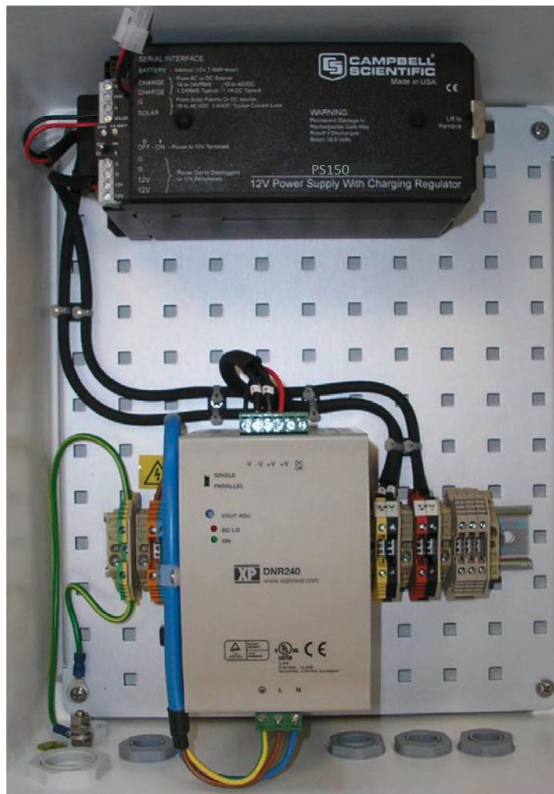


# INSTALLATION GUIDE



## ***Optical Sensor Power Supply (with Enclosure and Battery Backup)***



*Issued: 19.8.15*

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# Guarantee

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This equipment is guaranteed against defects in materials and workmanship. This guarantee applies for 24 months from date of delivery. We will repair or replace products which prove to be defective during the guarantee period provided they are returned to us prepaid. The guarantee will not apply to:

- Equipment which has been modified or altered in any way without the written permission of Campbell Scientific
- Batteries
- Any product which has been subjected to misuse, neglect, acts of God or damage in transit.

Campbell Scientific will return guaranteed equipment by surface carrier prepaid. Campbell Scientific will not reimburse the claimant for costs incurred in removing and/or reinstalling equipment. This guarantee and the Company's obligation thereunder is in lieu of all other guarantees, expressed or implied, including those of suitability and fitness for a particular purpose. Campbell Scientific is not liable for consequential damage.

Please inform us before returning equipment and obtain a Repair Reference Number whether the repair is under guarantee or not. Please state the faults as clearly as possible, and if the product is out of the guarantee period it should be accompanied by a purchase order. Quotations for repairs can be given on request. It is the policy of Campbell Scientific to protect the health of its employees and provide a safe working environment, in support of this policy a "Declaration of Hazardous Material and Decontamination" form will be issued for completion.

When returning equipment, the Repair Reference Number must be clearly marked on the outside of the package. Complete the "Declaration of Hazardous Material and Decontamination" form and ensure a completed copy is returned with your goods. Please note your Repair may not be processed if you do not include a copy of this form and Campbell Scientific Ltd reserves the right to return goods at the customers' expense.

Note that goods sent air freight are subject to Customs clearance fees which Campbell Scientific will charge to customers. In many cases, these charges are greater than the cost of the repair.



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# PLEASE READ FIRST

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## About this manual

Some useful conversion factors:

**Area:** 1 in<sup>2</sup> (square inch) = 645 mm<sup>2</sup>

**Length:** 1 in. (inch) = 25.4 mm  
1 ft (foot) = 304.8 mm  
1 yard = 0.914 m  
1 mile = 1.609 km

**Mass:** 1 oz. (ounce) = 28.35 g  
1 lb (pound weight) = 0.454 kg

**Pressure:** 1 psi (lb/in<sup>2</sup>) = 68.95 mb

**Volume:** 1 UK pint = 568.3 ml  
1 UK gallon = 4.546 litres  
1 US gallon = 3.785 litres

## Recycling information



At the end of this product's life it should not be put in commercial or domestic refuse but sent for recycling. Any batteries contained within the product or used during the products life should be removed from the product and also be sent to an appropriate recycling facility.

