

# ***DCDC18R*** ***Boost Regulator***

## ***User Guide***

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# Guarantee

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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:

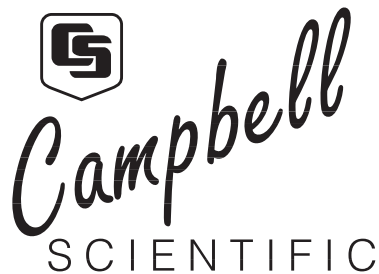
- Equipment which has been modified or altered in any way without the written permission of Campbell Scientific
- Batteries
- Any product which has been subjected to misuse, neglect, acts of God or damage in transit.

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)



# DCDC18R BOOST REGULATOR

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FIGURE 1. DCDC18R

## 1. General Description

The DCDC18R Boost regulator is intended to accept an 11 to 16 VDC input and boost it to 18 VDC. Its main use is to boost automobile supply voltages to the 17 VDC minimum required to charge the batteries in the CR23X and CR5000 LA bases. It can be conveniently bolted onto the side of the LA base next to the charger input.

## 2. Specifications

Input Voltage:	11 - 16 VDC
Output Voltage:	18 V $\pm$ 5%
Quiescent Current	4 mA
Maximum Output Current:	1 Amp
Maximum Input Current	2.25 Amps*
Power Conversion Efficiency	80 to 90%
Temperature Range:	-40 to +60°C

**Note** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

\* The slow start boost regulator typically starts to work at a supply voltage of about 10 volts. Supply voltages below 10 volts pass directly to V out (through 2 Schottky diodes dropping the voltage by ~ 0.6 volts). With the DCDC18R operating at the maximum output current (18 V \* 1 A = 18 W) the input power required is up to 18 W / 0.8 efficiency = 22.5 watts; that is the maximum current specification of 2.25 Amps at 10 volts.

