



DIN-Rail

Components

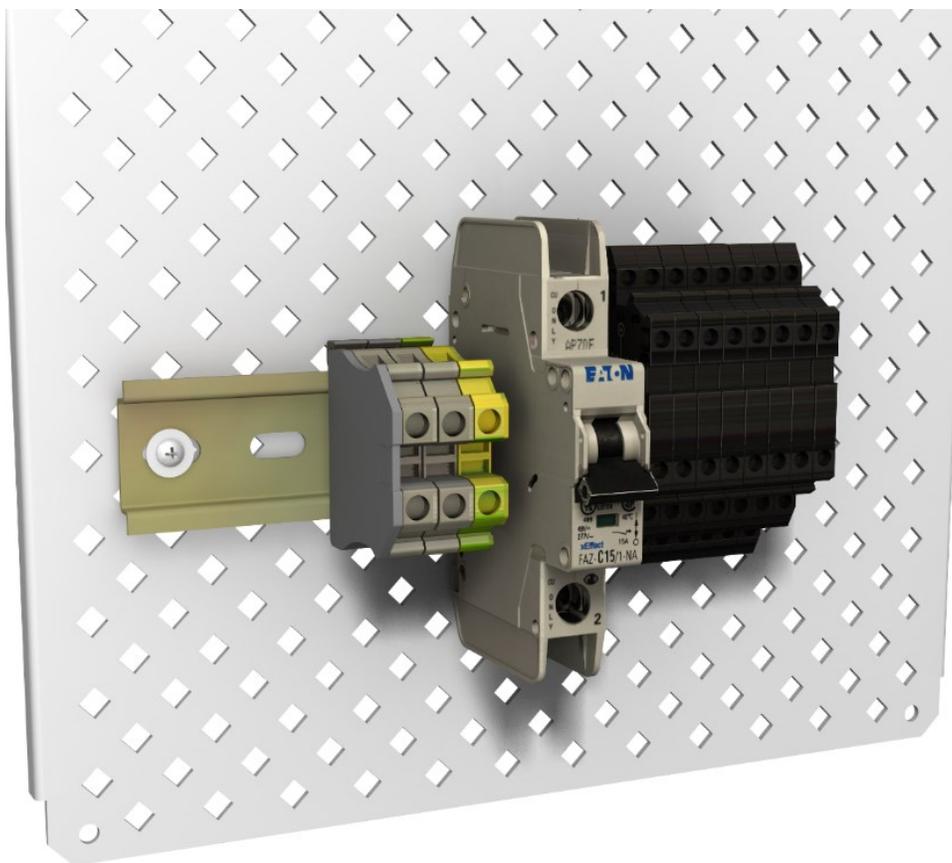


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1. Introduction

Space inside an enclosure is limited. DIN rails provide a convenient way to connect a large variety of electrical components in a small space. The modular design allows the installer to configure the connections in the most efficient manner possible to suit their needs. Individual components simply snap into place on the rail. Having the components close together helps keep the wiring organized and maintain a clean enclosure.

A DIN rail is capable of holding a wide variety of wire connectors, fused terminal blocks, surge protectors, circuit breakers, and power supplies. End cap/separators are used to cover the open side of a terminal strip when it would be exposed. [FIGURE 6-4](#) (p. 11) shows the open side of a terminal strip. The end cap/separators also act as spacers to separate different types of terminal blocks. Jumpers are used to electrically connect the terminals. A stopper needs to be on each end of the terminal strip assembly.

Campbell Scientific DIN-rail mounting kits facilitate wiring when many wires need to be connected to one terminal. DIN rails are available in multiple lengths from 15 cm to 52 cm (6 inches to 20-5/8 inches). Each kit contains one DIN-rail mounting bracket, screws, grommets, washers, DIN-rail end caps, and DIN-rail stoppers. A complete configuration will also include terminal blocks, end cap/separators, and jumpers ([FIGURE 1-1](#) (p. 1)). The DIN-rail end caps, terminal blocks, and DIN-rail stoppers are mounted onto the DIN-rail bracket. The DIN-rail bracket is mounted to an enclosure backplate using the kit screws and grommets.