Campbell Scientific Ltd can advise on the recycling of the equipment and in some cases arrange collection and the correct disposal of it, although charges may apply for some items or territories.

For further advice or support, please contact Campbell Scientific Ltd, or your local agent.



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# Precautions

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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.eu](http://www.campbellsci.eu) or by telephoning +44(0) 1509 828 888 (UK). 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, or 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.





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# ***Optical Sensor Power Supply Enclosure***

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*Important Safety Instructions – please request a translation or further advice if you cannot understand this document.*

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## **1. Installation instructions for the Optical Sensor Power Supply Enclosure**

This document is supplied with the PWS power supply enclosure as it requires direct wiring of an AC, mains power source to terminals inside this enclosure. The instructions below describe how to do this and precautions for the use of the system after installation.

### **1.1 Required knowledge**

The wiring of the enclosure should only be carried out by personnel qualified to install electrical equipment relevant to the installation. For permanent installations outside this usually requires a certified electrician who is also familiar with local electrical and safety legislation. Some general guidance is given below, but the responsibility for the installation lies with that installer.

### **1.2 Preparation and initial checks**

- Choice of site: unless otherwise stated, the enclosure supplied is designed to be mounted in an area with restricted access, i.e. not accessible to general public where it might be vandalised. If access is not restricted please contact Campbell Scientific for further advice.
- The enclosure should be mounted to a fixed structure in accordance to the general instructions for the enclosure or system supplied.
- A mains power source needs to be identified and the type of termination, cable type and cable run matched to comply with local regulations and the type of installation.

- The power source needs to be able to provide the correct voltage and frequency and current in excess of the power requirement of the system. See below.

Voltage requirements: 90-132 or 180-264 V AC

Current requirements: 4.00 A at 115 V AC, 1.55 A at 230 V AC.

Input frequency: 47-63 Hz.

- The power source needs to be fused. The fuse rating should be 6.3A or larger and an “anti-surge” design. The cable used should be capable of carrying current in excess of that fuse rating.
- The power source should be fitted with a two-pole isolator and should be fitted as near to the enclosure as is possible.
- The power cable needs to have three conductors, live, neutral and a protective earth, normally with IEC wiring colours to match those used in the enclosure.
- This equipment requires a protective earth. **THIS MUST BE CONNECTED FOR SAFETY REASONS.** Please ensure the earth connection at the power source is suitable for this purpose.
- This equipment also requires correct connection of the Live and Neutral conductors – make sure these are identified and wired correctly at the power source.
- For outside installations the power source should be fitted with its own or system wide earth leakage breaker (also known as an RCD).

### 1.3 Wiring into the enclosure

The main power supply for the enclosure will normally not be installed for shipping. It will be shipped packed in a cardboard box. After mounting the enclosure in its final position remove the power supply from its box and install it in the enclosure (refer to Fig. 1). The power supply clips in place on the DIN rail provided. Connectors are prewired to the power supply and those connectors should be plugged into the top and bottom of the supply as shown.

The enclosure is fitted with a cable gland specifically for the mains cable entry. This gland can be removed and replaced with an alternative which may be better suited to the cable, e.g. if armoured cable and matching fittings are to be used. The gland should be tightened on the cable and the cable fixed outside of the enclosure to prevent accidental removal of the cable.

Inside the enclosure there is a DIN rail fitted with a clearly identified, separate terminal block labelled L, N, E (the E may also have a protective earth symbol). See Fig. 2. Existing wires from the internal power supply will already be connected to one side of the terminal block and should not be disturbed. The installer should prepare the cable, route and wire to the spare terminals on the other side of the terminal block, matching the connections to the L, N and E terminals.

A clip is fitted to the chassis plate below the terminal block to allow the mains cable to be fixed with a cable tie to give some strain relief.

