

## FREQUENTLY ASKED QUESTIONS

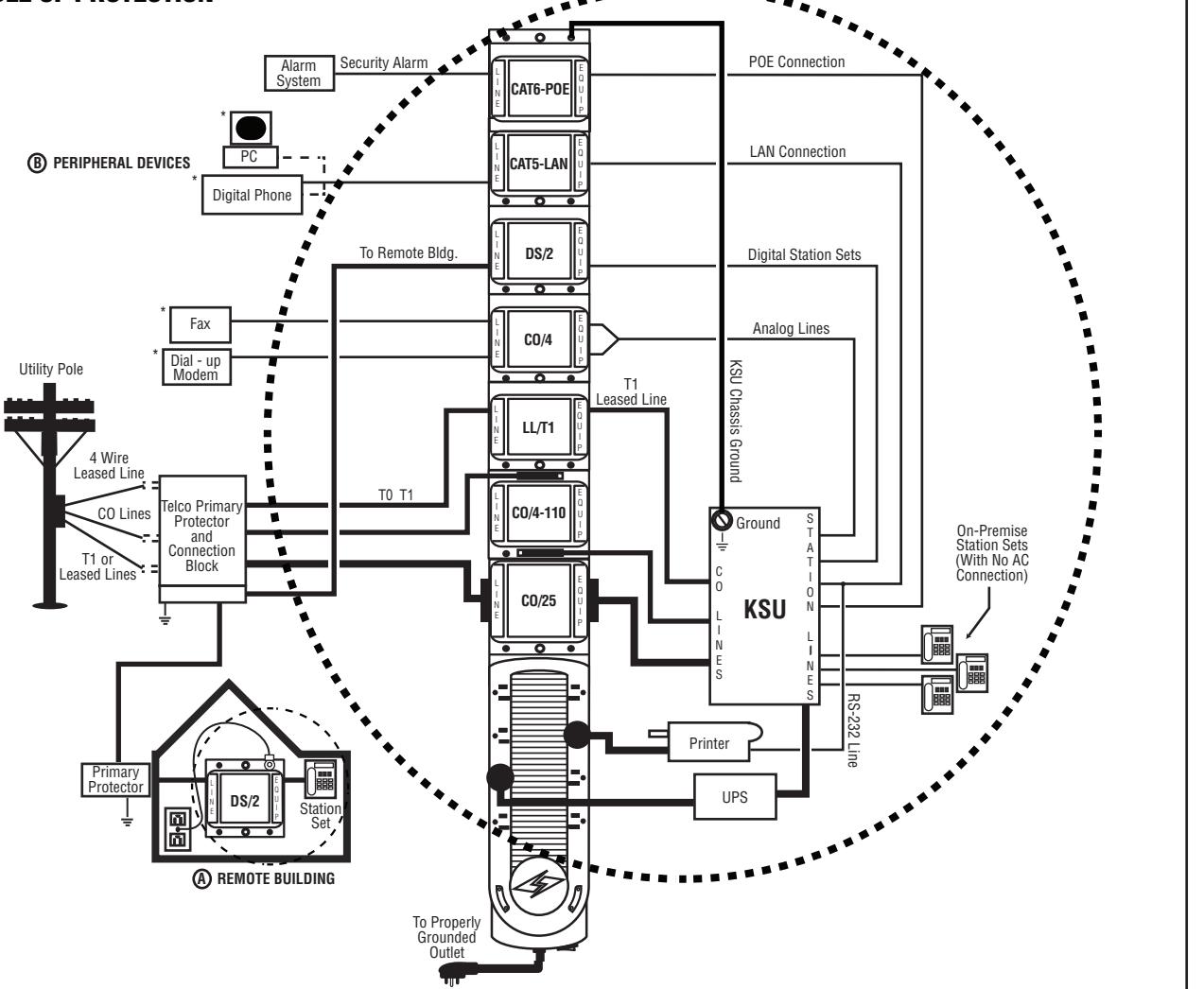
What are the Voltage Breakdown Ratings for the specified voltages on a Category Series protector?

| Voltage Breakdown Rating (@ 100V/sec.) |                          |                     |                          |                     |                          |
|--|--------------------------|---------------------|--------------------------|---------------------|--------------------------|
| Product Label Volts                    | Breakdown Voltage Rating | Product Label Volts | Breakdown Voltage Rating | Product Label Volts | Breakdown Voltage Rating |
| 7.5                                    | 5-10                     | 39                  | 29-49                    | 82                  | 60-100                   |
| 8.2                                    | 6-10                     | 62                  | 47-78                    | 220                 | 165-275                  |
| 16                                     | 12-20                    | 68                  | 51-85                    | 235                 | 176-294                  |
| 27                                     | 20-34                    | 75                  | 56-94                    | 270                 | 203-338                  |
| 30                                     | 23-38                    |                     |                          |                     |                          |

The provided telephone jumper cable is not long enough to reach my equipment. Can I use other cables?

