Data Acquisition & Signal Conditioning Units

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Bartington® Instruments

Data Acquisition and Signal Conditioning Units

Bartington Instruments' data acquisition and conditioning units accept analogue inputs from most of our sensors and output the signal in either analogue or digital format, depending on the unit selected.

The range includes:

- Spectramag-6
- SCU1

Product	Function
Spectramag-6 Data Acquisition Unit	Simultaneous acquisition and digitisation of magnetic field, vibration and acoustic signals in three axes
SCU1 Signal Conditioning Unit	Mains powered unit providing power supply and output conditioning for three-axis magnetic field sensors.

Product Compatibility

	Spectramag-6	SCU1
Mag-03	•	•
Mag-13	•	•
Mag690	•	•
Mag639		•
Mag648/649		•
Mag670	•	•
Mag678/679		•

Spectramag-6 Data Acquisition Unit

This portable six-channel 24-bit data acquisition unit is designed for the acquisition and synchronous digitisation of signals from magnetic field sensors, accelerometers or acoustic sensors.

Features

- Six input channels for magnetic field sensors, accelerometers or acoustic sensors
- Sampling rates up to 10kHz
- Supplied software collects and displays data in both the time and frequency domain
- Selectable AC and DC coupling, low-pass filtering and FFT options available
- Battery or mains powered

Typical Applications

- Magnetic field and vibration surveys
- Pre-installation MRI/electron microscope site surveys
- Ambient magnetic field interference survey

Spectramag-6 Specifications

Performance	
Number of input channels	Six (2 groups of 3 channels selectable for magnetic field sensors, accelerometers or acoustic sensors)
Input signal range	±10V
Input frequency range Magnetic field sensors Accelerometers and acoustic sensors	Up to 5kHz, reduced to 1kHz (1000 gain) DC to 5kHz (DC coupling); 0.01Hz to 5kHz (AC coupling) 0.1Hz to 5kHz (AC coupling only)
Resolution	24 bit A-D converter
Sampling interval	100µs (min) to 10s (max) up to 700,000 samples (PC dependent); continuous sampling mode (slower sampling rates only)
Frequency domain display options	Amplitude spectrum (RMS, peak-to-peak); Amplitude spectral density (RMS/√Hz, p-p/√Hz)
Analogue gain control	Software selected x1/x10/x100/x1000
Spectrum range	Software selected as sample rate or maximum frequency
Sensor input (magnetic field sensor)	Unbalanced
Suitable ICP™ vibration sensor	PCB Piezoelectronics type 393A03 (1V/g) low-noise rugged PCB Piezoelectronics type 393B31 (10V/g) low-noise rugged
Suitable ICP™ microphone	GRAS Microphone Type 40AE (50mV/Pa)
Optional accessories	Tripod and adaptor for Mag-03 sensors Rugged carrying case

Environmental	
Operating temperature range	-10ºC to +50ºC (0ºC to +45ºC for charging)
Storage temperature range	-20ºC to +70ºC
Humidity	0–90% non-condensing

Mechanical	
Dimensions (W x H x D)	170 x 112 x 210mm
Weight	2.85kg
Output interface	USB2
Enclosure	Aluminium
Connectors	2 x Hirose RM15TPD10P plug for magnetic field sensors 6 x BNC sockets for ICP™ piezoelectric vibration sensors / acoustic sensors preamplifiers 1 x USB to PC 1 x 2.1mm socket for 12V input from mains adaptor for recharging

Electrical	
Power output to sensor	±15V, ±90mA
Battery	Internal rechargeable Li-Ion 10.8V 72Wh UN approved battery with universal mains adaptor for charging
Battery life	8 hours (typical)
Battery charging time	10 hours for full charge
Input impedance (magnetic field sensor inputs)	1MΩ
ICP® constant current	4mA ±20% for cables up to 1km in length

Software Compatibility

32 and 64 bit	Windows™ 7, Windows™ 8, Windows™ 8.1, Windows™ 10
32 bit	Windows™ 98, Windows™ NT, Windows™ 2000, Windows™ XP 32 bit

SCU1 Signal Conditioning Unit

This mains powered combined power supply, display and analogue conditioning unit is suitable for use in the laboratory with compatible Bartington Instruments' magnetic field sensors. It is intended for use either as a standalone three-channel magnetic field measuring instrument, or as a conditioning unit prior to A-D conversion.

