 | 54.59 | CALL |
| AL-D8-24AC | 8 Wire 24 VAC Control Line Lightning and Surge Protector | 59.99 | 58.19 | 56.39 | 54.59 | CALL |
| AL-D8-48AC | 8 Wire 48 VAC Control Line Lightning and Surge Protector | 59.99 | 58.19 | 56.39 | 54.59 | CALL |
| HGLN-DC-12 | Indoor, 12 VDC Power Line, Screw Terminal | 37.99 | 36.85 | 35.71 | 34.57 | CALL |
| AL-D8-12DC | 8 Wire 12 VDC Control Line Lightning and Surge Protector | 59.99 | 58.19 | 56.39 | 54.59 | CALL |
| AL-D8-24DC | 8 Wire 24 VDC Control Line Lightning and Surge Protector | 59.99 | 58.19 | 56.39 | 54.59 | CALL |
| AL-D8-48DC | 8 Wire 48 VDC Control Line Lightning and Surge Protector | 59.99 | 58.19 | 56.39 | 54.59 | CALL |

RoHS Load Cell/RTD/Strain Gauge Sensor Protectors

The AL-LC series lightning and surge protectors that provide superior protection for devices such as load cells, weighbridges, resistance temperature detectors (RTD) and strain gauge sensors.

| | | | | | | |
|----------|---|-------|-------|-------|-------|-------|
| AL-LC-30 | Weatherproof 3-Stage Load Cell/RTD Lightning Surge Protector | 59.99 | 57.59 | 55.19 | 52.79 | 50.39 |
| AL-LC | Weatherproof Single Stage Load Cell/RTD Lightning Surge Protector | 39.99 | 38.79 | 37.59 | 36.39 | 35.19 |

New



HGLN-CAT5J
INDOOR



HGLN-CAT5-HP
INDOOR



AL-CAT5HPJW
WEATHER RESISTANT



AL-CAT6JW
WEATHER RESISTANT



AL-CAT6W
WEATHERPROOF

New



HGLN-D1-DT



AL-D4W-DP
WEATHER RESISTANT

New



AL-D8-12AC

New



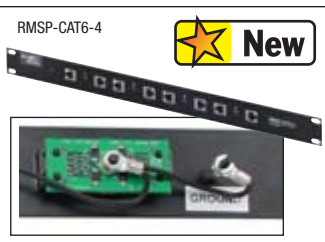
AL-D8-12DC

New



AL-LC-30

"Your site offers complete datasheet information for the lightning protectors I need. In addition, I see D-Sub tooling and connectors that I have not found anywhere else." - Vernon Jordan, Owner, Timberline Ventures



New

| Item # | Description | 1-9 | 10-24 | 25-99 | 100-249 | 250-499 |
|---|---|-------|-------|-------|---------|---------|
| Rack Mount Lightning and Surge Protector | | | | | | |
| RMSP-CAT6-4 | Category 6 19-inch Panel with 4 Surge Protector Ports | 89.99 | 82.79 | 75.59 | CALL | CALL |



| Item # | Description | Color | 1-9 | 10-24 | 25-99 | 100-249 | 250-499 |
|--|--|-------|-------|-------|-------|---------|---------|
| USB Panel Mountable Surge Protector | | | | | | | |
| AL-ECF504-AB | USB Panel Mountable Surge Protector, Type A / Type B | | 15.95 | 14.99 | 14.04 | 13.08 | 12.12 |

| Item # | Description | Color | 1-9 | 10-24 | 25-99 | 100-249 | 250-499 |
|---|--|--------|-----|-------|-------|---------|---------|
| RoHS L-com Isolator Wall Plates for 10/100 and 10/100/1000 Ethernet Networks | | | | | | | |
| 6000687-L | 10/100/1000 Base-T Ethernet Data Isolator, Stainless | Silver | | | | | 204.99 |
| 6000689-L | 10/100/1000 Base-T Ethernet Data Isolator, Plastic | Ivory | | | | | 199.95 |
| 6000691-L | 10/100 Base-T Ethernet Data Isolator, Stainless | Silver | | | | | 104.99 |
| 6000693-L | 10/100 Base-T Ethernet Data Isolator, Plastic | Ivory | | | | | 99.99 |

