

Fluxgate Magnetometers & Gradiometers

Product Range



Single-Axis Fluxgate Magnetic Field Sensors

Mag646/710 Low Cost Unpackaged Sensors

Compact general purpose sensors with a frequency response from DC to 1kHz, designed for integration into OEM systems. Versions are available in measuring ranges $\pm 100\mu\text{T}$, $\pm 500\mu\text{T}$ and $\pm 1000\mu\text{T}$. The Mag710 also features a low pass filter, making it ideal for detecting slow-moving metallic objects, such as handheld weapons.

Mag670 Low Cost Compact Sensor

A compact sensor with a frequency response from DC to $>1\text{kHz}$. It is available in measuring ranges $\pm 100\mu\text{T}$, $\pm 500\mu\text{T}$ and $\pm 1000\mu\text{T}$, and supports two fluxgate element orientations with an alignment error to datum $<2^\circ$. The Mag670 is suitable for a wide range of applications, including detection of magnetic materials, traffic monitoring, and integration into security systems.



**Mag646/710
Unpackaged
Sensor**



**Mag670 Low Cost
Compact Sensor**

Mag-01H Magnetometer

A portable, high resolution (to 0.1nT) instrument used for precise measurements of DC magnetic fields. A range of low field ($\pm 0.2\text{mT}$) and high field ($\pm 2\text{mT}$) probes is available in packages including axial, transverse and cryogenic. Typical uses include measurement of remanent magnetisation inside RF cavities in particle accelerators, field uniformity measurements during manufacture of electro and superconducting magnets, and compass safe distance testing during EMC tests.

Mag-01H Declinometer/Inclinometer system

This system includes a fluxgate sensor mounted on a 6-second Wild T1 non-magnetic theodolite, and a high resolution (to 0.1nT) readout unit. It is designed to measure declination and inclination of the geomagnetic field, with applications including use in magnetic observatories, compass and rangefinder calibration, site magnetic cleanliness, and in-field referencing for oil and gas exploration.



**Mag-01H Magnetometer
with Mag-01**



**Mag-01H
Declinometer/
Inclinometer
system**

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Three-Axis Fluxgate Magnetic Field Sensors

Mag-13 High Precision Magnetic Field Sensors

This range of high accuracy sensors offers three noise levels, down to $<4\text{pTrms}/\sqrt{\text{Hz}}$ at 1Hz, making Mag-13 the ideal choice in many applications. They are available in a range of enclosures, are environmentally sealed, and are shielded from electrical interference. They are available in measuring ranges from ± 60 to $\pm 1000\mu\text{T}$, with a frequency response from DC to 3kHz. Mag-13 also includes a test coil and temperature sensor.

Mag-03 High Precision Magnetic Field Sensors

A range of high performance sensors with three noise levels down to $<6\text{pTrms}/\sqrt{\text{Hz}}$ at 1Hz. They are available in a wide range of enclosures, and with measuring ranges from ± 70 to $\pm 1000\mu\text{T}$. This flexibility makes these sensors suitable for many applications, including magnetic field monitoring, MRI site surveying, electron microscope installation, electromagnetic and aeromagnetic surveys, and in magnetic signature ranges.

Mag639 Wide Bandwidth Sensor

This sensor offers measurements from DC to 12kHz, with field strengths up to $\pm 100\mu\text{T}$. It is designed for measurements of fast-changing magnetic fields. Applications include time-domain electromagnetics (TDEM), magnetotellurics (MT), EMC interference measurement, and unexploded ordnance (UXO) detection.



Mag-13 Range of Magnetic Field Sensors



Mag-03 Range of Magnetic Field Sensors

Mag690 Low Cost Sensors

These low cost sensors offer measuring ranges of static and alternating fields up to 1mT, at measuring ranges from $\pm 100\mu\text{T}$ to $\pm 1000\mu\text{T}$ and a frequency response from DC to $>1\text{kHz}$. This performance makes these sensors ideal for magnetic materials detection, surveillance, navigation, and traffic monitoring.