### 3. Installation

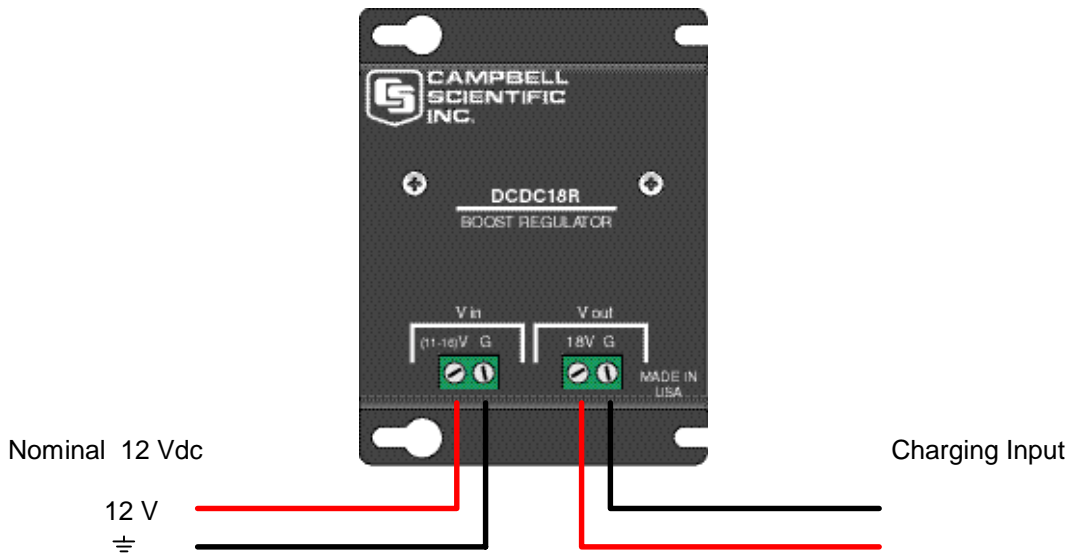


FIGURE 2. Wiring for DCDC18R

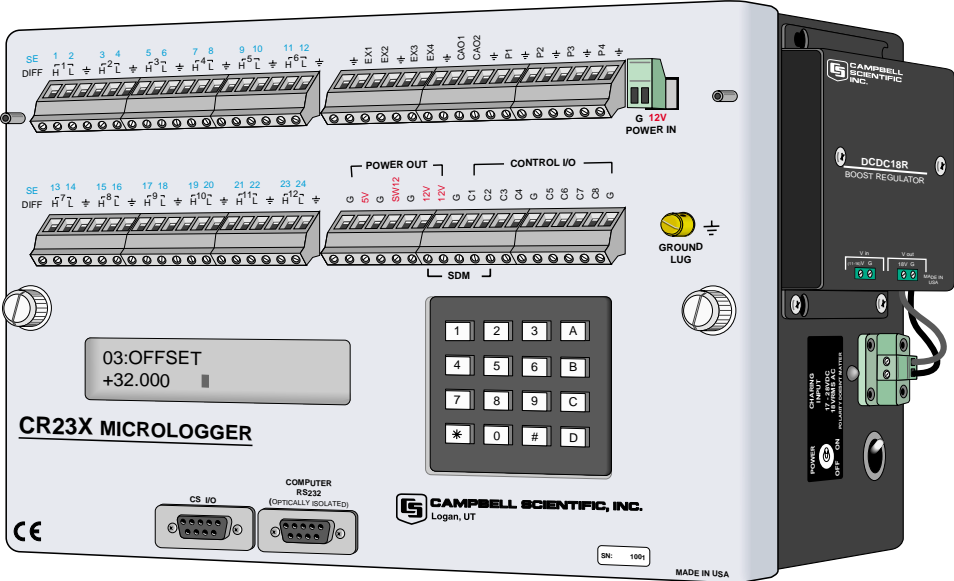


FIGURE 3. DCDC18R on CR23X

The DCDC18R is installed near the datalogger, either on the side of the datalogger (Figure 3) or to the back panel of the enclosure. The voltage input is connected to 12 volts and ground from the supply source. The leads from “V out” go to the charging input. The G lead from “V out” connects to either charge input terminal and the 18 V lead connects to the other. The polarity of the inputs does not matter.

### 4. Grounding

**Caution**

The datalogger must be grounded for its transient protection to work. CONNECTIONS TO THE CHARGING INPUT DO NOT PROPERLY GROUND THE DATALOGGER. The Ground connection should be made at the grounding lug on the wiring panel.

A full-wave bridge rectifier is included on the CR23X and CR5000 LA bases and the PS12LA. This creates a diode drop (0.7 V) between the datalogger ground and the return side of the charging input (Figure 4). If the datalogger ground (ground lug) and the return side of the charging input (G terminal of the DCDC18R) are tied together through a wire, then the return current to the DCDC18R will flow through this wire rather than through the diode in the bridge rectifier. This is a valid connection and does not cause measurement problems because the CR23X and CR5000 have star ground connection at the ground lug. However, unwanted ground loops that induce single-ended measurement offsets will be generated if the  $\pm$  terminals and the return side of the charging input are tied together because the return current to the DCDC18R will flow through the  $\pm$  terminals.

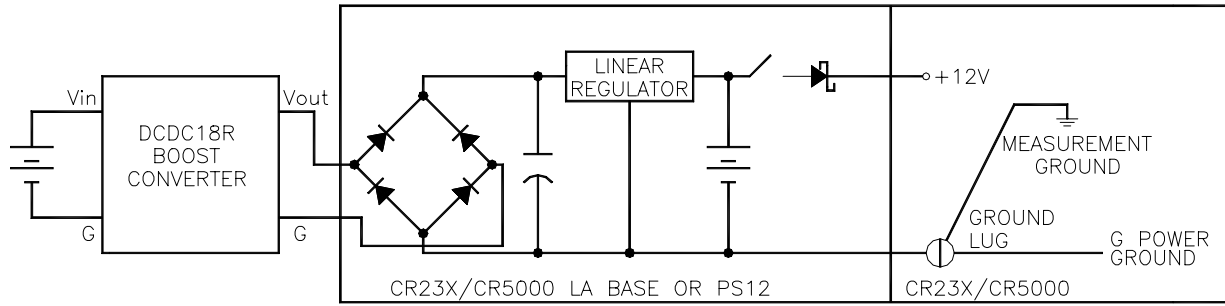


FIGURE 4. Schematic of Charging and Grounding Circuitry