

Bartington®
Instruments

Spectramag-6

Six-Channel Spectrum Analyser for
Magnetic Field and Vibration Surveys

For innovation in magnetic measuring instruments



Spectramag-6

Six-Channel Spectrum Analyser for Magnetic Field and Vibration Surveys



Spectramag-6 is a six-channel, 24-bit data acquisition and spectrum analysis system, designed for use with the Bartington Instruments **Mag-03** range of 3-axis fluxgate magnetometers. In addition to magnetometers, the system also has an ICP interface, allowing the connection of a range of accelerometers and microphones.

All six-channels are simultaneously sampled, making the **Spectramag-6** ideally suited for recording and analysis of magnetic field and/or vibration data in three axes. Typical applications include magnetic and vibration measurements for pre-installation surveys for MRI systems, electron microscopes and similar sensitive equipment, general magnetic measurements, dual magnetometer differential measurements, site surveys and recording magnetic fields due to 50/60Hz mains supplies.

The system consists of an interface unit and Windows® based PC software. The interface unit is linked to the host PC via a USB2 connection. The software-based nature of the instrument allows for easy upgrading, simply by downloading the latest software version from the internet.

Main Features

- 6-channel, simultaneously sampled, 24 bit data acquisition
- Magnetic Field and Vibration measurement inputs
- Time domain and Frequency domain display, with zoom facility
- 100µs to 10s sample intervals
- Fixed scan length or continuous acquisition mode (sample rate dependent)
- Compatible with all **Mag-03** and **Mag-01MS** magnetometers
- Direct connection of ICP accelerometers or microphones
- Programmable pass/fail test profiles for time & frequency domains
- Software based instrumentation – permits easy upgrades
- Operates under Windows® 98, 2000 or XP
- Operates from mains power or internal, rechargeable battery – use in the field, with a laptop PC

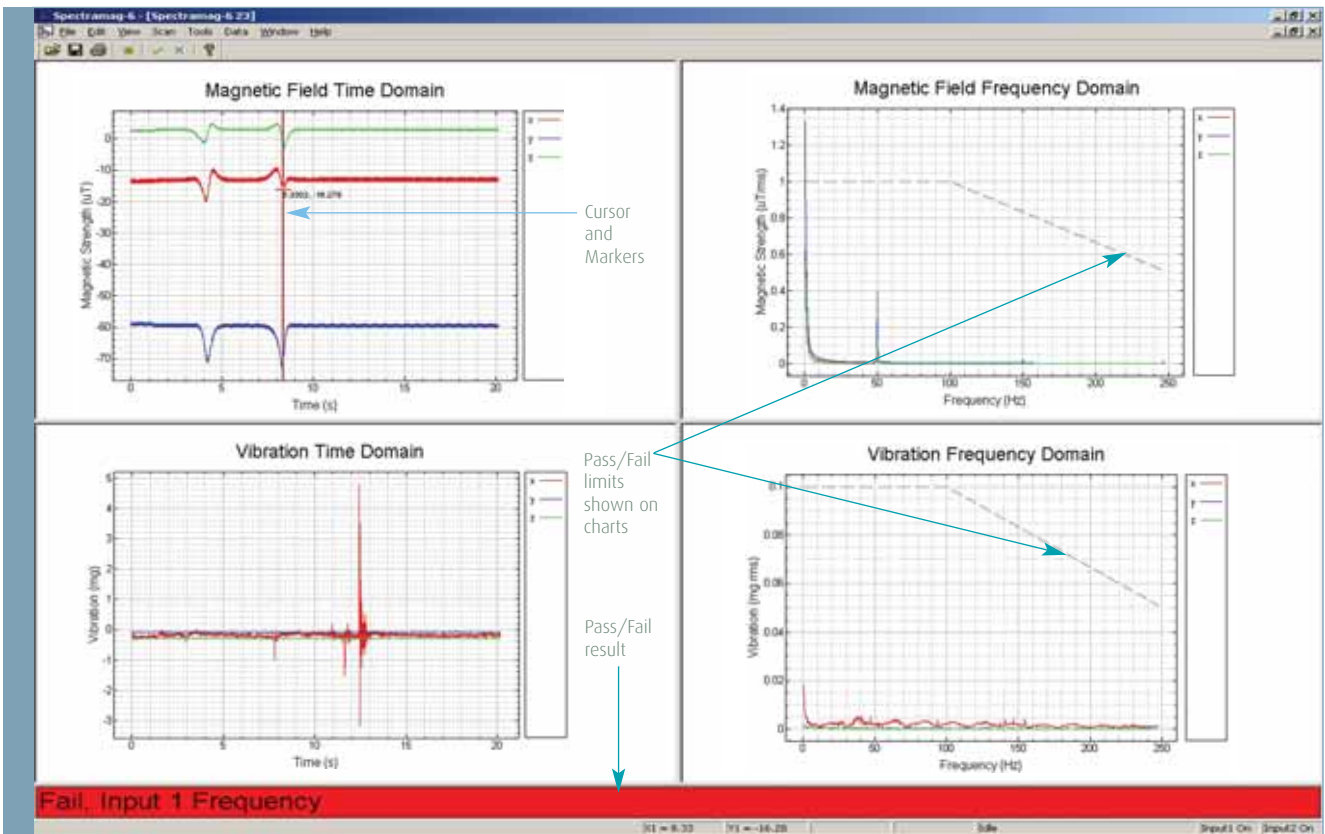
Additional features

- Averaging for Frequency domain plots,
- Total field magnitude (xyz vector sum)
- Selectable front-end gain amplifier
- Choice of various FFT windowing functions
- Display cursors
- Data can be exported as graphics in bitmap or JPG format, or as time-stamped data values
- Results scaled in engineering units for standard range of sensors.