FIGURE 1-1. Enclosure with DIN rail and other components

2. Precautions

- READ AND UNDERSTAND the [Safety](#) section at the back of this manual.
- Prior to performing site or installation work, obtain required approvals and permits.
- Use only qualified personnel for installation, use, and maintenance.
- Read all applicable instructions carefully and understand procedures thoroughly before beginning work.
- The use of licensed and qualified contractors is highly recommended.
- Use only manufacturer-recommended parts, materials, and tools.
- Comply with all electrical codes. Electrical equipment and related grounding devices should be installed by a licensed and qualified electrician.
- Use appropriate equipment and safety practices.
- Do not perform any work in inclement weather, including wind, rain, snow, lightning, etc.
- Periodically (at least yearly) check for wear and damage, including corrosion, stress cracks, frayed cables, loose cable clamps, cable tightness, etc. and take necessary corrective actions.
- Periodically (at least yearly) check electrical ground connections.
- The power adapter must be installed in a weatherproof enclosure or building. The mounting hardware provided with the kit is for Campbell Scientific enclosure installations. The DIN rail can be mounted to a metal or wood surface using appropriate hardware provided by the user.

3. Initial inspection

Make sure the parts contained in the packaging ([FIGURE 3-1](#) (p. 3)) match the parts on the order. Ensure no shipping damage has occurred. Be sure to keep track of any label sheets included in the order.

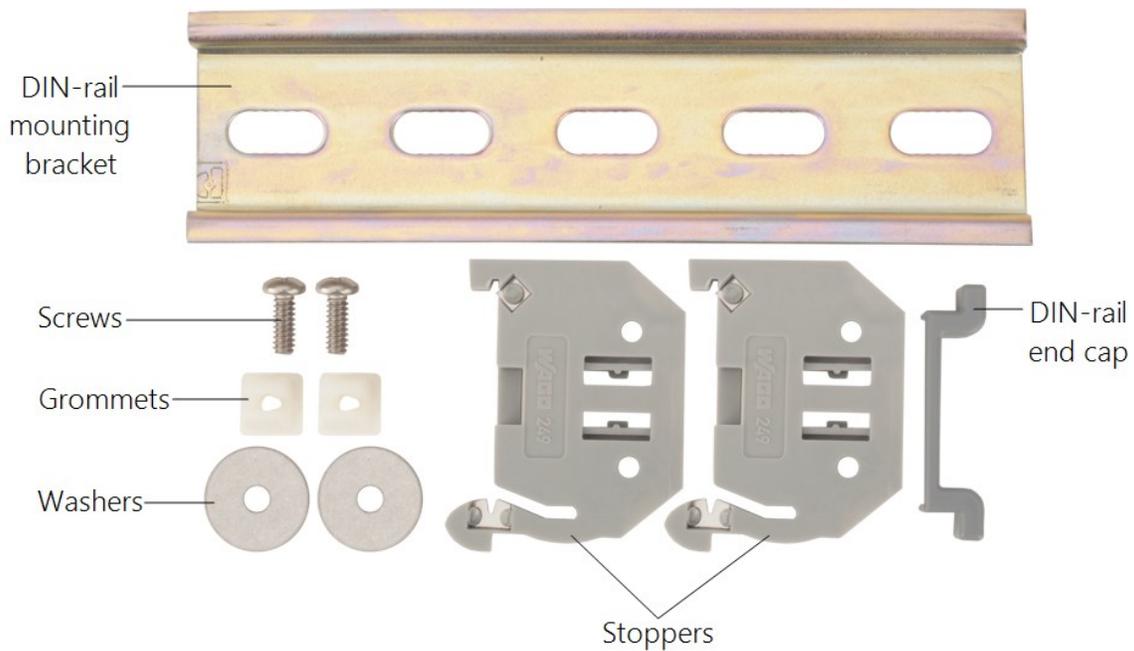


FIGURE 3-1. Example package components

4. Overview

A DIN rail and its corresponding components offer a flexible platform to easily mount terminal blocks and other devices. DIN rails are used for setting up terminal blocks to connect multiple components to a single datalogger terminal, creating a power bus, or installing equipment such as power supplies, conditioners, or breakers.

Campbell Scientific offers industry standard 35 mm 'top hat' DIN rails in multiple lengths (FIGURE 4-1 (p. 4)). This design was chosen for its widespread adoption for use in industrial control equipment. DIN-rail components can be installed based on the user's requirements (FIGURE 4-2 (p. 4)).