Mag648/649 Low Power Sensors

A range of low power ($<15\text{mW}$) and low noise ($<10\text{pTrms}/\sqrt{\text{Hz}}$ at 1Hz) sensors, with bandwidth of $>30\text{Hz}$ (Mag648) or $>1\text{kHz}$ (Mag649). They are available with measuring ranges of $\pm 60\mu\text{T}$ and $\pm 100\mu\text{T}$, in standard, submersible and unpackaged versions. Typical applications include incorporation in surveillance systems, magnetic field measurement in remote locations, multi-sensor magnetic signature ranges, and vehicle monitoring.



Mag690 Low Cost Sensor



Mag639 Wide Bandwidth Sensor



Mag648/Mag649 Low Power Sensors

Three-Axis Fluxgate Magnetic Field Sensors

Mag610/611/614 High Temperature Fluxgate Probes

These probes are designed to survive severe levels of shock and vibration, in high temperature environments up to 175°C (Mag610) and 215°C (Mag611). A low noise ($<30\text{pTrms}/\sqrt{\text{Hz}}$) version of Mag610 is also available. Packaged and unpackaged ambient temperature electronics can be supplied. These probes are outstanding for magnetic ranging, measurement while drilling (MWD), and applications requiring high temperature and shock resistance.

Mag614 Compact High Temperature Fluxgate Probe

This small size fluxgate probe offers high shock resistance, and can operate at up to 175°C. Packaged and unpackaged ambient temperature electronics can be supplied. This probe is ideal for magnetic ranging, measurement while drilling (MWD), and applications requiring high temperature and shock resistance.

Mag613 Fluxgate Magnetometer Array

This array of eight miniature three-axis fluxgate sensors is perfect for analysing the magnetic signatures of ship and submarine scaled models. It is designed to be used in an oil filled tank at pressures equivalent to 500m depth (50 bar). It is available with measuring ranges of $\pm 300\mu\text{T}$ or $\pm 500\mu\text{T}$.

Mag610 High Temperature Fluxgate Probe



Mag614 High Temperature Fluxgate Probe



Mag658 Unpackaged Digital Magnetometer

This fluxgate digital sensor has an RS422 interface and integrated three-axis accelerometer. Its measuring range of $\pm 524\mu\text{T}$, frequency response from DC to 5Hz ($\pm 5\%$ at DC), and MTTF of over 1 million hours, make it an extremely reliable sensor for long-term installations. Custom package design is also available. Applications include integration in surveillance systems, geomagnetic field measurements, and UAV-based measurements.

Mag651 Unpackaged Low Power Sensor

This budget sensor offers low power consumption ($<2.3\text{mA}$ in a $45\mu\text{T}$ field), low noise ($>10-20\text{pTrms}/\sqrt{\text{Hz}}$ at 1Hz), a measuring range of $\pm 60\mu\text{T}$, and bandwidth of $>30\text{Hz}$. This sensor is ideal for vehicle monitoring, intruder detection, magnetic field measurement in remote locations, and in multi-sensor magnetic signature ranges.



Mag658 Unpackaged Digital Magnetometer



Mag651 Unpackaged Low Power Sensor

Fluxgate Gradiometers

Grad-13 Digital Three-Axis Gradiometer

This gradiometer comprises two three-axis magnetic field sensors with separation from 500mm to 1000mm, and a measuring range of ± 70 or $\pm 100\mu\text{T}$. Available in either land or shallow submersible (200m), this unit is excellent for UXO detection, pipe and cable location, archaeogeophysics, and geotechnics. Multi-sensor GPS based surveys are possible using the Non-Magnetic Cart and third party data collection software.

Grad601 Gradiometer System

This portable and easy-to-use system comprises one or two Grad-01-1000L sensors, a data logger, and a battery power supply. It is well-suited to archaeological magnetic field surveys, forensics, unexploded ordnance (UXO) detection, and cable and pipe location.

Grad-01-1000L Fluxgate Gradiometer Sensor

This high precision single axis vertical magnetic field gradient sensor has a 1m baseline. It is used typically for archaeological and geophysical surveys, and unexploded ordnance (UXO) detection. It may also be intergrated into multi-sensor instruments.

