

GPS Options for Magnetometers

GEM
SYSTEMS
ADVANCED MAGNETOMETERS

Our World is **Magnetic**.

GEM's leading line of ground, airborne and stationary magnetometers and gradiometers now supports advanced new positioning options from OmniSTAR, SBAS and CDGPS for global and Canada-wide surveying.

Enhanced GPS positioning resolution.

Standard GPS:

<1.5m SBAS (WAAS, EGNOS, MSAS)

High resolution CDGPS Option:

<0.6m SBAS (WAAS, EGNOS, MSAS)

<0.6m CDGPS (Canada, USA, Mexico)

<0.7m OmniStar (VBS2 subscription)

OmniSTAR is a paid subscription service offering resolution of less than 1 m horizontal and vertical. SBAS comprises the US-based WAAS, European EGNOS and Japanese MSAS systems.

CDGPS is a new standard for Canada, USA and Mexico.

Some of the benefits include:

- * Accuracy 0.6m
- * Superior performance in foliated conditions
- * Spatial integrity with all Government maps and surveys
- * 24 x 7 operations with built-in network redundancy
- * No service costs



Coverage areas supported in GEM's advanced magnetometers. OmniSTAR is a global service; SBAS comprises WAAS, EGNOS and MSAS satellite systems; and CDGPS is the new Canadian standard.

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 differential global positioning systems (DGPS) has led to a revolution in ground positioning. The result is embedded DGPS that can guide surveys in remote regions and record positioned survey data to an accuracy never possible before.

As one of the market leaders in developing magnetometers with DGPS, GEM has now made available to its customers several new positioning technologies. These technologies are available throughout the company's leading line of ground, airborne and stationary magnetometers.

Positioning technologies include new options for working around the world as well as for working in Canada, USA and Mexico with a new Canada-wide DGPS system, called CDGPS. Global capabilities include OmniSTAR (paid subscription) and Satellite Based Augmentation Systems (SBAS) which, like CDGPS, is free.

Worldwide DGPS Coverage via OmniSTAR and SBAS

For customers working globally, there are two advanced options that are available to assist in acquiring high-resolution positioning information. These include OmniSTAR and SBAS.

OmniSTAR Support

GEM is pleased to provide support through the OmniSTAR positioning technology across its leading line of magnetometers.

OmniSTAR provides a cost-based GPS enhancement data via satellite for worldwide coverage. 70 reference stations and 3 network control centers provide a highly reliable positioning service.

GEM currently supports the OmniSTAR VBS level of differential GPS service. VBS is a "sub-meter" level of service. A typical 24-hour sample of VBS will show a 2-sigma (95%) of significantly less than 1 meter horizontal position error and the 3-sigma (99%) horizontal error will be close to 1 meter.

Activation of OmniSTAR service is typically through a special phone line monitored by a technician. After receiving the model number and serial number of your receiver as well as payment information, the technician will activate your subscription, typically within 15 minutes or up to 1/2 hour for first time receiver use.

SBAS Support

For users who require slightly less accuracy (0.7 m) than OmniSTAR, and who also want to use a free service, SBAS is a proven option.

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.

Surveying in Canada

The new option, CDGPS, is a nation-wide DGPS service that provides unmatched accuracy and coverage for positioning applications across Canada.

The CDGPS DGPS service uses "wide-area" technology deriving corrections from real-time positioning information collected across the country. This data is transmitted to Ottawa where mathematical algorithms produce a single GPS+C correction data stream which is uplinked to the MSAT satellites for broadcast across Canada.

The CDGPS has many advantages over existing wide area correction systems.

One example is the high Arctic where GPS coverage is poor. GEM customers will benefit significantly as CDGPS delivers superior correction signal penetration with high accuracy and high resolution differential GPS corrections.

And perhaps the best news is that CDGPS is a free service that can now be accessed easily via GEM magnetometers.

Magnetic surveys using CDGPS have better resolution (0.6 m) than standard SBAS positioning (1.5 m) and OmniSTAR (0.7 m). The new magnetometer option also supports 86 datums through CDGPS. As an integrated technology in GEM magnetometers, CDGPS brings other advantages.

For instance, GPS data is available up to 20 times per second. This means that even the fastest GEM magnetometer (Potassium) running at 20 times per second will provide readings with each reading having a time, position and altitude stamp.

Position is selectable (either latitude / longitude or UTM) giving GEM, for the first time, UTM availability directly from the GPS receiver. Users also have the built-in ability to select the GPS datum; previously this was only available as an option from GEM.

For users working with airborne data, GEM is also now offering an aircraft-certified antenna with CDGPS support.

Benefits of CDGPS

CDGPS provides a low-cost / high performance solution well-suited to the real-time data collection needs of Canadian, USA and Mexican users. It includes:

- * nation-wide Canadian coverage;
- * superior performance in foliated conditions;

* meter-level positioning accuracy (<0.6m) with mapping-grade GPS receivers;

* spatial integrity with all Government maps and surveys;

* 24 x 7 operations with built-in network redundancy;

* open published broadcast protocol;

* no service costs.

The data signal is structured to perform well in difficult, or foliated conditions, so the service is available more consistently. The network, which includes redundancy at the data collection, transmission and processing layers, has a high degree of service reliability.

The corrections signal has been structured around an open broadcast protocol so that additional hardware and software developers can easily extend the value of the data.

More information on CDGPS is available at www.cdgps.com.



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