Limited Warranty

“Products manufactured by CSI are warranted by CSI to be free from defects in materials and workmanship under normal use and service for twelve months from the date of shipment unless otherwise specified in the corresponding product manual. (Product manuals are available for review online at www.campbellsci.com.) Products not manufactured by CSI, but that are resold by CSI, are warranted only to the limits extended by the original manufacturer. Batteries, fine-wire thermocouples, desiccant, and other consumables have no warranty. CSI’s obligation under this warranty is limited to repairing or replacing (at CSI’s option) defective Products, which shall be the sole and exclusive remedy under this warranty. The Customer assumes all costs of removing, reinstalling, and shipping defective Products to CSI. CSI will return such Products by surface carrier prepaid within the continental United States of America. To all other locations, CSI will return such Products best way CIP (port of entry) per Incoterms® 2010. This warranty shall not apply to any Products which have been subjected to modification, misuse, neglect, improper service, accidents of nature, or shipping damage. This warranty is in lieu of all other warranties, expressed or implied. The warranty for installation services performed by CSI such as programming to customer specifications, electrical connections to Products manufactured by CSI, and Product specific training, is part of CSI’s product warranty. CSI EXPRESSLY DISCLAIMS AND EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CSI hereby disclaims, to the fullest extent allowed by applicable law, any and all warranties and conditions with respect to the Products, whether express, implied or statutory, other than those expressly provided herein.”
Assistance

Products may not be returned without prior authorization. The following contact information is for US and international customers residing in countries served by Campbell Scientific, Inc. directly. Affiliate companies handle repairs for customers within their territories. Please visit www.campbellsci.com to determine which Campbell Scientific company serves your country.

To obtain a Returned Materials Authorization (RMA) number, contact CAMPBELL SCIENTIFIC, INC., phone (435) 227-9000. Please write the issued RMA number clearly on the outside of the shipping container. Campbell Scientific’s shipping address is:

CAMPBELL SCIENTIFIC, INC.
RMA#_____
815 West 1800 North
Logan, Utah 84321-1784

For all returns, the customer must fill out a “Statement of Product Cleanliness and Decontamination” form and comply with the requirements specified in it. The form is available from our website at www.campbellsci.com/repair. A completed form must be either emailed to repair@campbellsci.com or faxed to (435) 227-9106. Campbell Scientific is unable to process any returns until we receive this form. If the form is not received within three days of product receipt or is incomplete, the product will be returned to the customer at the customer’s expense. Campbell Scientific reserves the right to refuse service on products that were exposed to contaminants that may cause health or safety concerns for our employees.
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 or by telephoning (435) 227-9000 (USA). 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

- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations, such as those of the FAA in the USA.
- 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, 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.

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.

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.
Table of Contents

PDF viewers: These page numbers refer to the printed version of this document. Use the PDF reader bookmarks tab for links to specific sections.

1. Introduction ................................................................. 1
2. Precautions ..................................................................... 1
3. Initial Inspection ........................................................... 2
4. Overview ......................................................................... 3
5. Specifications .................................................................... 4
   5.1 DIN-Rail Mounting Kits ................................................. 4
   5.2 Terminal Blocks ......................................................... 5
   5.3 Fuse Holders for Minifit Automotive Fuses ...................... 6
   5.4 Surge Protection ......................................................... 6
   5.5 UL489 Circuit Breakers ............................................... 6
6. Installation ................................................................. 7
7. Best Practices .............................................................. 12

Figures

1-1. Enclosure with DIN rail and other components .............. 1
3-1. Example package components ....................................... 2
4-1. 5-inch and 9-inch DIN rails ........................................... 3
4-2. Components mounted on a DIN rail .............................. 3
4-3. Standard (gray) and ground (green/yellow) components .. 4
6-1. DIN-rail caps ............................................................. 7
6-2. Determining the DIN-rail mounting hole locations .......... 7
6-3. Mounting the DIN rail and ground wire ......................... 8
6-4. Mounting a DIN-rail component .................................... 9
6-5. DIN rail with components ............................................ 9
6-6. Applying labels .......................................................... 10
6-7. Wiring the DIN-rail components to other equipment in the 
    enclosure ................................................................. 10
6-8. Securing a wire with a spring clamp .............................. 11
6-9. Attaching external wiring .............................................. 11
DIN-Rail Components

1. Introduction

DIN-rail components are used when it is necessary to connect many wires to a single terminal. These terminals provide connection points for sensors, power distribution, surge protection, fuses, and circuit breakers (FIGURE 1-1). DIN-rail-mounted power supplies are also available to provide power to a datalogger when ac voltage is available onsite.

