

# ***PSW12***

## ***Power Switch***

### ***User Manual***

*Issued 6.7.09*

Copyright © 1998 Campbell Scientific Inc.  
Printed under licence by Campbell Scientific Ltd.



# Guarantee

---

This equipment is guaranteed against defects in materials and workmanship. This guarantee applies for twelve 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.

When returning equipment, the Repair Reference Number must be clearly marked on the outside of the package.

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.



Campbell Scientific Ltd,  
Campbell Park, 80 Hathern Road,  
Shepshed, Loughborough, LE12 9GX, UK  
Tel: +44 (0) 1509 601141  
Fax: +44 (0) 1509 601091  
*Email: [support@campbellsci.co.uk](mailto:support@campbellsci.co.uk)*  
*[www.campbellsci.co.uk](http://www.campbellsci.co.uk)*



# PLEASE READ FIRST

---

## About this manual

Please note that this manual was originally produced by Campbell Scientific Inc. primarily for the North American market. Some spellings, weights and measures may reflect this origin.

Some useful conversion factors:

<b>Area:</b>	1 in <sup>2</sup> (square inch) = 645 mm <sup>2</sup>
<b>Length:</b>	1 in. (inch) = 25.4 mm
	1 ft (foot) = 304.8 mm
	1 yard = 0.914 m
	1 mile = 1.609 km
<b>Mass:</b>	1 oz. (ounce) = 28.35 g
	1 lb (pound weight) = 0.454 kg
<b>Pressure:</b>	1 psi (lb/in <sup>2</sup> ) = 68.95 mb
<b>Volume:</b>	1 UK pint = 568.3 ml
	1 UK gallon = 4.546 litres
	1 US gallon = 3.785 litres

In addition, while most of the information in the manual is correct for all countries, certain information is specific to the North American market and so may not be applicable to European users.

Differences include the U.S standard external power supply details where some information (for example the AC transformer input voltage) will not be applicable for British/European use. *Please note, however, that when a power supply adapter is ordered it will be suitable for use in your country.*

Reference to some radio transmitters, digital cell phones and aerials may also not be applicable according to your locality.

Some brackets, shields and enclosure options, including wiring, are not sold as standard items in the European market; in some cases alternatives are offered. Details of the alternatives will be covered in separate manuals.

## 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.



Campbell Scientific Ltd, Campbell Park, 80 Hathern Road, Shepshed, Loughborough, LE12 9GX, UK  
Tel: +44 (0) 1509 601141 Fax: +44 (0) 1509 601091  
Email: [support@campbellsci.co.uk](mailto:support@campbellsci.co.uk)  
[www.campbellsci.co.uk](http://www.campbellsci.co.uk)



# Contents

---

*PDF viewers note: These page numbers refer to the printed version of this document. Use the Adobe Acrobat® bookmarks tab for links to specific sections.*

- 1. Introduction..... 1**
  - 1.1 Dataloggers Without Power Switching Capability ..... 1
  - 1.2 Switching Multiple Sensors ..... 1
  - 1.3 Switching Power to Other Principals..... 1
  
- 2. Connections..... 1**
  - 2.1 Supplied as Part of an AWS Installation ..... 1
  - 2.2 User Connection Details ..... 2
  
- 3. Specifications ..... 3**
  
- Table**
  - 1. PSW12 Connections ..... 2





# PSW12 Power Switch

---

*The PSW12 provides a switched power supply, so allowing sensors such as the 50Y, HMP45C and MP100A Temperature and RH probes to be used with dataloggers which do not have a built-in power switch, or where there are a number of different sensors or other peripherals that need to be powered at different times, requiring more than one switch. The PSW12 can also be used to control the power to some GSM and radio 'modems'.*

## 1. Introduction

The PSW12 is an easy to fit, self-contained, power switch which can be used directly with many Campbell Scientific dataloggers without the need for soldering.

### 1.1 Dataloggers Without Power Switching Capability

The CR500 and older CR10 dataloggers (those fitted with *silver* wiring panels) do not provide a switched output. Running a sensor such as the MP100A continuously from the 5V or 12V output from these dataloggers is not always ideal because of the continuous power drain from the datalogger's batteries. The PSW12 is a power switch to allow the sensors to be switched on and off using either an excitation channel or a control port on the datalogger.

### 1.2 Switching Multiple Sensors

Although dataloggers such as the CR23X, CR10X and newer dataloggers (e.g. CR1000) incorporate a switched output, when a large number of sensors are incorporated into an installation (such as an Automatic Weather Station) the current drain may exceed the capacity of the switched 12V supply on the datalogger. In this case a PSW12 can be used. You may also need to use one or more PSW12s to turn different sensors on and off at different times.

### 1.3 Switching Power to Other Peripherals

The PSW12 can also be used to control power to other peripherals such as radio transceivers. The maximum average current that can be switched is 600mA at 50°C. The circuit will supply higher peak currents (>4A) for short periods.

## 2. Connections

### 2.1 Supplied as Part of an AWS Installation

When a separate switched output is required as part of a complete Automatic Weather Station, the power switch interface is connected between the datalogger wiring panel and the sensor, and is installed inside the enclosure.

The control line used to switch the power on and off is usually connected to an excitation port, or control port.

