Potassium

Magnetometer / Gradiometer (GSMP-35 v8.0)

NEW! Version 8

Our World is **Magnetic.**

The new Potassium system is the highest sensitivity and absolute accuracy magnetometer today. It is designed for ground applications where data quality, cost control and ruggedness are the keys for project success.

New Version 8 technologies provide even more value:

Highest sensitivity available at 0.0025 nT at 1 Hz

Gradient tolerance 30,000 nT/m

Fast sampling up to 20 Hz; ideal high resolution surveys

Integrated backpack: convenience and high productivity

Low power consumption up to 16 hours of continuous operation per charge

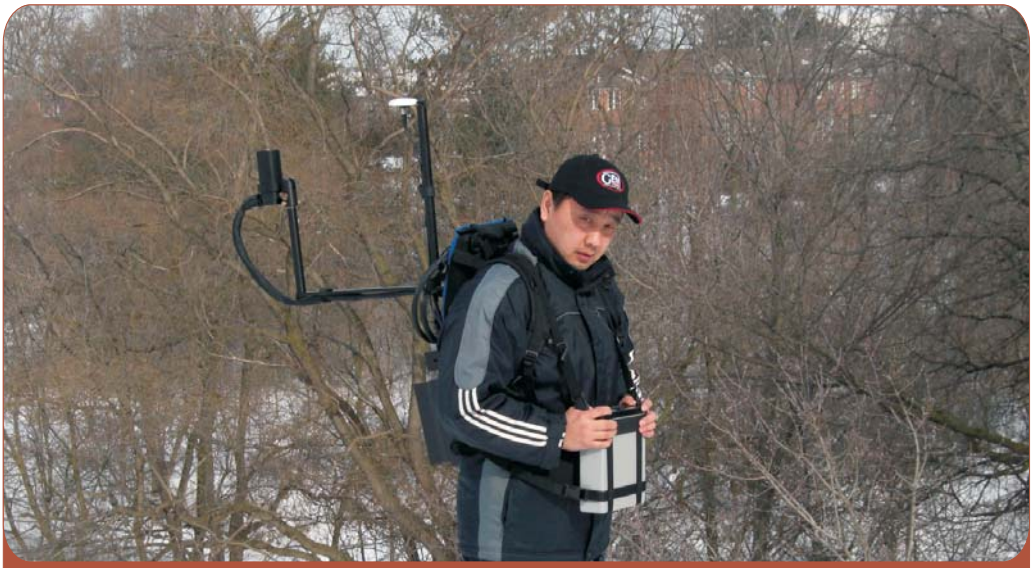
Light weight and compact design

Two GPS Options available:
Standard GPS
<1.5m SBAS (WAAS, EGNOS, MSAS)
High resolution CDGPS
<0.6m SBAS (WAAS, EGNOS, MSAS)
<0.6m CDGPS (Canada, USA, Mexico)
<0.7m OmniStar (VBS2 subscription)

Easy-to-use mapping and navigation capabilities for enhanced survey performance

Proven reliability based on 28 years of R&D

All of these technologies come complete with a two year warranty.



Optically pumped Potassium Magnetometer (GSMP-35 v8.0) with ruggedized console, backpack for electronics, light weight sensors and cables.

Looking for minerals, diamonds or oil & gas, and the optimal technologies to assist you in acquiring high-quality magnetic or gradiometric data for analysis and decision making?

GEM has the solution you have been seeking. The new v8.0 release of our optically pumped Potassium magnetometer is specially designed for your needs establishing a standard in data quality, cost control and ruggedness.

The result of more than two decades of development, the GSMP-35 v8.0 is a backpack-mounted version of GEM's proven GSMP-40 ground magnetometer with many new key features.

Its features span a variety of functions, including import, display, navigation, surveying, sampling, and more. The new system also supports GPS, another impor-tant capability for today's production-minded explorationist.

Data Quality

High data quality is assured through the GSMP-35 v8.0 Magnetometer's sensitivity, gradient tolerance and minimal heading error. Sensitivity is 0.0025 nT at 1 Hz - the highest in the industry. This makes the system effective for mapping subtle anomalies and structures in resource exploration applications.

The instrument also has a gradient tolerance of 30,000 nT / m, making it ideal for mapping highly ferrous geological units such as those sometimes encountered in mineral exploration. In addition, the system has the lowest heading (orientation) error, thereby resulting in the "cleanest" magnetic readings possible.