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

2. Precautions

- READ AND UNDERSTAND the Safety section at the front 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) 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

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 5-inch and 9-inch lengths (FIGURE 4-1). This 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).

FIGURE 4-1. 5-inch and 9-inch DIN rails

FIGURE 4-2. Components mounted on a DIN rail

Components designed to function as ground connections (P.E. models, typically colored in green/yellow) use the DIN rail as a common ground path.
FIGURE 4-3 shows a standard component (gray) and a ground component (green/yellow). Note the metal bracket for the DIN rail on the ground component.

**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

#### 5.1 DIN-Rail Mounting Kits

<table>
<thead>
<tr>
<th>Model</th>
<th>Mounting Bracket Length</th>
<th>Mounting Space to Hold Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>25458</td>
<td>5 in (12.7 cm)</td>
<td>101 mm</td>
</tr>
<tr>
<td>28532</td>
<td>9 in (22.9 cm)</td>
<td>203 mm</td>
</tr>
</tbody>
</table>
## 5.2 Terminal Blocks

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Why/When to Use</th>
<th>Grounded</th>
<th>Number of Wires</th>
<th>Connection Method</th>
<th>Mounting Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>15920</td>
<td>3-Wire, Spring Terminals, Sensor connections</td>
<td>No</td>
<td>3 (28-to-16 AWG)</td>
<td>Spring clamp</td>
<td>3 mm</td>
</tr>
<tr>
<td>28374</td>
<td>2-Wire, Screw Terminals, Sensor connections</td>
<td>No</td>
<td>2 (26-to-12 AWG)</td>
<td>Screw</td>
<td>5.2 mm</td>
</tr>
<tr>
<td>33251</td>
<td>2-Wire, Screw Terminals, Sensor connections</td>
<td>Yes</td>
<td>2 (26-to-12 AWG)</td>
<td>Screw</td>
<td>5.2 mm</td>
</tr>
<tr>
<td>21329</td>
<td>3-Tiered, 6-Wire, Spring Terminals, Sensor connections. Tiers allow</td>
<td>No</td>
<td>6 (28-to-12 AWG)</td>
<td>Spring clamp</td>
<td>5.2 mm</td>
</tr>
<tr>
<td>21330</td>
<td>3-Tiered, 6-Wire, Spring Terminals, Sensor connections. Tiers allow</td>
<td>Yes</td>
<td>6 (28-to-12 AWG)</td>
<td>Spring clamp</td>
<td>5 mm</td>
</tr>
<tr>
<td>27479</td>
<td>3-Tiered, 6-Wire, Spring Terminals, For distributing power inside the</td>
<td>No</td>
<td>6 (28-to-12 AWG)</td>
<td>Spring clamp</td>
<td>5.2 mm</td>
</tr>
<tr>
<td>27478</td>
<td>3-Tiered, 6-Wire, Spring Terminals, For distributing power inside the</td>
<td>Yes</td>
<td>6 (28-to-12 AWG)</td>
<td>Spring clamp</td>
<td>5.2 mm</td>
</tr>
<tr>
<td>27480</td>
<td>2-Wire, Screw Terminals, For connecting power into the enclosure or large</td>
<td>No</td>
<td>2 (24-to-8 AWG)</td>
<td>Screw</td>
<td>8.2 mm</td>
</tr>
<tr>
<td>27481</td>
<td>2-Wire, Screw Terminals, For connecting power into the enclosure or large</td>
<td>Yes</td>
<td>2 (24-to-8 AWG)</td>
<td>Screw</td>
<td>8.2 mm</td>
</tr>
</tbody>
</table>
### 5.3 Fuse Holders for Minifit Automotive Fuses

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Why/When to Use</th>
<th>Number of Wires</th>
<th>Mounting Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>30137</td>
<td>2-Wire, Blade-Fuse Holder</td>
<td>Fuse block with one input and one protected output</td>
<td>2 (22-to-12 AWG)</td>
<td>5.2 mm</td>
</tr>
<tr>
<td>30139</td>
<td>4-Wire, Blade-Fuse Holder</td>
<td>Fuse/distribution block with one input, one unprotected output and two protected outputs</td>
<td>4 (22-to-12 AWG)</td>
<td>5.2 mm</td>
</tr>
</tbody>
</table>

### 5.4 Surge Protection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Why/When to Use</th>
<th>Number of Wires</th>
<th>Mounting Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>31273</td>
<td>Analog Surge Protector, 24 V</td>
<td>Surge protector for two analog lines with common reference wires</td>
<td>2 (24-to-14 AWG)</td>
<td>6.2 mm</td>
</tr>
<tr>
<td>31274</td>
<td>Digital Surge Protector, 24 V</td>
<td>Surge protector for two digital lines with common reference wires. Also suitable for dc power that is 24 V and below.</td>
<td>2 (24-to-14 AWG)</td>
<td>6.2 mm</td>
</tr>
</tbody>
</table>