- Yes, any length cable of the same type will work.

## BUBBLE OF PROTECTION



- If there are any wires that run outside the building or between buildings, they must have primary protectors at the building entrance, per NEC or applicable code, and secondary SurgeGate protectors at the piece of equipment (Remote Building).
- Signal or control lines from AC-powered operator-consoles or station sets must pass through additional SurgeGate modules if the console is not plugged into the SurgeGate 4 KSU protector installed at the KSU or PBX.

My telecommunication equipment has AC power, but the surge protector will not pass the phone signal. What could be the problem?

- Check to see if your connected equipment is receiving a dial tone.
- If not, bypass the surge protector's phone jacks to see if the protector is damaged.
- If your dial tone returns, the protector is damaged. Call ITW Linx Customer Service Department at 800-336-LINX.
- If you still have no dial tone, a problem with your phone company's lines may exist.

What kind of warranties does ITW Linx offer?

- ITW Linx offers a Lifetime Product warranty on all SurgeGate Products. See our website: [www.itwlinx.com](http://www.itwlinx.com) for up-to-date warranty information.
- ITW Linx also offers Connected Equipment warranty up to \$50,000. See our website: [www.itwlinx.com](http://www.itwlinx.com) for up-to-date warranty information.



Communications Products

## Surge Protection Solutions



ITW Linx offers a Lifetime Product and Connected Equipment Warranty on all SurgeGate products. Please visit us at [www.itwlinx.com](http://www.itwlinx.com) for up-to-date warranty information.

Make sure you have the right ITW Linx product to protect your electronic equipment. ITW Linx makes protectors for virtually all types of electronic equipment. Protectors that may look identical from the outside can be very different on the inside. It is very important that you use the surge protector designed for your application.

|         |                   |                |                           |            |                 |                |
|---------|-------------------|----------------|---------------------------|------------|-----------------|----------------|
| Models: | • MCO4            | • MCO4X4       | • MCO25                   | • MCO4110  | • MCO8110       | • MDS2         |
|         | • MDSC0           | • MDS25        | • MLLT1                   | • CAT5-LAN | • CAT5-LAN-RJ45 | • CAT5-75      |
|         | • CAT5-75-RJ45    | • CAT5-POE     | • CAT5-POE-RJ45           | • CAT5-235 | • CAT-235-RJ45  | • 1GB CAT6-LAN |
|         | • 1Gb CAT6-75-POE | • 1Gb CAT6-235 | • 1Gb SECONDARY PROTECTOR |            |                 |                |

## CHOOSING THE CORRECT SURGEgate MODULES FOR YOUR NEEDS

For full protection of the KSU, appropriate modules must be installed to protect all incoming wires and all wires leaving the building from the KSU, and also to equipment inside the building that have AC power connections—such as fax machines, PC's with modems, voicemail systems, operator consoles, etc.

Connect the fax, modem, and telephone answering device lines from the KSU through a SurgeGate module. This will prevent any "backdoor" power problems or rise in ground potential from reaching the KSU via lines from other equipment in the building.

**Note:** If you intend to use CAT5/CAT6 modules as a primary protector, you may not connect it to a SurgeGate AC base unit for grounding purposes. To ground a CAT5/CAT6 modules used in a primary protection application, follow the specific instructions on page 3.