FIGURE 4-1. DIN rails

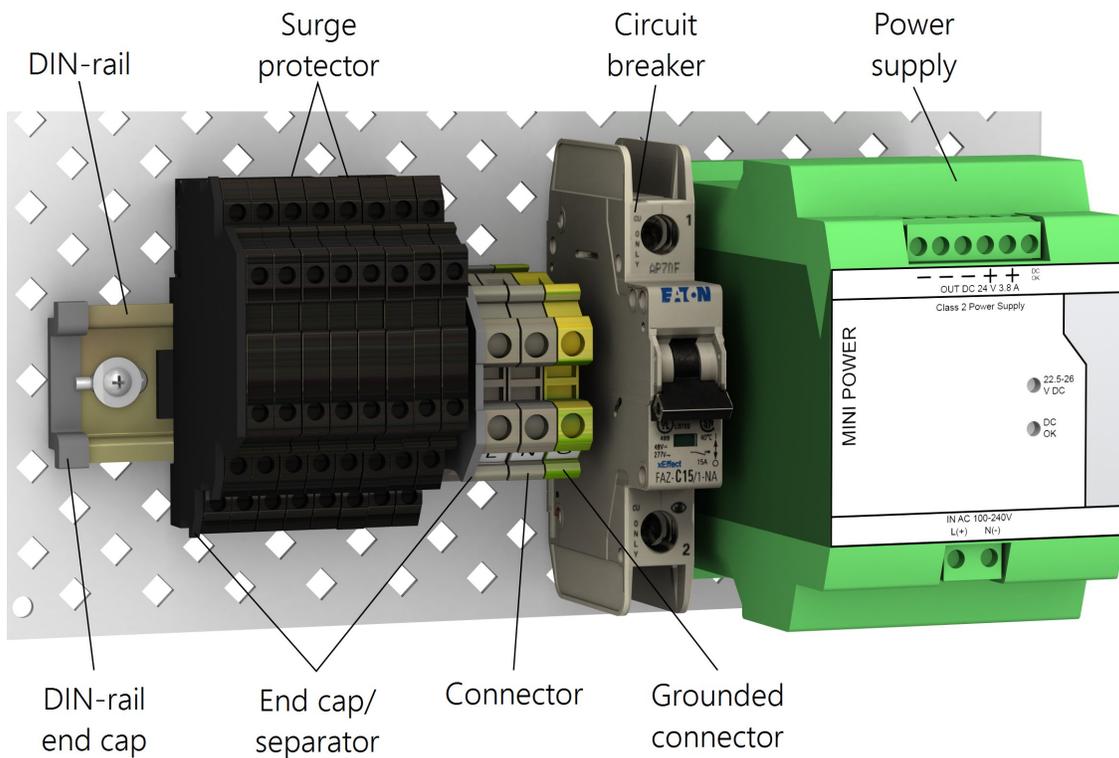


FIGURE 4-2. Components mounted on a DIN rail

Components designed to function as protective earth (PE) ground connections (typically colored in green/yellow) use the DIN rail as a common ground path. FIGURE 4-3 (p. 5) shows a standard component (gray) and a PE ground component (green/yellow). Note the metal bracket for the

DIN rail on the ground component. The extension above the component is designed to hold labels for the component terminals.

NOTE:

A ground wire must be connected between one of the DIN-rail mounting screws, or through a self-tapping electrical grounding screw. Please consult a licensed electrician for proper grounding methods of all connections.

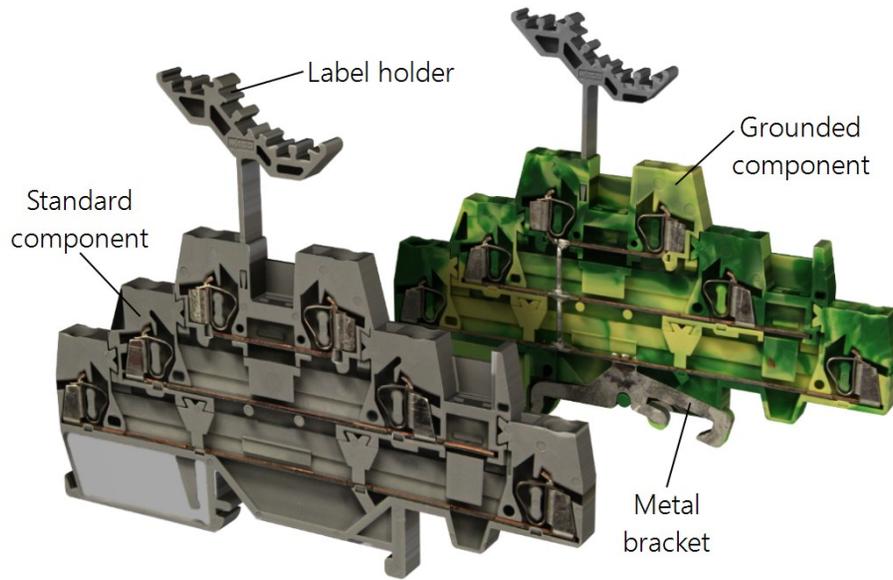


FIGURE 4-3. Standard (gray) and ground (green/yellow) components

5. Specifications

Visit www.campbellsci.com/din-rail-products to see the full line of DIN-rail components available from Campbell Scientific.