By connecting to an excitation output (rather than a control port) the datalogger can be programmed so that only one instruction (the CRBasic Bridge instructions or the Edlog loggers, Instruction 4: Excite, Delay, Measure Single-Ended) need be

used to turn on the sensor, take a measurement and then turn the sensor off. The excitation voltage should be at least 2500mV. For applications where no excitation output is free or where the datalogger is required to perform other tasks during the excitation period, the control line can be connected to a control port. (Contact Campbell Scientific for further advice on programming techniques for this option.)

---

**NOTE** Please refer to the relevant sensor manual for specific excitation times.

---

PSW12 units fitted with an extra white (failsafe) wire will have this connected either to 5V or G.

## 2.2 User Connection Details

The PSW12 can be purchased as an individual item. It is supplied with a removable connector at one end, with two screw terminals, for sensor connection. At the other end are four colour-coded wires for connection to the datalogger. The switch should be connected as shown in Table 1, below.

Table 1 PSW12 Connections	
PSW12 Input/Output	Connect to
Screwed Terminal (labelled 12V)	Sensor switched supply
Screwed Terminal (labelled G)	Sensor Ground
Red Wire	High side of unregulated +12V nominal source
Yellow Wire	Datalogger excitation or control output
White Wire	Failsafe function connect to 5V or G
Black Wire	Supply Ground – should also be connected to datalogger ground

PSW12 units made in mid-2009 on have an extra white failsafe wire fitted. This wire sets the state of the output to either 0 or 12V when the yellow control wire is not actively driven by the datalogger. If connected to G the output will be off (0V) or if connected to +5V the output will be on (12V). The datalogger does not actively drive excitation outputs, between instructions; it also does not drive control ports on/off if not running a program. A typical requirement for this line is to ensure a communications device remains powered on in the event of the logger program stopping. In this case the line should be connected to +5V.

---

**CAUTION** Although the body of the PSW12 is enclosed in heat-shrink insulation, it is not waterproof, and any ingress of moisture could affect its performance. It should, therefore, always be installed in a weatherproof enclosure for outdoor use.

---

**NOTE**

---

The output of the PSW12 is short circuit protected by a thermal fuse. If this fuse trips, remove the short and then disconnect the supply for a few seconds to allow the fuse to reset.

---

### 3. Specifications

Input Voltage Range	+5V to +20V
Maximum Control Voltage	20V
Maximum Output Current	600mA @ 50°C
Minimum On/Off control voltage for ON state	>2.0V
Maximum On/Off voltage for	<0.5V OFF state
Max. voltage drop from input to switched output	1.0V





## **CAMPBELL SCIENTIFIC COMPANIES**

### **Campbell Scientific, Inc. (CSI)**

815 West 1800 North  
Logan, Utah 84321  
UNITED STATES

[www.campbellsci.com](http://www.campbellsci.com) • [info@campbellsci.com](mailto:info@campbellsci.com)

### **Campbell Scientific Africa Pty. Ltd. (CSAf)**

PO Box 2450  
Somerset West 7129  
SOUTH AFRICA

[www.csafrica.co.za](http://www.csafrica.co.za) • [sales@csafrica.co.za](mailto:sales@csafrica.co.za)

### **Campbell Scientific Australia Pty. Ltd. (CSA)**

PO Box 444  
Thuringowa Central  
QLD 4812 AUSTRALIA

[www.campbellsci.com.au](http://www.campbellsci.com.au) • [info@campbellsci.com.au](mailto:info@campbellsci.com.au)

### **Campbell Scientific do Brazil Ltda. (CSB)**

Rua Luisa Crapsi Orsi, 15 Butantã  
CEP: 005543-000 São Paulo SP BRAZIL

[www.campbellsci.com.br](http://www.campbellsci.com.br) • [suporte@campbellsci.com.br](mailto:suporte@campbellsci.com.br)

### **Campbell Scientific Canada Corp. (CSC)**

11564 - 149th Street NW  
Edmonton, Alberta T5M 1W7  
CANADA

[www.campbellsci.ca](http://www.campbellsci.ca) • [dataloggers@campbellsci.ca](mailto:dataloggers@campbellsci.ca)

### **Campbell Scientific Centro Caribe S.A. (CSCC)**

300N Cementerio, Edificio Breller  
Santo Domingo, Heredia 40305  
COSTA RICA

[www.campbellsci.cc](http://www.campbellsci.cc) • [info@campbellsci.cc](mailto:info@campbellsci.cc)

### **Campbell Scientific Ltd. (CSL)**

Campbell Park  
80 Hathern Road  
Shepshed, Loughborough LE12 9GX  
UNITED KINGDOM

[www.campbellsci.co.uk](http://www.campbellsci.co.uk) • [sales@campbellsci.co.uk](mailto:sales@campbellsci.co.uk)

### **Campbell Scientific Ltd. (France)**

Miniparc du Verger - Bat. H  
1, rue de Terre Neuve - Les Ulis  
91967 COURTABOEUF CEDEX  
FRANCE

[www.campbellsci.fr](http://www.campbellsci.fr) • [info@campbellsci.fr](mailto:info@campbellsci.fr)

### **Campbell Scientific Spain, S. L.**

Psg. Font 14, local 8  
08013 Barcelona  
SPAIN

[www.campbellsci.es](http://www.campbellsci.es) • [info@campbellsci.es](mailto:info@campbellsci.es)

### **Campbell Scientific Ltd. (Germany)**

Fahrenheitstrasse13, D-28359 Bremen  
GERMANY

[www.campbellsci.de](http://www.campbellsci.de) • [info@campbellsci.de](mailto:info@campbellsci.de)