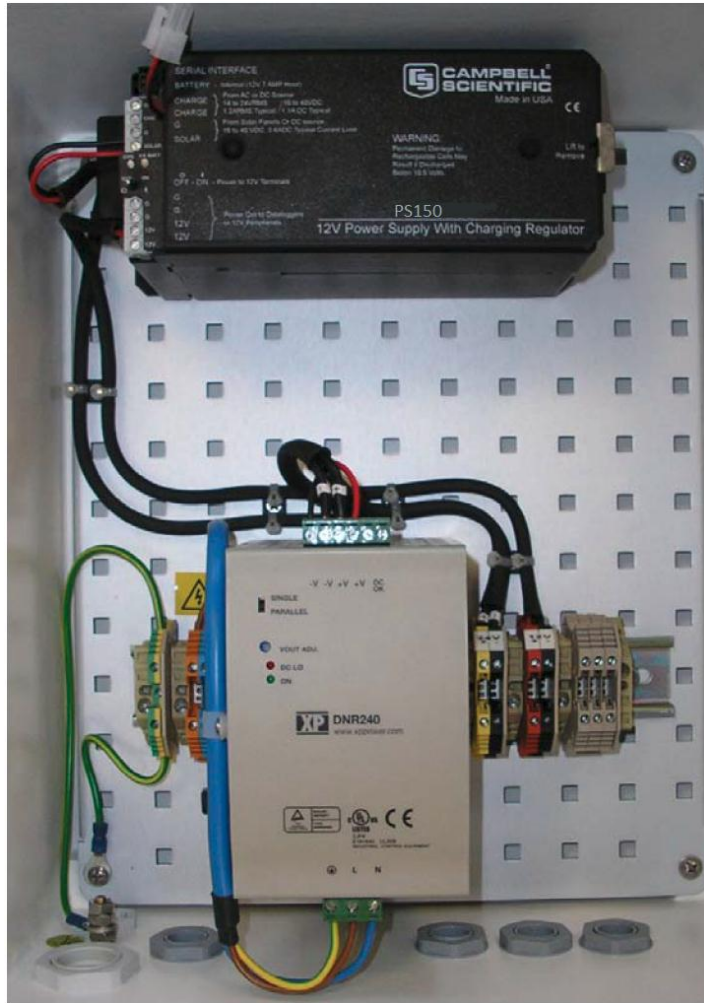


Fig. 1. General View

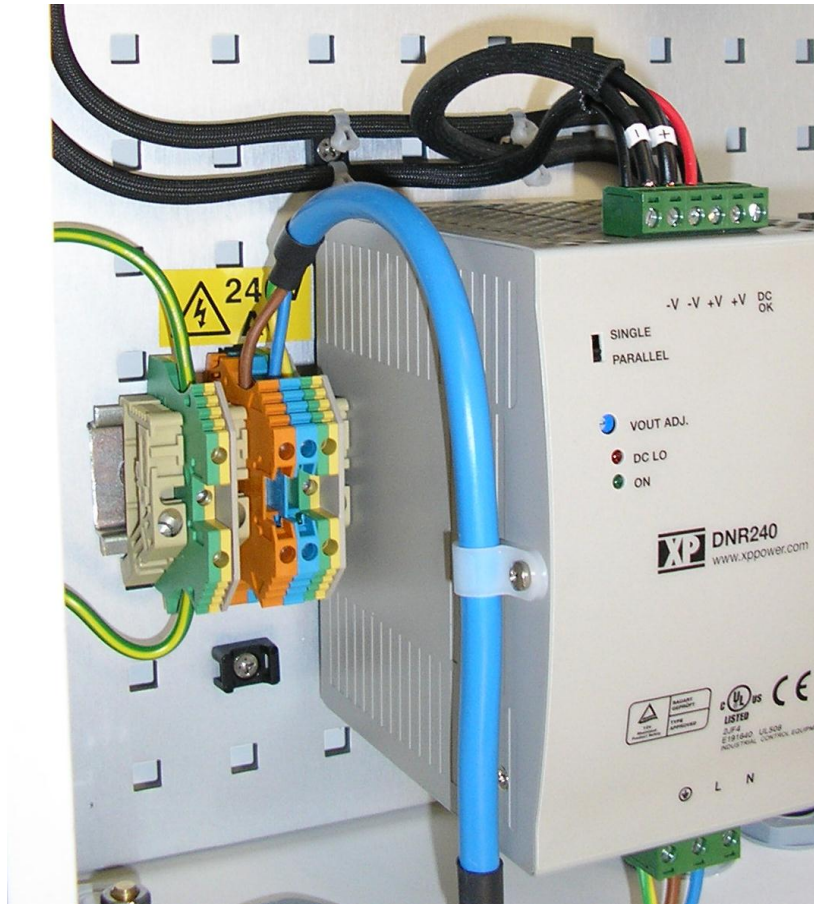


Fig. 2. Mains Connections

The earth terminal acts as the main protective earth input for the enclosure. This will be connected to the chassis plate and also to an earth boss on the base of the enclosure which is identified as a protective earth.

If local regulations allow and/or require, the earth boss can be connected to an earth external to the enclosure either to provide a better external earth for transient protection or to ensure all local earths are bonded together, e.g. the earthing point of a tower.