5.1 DIN rails

Mounting bracket length	Usable space on bracket	Maximum components ¹	Average components ²
15.2 cm (6 in)	12.7 cm (5 in)	42	24
25.4 cm (10 in)	22.9 cm (9 in)	76	43
30.5 cm (12 in)	27.9 cm (11 in)	93	53
35.6 cm (14 in)	33.0 cm (13 in)	110	63
52.4 cm (20.625 in)	49.5 cm (19.5 in)	165	95

¹Assumes no separators are being used with 4 mm components.
²Average components is a mixture of component sizes used on the bracket.

5.2 Terminal blocks

	Why/when to use	Grounded	Number of wires	Connection method	Mounting width
DIN-Rail Mountable 3-Wire 4 mm Spring-Loaded Connector	Sensor connections	No	3 (28-to-16 AWG)	Spring clamp	3 mm
DIN-Rail Mountable 2-Wire 5.2 mm Screw Connector	Sensor connections	No	2 (26-to-12 AWG)	Screw	5.2 mm

	Why/when to use	Grounded	Number of wires	Connection method	Mounting width
DIN-Rail Mountable 2-Wire 5.2 mm Grounded Screw Connector	Sensor connections	Yes	2 (26-to-12 AWG)	Screw	5.2 mm
DIN-Rail Mountable 6-Wire 5 mm Spring-Loaded 3-Tier Connector	Sensor connections. Tiers allow multiple connections to be stacked to save on horizontal space inside enclosure.	No	6 (28-to-12 AWG)	Spring clamp	5.2 mm
DIN-Rail Mountable 6-Wire 5 mm Spring-Loaded 3-Tier Grounded Connector	Sensor connections. Tiers allow multiple connections to be stacked to save on horizontal space inside enclosure.	Yes	6 (28-to-12 AWG)	Spring clamp	5 mm
DIN-Rail Mountable 6-Wire 5.2 mm Spring-Loaded 3-Tier Connector	For distributing power inside the enclosure. All connections are internally bonded.	No	6 (28-to-12 AWG)	Spring clamp	5.2 mm
DIN-Rail Mountable 6-Wire 5.2 mm Spring-Loaded 3-Tier Grounded Connector	For distributing power inside the enclosure. All connections are internally bonded.	Yes	6 (28-to-12 AWG)	Spring clamp	5.2 mm

	Why/when to use	Grounded	Number of wires	Connection method	Mounting width
DIN-Rail Mountable 2-Wire 8.2 mm Screw Connector	For connecting power into the enclosure or large ground wires from branch circuit.	No	2 (24-to-8 AWG)	Screw	8.2 mm
DIN-Rail Mountable 2-Wire 8.2 mm Grounded Screw Connector	For connecting power into the enclosure or large ground wires from branch circuit.	Yes	2 (24-to-8 AWG)	Screw	8.2 mm

5.3 Fuse holders for minifit automotive fuses

	Why/when to use	Number of wires	Mounting width
DIN-Rail Mountable 2-Wire 5.2 mm Blade-Type Fuse Holder Terminal Block	Fuse block with one input and one protected output	2 (22-to-12 AWG)	5.2 mm
DIN-Rail Mountable 4-Wire 5.2 mm Blade-Type Fuse Holder Terminal Block	Fuse/distribution block with one input, one unprotected output and two protected outputs	4 (22-to-12 AWG)	5.2 mm

5.4 Surge protection

	Why/when to use	Number of wires	Mounting width
DIN-Rail Mountable 2-Wire 6.2 mm 24 V Analog Surge Protector	Surge protector for two analog lines with common reference wires	2 (24-to-14 AWG)	6.2 mm
DIN-Rail Mountable 2-Wire 6.2 mm 24 V Digital Surge Protector	Surge protector for two digital lines with common reference wires. Also suitable for dc power that is 24 V and below.	2 (24-to-14 AWG)	6.2 mm

6. Installation procedure

1. Slide a DIN-rail end cap onto each end of the DIN rail (FIGURE 6-1 (p. 9)).



FIGURE 6-1. DIN-rail end caps

2. Locate the position to mount the DIN rail inside the enclosure (FIGURE 6-2 (p. 9)). There must be sufficient room on all sides to provide clearance for any component mounted on the DIN rail. Note the location of the backplate mounting holes at either end of the DIN rail.