If you are not sure which SurgeGate modules you will need, follow these steps to find out:

1. **What types of phone lines are coming into the KSU?**  
(E.g., CO lines, T-1 lines, 56K [also called a leased line], ISDN lines)
  - If they are T-1, 56K, or ISDN, then use an LL/T1 module.
  - If they are CO lines, go to question 2
2. **What kind of cables are the CO lines coming in on, and how many?**  
(E.g., single-line cords [RJ11], two-line cords [RJ14], amphenol cable [RJ21X].)
  - If they are RJ11, use CO/4X4 modules. One module for every 4-lines/4 cords.
  - If they are RJ14, use CO/4 modules. One module for every 4-lines/2 cords.
  - If they are RJ21X, use CO/25 (for up to 25 lines).
  - If bare-wire pairs are used, they can be punched down on a CO/4-110 module for up to 4 lines, or a CO/8-110 module for up to 8 lines.
3. **Do any of the lines running from the KSU to the station sets (phones) go to a different building or to station sets that plug into an AC outlet?**
  - If yes, then those lines must pass through a module where the KSU is located to prevent "backdoor" surge damage.
  - If they are digital key sets (e.g. full feature phones with LCD displays), a DS module should be used. (DS/2's for few lines, DS/25 for many lines)
  - If they are regular analog phones (like what you have in your home), then CO modules are to be used.
  - If they are digital/analog hybrid phones, then use a DS/CO module.
  - The phone sets in the other building (out of building extensions) will need their own protection.
4. **Do any of the lines from the KSU go to any fax machines or modems?**
  - If yes, those lines must pass through a CO module where the KSU is located to prevent "backdoor" surge damage. The down-line equipment will need its own protection.
5. **Is there an external KSU chassis ground?**
  - If yes, the ground wire must be directly connected to the top most SurgeGate modules' AutoGround™ strap. No other ground connections (such as cold water pipe) may be used.

## STEP 1: MOUNTING THE SURGEgate AC BASE UNIT (optional)

1. Install the SurgeGate protector near the connected equipment and within 7 feet of a properly grounded 3-wire outlet. The protector should be mounted in a dry, indoor location as close to the floor as possible. Leave room above the protector to add additional modules for future expansion.
2. If possible, mount the protector between the 66 block or incoming wall phone jacks and KSU/PBX when protecting a phone system—this will simplify wiring later.
3. The protector must be attached to a solid surface, such as 3/4" plywood. If the protector will be mounted on sheet rock, you must provide appropriate fasteners.

## CAUTION

- Do not install this device if there is not at least 10 meters (30 feet) or more of wire between the electrical outlet and the electrical service panel.
- Risk of Electric Shock. Do not plug into another relocatable power tap.
- Do not use any other "power strips".
- Do not use 2-prong adapters with this product.

## IMPORTANT SAFETY POINTS

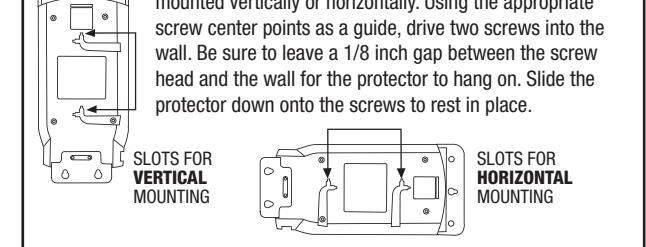
ITW Linx surge protectors and the connected equipment must be indoors and in a dry location and in the same building. Although your ITW Linx protector is very durable, its internal components are not isolated from the environment. Do not install any ITW Linx product near any heat emitting appliances such as a radiator or heat register. Do not install this product where excessive moisture is present; for example near a bathtub, sink, pool, basement floor, fish tank, etc.

It is not unusual for a building to be improperly grounded. In order to protect your equipment, ITW Linx products must be plugged into a properly grounded 3-wire outlet. Additionally, building wiring and grounding must conform to applicable NEC (USA) or CEC (Canada) codes.

This Device features an internal protection that will disconnect the surge protective component at the end of its useful life but will maintain power to the load- now unprotected. If this situation is undesirable for the application, follow the manufacturer's instructions for replacing the device.

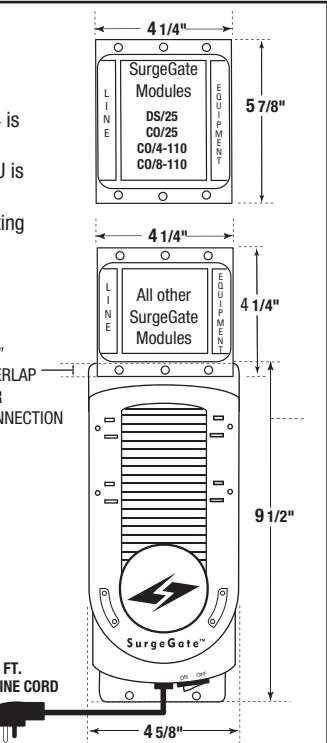
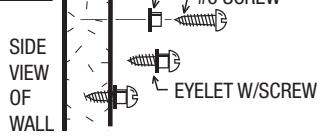
## IMPORTANT SAFETY POINTS

