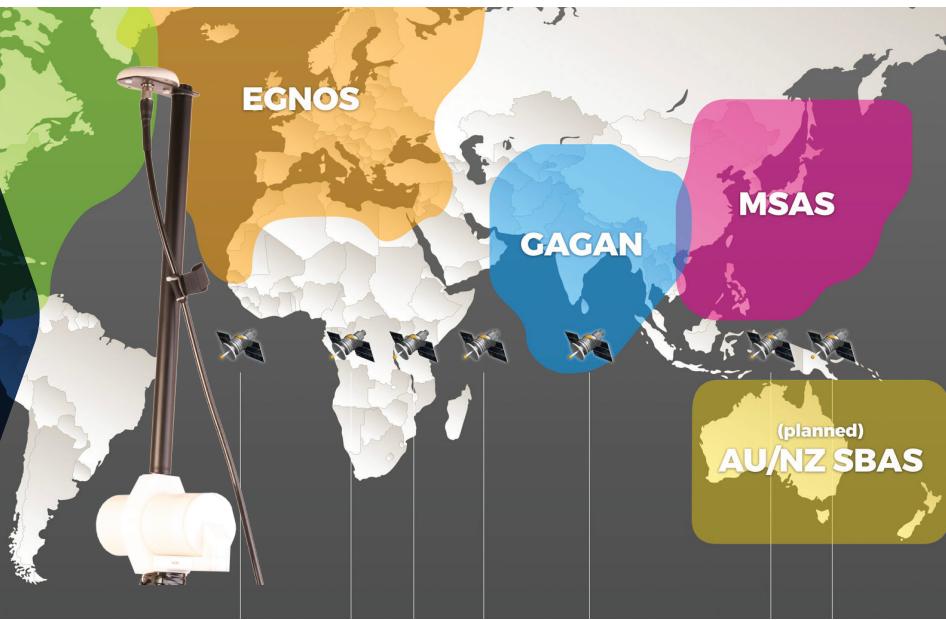




GPS Options for Magnetometers

Major advantages:

- **High positional accuracy**
- **Real time data**
- **Improved positioning accuracy**



Global "SBAS" Coverage areas. Integrated GPS with GEM's advanced magnetometers provide approx. 70cm accuracy in SBAS Regions. SBAS comprises WAAS, EGNOS and MSAS satellite systems and soon will include Africa, Russia and South America.

GPS for accurate survey positioning and real time navigation

Magnetics are an increasingly key investigative method for many applications from Exploration to Archaeological and Engineering studies. Integrated GPS makes magnetic data easy to plot and easy to use.

About GPS

In the past, geophysical surveying tools, such as magnetometers, relied on time-consuming manual positioning options, usually via a grid-based system of staked lines. However, the development of Global Positioning via satellite communications in the late 1980's provided a quick means for positioning. Since then, vast improvements have occurred to the technology and methodology of collecting GPS information.

Today GNSS (Global Navigational Satellite Systems) incorporates a variety of Satellite information from different networks of Satellites. (Glonass, Galileo, Beidou, GPS, etc.) to provide better accuracy across the globe.

The design of the receivers today are focused on utilizing combinations of different satellite configurations to improve results.

Today positioning accuracy can be achieved at the cm accuracy level via differential global positioning systems (DGPS) Accurate Real-Time information is used to navigate in remote regions and record positioned survey data to sub metre accuracy. With an integrated system to collect the data at the same time as the magnetometer readings, end users benefit from having access to free positioning for global applications.



For more info
SCAN HERE!

GEM's GSM-19 system with integrated GPS option. This system provides a light weight, low cost solution for walking use. It includes a "Walking" mode that enables continuous readings as well as navigation resulting in high productivity surveys.



SBAS Support

Positioning technologies include new options for working around the world as well as for working in Canada, USA, and Mexico. DGPS (differential GPS) is now provided in certain regions around the globe. SBAS GPS coverage (Satellite Based Augmentation Systems (SBAS)), is automatically supplied differential GPS. Users of integrated GEM / GPS systems benefit with roughly 70 cm positional accuracy when in SBAS regions. (see map for SBAS regions)

SBAS supports wide-area or regional augmentation through the use of a satellite-broadcast message. Such systems are commonly composed of multiple ground stations, which take measurements concerning the networks' accuracy, reliability, and availability, and one or more

satellites, which broadcast the information to the receivers. SBAS is freely available to GEM magnetometer users through its integrated positioning support. Where SBAS does not exist, typically users can still achieve positioning accuracy to roughly 1.5 metres with our antennas which obtain information from the standard GPS satellite as well as GLONASS satellites.

Improved Positioning Accuracy

GEM Magnetometer systems can be upgraded to include a GPS module which can take advantage of the NovAtel TerraStar service. This service provides additional accuracy through a paid subscription for DGPS. Two services are currently available (40 cm and 2.5 cm). In addition, these units can also be configured for RTK corrections which can provide cm accuracy.

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 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.

Available GPS

Enhance positioning resolution.

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 GEM for availability

High resolution GPS (Option D):

- 0.6m SBAS (WAAS, EGNOS, MSAS), GLONASS, BeiDou, Galileo
- 40 cm or 2.5 cm accuracy with NovAtel TerraStar (TerraStar Subscription required)
- 1cm accuracy with RTK

Magnetometer Specifications

Overhauser Performance

Sensitivity: 0.022 nT / $\sqrt{\text{Hz}}$

Resolution: 0.01 nT

Absolute Accuracy: 0.1 nT

Range: 20,000 to 120,000 nT

Gradient Tolerance: > 10,000 nT/m

Samples at: 60+, 5, 3, 2, 1, 0.5, 0.2 sec.

Operating Temperature: -40°C to +55°C

Dimensions & Weights:

Console: 223 x 69 x 240 mm, 2.1 kg

Sensor: 175 x 75 mm dia. cylinder, 1.0 kg

Potassium Performance

Sensitivity: 0.0002 nT @ 1 Hz

Resolution: 0.0001 nT

Absolute Accuracy: \pm 0.1 nT

Range: 20,000 to 120,000 nT

Low/High Field Options: 3000 to 350,000 nT

Gradient Tolerance: 50,000 nT/m

Heading Error: \pm 0.05 nT between 10° to 80° and 360° full rotation about axis.

Samples at: 1, 5, 10, 20 Hz

Operating Temperature: -40°C to +55°C

Dimensions & Weights:

Electronics box: 229 x 56 x 39 mm; 0.63 kg

Sensor: 112 x 64 mm external dia., 0.9 kg

GEM Systems, Inc.

Address: 135 Spy Court Markham, ON Canada L3R 5H6
 Phone: 1 905 752 2202
 Fax: 1 905 752 2205
 Email: info@gemsystems.ca
 Web: www.gemsystems.ca

All components are backed by GEM's industry leading three-year warranty.