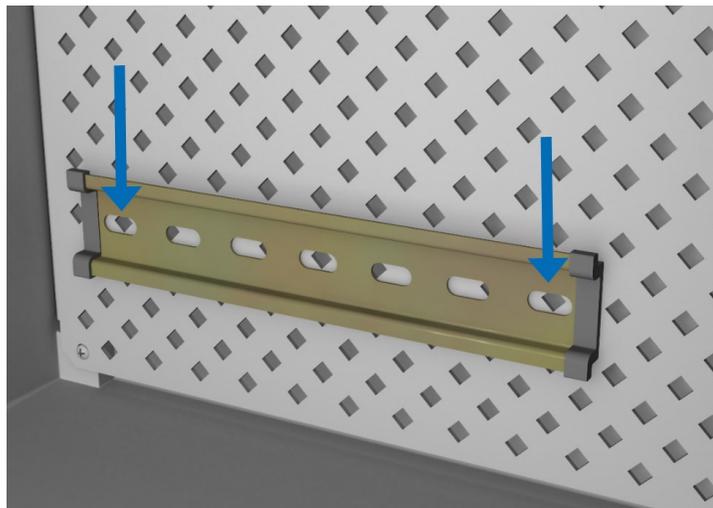


FIGURE 6-2. Determining the DIN-rail mounting hole locations

3. Insert grommets into the two holes noted in step 2 (FIGURE 6-3 (p. 10)). Secure the DIN rail to the backplate with the screws and washers included with the DIN rail. If a ground wire is included, slide the eyelet on one end of the ground wire over one of the mounting screws prior to securing the DIN rail. The other end of the ground wire is secured to the enclosure ground terminal.

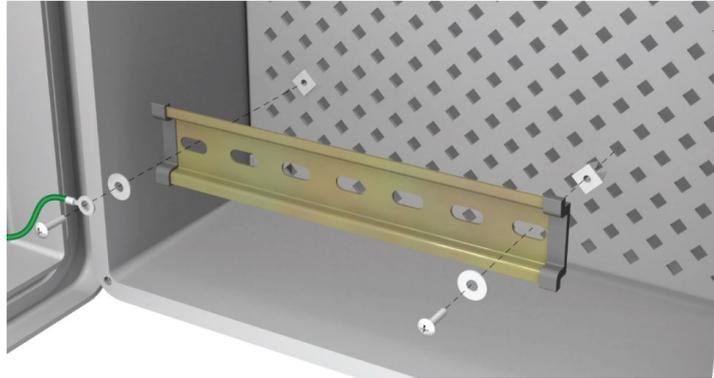


FIGURE 6-3. Mounting the DIN rail and ground wire

4. Determine the mounting order for the DIN-rail components. The order of components should provide for the simplest wiring later. Avoid positioning components so wires must pass back and forth over other components. It is also beneficial to mount components with the same profile next to one another to reduce the number of end cap/separators required.

5. Starting at one end, mount the DIN-rail components on the rail. One end of each component is designed to catch one side of the rail. The other end of the component then snaps into place when the component is pressed against the rail (FIGURE 6-4 (p. 11)). Place DIN-rail stoppers and end cap/separators next to components when the profiles of two adjacent components differ, when a gap between two components is desired, or when the last component is mounted to the DIN rail (FIGURE 6-5 (p. 12)).

