

SCU1 Signal Conditioning Unit

The mains powered SCU1 is a combined power supply, display and analogue conditioning unit for use in the laboratory with most Bartington magnetic field sensors. It is intended for use either as a standalone three-channel magnetic field measuring instrument, or as a pre-conditioning unit for an A/D data acquisition system.



Features

- Provides power to one three-axis sensor, with sensor outputs available both as analogue voltages and on LCD displays
- Low- and high-pass filtering gain, and offset available, independent for X, Y and Z channels
- Both the unconditioned and conditioned (after application of gain, offset and filtering) XYZ signals are available as analogue voltage outputs on the unit back panel
- When used with Bartington balanced (differential) sensors, the unit converts their analogue outputs into unbalanced (single-ended) signals
- Power supply voltage to the sensor can be increased for operation over long cables (up to 500m)

Typical Application

- Accurate laboratory magnetic field measurements

SCU1 Specifications

Performance

Number of input channels	Three (X, Y and Z)
Input signal range	±10V maximum – surge protection with ±12V clamp
Common mode rejection ratio	>70dB - fully differential input
Signal coupling	AC or DC depending on filter selection
Internal measurement noise floor	Minimum discernible input signal variation of ±0.1mV with signal/noise ratio of ≥10dB at all gain settings
Low-pass filter	1, 10, 100, 1000 or 10000Hz switch selected
High-pass filter	0 (DC), 0.01 or 1.0Hz switch selected
Gain	1, 50, 100, 300, 500 or 1000 switch selected
Offset range	±10V
Offset control: coarse fine	10 turn potentiometer with polarity switch for each channel Centre-off position potentiometer
Display	3 x 3½ digit LCD
Thermal drift	≤6mV/hour for filtered/null signal output with gain = 300

Environmental

Operating temperature range	0°C to +70°C
Storage temperature range	-20°C to +70°C
Humidity	0–90% non-condensing

Mechanical

Enclosure material	Aluminium
Dimensions (W x H x D)	483 (19" rack) x 88 (2U) x 300mm
Weight	5.5kg
Connectors: power input sensor input analogue output	3-way IEC with integral filter (mains cable provided) Hirose RM15TRD10P 6 x BNC sockets
Display	3 x 3½ digit LCD (resolution up to 0.1µT)

Electrical

Analogue output voltage	±10V, three unfiltered, three filtered
Power input	110/220V AC Auto selected
Fuses	1A, 250V rating, 20mm or 3/4 inch
Power output to sensor	±12V, ±15V, ±17V (switch selected) at 250mA; ripple <1mV p-p, short circuit protected; surge protection provided with ±18V clamp
Sensor input	Balanced/unbalanced
Maximum load	Unconditioned outputs: 50kΩ per channel Conditioned outputs: 50kΩ per channel

Cable length	Voltage setting for Mag-03MC, MS and IE sensors
<100m	12
100–300m	15
>300m	17

Power Supply and Signal Conditioning Units

A wide range of power supply and signal conditioning units are available for our range of single and three-axis magnetic field sensors.

All units accept analogue input from our sensors and output the signal to an analogue-to-digital converter or other separate device. The range includes:

Product	Function
PSU1 Power Supply Unit	Battery powered portable power supply for a single or three-axis magnetic field sensor and AC filtering of the sensor's outputs.
Magmeter Power Supply and Display Unit	A PSU1 with three displays for magnetic field value readings.
SCU1 Signal Conditioning Unit	Mains powered unit providing power supply and output conditioning for three-axis magnetic field sensors.
DecaPSU	Power supply unit and low-noise connection for up to 10 magnetometers at the end of long sensor cables.

Further details of each product, including performance, environmental, mechanical and electrical specifications, are shown on the following pages.

Product Compatibility

	PSU1	Magmeter	SCU1	DecaPSU
Mag-13	•	•	•	•
Mag-03	•	•	•	•
Mag-03RC	•	•	•	•
Mag639			•	•
Mag648/649	•	•	•	•
Mag670	•	•	•	•
Mag678/679	•	•	•	•
Mag690	•	•	•	•