

LEMI Sensors:

Fluxgate magnetometer LEMI-025

Product description

Fluxgate magnetometer (FGM) LEMI-025 was developed for the super sensitive measurements of 3 components of Earth magnetic field induction and their variations in accordance with new 1-second INTERMAGNET standard. The signals with periods from 1 to 100.000 seconds and more may be collected with reasonable error. In order to realize this design, the major attention was paid to such principal FGM characteristics and parameters as frequency response and sampling synchronization accuracy as well as thermal and temporal stability and noise level. To fulfil such mutually contradictory requirements as speed of response and deep suppression of industrial noise, the specific combination of analogue and digital filters was realized in this instrument. The magnetic sensor of flux-gate type, which mainly determines magnetometer stability and noise level, was manufactured with high-tech glass-ceramics having close to zero thermal expansion factor using well-proved technology, which implements recent findings in the excitation circuit construction and operation mode. Three types of the sensor construction are possible (optional selection, see Figures). Using best available voltage references and passive components provides excellent stability of the FGM electronics.

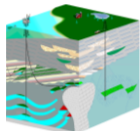


Figure 1: LEMI-025 system with sensor in various options. The suspended option is shown on the right

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Product applications

This FGM is intended for operation in the geomagnetic observatory conditions and in normal operation mode requires external PC for storing the acquired data. For this purpose, FGM includes RS-232 digital interface. It is also possible to accumulate data into an embedded removable Compact FLASH memory card up to 2 GB volume. This mode of operation is recommended as a temporary one only. The instrument has GPS receiver for data sampling synchronization and FGM location co-ordinates determination.

Product specifications

Measured range of magnetic field variations	± 3000 nT
Automated offset compensation band along each magnetic component	± 65000 nT
Resolution along each component: at the display in the 1-second and 1-minute data files in the 0.1-second file and Flash card data	0.1 nT 0.01 nT 0.001 nT
Temperature drift	<0.2 nT/°C
Frequency band	DC-3.5 Hz
Output noise in frequency band (0.01 – 1) Hz	< 0.01 nT rms
Magnetic sensor components orthogonality	<30 min of arc
Sampling rate at the magnetometer digital output and FLASH card after PC software digital filtration	10 per second 1 per second 1 per minute
Error of synchronization with UTC time	< 10 ms
Volume of the removable Compact FLASH memory card	2 GB
Digital output	RS 232
GPS timing and co-ordinates determination	
Operating temperature range	Minus 5 to +40°C
Power supply	12 ⁺³ ₋₂ V
Power consumption	<4 W
Weight: Sensor (observatory type) with 10 m cable electronic unit with cables GPS antenna with 15 m cable	3.3 kg 3.8 kg 0.7 kg

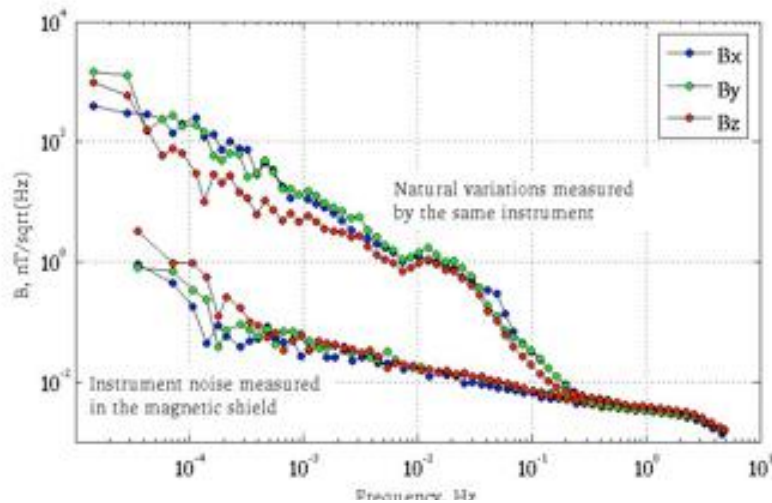


Figure 2: LEMI-025 noise plot example.