Medical Grade

Meets IEC 6060-1 Medical Device Safety Standards

6000693-L 6000693-L

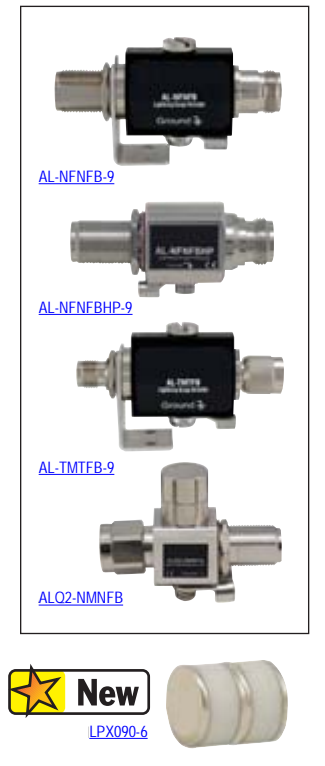
Tip *How isolation works*

Isolators place a physical barrier between your computer or other device and the network cables that are attached to it. Only data can travel across this barrier through the coupling of magnetic fields. Hazardous voltages and ground potential differences are blocked. Surge suppressors don't electrically separate the connected equipment - they use special components to limit the energy that can travel through a data connection. Isolators eliminate the wire connections that surge suppressors don't.

DATA → ← DATA

AIR GAP

Hazardous voltage stopped by air gap between inputs and outputs.



| Item # | Description | 1-9 | 10-24 | 25-99 | 100-249 | 250-499 |
|--|--|-------|-------|-------|---------|---------|
| HyperLink® Coaxial Lightning and Surge Protectors | | | | | | |
| RoHS 0-3 GHz Coaxial Protectors | | | | | | |
| AL-NFNFB-9 | Type N Female to Type N Female Bulkhead, 90V | 18.99 | 17.09 | 15.19 | 13.29 | 11.39 |
| AL-NFNFBHP-9 | Type N Female to Type N Female Bulkhead, Indoor, High Power, 90V | 24.99 | 23.99 | 22.99 | 21.24 | 18.74 |
| AL-NMNFB-9 | Type N Male to Type N Female Bulkhead, 90V | 18.99 | 17.09 | 15.19 | 13.29 | 11.39 |
| AL-BMBFB-9 | BNC Male to BNC Female Bulkhead, 90V | 14.99 | 14.39 | 13.79 | 12.74 | 11.24 |
| AL-TMTFB-9 | TNC Male to TNC Female Bulkhead, 90V | 23.99 | 23.03 | 22.07 | 20.39 | 17.99 |
| AL-UJUFEB-6 | UHF Female to UHF Female Bulkhead, 600V | 14.99 | 14.39 | 13.79 | 12.74 | 11.24 |
| AL-RBPRJB-9 | RP-BNC Plug to RP-BNC Jack Bulkhead, 90V | 14.99 | 14.39 | 13.79 | 12.74 | 11.24 |
| AL-RTPRTJB-9 | RP-TNC Plug to RP-TNC Jack Bulkhead, 90V | 23.99 | 23.03 | 22.07 | 20.39 | 17.99 |
| AL-EFFF-9 | Type F Female to Type F Female, 90V | 23.99 | 21.59 | 19.19 | 16.79 | 14.39 |
| AL-F | Type F Male to Type F Female, 50V | 7.49 | 6.89 | 6.29 | 5.69 | 5.09 |
| RoHS 0-6 GHz Coaxial Protectors | | | | | | |
| AL6-NFNFB-9 | Type N Female to Type N Female Bulkhead, 90V | 29.99 | 27.59 | 25.19 | 22.79 | 20.39 |
| AL6-NMNFBW-9 | Type N Male to Type N Female Bulkhead, 90V | 34.00 | 30.60 | 27.20 | 23.80 | 20.40 |
| RoHS 2.4 GHz Quarter Wave Coaxial Protectors | | | | | | |
| ALQ2-NMNFB | Type N Male to Type N Female Bulkhead, 1/4 Wave | 34.99 | 33.59 | 32.19 | 29.74 | 26.24 |
| RoHS Replacement Gas Tubes | | | | | | |
| LPX090C | 0-6 GHz, 90V, Replacement Gas Tube | 9.99 | 8.99 | 7.99 | 6.99 | 5.99 |
| LPX090-6 | 0-6 GHz, 90V, Replacement Gas Tube For AL-NMNFBW-9 | 5.99 | 5.39 | 4.79 | 4.19 | 3.59 |
| LPX090 | 0-3 GHz, 90V, Replacement Gas Tube | 4.99 | 4.49 | 3.99 | 3.49 | 2.99 |
| LPX230 | 0-3 GHz, 230V, Replacement Gas Tube | 4.99 | 4.49 | 3.99 | 3.49 | 2.99 |
| LPX350 | 0-3 GHz, 350V, Replacement Gas Tube | 4.99 | 4.49 | 3.99 | 3.49 | 2.99 |
| LPX600 | 0-3 GHz, 600V, Replacement Gas Tube | 4.99 | 4.49 | 3.99 | 3.49 | 2.99 |
| RoHS Accessories | | | | | | |
| HG2-LPMOUNT01 | ALQ2 Mounting Bracket | 4.99 | 4.49 | 3.99 | 3.49 | 2.99 |