CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

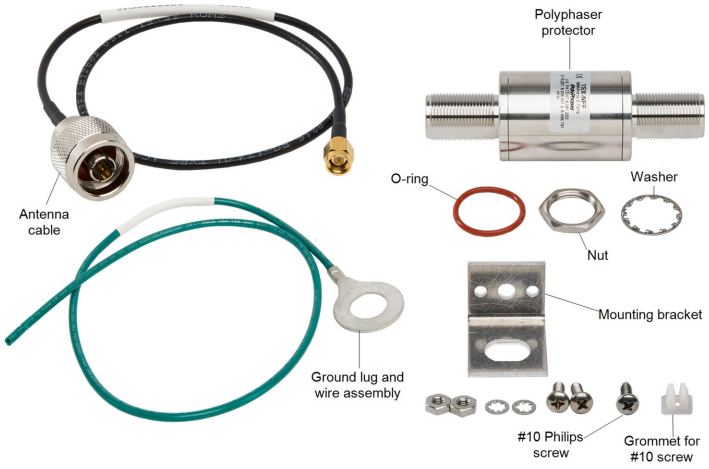
Surge protector kits: installation and troubleshooting

1. Introduction

Campbell Scientific offers several surge protector kits to help protect our communication devices from electrical transients conducted through the antenna cable. The kits have the same surge protector, but use different cables to connect the surge protector to the communication devices.

The Surge Protector Kits include the following:

- Polyphaser protector
- Antenna Cable
- Ground lug and wire assembly (position the lug between the connector and the enclosure wall or secure the lug using the nut and lock washer supplied)
- Surge protector flange mounting bracket and hardware for securing the polyphaser protector to an enclosure backplate



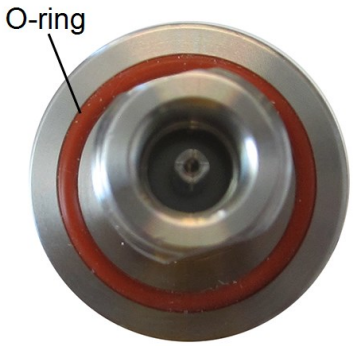
Campbell Scientific surge protector kits protect RF equipment by equalizing the potential difference between the centre pin of the coax cable and its shield. The kits include a capacitive-coupled gas tube protector with multi-strike capability. If properly grounded, the capacitor will block low frequency surge currents induced onto the centre-pin from the antenna side until the gas tube reaches a high enough voltage to shunt the surge to ground.

The protector gas tube lies between the centre conductor and the coax cable shield. During a surge event, the gas tube raises the centre conductor potential to the same potential as the shield. Once the centre conductor and shield are equalized, current cannot flow between the circuitry connected to the centre conductor and the shield/equipment chassis ground, thus protecting the equipment.

2. Surge protector enclosure installation

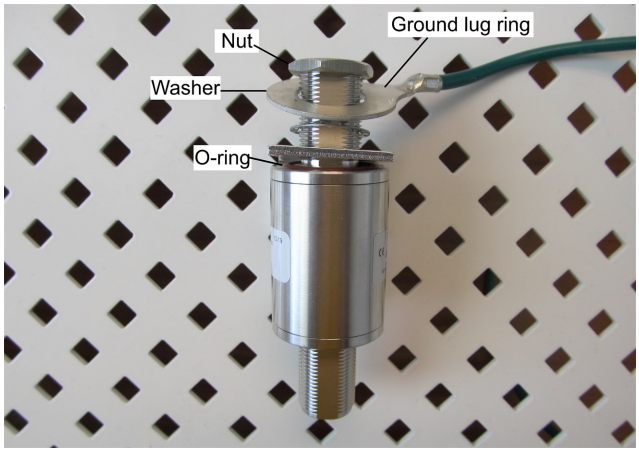
1. Use grommet and screw to secure the bracket to the enclosure backplate.

