



# Proton Magnetometers

Reliable and Robust For Exploration, Environmental and Engineering Applications

**Celebrating 35 Years**  
Leading the World of Magnetics

**GEM Systems is the number one global leader in the manufacture and sale of high precision magnetometers.**

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

**Our Potassium Magnetometers are the most precise magnetometers in the world.**

Our Proton sensors are considered the most practical and robust magnetometers for general field use.

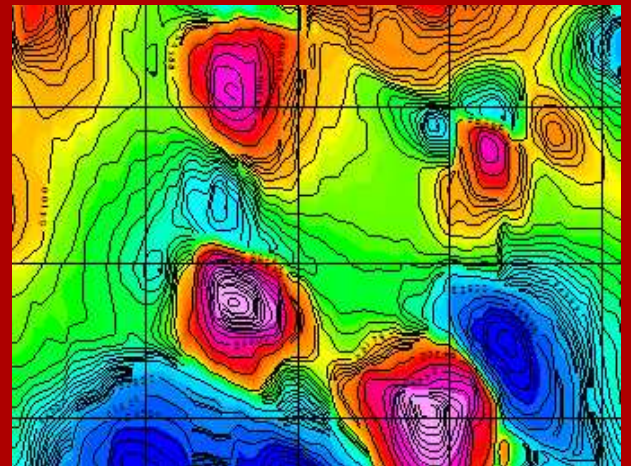
**Proven reliability based on 35 years of R&D.**

We deliver fully integrated systems with GPS and additional survey capability with VLF-EM for convenience and high productivity.

**Today we are creating the absolute best in airborne sensors and are leading the way in super sensitive potassium sensors specially designed for highly sensitive studies with super large sensors for research of Natural Hazards globally and now smaller and lighter sensors for practical UAV applications.**

Our Leadership and Success in the World of Magnetics is

**Your key to success** in applications from Archeology, Volcanology and UXO detection to Exploration and Magnetic Observation **Globally.**



**GEM GSM-19T Proton Precession system. The image shows a staff-mounted configuration with console, sensor, supporting pole and cables. A backpack-mounted version, and optional GPS are available for hands free operation.**

## GEM - Proton Magnetometers

GEM's Proton Precession magnetometer (GEM GSM-19T) is a versatile and easy-to-use instrument for subsurface investigations and exploration. The Proton system is designed for clients who require a low-cost, yet versatile and accurate magnetometer for ground geophysical surveys. This system is an entry-level system for clients who require an advanced system without the higher-order features and benefits of GEM's Overhauser and Potassium systems.



### GSM-19T Proton Magnetometer

The Proton Magnetometer from GEM provides a reliable, robust affordable survey solution.

## Sound Technology and Features

The GSM-19T Proton Precession features highly-effective proton polarization, three data acquisition modes (Mobile, Gradient, Base Station and optional walking); has a large-volume on-board memory; and comes with an optional high-resolution (0.7 m) integrated GPS.

This GEM GSM-19T provides excellent sensitivity for many applications in most environments. (.15nT @ 1 reading per sec).

- Useability: Easy menu-driven operation using a rugged console
- Integrated backpack: convenience and high productivity
- Low power consumption for up to 16 hours of continuous operation per charge
- Light weight and compact design

The GSM-19T is an effective tool for many environmental and engineering applications, such as detecting buried drums, utilities and other man made objects.

## GEM Systems, Inc.

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Our World is **Magnetics.**



Single sensor and gradiometer modes coupled with the VLF option provide multiple survey capability from one easy to use platform.

## Why use 'GEM' Proton Magnetometers

GEM has been making quality engineered products for 35 years. Our systems are built for robust use and they are used all over the world. The GSM-19T is operator-friendly with an easy-to-read LCD display in graphical or text format.



**GEM Proton magnetometer consoles** are trouble free and reliable. Many features from our more advanced systems are included in our Proton consoles.

The 19T has a signal quality indicator for individual readings to assure the operator of quality readings. It is also gradient tolerant and provides a warning indicator so that the operator can monitor data quality continuously. In addition, our warranty is the best in the business.



**GEM Proton magnetometers** have been carefully engineered to provide reliable trouble free use for years to come.

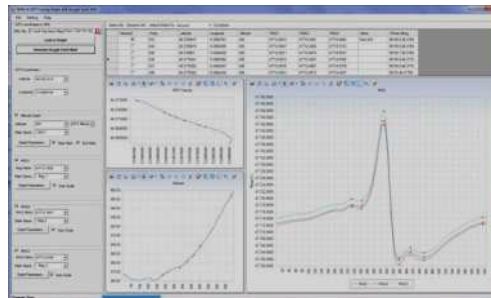
## GPS and Navigation

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. Complete surveys can be defined on PC and downloaded 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. **GEMLink+** provides all of the 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 and some basic mapping and modeling functions. Files can be imported/exported to Google kmz format and coordinate transformations can be made.



**GEMLink+** Data QAQC software with multi window data processing and plotting (screen shot)

## Specifications

### Performance

Sensitivity: 0.15 nT @ 1 reading per sec.  
0.05 nT @ 1 reading every 4 sec.  
Resolution: 0.01 nT  
Absolute Accuracy: +/- 0.2 nT @ 1 Hz  
Dynamic Range: 20,000 to 120,000 nT  
Gradient Tolerance: over 7000 nT/m  
Samples at: 60+, 5, 4, 3, 2, 1, 0.5 sec  
Operating Temperature: -40°C to +50°C

### Operating Modes

**Manual:** coordinates, time, date and reading stored automatically (GSM-19T: 3s, 19TW: 0.5s, 19TGW: 0.5s)

**Base Station:** time, date and reading stored at 3(or 0.5) to 60 second intervals

**Remote Control:** optional remote control using RS-232 interface

**Input/Output:** RS-232 using 6-pin weatherproof connector with USB adapter.

### Memory - 32 MB (# of Readings in millions)

Mobile: 1.4M, Base Station: 5.3M  
Gradiometer: 1.2M, Walking Mag: 2.6M

### Dimensions & Weights

Console: 223 x 69 x 240 mm (8x3x9.5 in)  
Console: 2.1 kg (4.6 lbs)  
Sensor and Staff Assembly: 2.2 kg (4.8 lbs)

### Standard Components

GSM-19T console, GEMLink+ software, battery, harness, charger, sensor with cable, RS-232 cable and USB adapter, staff, instruction manual and shipping case.

### Options

Gradient Magnetometer, Walking Mode, VLF, GPS

**Standard GPS Option : 0.6m** SBAS (WAAS, EGNOS, MSAS)

**High resolution GPS Option : 4cm**

Novatel (plus TerraStar-C subscription)

**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. 2 relative components of the horizontal field.

Resolution: 0.1% of total field for VLF fields of 5pT or stronger.

**The GSM 19T, 19TG, 19TW and 19TGW systems come complete with an industry leading three year warranty**

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