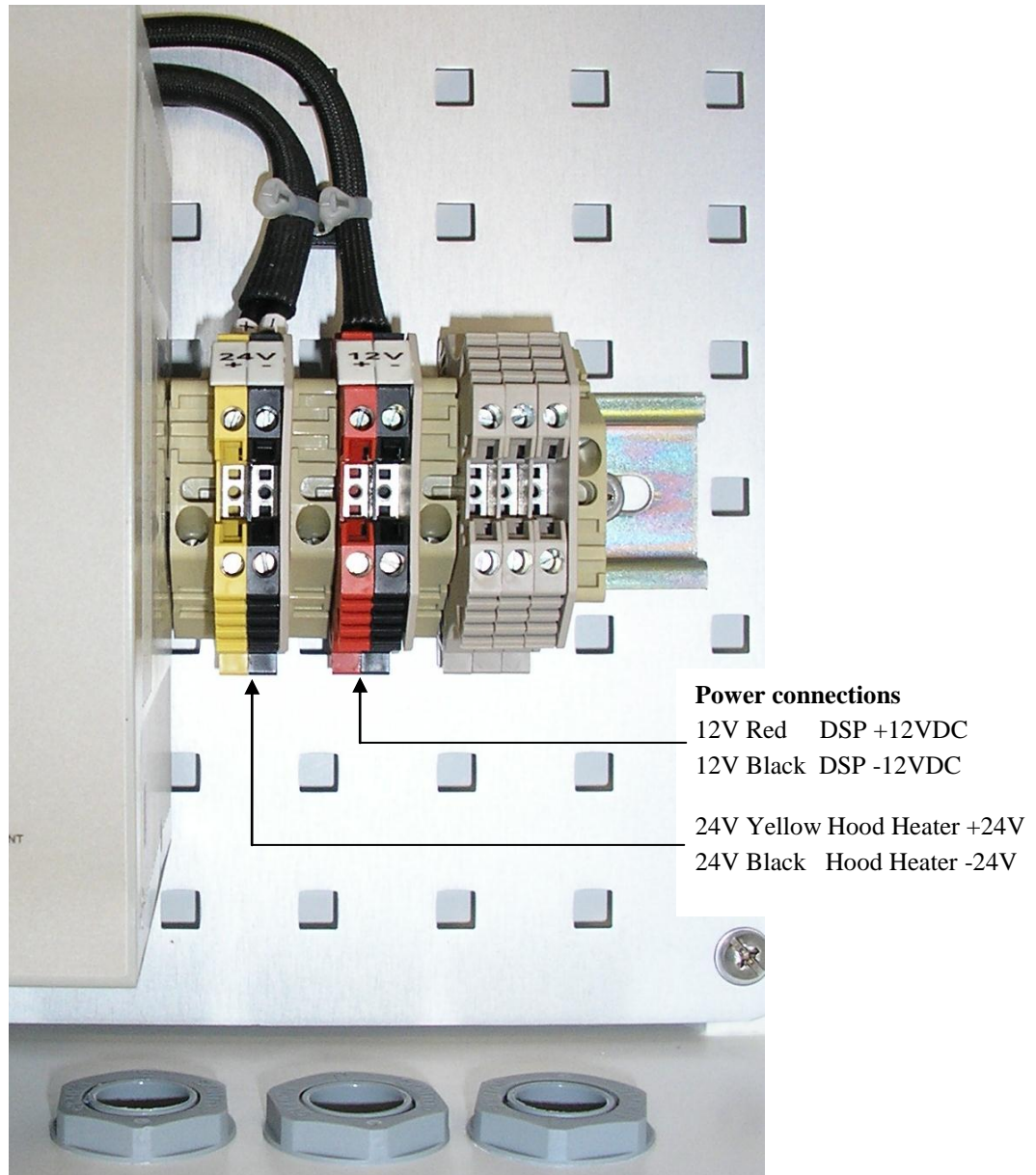
The enclosure will be fitted with a secondary block of terminals labelled 24V DC and 12 V DC (Fig. 3). The 24V DC is the output to power the hood heaters in the Optical Sensor. The 24V supply is also used to provide charging power to the PS150 battery power supply which is installed in the enclosure and that will charge the battery. The 12V feed is battery backed by the PS150 supply and is used to power the DSP (signal processing) electronics in the Optical Sensor. It will run the sensor for up to 8 hours.