### 5.5 UL489 Circuit Breakers

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Why/When to Use</th>
<th>Type</th>
<th>Amperage</th>
<th>Mounting Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>30088</td>
<td>15 A Circuit Breaker</td>
<td>Typically used to protect incoming ac power. Useful for creating a branch circuit for 120 to 277 Vac or 100 Vdc maximum.</td>
<td>Single pole/Single throw</td>
<td>15 A</td>
<td>17.7 mm</td>
</tr>
<tr>
<td>27476</td>
<td>4 A Circuit Breaker</td>
<td>Typically used in-line between battery and charge regulator. Branch circuit protector rated at 120 to 277 Vac or 100 Vdc maximum.</td>
<td>Double pole/Single throw</td>
<td>4 A</td>
<td>17.7 mm</td>
</tr>
</tbody>
</table>
6. Installation

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

   FIGURE 6-1. DIN-rail caps

2. Locate the position to mount the DIN rail inside the enclosure (FIGURE 6-2). 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). 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’s ground terminal.

![FIGURE 6-3. Mounting the DIN rail and ground wire](image)

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 spacers and end caps 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). Use spacers between components when the profile of the components differs, and end caps when a gap between components is desired, or when the last component is mounted (FIGURE 6-5).
6. Apply any labels needed to identify specific connections (FIGURE 6-6).

![FIGURE 6-6. Applying labels](image)

7. Attach wire jumpers between the DIN-rail components and other equipment inside the enclosure. To keep the enclosure organized, wiring tracks are available to keep the loose wires gathered together (FIGURE 6-7).

![FIGURE 6-7. Wiring the DIN-rail components to other equipment in the enclosure](image)
8. 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 6-8 to open the terminal. The wire end is inserted into the spring, and then the screwdriver is removed to close the terminal.

![FIGURE 6-8. Securing a wire with a spring clamp](image)

9. Attach any wires coming from outside the enclosure to the DIN-rail components (FIGURE 6-9). 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 6-9. Attaching external wiring](image)
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 wire track 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.
Campbell Scientific Companies

Campbell Scientific, Inc.
815 West 1800 North
Logan, Utah 84321
UNITED STATES
www.campbellsci.com • info@campbellsci.com

Campbell Scientific Canada Corp.
14532 – 131 Avenue NW
Edmonton AB T5L 4X4
CANADA
www.campbellsci.ca • dataloggers@campbellsci.ca

Campbell Scientific Africa Pty. Ltd.
PO Box 2450
Somerset West 7129
SOUTH AFRICA
www.campbellsci.co.za • cleroux@csafrica.co.za

Campbell Scientific Centro Caribe S.A.
300 N Cementerio, Edificio Breller
Santo Domingo, Heredia 40305
COSTA RICA
www.campbellsci.cc • info@campbellsci.cc

Campbell Scientific Southeast Asia Co., Ltd.
877/22 Nirvana@Work, Rama 9 Road
Suan Luang Subdistrict, Suan Luang District
Bangkok 10250
THAILAND
www.campbellsci.asia • info@campbellsci.asia

Campbell Scientific Ltd.
Campbell Park
80 Hathern Road
Shepshed, Loughborough LE12 9GX
UNITED KINGDOM
www.campbellsci.co.uk • sales@campbellsci.co.uk

Campbell Scientific Australia Pty. Ltd.
PO Box 8108
Garbutt Post Shop QLD 4814
AUSTRALIA
www.campbellsci.com.au • info@campbellsci.com.au

Campbell Scientific (Beijing) Co., Ltd.
8B16, Floor 8 Tower B, Hanwei Plaza
7 Guanghua Road
Chaoyang, Beijing 100004
P.R. CHINA
www.campbellsci.com • info@campbellsci.com.cn

Campbell Scientific Ltd.
3 Avenue de la Division Leclerc
92160 ANTONY
FRANCE
www.campbellsci.fr • info@campbellsci.fr

Campbell Scientific Ltd.
Fahrenheitstraße 13
28359 Bremen
GERMANY
www.campbellsci.de • info@campbellsci.de

Campbell Scientific do Brasil Ltda.
Rua Apinagés, n°r. 2018 — Perdizes
CEP: 01258-00 — São Paulo — SP
BRASIL
www.campbellsci.com.br • vendas@campbellsci.com.br

Campbell Scientific Spain, S. L.
Avda. Pompeu Fabra 7-9, local 1
08024 Barcelona
SPAIN
www.campbellsci.es • info@campbellsci.es

Please visit www.campbellsci.com to obtain contact information for your local US or international representative.