

Potassium Magnetometers

For High Precision Applications

Our Supplier, GEM Systems, is the global leader in the manufacture and sale of high precision magnetometers.

GEM Systems is the only commercial manufacturer of Overhauser magnetometers that are accepted and used at Magnetic Observatories over the world.

GEM's Potassium Magnetometers are the most precise magnetometers in the world.

GEM's Proton sensors are considered the most practical and robust magnetometers for general field use.

Proven reliability based on GEM's R&D since 1980.

Integrated systems with GPS and additional survey capability with VLF-EM are available as options for convenience and high productivity.

GEM is creating the absolute best in airborne sensors and is leading the way with smaller and lighter sensors for practical UAV applications.

GEM Systems large potassium sensors offer the highest sensitivity (20-50 fT) for use in natural hazard research and global ionospheric studies.

GEM's Leadership and Success in the World of Magnetics is your key to success in applications from Archaeology, Volcanology and UXO detection to Exploration and Magnetic Observation Globally.



Optically Pumped Potassium Magnetometer with ruggedized console, backpack for electronics, light weight sensors and cables.

Potassium Technology

The GSMP-35 Magnetometer and the GSMP-35G Gradiometer are the most precise magnetometers on the market today.

The GSMP-35 is the result of development since 1980 and provides the highest available sensitivity at $.0002\text{nT} @ 1\text{Hz}$. The Potassium optically pumped technology allows for extreme gradient tolerance of up to $50,000\text{nT/m}$ and systems can be configured to measure in extremely high (greater than $350,000\text{nT}$) or low fields (less than 3000nT). Standard systems provide fast sampling of 20Hz (20 samples per second). In addition Potassium magnetometers, with high absolute accuracy, have the lowest heading error for precise airborne and UAV applications.



GEM GSMP-35 Magnetometer

The GSMP-35 magnetometer provides the highest sensitivity and greatest absolute accuracy on the market for multiple high precision applications. Shown with optional GPS.

Highest Precision Applications

The latest Potassium magnetometers offer the same reliability of GEM's proton and Overhauser magnetometer systems, yet with a level of precision that is the highest in the world for portable magnetometers. GEM's GSMP line of Potassium magnetometers are an excellent choice for applications where the ability to map and characterize the smallest contrasts in magnetic physical properties is important. The potassium magnetometer provides best in class data for a variety of projects including:

- **Archeology**
- **Magnetic observatory measurements**
- **Volcanology and earthquake research**
- **Airborne Survey**
- **Unexploded Ordnance Detection**

Multiple sensor systems are available for customers including non-magnetic cart applications with 2 to 10 sensors for sophisticated imaging. In addition, the add-on VLF system provides a multiple parameter geophysical tool for imaging the earth.



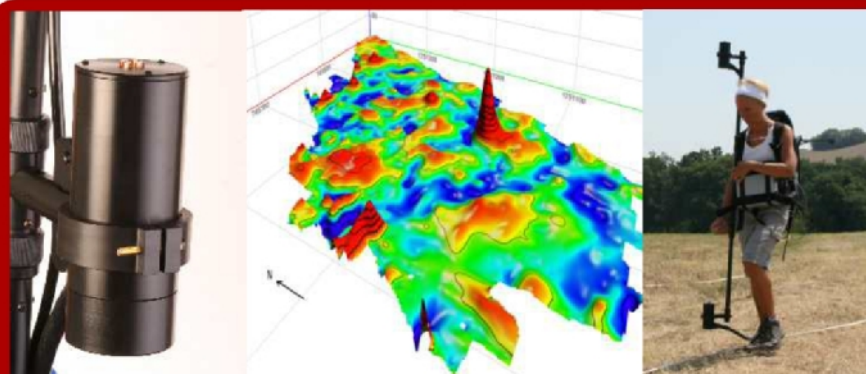
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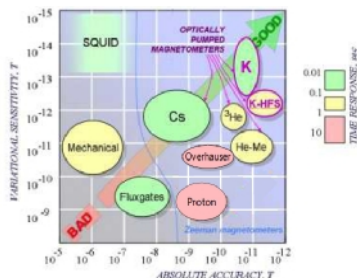
sales@terraplus.ca



Single sensor and gradiometer modes provide flexibility and fast sampling and are used for detecting subtle changes in the magnetic field. Applications include; alteration mapping, structural geology, archeology and UXO applications

Why use 'K' Magnetometers

Potassium magnetometers work within a **narrow spectral line** this means that when they are locked on signal the error due to heading miss alignment is very small. Other alkali vapor sensors have a much broader spectral line, which translates to larger heading errors. For this reason repeatability between sensors is also the highest possible for Potassium magnetometers over Cs and others. This has significant benefits for high sensitivity gradient surveys, and multiple sensor array surveys for archeology and UXO applications.



