

*Operation Manual for
DecaPSU Power Supply Unit*



Bartington[®]
Instruments

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1. How to use this manual

This document describes the installation, operation and maintenance of the DecaPSU Power Supply Unit.

Take the time to get well acquainted with your DecaPSU by reading this manual. Knowing and understanding the equipment will ensure you experience the most reliable operation.

When service or maintenance is required, please contact Bartington Instruments or your local agent company.

Technical specifications for this product can be found in the product brochure [DS2520](#) on the Bartington Instruments website.

1.1. Symbols glossary

The following symbols used within this manual call your attention to specific types of information:



WARNING: Indicates a situation in which serious bodily injury or death could result if the warning is ignored.



Caution: Indicates a situation in which bodily injury or damage to your instrument, or both, could result if the caution is ignored.



Identifies items that must be disposed of safely to prevent unnecessary damage to the environment.

Note: Provides useful supporting information on how to make better use of your purchase.

2. Safe use



WARNING: These products are not qualified for use in explosive atmospheres or life support systems. Consult Bartington Instruments for advice.



WARNING: This equipment is powered by mains electricity. It should not be used in wet or damp locations, where water may enter the unit and create a safety hazard.

2.1. Compatible magnetic field sensors

The DecaPSU is designed to operate with various magnetic field sensors. For the current compatibility table refer to the product brochure.



Caution: Use of incompatible sensors may cause damage to the DecaPSU and/or the sensor.

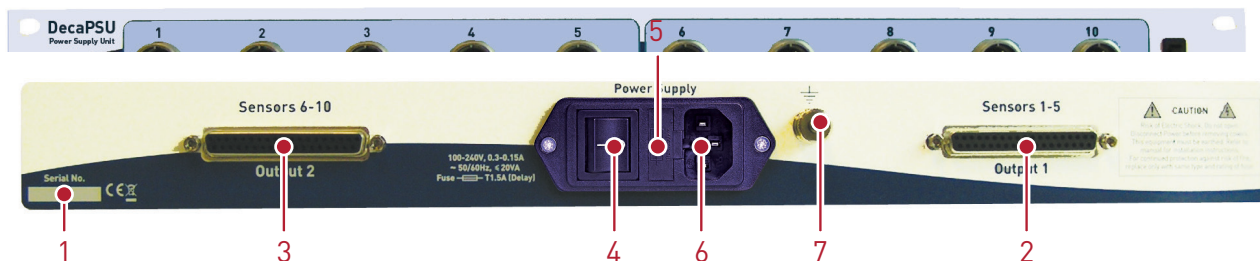
3. Introduction to the DecaPSU

3.1. Back panel connections and controls

1. Space for unique serial number.
2. Output 1: 37-way D connector for customer's output device, for signals from sensors 1–5. [See Output Connections](#) for pin connection table.
3. Output 2: 37-way D connector for customer's output device, for signals from sensors 6–10. [See Output Connections](#) for pin connection table.
4. ON/OFF switch.
5. Fuse (including spare).
6. Power supply.
7. Earth grounding stud.

Note: If an appropriate earth/ground connection is not provided through your mains supply lead, the earth terminal should be connected to ground.

3.2. Front panel connections and controls



1. ON/OFF LED.
2. 10-way input connectors: multi-pin sockets for the connection of cables from sensors.
3. ON/OFF switch.

3.3. Functional description

The DecaPSU provides a power supply of $\pm 15V$ DC for compatible three-axis fluxgate magnetic field sensors. The sensors are connected to the front of the unit.

Outputs from the sensors are conditioned by the DecaPSU and available as analogue signals on the two output connectors on the rear panel of the unit. These can then be connected to the user's analogue-to-digital converters for visualisation and storage. Each connector provide outputs from up to five connected sensors.

Note: The choice of A-D converter (or other device to read the analogue output) is made by the customer. Bartington Instruments does not supply these and cannot advise on their operation. Customers should refer to the documentation of their devices for correct operation.

3.3.1. Power

The DecaPSU is AC mains powered. Refer to the product brochure for voltage and current requirements.

3.3.2. Signal buffering

The DecaPSU contains filters for the analogue sensor outputs. After filtering, each analogue signal is sent to the appropriate pin of one of the 37-way D connectors on the rear panel ([see Back Panel Connections and Controls](#)) via a low impedance buffer. These buffers allow long cables and low input impedance data acquisition systems to be connected. Refer to the product brochure for recommended input impedance. The output is relative to the common 0V of the DecaPSU.

3.3.3. Filtering

Filtering is provided by a low-pass 4-pole filter. Refer to the product brochure for the frequency response of the filters.

The low pass filters remove any high frequency noise components of the signal from the sensors, including the breakthrough.