Features

- Low and high-pass filters
- Gain and offset controls, independent for X, Y and Z channels
- Powers one three-axis sensor, with sensor outputs available both as analogue voltages and on LCD displays
- Unconditioned and conditioned (after application of gain, offset and filtering) XYZ signals are available as analogue voltage outputs
- 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

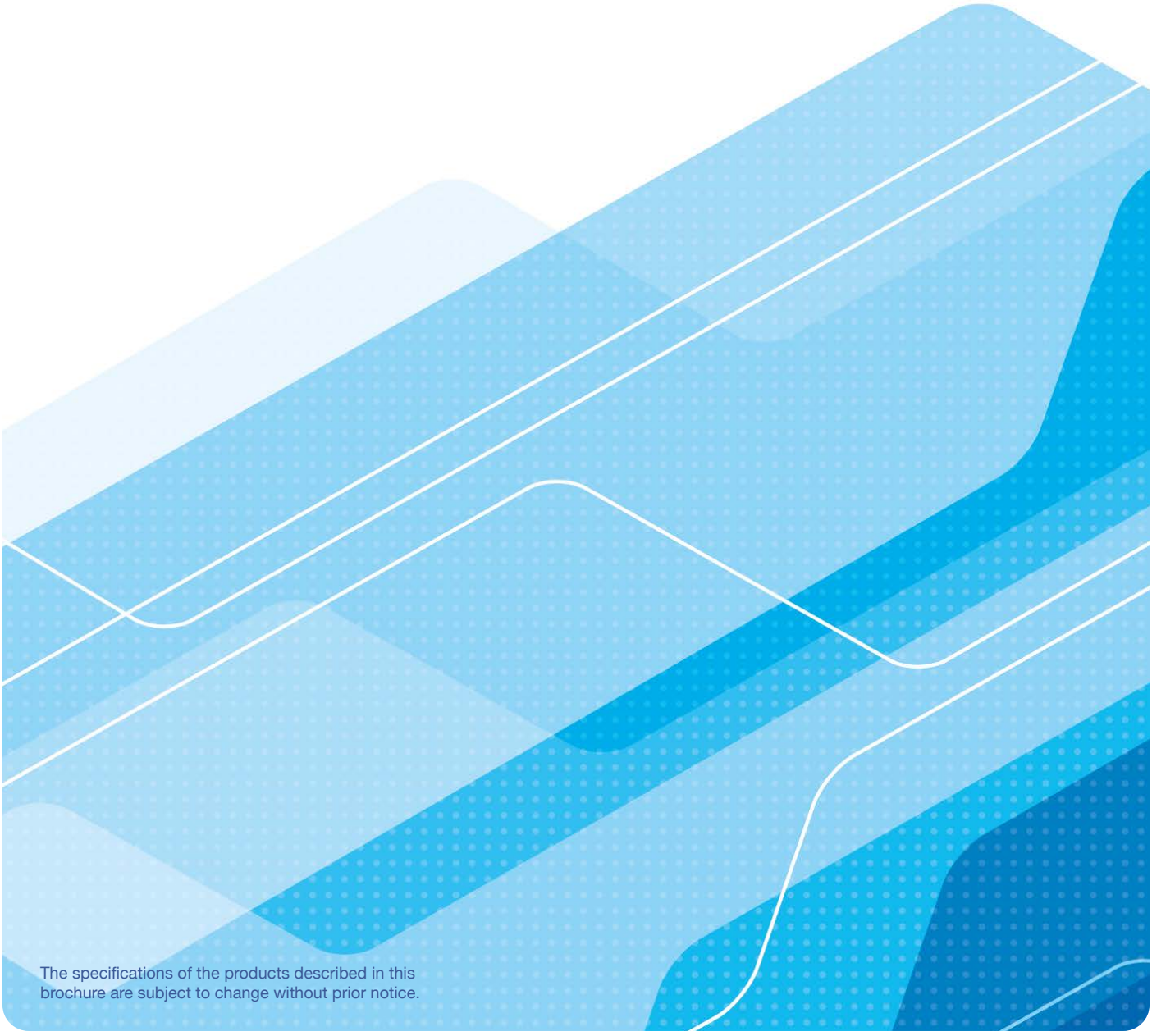
Performance	
Number of input channels	Three (X, Y and Z)
Input signal range	±10V maximum – surge protection with ±12V clamp
Common mode rejection ratio	>70dB - fully differential input
Signal coupling	AC or DC depending on filter selection
Internal measurement noise floor	Minimum discernible input signal 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	0ºC to +70ºC
Storage temperature range	-20ºC to +70ºC
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 unbalanced, 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	12V
100-300m	15V
>300m	17V



The specifications of the products described in this brochure are subject to change without prior notice.

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