**Figure 1 Wall Mounting Instructions:**  
Hold wall mounting template (provided) up to the wall where you want the protector mounted. The protector can be mounted vertically or horizontally. Using the appropriate screw center points as a guide, drive two screws into the wall. Be sure to leave a 1/8 inch gap between the screw head and the wall for the protector to hang on. Slide the protector down onto the screws to rest in place.



**Figure 2**

- The length of any SurgeGate 4 is 9.5 inches.
- The length of SurgeGate 8 KSU is 13.5 inches.
- Dimensions include the mounting clips.

**Figure 3****Figure 4**

## STEP 2: INSTALLING AC POWER CONNECTIONS TO THE SURGEgate AC BASE UNIT

**Note:** ITW Linx surge protectors require that you have a properly grounded 3-wire outlet to protect the connected equipment. The protector is equipped with a green "Ground OK" diagnostic light to indicate proper power grounding. The "Ground OK" light will not come on and the red "Line Fault" indicator light will come on if your AC outlet is improperly wired (reverse polarity or no ground present).

- Turn OFF the power to all equipment that will be plugged into the surge protector.
- Make sure the ON/OFF switch is in the OFF position, plug the unit into the wall outlet, and then turn it on. See Figure 4.
- Once proper AC wiring and grounding has been established via a green "Ground OK" light, plug the equipment to be protected into the AC outlets on the unit.
- One at a time, turn each piece of connected equipment ON and check for power and correct operation.
- Turn OFF the unit, as well as all connected equipment before installing modules.

**Note:** If the KSU/PBX has a "Ground" terminal, connect it to the top (right) of the top SurgeGate module. Use a minimum #14 green insulated copper wire, with a ring terminal at each end. Route the wire as directly as possible. Do not make any other connections to the ground terminal of the KSU/PBX.

## STEP 3: CONNECTING SURGEgate MODULES

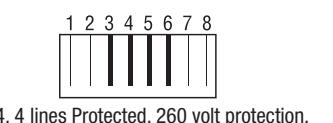
**Note:** For proper installation, the line(s) between the KSU/PBX and the module(s) must be a minimum of 6 feet in length to avoid surge damage. Never install telephones during a lightning storm.

### CENTRAL OFFICE (CO) LINES

#### A.) SurgeGate CO/4 and CO/4X4 Modules (Secondary Protector)

The SurgeGate CO/4 and CO/4X4 modules are designed to protect CO (central office) lines. If you have more than 8 CO lines, we recommend that you use a SurgeGate CO/25 module that uses an RJ21x connector, or a CO/4-110 or CO/8-110.

1. Connect the telephone CO lines to the "LINE" jacks on the SurgeGate module. Use the modular cords provided to connect the "EQUIPMENT" modular jacks to the KSU/PBX CO line connections.



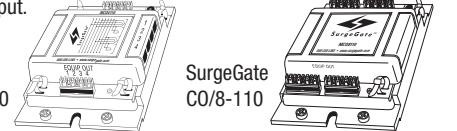
CO/4, 4 lines Protected, 260 volt protection, RJ-14 configuration, pins 3, 4, 5, 6 protected



CO/4X4, 4 lines Protected, 260 volt protection, RJ-11/45 compatible pins 4, 5

#### B.) SurgeGate CO/4-110 and CO/8-110 Modules (Secondary Protector)

The SurgeGate CO/4-110 protects 4 CO (Central Office) lines using 110 punchdown connectors on the input, and 110 connectors or RJ-11/45 on the output. The CO/8-110 modules are designed to protect KSU/PBX systems with up to 8 CO lines using 110 punchdown connectors on both the input and output.



- Cut the cable from the primary protector to the correct length and punch down the cable to the "LINE IN" punchdown block on the module.
- Punch down another cable to the "EQUIP OUT" punchdown block on the CO/4-110 or CO/8-110 module and connect to the KSU/PBX, or to use modular outputs on the CO/4-110 module skip to step 4.
- Secure any cables connected to punchdown blocks with the reusable cable ties installed on the CO/110.
- Connect an RJ-11 or RJ-14 modular cable to each RJ-11/45 output jack on the side of the CO/4-110 module, using the schematic diagram on the face of the module as a connection guide.

