



GEM Systems Advanced Magnetometers
52 West Beaver Creek Road West, Suite 14
Richmond Hill, ON Canada L4B 1L9
Ph. 905-764-8008 Fax. 905-764-2949
info@gemsys.ca www.gemsys.ca

Advantages of Overhauser with GPS over Cesium Magnetometers

Overhauser magnetometers take advantage of key phenomena –the ability to use radio frequencies (RF) signals to excite both protons and electrons contained in a mixture of proton-rich solvent and electron-rich free radicals, and the fact that electrons can be induced to add their net (higher) energy to that of protons. The Overhauser technology has a number of advantages over cesium magnetometers:

1. Sensitivity adequately matches cesium magnetometers (0.015 nT for Overhauser compared with 0.010 for cesium) providing sensitivity required for most surveys
2. Significantly lower cost with high quality data for enhanced return on investment
3. Overhauser provides raw data without filtering so that data manipulation is at the discretion of the professional rather than the instrument (some Cesium devices)
4. Omnidirectional sensors for superior operation in low fields without orientation
5. No dead zones for high quality data with no "drop-outs" or missing field values
6. Minimal or no heading errors as compared with +/- 1.0 nT for Cesium to deliver more consistent and reasonable results
7. No warm-up time prior to surveys for increased survey efficiency
8. Wide temperature range of operation (from -40 to 55 degrees Celsius standard and -55 to 60 degrees Celsius optional) for maximum usability in all climate types
9. Rugged design for maximum reliability and lifespan



GEM Systems Advanced Magnetometers
52 West Beaver Creek Road West, Suite 14
Richmond Hill, ON Canada L4B 1L9
Ph. 905-764-8008 Fax. 905-764-2949
info@gemsys.ca www.gemsys.ca

10. Virtually maintenance-free in comparison with Cesium magnetometers which require periodic and unpredictable servicing, particularly in optical components
11. High absolute accuracy enabling interchangeability of sensors as well as repeatability of measurements
12. Rapid speed of operation (up to 5 readings per second) for effective surveys at walking pace
13. Very low power consumption for maximum time of operation in the field (8 to 10 hours in comparison with 3 to 6 hours for Cesium)
14. High operating range (10,000 to 120,00) in comparison with Cesium (17,000 to 100,000) for complete confidence that data values will not exceed range
15. Gradient tolerance suitable for the range of targets encountered in geologic prospecting for maximum versatility and range in data
16. Simplicity of design for fewer and less costly repairs over the instrument's lifetime
17. Internet upgrades available via Internet for maximum protection of investment and containment of shipping costs with new magnetometer releases

GEM also delivers a range of GPS and DGPS systems that enable customers to perform magnetic surveys with a variety of positioning accuracies, according to their application needs and budgets.

GEM is the only commercial magnetometer manufacturer to offer built-in GPS / DGPS. The advantages of this approach include a truly seamless and integrated positioning solution that minimizes weight and simplifies survey procedures.



GEM Systems Advanced Magnetometers
52 West Beaver Creek Road West, Suite 14
Richmond Hill, ON Canada L4B 1L9
Ph. 905-764-8008 Fax. 905-764-2949
info@gemsys.ca www.gemsys.ca

Some other advantages are:

1. GPS surveying eliminates the need to provide a grid prior to surveying for more efficient project work
2. Specially designed non-magnetic GPS is available in two options - built-in and external - for the greatest range of solutions and choices available today:
 - a. Internal GPS positions available in real time using WAAS with DGPS available through post-processing
 - b. External GPS provides DGPS values in real time using subscription service, such as Raycal or Omnistar
2. Internal GPS delivers <1.5m survey resolution (suitable for mineral exploration surveys) at lower cost than with cesium systems
3. Internal GPS eliminates cabling for greater reliability in the field
4. Internal GPS provides outstanding performance even in challenging environments (foliage, canyons) according to manufacturer's specifications
5. Both internal and external GPS provides onscreen navigation automatically without using light bar components for lower investment than Cesium units
6. Survey waypoints can be preprogrammed (up to 1000) prior to performing field work for highly efficient field operation
7. Implementation of custom GPS datums as required by customer to provide maximum survey precision and accuracy