Magnetometer Technology: When plotted with other magnetometers for the main metrological parameters Potassium is one of the most sensitive and has the highest absolute accuracy (ref. Ioffe Phys.-Tech. Institute).

The GSMP-35 Potassium Magnetometer is packaged with the same attention to detail that all of GEM magnetometers are made. Robust and practical for real world use. A light weight version of this sensor is available for drone applications.

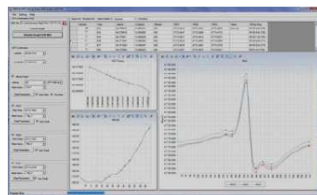
GPS and Navigation

Along with basic GPS tracking, GEM provides a Navigation feature with real-time coordinate transformation to UTM and local grid. A survey "lane" guidance system with cross track display coupled with automatic end-of-line flag and guidance to the next line allows the operator to navigate seamlessly while carrying out the magnetic survey. Operators can define a complete survey on PC and download points to the magnetometer via RS-232 before leaving for the field.

GEMLink+

Software for Processing Magnetic Data

GEMLink+ processing software is provided with every GEM magnetometer system. GEMLink+ provides data visualization needed by the geoscientist to quickly assess the data quality in the field. The software provides diurnal correction, profile plotting, line path maps coordinate transformations and some basic mapping and modeling functions. Files can also be imported / exported to Google kmz format.



GEMLink+ Data QA/QC software with multi window data processing and plotting (screenshot)

Specifications

Performance

Sensitivity:	0.0002 nT / $\sqrt{\text{Hz}}$ (GSMP-35) 0.022 nT / $\sqrt{\text{Hz}}$ (GSMP-25)
Resolution:	0.0001 nT
Absolute Accuracy:	± 0.1 nT
Range:	15,000 to 120,000 nT
Low/High Field Options:	3,000 to 350,000 nT
Gradient Tolerance:	50,000 nT/m
Sampling Rate:	1, 5, 10, 20 Hz

Orientation

Sensor Angle: optimum angle 35° between sensor head axis & field vector
Proper Orientation: 10° to 80° & 100° to 170°
Heading Error: ± 0.05 nT @ 360° full rotation about axis

Storage (# of Readings in millions)

Magnetometer: 3.3M, Gradiometer 2.4M,
Base Station: 8.3M

Environmental

Operating Temperature: -40°C to +55°C
Storage Temperature: -70°C to +55°C
Humidity: 0 to 100%, splashproof

Dimensions and Weights

Console: 223 x 69 x 240 mm (8.7 x 2.7 x 9.5 in)
Sensor: 161 x 64 mm dia (6.8 x 3 in); 1.0 kg (2.2 lb.)
Electronics Box: 236 x 56 x 39 mm (9.3 x 2.2 x 1.5 in);
0.60 kg (1.32 lb.)

Power

Power Supply: 22 to 32 V DC
Power Consumption: 0.5 amp typical at 20°C
Warm-up time: < 10 minutes at 20°C

Standard Components

Console, electronics box, backpack, GEMLink+ software, harness, charger, sensor with cable, 25.9V 4Ah Lithium battery, RS-232 cable with USB adapter, staff, instruction manual, and case.

Options

Gradient Magnetometer, Walking Mode, Multi sensor

Available GPS

GPS Time Only (Option A)

Standard GPS (Option B)

- 0.7m SBAS (WAAS, EGNOS, MSAS)
- < 1.5m non-SBAS

Enhanced GPS (Option C)

- 0.6m SBAS (WAAS, EGNOS, MSAS), GLONASS, BeiDou, Galileo
- Consult for availability

High resolution GPS (Option D)

- 0.6m SBAS (WAAS, EGNOS, MSAS), GLONASS, BeiDou, Galileo
- 40cm or 4cm accuracy with NovaTel Correct (TerraStar Subscription required)
- Consult for availability

VLF Option

Frequency range: 15 to 30.0 kHz with up to 3 stations.
Parameters: Vertical in-phase and out-of-phase components as % of total field.

The Potassium Magnetometer systems come complete with an industry leading three year warranty



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