2. Place the O-ring on a connector of the Polyphaser protector.

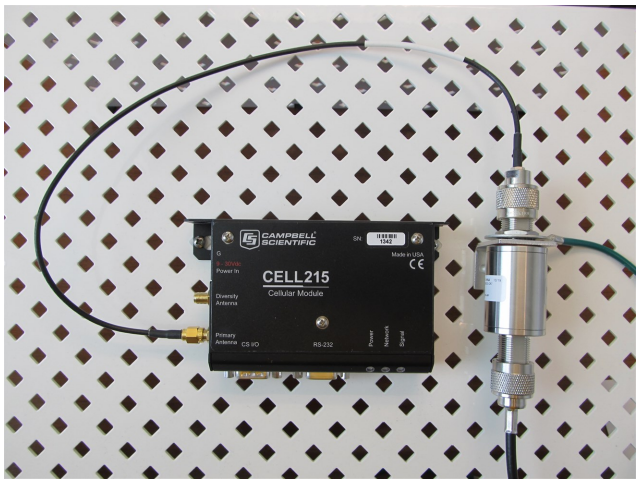


3. Insert that connector through the large hole in the bracket.

4. Place the washer, ground lug ring, and nut on the connector.



5. Connect the ground lug wire to the enclosure ground lug.
6. Connect cables to the Polyphaser protector, cell modem, and antenna.



3. Outdoor surge protector installation

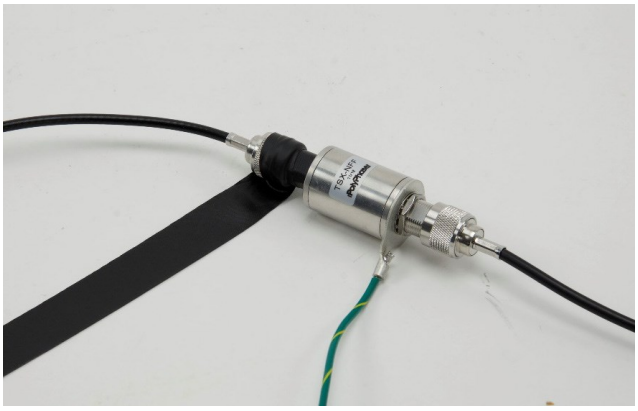
Required equipment:

- Roll of self-vulcanizing tape (cold shrink tape), 25 mm x 3 m (1 inch x 10 feet)
- Scissors or tool for cutting the tape
- Cleaning supplies to clean the surge protector and connections
- Surge Protector Kit

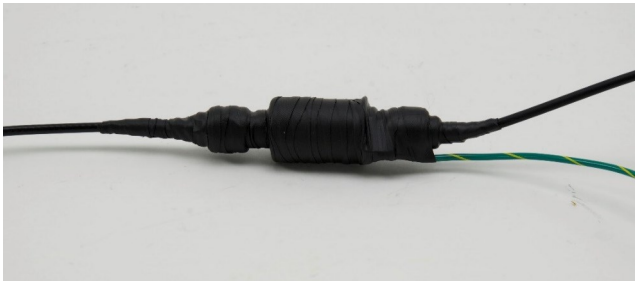
Procedure for connection:

1. Inspect connection components. If connectors are contaminated with dust, oil, or corrosion, thoroughly clean the connections without introducing liquid onto cable ends. Consider replacing connectors that have significant corrosion or cables that may have become water or oil soaked.
2. Clean the body of the Polyphaser protector.
3. Connect the Polyphaser protector to the antenna and use a SWR meter to ensure the measured surge protector value is in the 1.1:1 SWR range, which meets the protector SWR specification.
4. Place the washer, ground lug ring, and nut on a Polyphaser protector connector.
5. Connect cables to the Polyphaser protector.

6. On each connector, wrap tape in the direction of the threads. Apply tension while wrapping to ensure a good seal between the tape and connectors and between the tape layers.



7. Wrap both connectors a second time, contiguous with the surge protector, from end to end.



8. Extend the ground wire from the wrapping parallel to an antenna cable.

9. Use UV-resistant cable ties to secure the surge protector assembly to the mast that supports the antenna. To minimize moisture entry, point the end from which the ground wire emerges down.

4. Troubleshooting the surge protector

The surge protector kit protects RF equipment by equalizing the potential difference between the centre pin of the coax cable and its shield. High currents can damage the centre pin that makes the connection between the cable connector and protector. The protector can withstand 1,000 events at 500 A, 10/100 microsecond, or five events at 20,000 A, 8/20 microsecond surge. Expected life, without a surge strike, is 20 years. However, the actual Polyphaser lifespan varies because lightning has different current waveforms and return strokes. Tower size and placement, the ground conductivity, and number of storms per year also influence the life span.

At least every year, use the following procedure to check the surge protector:

1. Connect the Polyphaser protector to the antenna.
2. Connect the Polyphaser protector to the SWR meter.
3. Measure the SWR with the SWR meter. If the SWR value is greater than 2.5:1, replace the surge protector to avoid antenna damage.

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