Overview

The Digital Fluxgate Magnetometer is a three component, high precession, low noise vector magnetometer in single (MFG-1S) and dual (MFG-2S) sensor configuration. It is useable in a wide range of applications like continuous recording of the magnetic field in observatories, magnetic exploration campaigns and in technical applications e.g. magnetic cleanliness measurements.
The small-sized, lightweight vector compensated magnetic field sensor is built up of self-manufactured low noise ring cores and a self-supporting Helmholtz coil system.
The magnetometer is controlled by a powerful ARM9 microcontroller with a Linux operation system and can be operated stand-alone via a touch screen or remote over a TCP/IP network connection or a serial link.
Magson offers several add-ons to extend the functionality e.g. a second magnetic field sensor for using the device as a gradiometer, a GPS receiver, inclinometers, a rotary encoder and a heater option to keep the sensors and electronics at constant temperature.

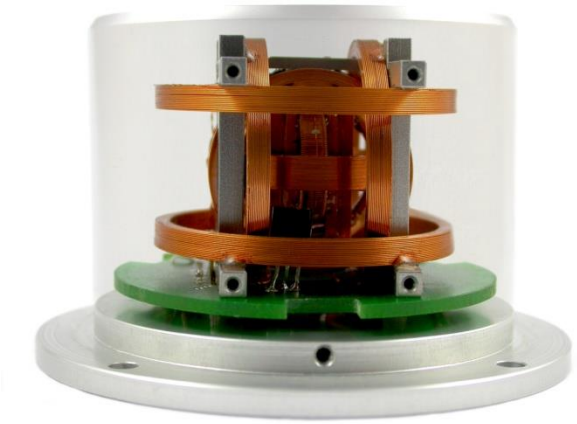
Applications

- *Observations, Remote control via network*
- *Gradiometers for magnetic moment measurements*
- *Towfish and ship board magnetometers*

Sensor

The magnetic field is measured by a vector compensated ringcore fluxgate sensor.
The sensor consists of two crossed ringcores, three pick-up coils and a tri-axial Helmholtz coil system for field feedback. The noise level of the ringcores is in less than 15pT/√Hz @ 1Hz The field sensitive ringcores are kept by the feedback system always in zero field. This vector compensation allows the measurement of all three components of the magnetic field vector in the center of the sensor. The stability of the offsets depends on the individual characteristics of the ringcores, however scale values and non-orthogonality depends on stability of the feedback coil system only. The isotropic design and the usage of material with very similar expansion coefficients ensures an extremely high axis stability (alteration < 0.02° total), the possibility to use the sensor in a very large temperature range (-100°C to +200°C) and a scale value which depends very linearly on the expansion coefficient of the feedback system (17.5ppm/°C +/- 1.5ppm/°C).

Construction:	*Self-supporting Helmholtz coil system*
Oriantation:	*X, Y, Z*
Size:	*H: 40mm,* *Cover ∅: 50mm,* *Socket ∅: 67mm*
Weight:	*105g*
Cable length:	*Up to 20m*
Noise:	*<15pT/√Hz* *(typical 10pT/√Hz) at 1 Hz*
Long-term stability:	*<10nT/year*



Electronics

- *Measurement of 3 or 6 magnetic field components (Measurement range ±65000nT)*
- *Measurement of electronics and sensor temperature*
- *Optional: measurement of inclination (2 axis each sensor)*
- *Magnetometer control and data output via touch screen, network services and serial interface*
- *Data recording on SD card with different sampling rates (ASCII or binary data format)*
- *Manually triggered measurement including geographical position*
- *Simultaneous data access and recording*
- *Synchronization of time and position determination with a GPS receiver*

Electronics size:	*172 x 107 x 56 mm*
Electronics weight:	*565 g*
Range:	*+/-65000 nT*
Resolution:	*10pT*
Sampling rate	*selectable: 1Hz, 10Hz, 50Hz, and 100Hz (200Hz optional)*
User interfaces:	*Touch screen* *serial interface* *FTP* *socket connections* *website*
Data format:	*ASCII / binary*
Disk space:	*4GByte* *(32GByte maximum)*
Operating voltage:	*4.5-9V, 9.5V-18V or 18-36V*
Power consumption at 12V:	*1.4 W Minimum* *1 Sensor,* *Touch screen, GPS off,* *no Network cable plugged in*
	2.7 W Maximum *2 Sensors,* *Touch screen, GPS on* *Network cable plugged in*

Detailed information can be found in the Instruction Manual.