Cost Control

In the past five years, industry rationalization has resulted in a greater emphasis on increasing productivity of surveying. With the new Potassium Magnetometer, the emphasis is also on cost control, through the following features:

* Useability: Easy menu-driven operation using a rugged console

* Display: Easy-to-read display with specific settings for presenting real-time data on console

* Navigation / GPS: The industry's most versatile precise navigation technology for surveying without cutting grids for significant cost savings

*Import: Streamlined import of maps for georeferenced walking surveys

* High Capacity Memory: 3,000,000 readings without concern for memory space or the need to dump memory during the survey

Ruggedness

Resource exploration often requires traveling to remote locations and operating instruments in less than ideal conditions (heat, cold, damp, etc.).

The new Potassium magnetometer has excellent environmental specifications as well as other capabilities that contribute to robustness. These include rugged packaging on an ergonomic backpack, and robust sensors, the main component of any magnetometer system.

Advancing the Field of Potassium Magnetometry

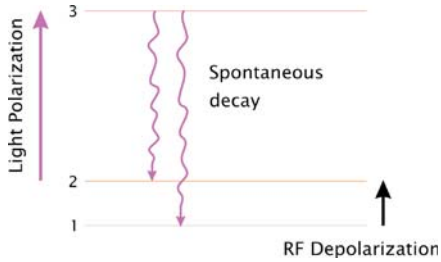
GEM's R&D programs continue to advance the frontiers of magnetometry.

For example, recent developments in small sensor designs have increased gradient tolerance by five times while maintaining the industry standard in sensitivity and absolute accuracy.

At GEM, we work in delivering the most advanced and reliable products continues every day.

Theory of Operation

A typical alkali vapour magnetometer consists of a glass cell containing an evaporated alkali metal (i.e. alkali atoms). According to quantum theory, there is a set distribution of valence electrons within every population of alkali atoms. These electrons reside in two energy levels as represented by the numbers 1 and 2 in the figure below.



Light of a specific wavelength is applied to the vapour cell to excite electrons from level 2 to 3 only. This process (called ***polarization***) reduces the number of atoms with electrons at level 2. The result is that the cell stops absorbing light and turns from opaque to transparent.

Electrons at level 3 are not stable and spontaneously decay back to levels 1 and 2. Eventually, level 1 becomes fully populated and level 2 is fully depopulated.

At this point, ***RF de-polarization*** comes into play. Here, we apply RF power of a wavelength that corresponds to the energy difference between levels 1 and 2 to move electrons from level 1 back to level 2.

The significance of de-polarization is that **the energy difference between levels 1 and 2 (i.e. the frequency of the RF de-polarizing field) is directly proportional to the magnetic field**.

The system detects the fluctation of light intensity (i.e. modulation) as the cell becomes opaque and transparent, and measures the corresponding frequency. The frequency value is then converted to magnetic field units.

Specifications

Performance
Sensitivity: 0.0025 nT @ 1 Hz
Resolution: 0.0001 nT
Absolute Accuracy: +/- 0.1 nT
Range: 20,000 to 100,000 nT*
Gradient Tolerance: 30,000 nT/m
Sampling Rate: 1, 5, 10, 20 Hz
* Low/High Field Options Available: 10,000 to 350,000 nT

Orientation
Sensor Angle: optimum angle 30° between sensor head axis & field vector
Orientation: 10° to 80° & 100° to 170°
Heading Error: +/- 0.05 nT between 10° to 80° and 360° full rotation about axis

Storage (# of Readings)
Magnetometer: 3,303,000
Gradiometer: 2,359,000

Environmental
Operating Temperature: -20°C to +55°C **
Storage Temperature: -70°C to +55°C
Humidity: 0 to 100%, splashproof
** Optional to -40°C

Dimensions and Weights
Console: 223 x 69 x 240 mm
Sensor: 148mm x 64mm (cylinder type); 1.5 kg
Electronics Box: 229mm x 56mm x 39mm; 0.63 kg

Power
Power Supply: 22 to 32 V DC
Power Requirements: approx. 50 W at start up, dropping to 12 W after warm-up
Power Consumption: 12 W typical at 20°C

Outputs
Outputs UTC time, magnetic field, lock indication, heater, field reversal, latitude and longitude, and GPS altitude.

Standard Components
Console, electronics box, backpack, GEMLinkW software, harness, charger, sensor with cable, 29,6V 8Ah Lithium battery, RS-232 cable with USB adapter, staff, instruction manual and shipping case.

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ADVANCED MAGNETOMETERS

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