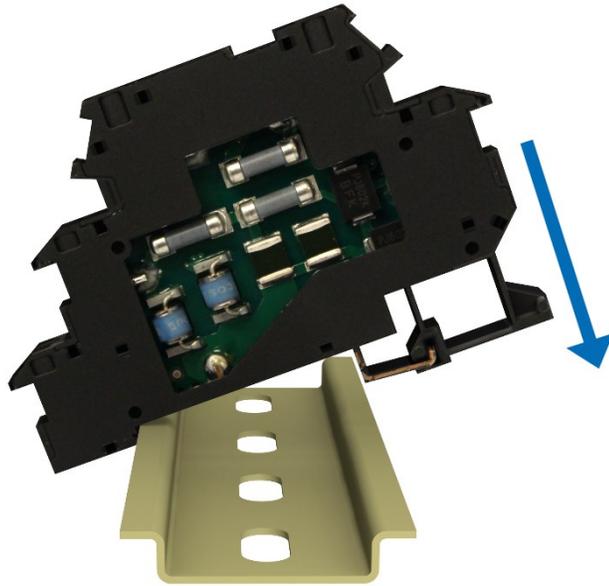


FIGURE 6-4. Mounting a DIN-rail component

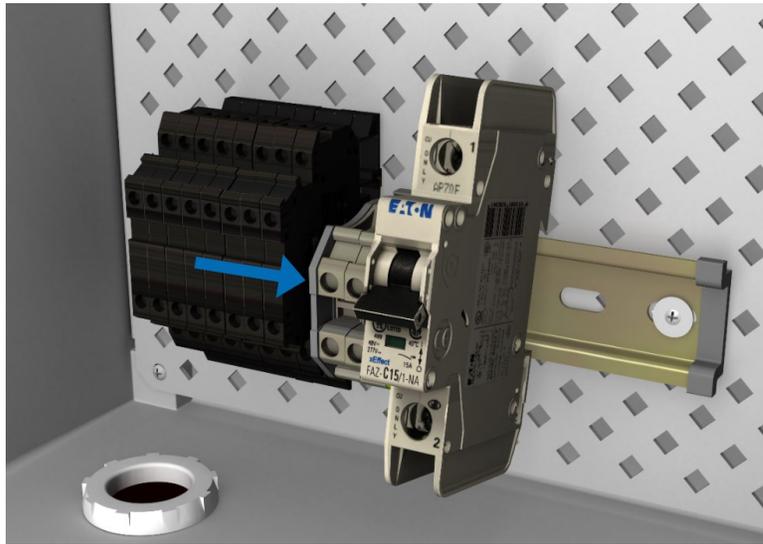


FIGURE 6-5. DIN rail with components

6. Apply any labels needed to identify specific connections ([FIGURE 6-6](#) (p. 12)).



FIGURE 6-6. Applying labels

- Attach wire jumpers between the DIN-rail components and other equipment inside the enclosure. If it is necessary to use jumpers to join two components, press each jumper firmly into the receptacles on each component (FIGURE 6-7 (p. 13)). To keep the enclosure organized, wiring ducts with covers are available to keep the loose wires gathered together (FIGURE 6-8 (p. 13)).