Non-Magnetic Cart

This lightweight carbon-fibre cart is ideal for multi-sensor GPS-based archeological surveys, and near-surface geophysical scanning. It is easily assembled and disassembled, making it highly portable.



Grad-13 Digital Three-Axis Gradiometer



Non-Magnetic Cart



Grad601 Gradiometer System



Grad-01-1000L Fluxgate Gradiometer Sensor

Data Acquisition and Conditioning Units

PSU1 Power Supply Unit

This battery-powered portable power supply is compatible with most single or three-axis Bartington® Instruments magnetic field sensors. The unit includes a low pass filter and a switch-controlled AC/DC coupling.

Magmeter-2 Power Supply and Display Unit

A self-contained, portable power supply, which can be used with most of our magnetic field sensors. It provides simple access to filtered versions of the sensors' XYZ outputs. Low-pass filtering (9.5kHz) is applied to all sensor outputs. A high-pass filter (0.1Hz) can also be selected. The unit includes a mains AC charging adaptor for continuous operation.



PSU1 Power Supply Unit



Magmeter-2 Power Supply and Display Unit

DecaPSU Power Supply Unit

SCU1 Signal Conditioning Unit

A high-precision unit suitable for use with most Bartington Instruments single and three-axis magnetic field sensors. It powers the sensor, and conditions and displays analogue outputs. Gain and offset control are independent to each axis, while low-pass and high-pass filters are common to all three axes. Use as a standalone field measuring instrument, or as a conditioning unit in an A to D data acquisition system. Typical applications include magnetic and field vibration surveys, and MRI and electron microscope interference surveys.

DecaPSU Power Supply Unit

A mains-powered unit providing power and conditioning for up to 10 magnetometers. DecaPSU is compatible with most Bartington Instruments single and three-axis sensors. Analogue outputs are available for connection to an external digitiser.



SCU1 Signal Conditioning Unit



Data Acquisition and Conditioning Units

Spectramag-6 Data Acquisition Unit

A battery-powered 24-bit data acquisition unit, which offers synchronous digitisation of outputs from six magnetic field sensors, accelerometers or acoustic sensors. It is software controlled, with features including gain, low-pass filtering, and time and frequency domain display. Spectramag-6 is designed for use in magnetic field site surveys, and surveys prior to MRI installation.

Mag-03DAM Data Acquisition Module

This battery-powered unit provides power, and digitises the signal from one or two three-axis sensors. Its 24-bit resolution and optional digital filtering makes it ideal for recording DC and low frequency signals.

Decaport Analogue Interface Module

A mains-powered unit that provides power and conditioning for up to 10 magnetometers. The unit is compatible with most Bartington Instruments single and three-axis sensors. Its I/O connections allow for programming of analogue low-pass filters. Analogue output is available for connection to a NI™ PXI system.

DAS1 Data Acquisition System

A PXI-based unit which, when connected to one or more Decaports, can digitise up to 80 magnetic field sensors. It includes an 18-bit resolution A-D card, and is extendable to 24-bit with oversampling.

Spectramag-6 Data Acquisition Unit



Decaport Analogue Interface Module



Mag-03DAM Data Acquisition Module

DAS1 Data Acquisition System



Product Compatibility

Use this table to cross-check which products are compatible with our range of data processing units.

	PSU1	Magmeter-2	SCU1	Spectramag-6	Mag-03DAM	DecaPSU	Decaport	DAS1
Mag-13*	•	•	•	•	•	• ¹	•	•
Mag-03	•	•	•	•	•	• ¹	•	•
Mag690	•	•	•	•	•	• ¹	•	•
Mag648/649	•	•	•			•	•	•
Mag639**	•	•	•			• ¹		
Mag650	•	•	•			•	•	•
Mag651	•	•	•			•	•	•
Mag646	•	•	•	•	•	• ¹	•	•
Mag670	•	•	•	•	•	• ¹	•	•
Mag678/679	•	•	•			•	•	•

* Mag-13 Test Coil function will only operate with DecaPSU and Decaport. An adaptor cable will be required when connected to Mag-03DAM.

** Mag639 will see a bandwidth reduction when used with SCU1 and DecaPSU, and range reduction when used with PSU1.

¹ An adaptor cable is required.



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