#### C.) SurgeGate CO/25 Modules (Secondary Protector)

The SurgeGate CO/25 modules are designed to protect KSU/PBX systems that are connected to more than 8 CO (Central Office) lines. These units are very cost effective for protecting more than 8 CO lines and up to 25 CO lines.

- Install the Velcro clamps provided on the protector RJ-21x connectors. Mount the protector on the SurgeGate assembly.
- Connect the RJ-21x connector from the 66 block to the "LINE" jack on the SurgeGate module. Some KSU/PBX systems use RJ-14 connections for the incoming CO lines. In this case, an octopus cable (RJ-21x to 8 RJ-14s) may be required from the "EQUIPMENT" jack to the KSU/PBX connection.

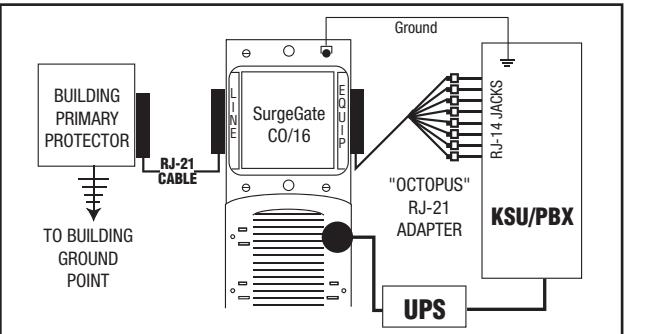


SurgeGate CO/25

- Connect the digital station line to the "LINE" jack on the SurgeGate module. Use the modular cords (provided) to connect the "EQUIPMENT" jack to the KSU/PBX digital line connection.



SurgeGate CO/25



#### D.) SurgeGate LL/T1 Module (Secondary Protector)

The SurgeGate T1/ISDN is a secondary protector designed to protect T-1 or ISDN lines. Each SurgeGate T1/ISDN module will protect two T-1 lines or two ISDN lines.

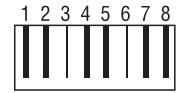
### FOR T-1 EQUIPMENT

The SurgeGate T1/ISDN module is wired to accept standard, straight-through cords on both the Line and Equipment sides. No crossover cords or other special cables are needed when using T1 (or other RJ48C compatible) lines.

### FOR LEASED-LINE EQUIPMENT

To protect equipment that is wired for RJ48S cords (pins 1, 2 and 7, 8), a custom cable will need to be made. See "Connecting the SurgeGate T1/ISDN Module" sheet, 9026-180-00.

(Pins 7 & 8 need to be moved to positions 4 & 5 in order to pass through the SurgeGate module.)



SurgeGate LL(T-1)

### STATION SET LINES

#### A.) SurgeGate DS/25 Module (Secondary Protector)

(You must use primary protection before the station set protectors). The SurgeGate DS/25 module is designed to protect KSU/PBX systems that are connected to up to 25 digital station sets. If analog (tip and ring) sets are used, you must use a CO/25 module.

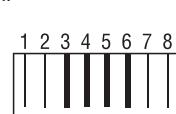
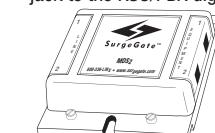


- Install the Velcro clamps provided on the protector RJ-21x connectors. Mount the protector on the SurgeGate assembly.
- Connect the RJ-21x female cable to the remote building into the "LINE" side of the DS/25 module.
- Connect one end of a RJ-21x male cable (not provided) into the "EQUIP" side of the SurgeGate module. Connect the other end to the KSU/PBX.
- Secure the RJ-21x connections to the DS/25 with the hook and loop hold-down straps.

#### B.) SurgeGate DS/2 Module (Secondary Protector)

The SurgeGate DS/2 is designed to protect Digital Station (DS) set lines for KSU/PBX systems. One SurgeGate DS/2 module protects two 4-wire digital station sets or two KSU/PBX digital station lines.

- Connect the digital station line to the "LINE" jack on the SurgeGate module. Use the modular cords (provided) to connect the "EQUIPMENT" jack to the KSU/PBX digital line connection.