3.3.4. Sensor power

Each 10-way input connector ([see Front panel connections and controls](#)) provides $\pm 15V$ for Mag-03 or other compatible sensors. Each line is separately protected by a self-resetting fuse against short circuit. Current limit is approximately 250mA under fault conditions.

3.3.5. Test coil activation

Some sensors are fitted with test coils that generate a field when the feature is activated. Noting the change in output voltage caused by the test field indicates that the sensor is functional.

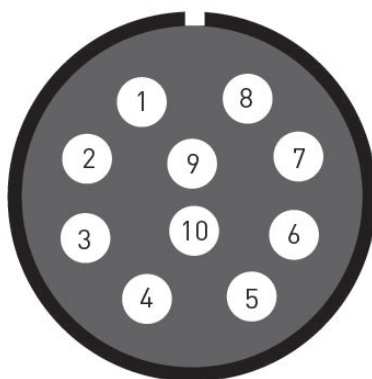
Sensors with this feature are activated by grounding of the relevant input pin(s) on the 37-way D connector.

Separate activation for each sensor is provided on the 37-way D connectors at the rear of the unit. One pin is also provided on each 37-way D connector to enable all the test inputs to be operated at once. See [Output Connections](#) for the pin functions of the 37-way D connectors.

The relevant 37-way D connector pin is connected to 0V (pin 16). Activation pins are internally pulled up to 5V (nominal), and should be driven from an open collector, or open drain output, in the user's equipment capable of sinking 1mA to 0.4V(max).

Note: As the equipment connected is provided by the user, Bartington Instruments cannot advise on its operation. Users should consult their equipment's own documentation for this purpose.

3.3.6. Input connections



10-way input connector pin-out diagram (rear view)

Each 10-way input connector has three differential inputs:

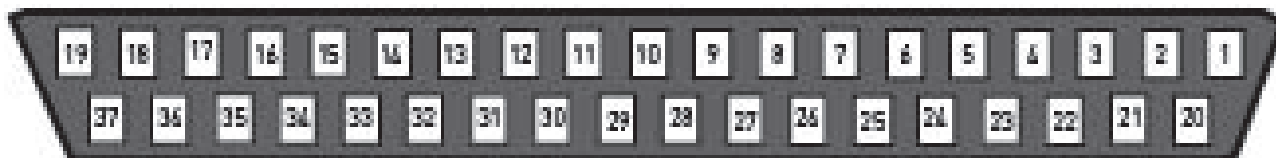
- X between pins 1-8
- Y between pins 2-9
- Z between pins 3-10.

Note: Customers using Mag-03 sensors with the DecaPSU must be aware that with standard Mag-03 wiring, pin 4 = signal ground and pin 5 = power ground. Therefore a cable wired 'pin-to-pin' between Mag-03 and DecaPSU is NOT suitable. When used with a standard Mag03 the lines should be wired as shown in Table 1.

Function	Standard Mag-03 pin	DecaPSU pin
X	1	1
Y	2	2
Z	3	3
Sig Gnd	4	8, 9 & 10
Pwr Gnd	5	4
+V	6	6
-V	7	7

Table 1. Wiring connections for Mag-03 and DecaPSU.

3.3.7. Output connections



37-way D connector pin diagram (female)

The connectors on the rear of the DecaPSU are a standard 37-way D sub-miniature type supplied by a number of manufacturers.

Examples of mating connectors to plug into DecaPSU include FCI DC37P064HTXLF and ITT Cannon ZDC37P, together with corresponding back-shell and locking screws.

Table 2 on page 10 shows the wiring for sensors 1 to 5 on output 1, the right-hand 37-way D connector. Wiring for sensors 6 to 10 is identical on output 2, the left-hand connector.

Equipment case and connector body are connected to system ground (pin 16). Sensor ground pins are connected to system ground through a 10Ω resistor.

Other pins are not connected.

BARTINGTON INSTRUMENTS

Function	Pin number	
Sensor 1 or 6 – Test Activation	1	Connect to Ground (pin 16) to activate
Sensor 1 or 6 – Ground	20	Ground connection for Sensor 1 outputs
Sensor 1 or 6 – X	3	
Sensor 1 or 6 – Y	21	
Sensor 1 or 6 – Z	2	
Sensor 2 or 7 – Test Activation	22	
Sensor 2 or 7 – Ground	4	
Sensor 2 or 7 – X	24	
Sensor 2 or 7 – Y	5	
Sensor 2 or 7 – Z	23	
Sensor 3 or 8 – Test Activation	6	
Sensor 3 or 8 – Ground	25	
Sensor 3 or 8 – X	8	
Sensor 3 or 8 – Y	26	
Sensor 3 or 8 – Z	7	
Sensor 4 or 9 – Test Activation	27	
Sensor 4 or 9 – Ground	9	
Sensor 4 or 9 – X	29	
Sensor 4 or 9 – Y	10	
Sensor 4 or 9 – Z	28	
Sensor 5 or 10 – Test Activation	11	
Sensor 5 or 10 – Ground	30	
Sensor 5 or 10 – X	13	
Sensor 5 or 10 – Y	31	
Sensor 5 or 10 – Z	12	
Sensor 1 to 5 (or 6 to 10) Group Test Activation	35	
Ground (for test activation)	16	Connect to any ‘Test Activation’ pin to activate the test coil.