A spare set of terminals are fitted for wiring the communication cable in and out of the enclosure.

**WARNING**

**Do not leave the Optical Sensor connected to the 12V feed for extended periods without the main supply connected otherwise the Optical Sensor may shutdown and/or the battery in PS150 may be damaged. It is advised you enable the low battery shutdown at 11 volts in the optical sensor(s) to avoid risk of battery damage.**

Please refer to the Optical Sensor manual for more details of the low battery shutdown settings.



*Fig. 3. DC Connections*

The 24V supply is also used to provide charging power to the PS150 battery power supply which is installed in the enclosure and that will charge the battery.

The 12V feed is used to power the DSP (signal processing) electronics in the Optical Sensor.

Function	Terminal colour	Optical Sensor standard cable colour
12VDC supply for Optical Sensor DSP, +ve	Red	Red, 5 core comms/power cable
12VDC supply for Optical Sensor DSP, -ve	Black	Black, 5 core comms/power cable
24VDC supply for Optical Sensor Hood Heater, +ve	Yellow	Red, 2 core heater cable
24VDC supply for Optical Sensor Hood Heater, -ve	Black	Black, 2 core heater cable

After wiring, carry out any statutory tests on the earth bonding, before applying AC power. When power is applied, if you have the equipment and qualifications to do so, check the AC voltage at the DIN rail terminal block is within the range specified on the equipment ratings label. Check the grey power supply has powered on correctly by obvious status indicators on the front of the supply.

Then connect the battery connector of the PS150 and turn on the power switch on the PS150.

On completion, shut the door and fit the padlock supplied. Please prepare and leave any statutory documentation with the normal user of the system, including details of how to isolate power to the enclosure.

## 1.4 General use and access to the enclosure

The enclosure is supplied with and should always be fitted with a padlock to stop unqualified personnel opening the enclosure. The enclosure should be left locked at all times.

If acceptable for the system operation, it is best practice to isolate the mains power supply to the enclosure before opening the enclosure.

If this is not possible, only allow personnel with adequate training to open the enclosure when it is powered on. Although the mains terminals provided are “finger safe”, users should not attempt to adjust or amend any wiring in the enclosure when it is powered on.

If the enclosure is supplied with desiccant this should be changed at the intervals stated in the general manual for the enclosures, although if there are sources of heat inside the enclosure the frequency they are changed can be reduced. The power supplies inside this enclosure will generate some heat. Desiccant should still be used though, especially if the external humidity is high.

If the enclosure, cables or ancillary equipment is damaged or has signs of moisture ingress then the equipment should not be used and isolated from the mains supply.





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