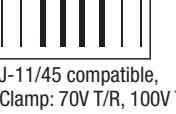
SurgeGate DS/2

### OTHER CONNECTIONS

#### A.) SurgeGate DS/CO Module (Secondary Protector)

The DS/CO module protects two 4-wire digital/analog lines or two 2-wire tip/ring analog lines using RJ-11/45 connectors.

- Simply plug the RJ45 jack from the line input cable into the "Line" side of the protector. Using a patchcord, plug one end into the "Equipment" side of the protector and the other side of the patchcord into the equipment to be protected.



SurgeGate DS/CO

DS/CO, RJ-11/45 compatible, pins 3, 6 Clamp: 70V T/R, 100V T/G, R/G pins 4, 5 Clamp: 260V T/R, T/G, R/G

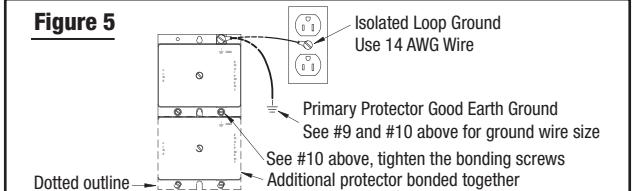
These models protect one 8-wire Cat5e or CAT6 cable using 110 connectors.

- Remove protector cover.
- Strip off 1.5" of jacket from line input 24 AWG OSP cable and protected equipment cable.



SurgeGate CAT5e / CAT6

- Insert OSP cable ("LINE" side) into clip on the printed circuit board. If shielded cable is used, contact shield with the clip.
- Punch down line input pairs on the 110 connectors ("LINE" side) carefully maintaining proper wire twist. (Note: The color code is printed on the PC board next to the connector.)
- Punch down the protected equipment pairs on the opposite 110 connectors ("EQUIPMENT" side) carefully maintaining proper wire twist. (Note: The color code is printed on the PC board next to the connector.)
- Position and tightly secure a cable tie on each cable to provide strain relief next to cable exit holes in the protector housing.
- Replace cover.
- Mount protector to a solid surface, like plywood. Drill a 3/32 hole for the #6 x 3/4 screw and eyelets provided. See figure 3 on page 2. Attach screw and eyelet to wall and slide protector over screw and tighten. Add second screw to bottom of protector.
- When used as a Primary Protector, connect the grounding strip to a good earth ground with a minimum 10 AWG wire. Use ring lug and machine screw provided. Route wire as direct and as short as possible. For Isolated Loop applications, connect to a single point ground with a minimum 14 AWG wire as shown in figure 4 below.
- Additional protectors may also be bonded together as shown in figure 5 below (dotted outline). Connect to a single point ground with a 6 AWG wire.



**Note:** • The protector shall be installed in accordance with the applicable requirements of the National Electric Code, ANSI/NFPA-70, Article 800, Section C.  
• Never install telephone wiring during a lightning storm.  
• Do not attach module to an AC base unit in a Primary application.

#### C.) SurgeGate CAT 5e Modules (Models: CAT5-LAN-RJ45, CAT5-POE-RJ45, CAT5-75-RJ45, CAT5-235-RJ45)

These models protect one 8-wire Cat 5 cable using RJ45 connectors.

- Simply plug the RJ45 jack from the line input cable into the "Line" side of the protector.
- Using a Cat 5 (or better) patchcord, plug one end into the "Equipment" side of the protector and the other side of the patchcord into the equipment to be protected.



SurgeGate CAT5

- Mount protector to a solid surface, like plywood. Drill a 3/32 hole for the #6 x 3/4 screw and eyelets provided. See figure 3 on page 3. Attach screw and eyelet to wall and slide protector over screw and tighten. Add second screw to bottom of protector.

If you are not using a SurgeGate base unit, connect the protector to a single point ground with a minimum 14 AWG wire as shown in figure 5 on page 3. Additional protectors may also be bonded together as shown in figure 5 on above.(dotted outline). Connect to a single point ground with a 6 AWG wire.

### SURGEgate POE PROTECTORS: WIRING CONVENTIONS

- Shall be wired per TIA/EIA 568A or 568B.
- Power Pairs: Blue, Brown (Clamp at 62V).
- Data Pairs: Orange, Green (Clamp at 16V).

#### STEP 4: POWER UP!

After all the modules and base units have been properly installed and connected, turn on the power to the SurgeGate AC unit and then the protected equipment. You're Done!