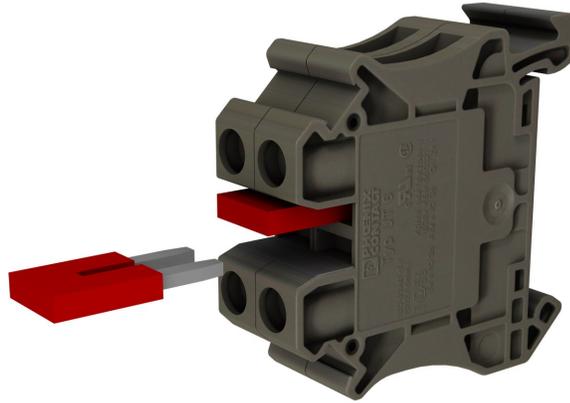


FIGURE 6-7. Attaching wire jumpers

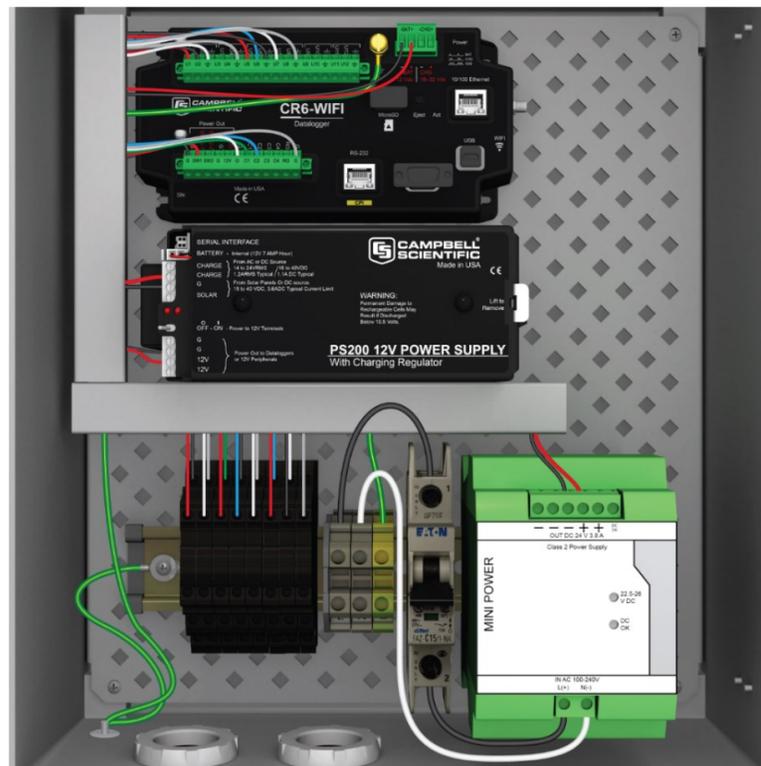


FIGURE 6-8. Wiring the DIN-rail components to other equipment in the enclosure

- The terminals on DIN-rail components may be secured by screws or spring clamps. To open the spring clamp, insert a small flathead screwdriver as shown in [FIGURE 6-9](#) (p. 14) to open the terminal. The wire end is inserted into the spring, and then the screwdriver is removed to close the terminal.

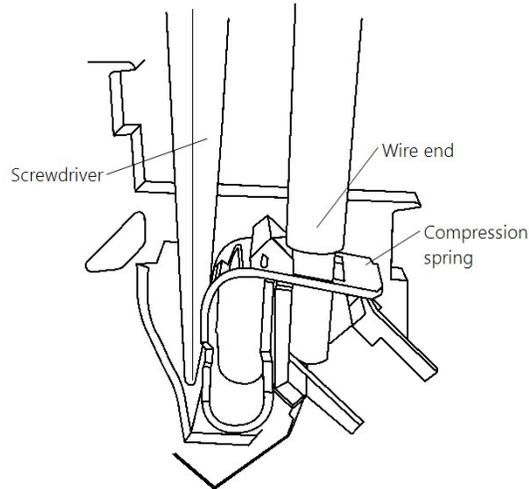


FIGURE 6-9. Securing a wire with a spring clamp

9. Attach any wires coming from outside the enclosure to the DIN-rail components (FIGURE 6-10 (p. 15)). Do not attach any voltage sources, such as AC power or a solar panel, until all other terminal connections have been made and verified.

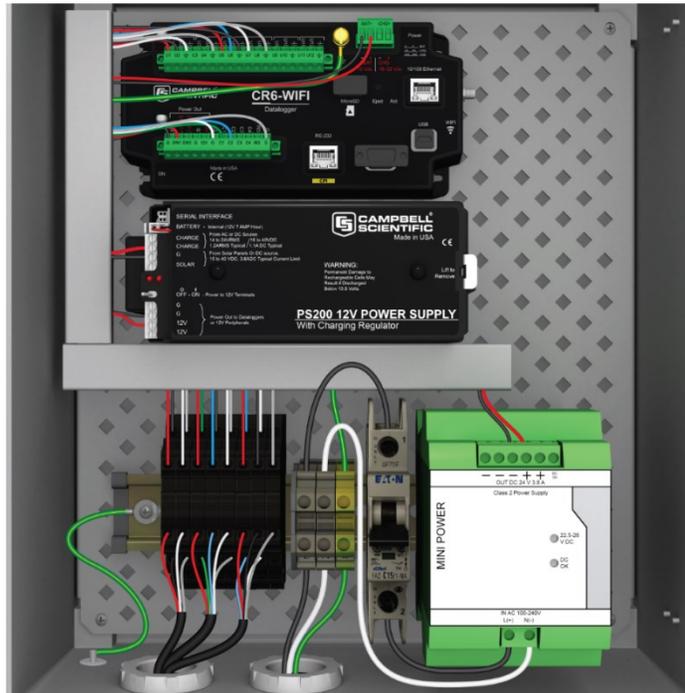


FIGURE 6-10. Attaching external wiring

7. Best practices

This section provides guidance and a list of best practices when installing a DIN-rail system. Following these guidelines will help develop a design that is efficient in its function and use of space inside the enclosure.

1. Wire routing
 - a. Whenever possible when wiring into the enclosure, use conduits to route AC power runs separately from DC powered circuits and sensor lines. While Campbell Scientific dataloggers provide 50 Hz/60 Hz AC noise filtering, it is good practice to avoid introducing this noise in the first place. Small voltage measurements are the most susceptible to inductive noise, with DC power being the least. However, it is best to keep these wires a minimum of 3 inches apart.

- b. When connecting the DIN-rail components to other devices inside the enclosure, use wire ties and wiring ducts with covers to keep the wiring clean and orderly. This will assist in the initial setup of the enclosure as well as for any component troubleshooting later.
2. DIN-rail component location
- a. When mounting DIN-rail components, keep AC components separate from DC components. If space permits, mount AC components on one DIN rail and DC and sensor components on a second DIN rail. If the components must be mounted on the same DIN rail, mount AC components on one end of the rail and DC components on the other, leaving as much space as possible between the two sets of components, preferably at least three inches.