Optional accessories

- Tripod and adaptor for **Mag-03** magnetometers
- Rugged carrying case

Typical Spectramag-6 Display



Modes of use

The six input channels are arranged in 2 groups of 3 inputs, which are independently selected for magnetic or vibration measurements. This allows connection of :

- or {
- Two 3-axis magnetometers
 - One 3-axis magnetometer and up to three single-axis accelerometers
 - Up to six single-axis accelerometers

For MRI pre-installation surveys the **Mag-03MS1000** three-axis magnetic field sensor, with a full-scale range of $\pm 1000\mu\text{T}$ ($\pm 10\text{Gauss}$) and a resolution down to a few nT, is recommended. The ICP® interface provides a 4mA constant current source via a BNC connector and a gain between 1 and 1000 can be selected for vibration measurements down to a few μg .

A minimum system for magnetic field measurement comprises:

Spectramag-6 unit + **Mag-03** magnetic field sensor + **Mag-03** cable + tripod + **Mag-03** tripod adaptor. A Windows® PC with USB2.0 is also required.

Specification

Resolution	24 bit A-D Converter
Input channels	6 selectable in groups of 3 for magnetometer or accelerometer
Input coupling	DC or AC selectable with 0.01Hz (-3dB) high-pass filter
Magnetometers	AC with 0.1Hz (-3dB) high-pass filter
Accelerometers	
Sampling Interval	100µs (min) to 10s (max) Up to 100,000 samples (PC dependent) Continuous sampling mode (slower sample rates only)
Frequency range	0-3.5kHz (-3dB point), reduced to 1kHz for gain of 1000
Input impedance (magnetometer inputs)	1MΩ
ICP® constant current	4mA ± 20% for cables up to 1km in length
Gain control	software selected x1/x10/x100/x1000
Spectrum range	software selected as sample rate or maximum frequency
Output interface	USB2
Software	Windows 98/2000/XP compatible
Controls	power on/off switch
Connectors	2 x Hirose RM15TPD10P fixed plug to magnetic field sensors 6 x BNC sockets for ICP® piezoelectric vibration sensors/microphone preamplifiers 1 x usb to PC 1 x 2.1mm socket for 12V input from mains adaptor for recharging
Frequency domain display options	Amplitude spectrum (RMS) Amplitude spectral density (RMS/√Hz)
Power supply	Internal rechargeable battery with universal mains adaptor for charging
Battery charging time	10 hours for full charge
Battery life (typical)	8 hours
Enclosure	Aluminium
Dimensions (mm)	210 x 170 x 112
Weight (kg)	2.85
Operating temperature	-10°C to +50°C
Storage temperature	-10°C to +70°C
Suitable ICP® vibration sensor	PCB Piezoelectronics type 393A03 (1V/g) low-noise rugged PCB Piezoelectronics type 393B31 (10V/g) low noise rugged
Carrying case dimensions (mm)	610 x 230 x 200
Total weight with carrying case	12kg with <i>Spectramag-6</i> , <i>Mag-03</i> magnetometer, 5m cable and tripod.

ADDENDUM:

THE LATEST SOFTWARE FEATURES ARE DETAILED ON THE FOLLOWING PAGE

Specifications of the products described in this brochure are subject to change without prior notice.
Windows® and Microsoft® are registered trademarks of Microsoft Corporation.
Bartington® is a registered trademark of Bartington Instruments Ltd.

Bartington Instruments
5 & 10 Thorney Leys Business Park
Witney, Oxford, OX28 4GE, England

T +44 1993 706565
F +44 1993 774813
E sales@bartington.com
www.bartington.com

SPECTRAMAG-6 VERSION 6 UPGRADE

NEW FEATURES TO EXTEND THE CAPABILITIES OF THE SPECTRAMAG-6 SYSTEM.

Features	Benefits	V4.2	V6.1
Increased no. of samples	Record seven times more data in a single scan	100,000 samples	700,000 samples
Multiple-scan logging	Permits many days of automatic data recording	Not available	Up to 10000 * back-to-back scans
Digital pre-filtering	Allows filtering of sampled data, displayed in near realtime	Not available	Low-pass filter with variable cut-off frequency
Post process filtering	Digital filtering can be applied to saved scan data Cumulative frequency spectrum can be generated from multiple saved scans	Not available	Low pass filter Cumulative FFT
Anti-alias oversampling	Reduce aliasing effects at low data sampling rates	Not available	Included

* Number of scans is dependant on PC performance and other scan settings

With V6.1 software, users can perform operations that are difficult to achieve with earlier versions:

- Oversampling allows data to be collected at slow sampling rates, but without the danger of aliasing of high frequency signals
- Digital filtering permits discrimination of different frequency components in both time & frequency domains (in V4.2, this can only be done effectively in the frequency domain). If your signals include two or more distinct frequency components (say 50Hz and 1kHz), you can now filter the time domain display to view just the lower frequency.
- Digital filtering can be applied after data has been acquired and recorded. You would record data at high speed to prevent aliasing, then apply digital filters afterwards (post process) in a controlled fashion.
- Multiple-scan logging extends the maximum length of data recording to many days, compared to a few hours achievable with V4.2
- For the fastest 10kHz sampling rate (used in single-scan mode), the maximum number of samples is now 700,000 per channel, increasing the scan period to 70 seconds.

All new Spectramag-6 systems will include V6.1 software.

Existing customers can download V6.1 from the www.bartington.com

Bartington Instruments Limited
5 & 10 Thorney Leys Business Park
Witney
Oxfordshire
OX28 4GE
ENGLAND

Telephone: +44 1993 706565
Facsimile: +44 1993 774813
E-mail: sales@bartington.com
Internet: www.bartington.com

Bartington[®]
Instruments