Table 2. Wiring for Sensors 1-5. and 6–10

4. Installing the DecaPSU

4.1. Location of the equipment

4.1.1. Potentially hazardous locations

WARNING: This equipment is powered by mains electricity. It should not be used in wet or damp locations, where water may enter the unit and create a safety hazard.

4.1.2. Orientation

The DecaPSU is intended for mounting in a standard 19" rack.

4.1.3. Proximity to other equipment

Note: The DecaPSU is inherently magnetic and should, therefore, be sited as far from any sensors as possible.

4.2. Connecting the equipment

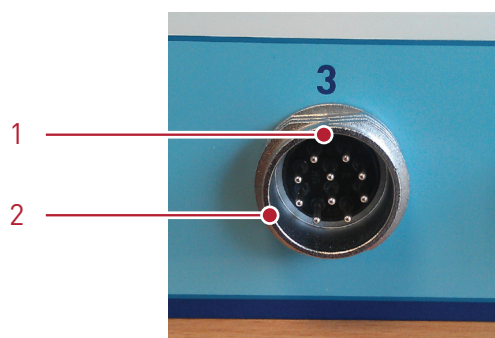
Caution: Connection between sensors and the DecaPSU should not be made or broken with the power supply switched on, as this could cause damage to the sensors.

Connect the equipment in the following sequence:

1. Ensure the front panel ON/OFF switch is OFF (position "0"). (The rear panel ON/OFF switch may be set to ON or OFF.)
2. Connect the sensors to the front panel connectors.

Note: Ensure the connector pins are correctly aligned with those in the socket. The locking ring should be hand-tightened only.

Note: Ensure correct orientation of the connector, indicated by the notch in the socket aligning with the cut-out on the connector body (shown below).



Key

1. Cut-out
2. 10-way connector socket

3. Connect outputs to your external equipment, as required, via 37-way connectors at rear.

5. Using the DecaPSU

5.1 Environmental precautions

Refer to the product brochure for maximum environmental, electrical and mechanical ratings for the DecaPSU.



Caution: Exceeding the maximum environmental ratings may cause irreparable damage to the equipment.

5.2. Switching ON and OFF



Caution: Connect the magnetometers before switching on the DecaPSU, as connecting a “live” cable to the magnetometers may cause damage. Similarly, switch the DecaPSU OFF before disconnecting the magnetometers.

With both the front and rear power switches ON (position “1”), the power LED will be continuously lit (ON).

5.3. Operation

If properly connected to functioning devices, power will be supplied to the sensors and analogue output signals sent to the output devices immediately when the DecaPSU is switched on, without further intervention by the user.

Note: For best results leave the DecaPSU for 20 minutes after switching on the power to allow the internal temperature to stabilise before performing any measurements.

6. Troubleshooting

The unit is unlikely to suffer any defects in normal use: no internal components are serviceable. The most likely causes of failure, and their solutions, are detailed in the following table.

In the event of any apparent malfunction beyond those described in the table below, please email service@bartington.com, or telephone the Bartington Instruments service team on +44 (0)1993 706565.

Fault	Possible cause	Solution
No power output from one 10-way input connector	Overloading (sensor current too high)	Check voltages and currents on pins 6 and 7. (This can be done by connecting a digital voltmeter to these pins alone.)

Power LED does not illuminate	No AC mains line power	Check both power supplies are ON and fuse is not open circuit (i.e. blown).
With a sensor connected, all output signals are faulty	Defective sensor cable wiring	Check the sensor cable using wiring details in the relevant product brochure for that sensor. Return the sensor to Bartington Instruments if a defect is found.
		If using Mag-03 magnetic field sensors, note that with standard Mag-03 wiring, pin 4 = signal ground and pin 5 = power ground. A cable wired 'pin-to-pin' between Mag-03 and DecaPSU is NOT suitable. See Table 1 .
	Sensor defective	Where applicable, run the sensor's self-test routine. Test the sensor for defects according to its own documentation. If a defect is established, return the sensor to Bartington Instruments for repair.
	DecaPSU defective	If the procedures above do not identify any defect in the sensors or cables, return both DecaPSU and sensors to Bartington Instruments for repair.
With a sensor connected, one or two output signals are faulty	Defective sensor cable	Check the sensor cable using wiring details in the relevant product brochure for that sensor. Return the sensor to Bartington Instruments if a defect is found.
	Sensor defective	Where applicable, run the sensor's self-test routine. Test the sensor for defects according to its own documentation. If a defect is established, return the sensor to Bartington Instruments for repair.
	DecaPSU defective	If the procedures above do not identify any defect in the sensors or cables, return both DecaPSU and sensors to Bartington Instruments for repair..