Limited warranty

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Refer to www.campbellsci.com/terms#warranty[↗] for more information.

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Safety

DANGER — MANY HAZARDS ARE ASSOCIATED WITH INSTALLING, USING, MAINTAINING, AND WORKING ON OR AROUND **TRIPODS, TOWERS, AND ANY ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC.** FAILURE TO PROPERLY AND COMPLETELY ASSEMBLE, INSTALL, OPERATE, USE, AND MAINTAIN TRIPODS, TOWERS, AND ATTACHMENTS, AND FAILURE TO HEED WARNINGS, INCREASES THE RISK OF DEATH, ACCIDENT, SERIOUS INJURY, PROPERTY DAMAGE, AND PRODUCT FAILURE. TAKE ALL REASONABLE PRECAUTIONS TO AVOID THESE HAZARDS. CHECK WITH YOUR ORGANIZATION'S SAFETY COORDINATOR (OR POLICY) FOR PROCEDURES AND REQUIRED PROTECTIVE EQUIPMENT PRIOR TO PERFORMING ANY WORK.

Use tripods, towers, and attachments to tripods and towers only for purposes for which they are designed. Do not exceed design limits. Be familiar and comply with all instructions provided in product manuals. Manuals are available at www.campbellsci.com. You are responsible for conformance with governing codes and regulations, including safety regulations, and the integrity and location of structures or land to which towers, tripods, and any attachments are attached. Installation sites should be evaluated and approved by a qualified engineer. If questions or concerns arise regarding installation, use, or maintenance of tripods, towers, attachments, or electrical connections, consult with a licensed and qualified engineer or electrician.

General

- Protect from over-voltage.
- Protect electrical equipment from water.
- Protect from electrostatic discharge (ESD).
- Protect from lightning.
- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations.
- Use only qualified personnel for installation, use, and maintenance of tripods and towers, and any attachments to tripods and towers. The use of licensed and qualified contractors is highly recommended.
- Read all applicable instructions carefully and understand procedures thoroughly before beginning work.
- Wear a **hardhat** and **eye protection**, and take **other appropriate safety precautions** while working on or around tripods and towers.
- **Do not climb** tripods or towers at any time, and prohibit climbing by other persons. Take reasonable precautions to secure tripod and tower sites from trespassers.
- Use only manufacturer recommended parts, materials, and tools.

Utility and Electrical

- **You can be killed** or sustain serious bodily injury if the tripod, tower, or attachments you are installing, constructing, using, or maintaining, or a tool, stake, or anchor, come in **contact with overhead or underground utility lines**.
- Maintain a distance of at least one-and-one-half times structure height, 6 meters (20 feet), or the distance required by applicable law, **whichever is greater**, between overhead utility lines and the structure (tripod, tower, attachments, or tools).
- Prior to performing site or installation work, inform all utility companies and have all underground utilities marked.
- Comply with all electrical codes. Electrical equipment and related grounding devices should be installed by a licensed and qualified electrician.
- Only use power sources approved for use in the country of installation to power Campbell Scientific devices.

Elevated Work and Weather

- Exercise extreme caution when performing elevated work.
- Use appropriate equipment and safety practices.
- During installation and maintenance, keep tower and tripod sites clear of un-trained or non-essential personnel. Take precautions to prevent elevated tools and objects from dropping.
- Do not perform any work in inclement weather, including wind, rain, snow, lightning, etc.

Maintenance

- Periodically (at least yearly) check for wear and damage, including corrosion, stress cracks, frayed cables, loose cable clamps, cable tightness, etc. and take necessary corrective actions.
- Periodically (at least yearly) check electrical ground connections.

Internal Battery

- Be aware of fire, explosion, and severe-burn hazards.
- Misuse or improper installation of the internal lithium battery can cause severe injury.
- Do not recharge, disassemble, heat above 100 °C (212 °F), solder directly to the cell, incinerate, or expose contents to water. Dispose of spent batteries properly.

WHILE EVERY ATTEMPT IS MADE TO EMBODY THE HIGHEST DEGREE OF SAFETY IN ALL CAMPBELL SCIENTIFIC PRODUCTS, THE CUSTOMER ASSUMES ALL RISK FROM ANY INJURY RESULTING FROM IMPROPER INSTALLATION, USE, OR MAINTENANCE OF TRIPODS, TOWERS, OR ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC.



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