7. Care and maintenance

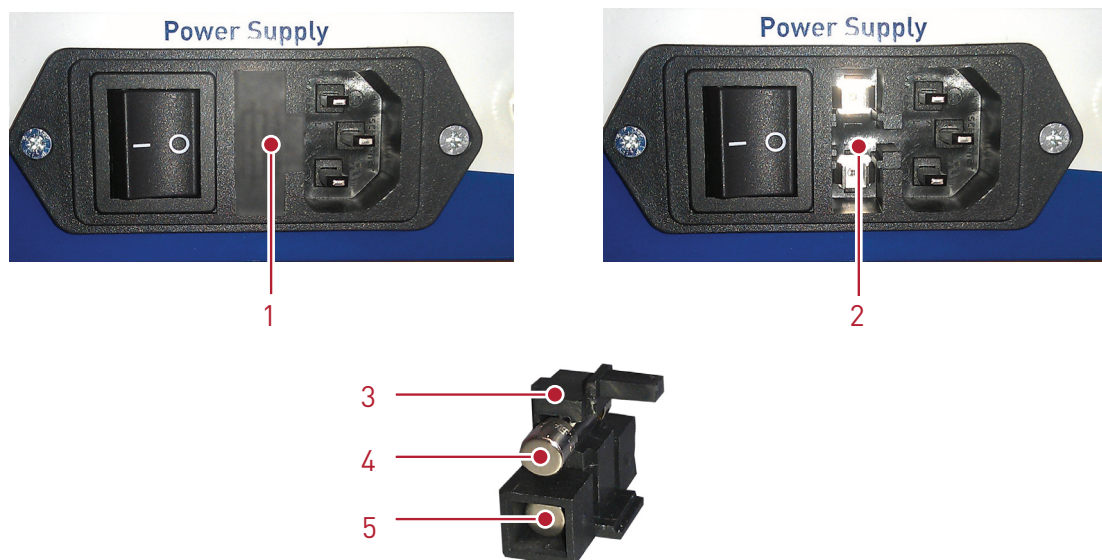
The DecaPSU requires no routine maintenance. Other than the fuse there are no user serviceable parts.



Caution: Other than changing the fuse, no attempt should be made by a user to repair the unit. Repairs by unauthorised people may be dangerous and could affect the safety

of users, damage the equipment, and also invalidate the terms and conditions of the Warranty.

7.1. Fuses



Key

1. Fuse socket, closed, showing top of fuse holder.
2. Fuse socket, open, with fuse holder removed.
3. Fuse holder, removed.
4. Fuse.
5. Spare fuse.

The time-delay fuse is rated for 1.5A. As indicated in [Back panel connections and controls](#), the fuse is located between the ON/OFF switch and the power supply. The fuse holder can be removed simply by inserting the tip of a small flathead screwdriver into the notch next to the power supply socket and levering out.


WARNING: To prevent risk of fire, only replace the fuse with one of the same rating and type. A spare fuse is provided in the fuse holder.

Note: The DecaPSU is designed so that the fuse holder cannot be removed if the power cable is still plugged into the power supply.

7.2 Calibration

A re-calibration service is available. Please contact service@bartington.com for further information.

7.3. Cleaning


 **WARNING:** Ensure water does not enter the system. The system must be completely dry before the electrical supply is reconnected.


 **Caution:** Disconnect the electrical supply before performing any cleaning operation.

Periodic cleaning is not normally required.

If the system becomes soiled and cleaning is necessary:


1. Use a damp cloth to clean the outer surfaces.
2. Use an air duster to blow debris from the connectors.


 **Caution:** Never use chemicals, such as solvents, when cleaning the DecaPSU.

 **Caution:** Take particular care when cleaning around electrical connections. Bent or damaged pins may cause the equipment to malfunction.

8. Storage & Transport

The DecaPSU is a precision electronic instrument and should be treated as such.

 **Caution:** Avoid exposing this instrument to shocks or continuous vibration.

 **Caution:** Store only within the temperature range specified in the product brochure.

9. Disposal

This product should not be disposed of in domestic or municipal waste. For information about disposing of your sensor safely, check local regulations for disposal of electrical / electronic products.

9.1. Waste Electrical and Electronic Equipment (WEEE) Regulations



This sensor complies fully with Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) and WEEE Regulations current at the time of printing.

Notes



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