Geometrics Knowledgebase

Can I put a cesium magnetometer on an Unmanned Aerial Vehicle?

Geometrics has many years of experience working with autonomous vehicles (AUV, UAV, UUV, ROV, etc.) for magnetic surveying in the search for minerals, geothermal resources, UXO and related fields of interest. The main questions customers have are What is the right magnetometer for my application? and What platform should I use? The answers vary case by case.

Geometrics offers several airborne magnetometer options for use in an UAV (Unmanned Aerial Vehicle), including our models G-822, G-823, G-824 and G-862. The G-822 is not typically integrated with UAV s primarily because this magnetometer system requires an external counter, which in most cases is not miniaturized sufficiently for use on small platforms. Geometrics has solved this problem with the development of the internal Larmor Counter available as the CM-201, CM-221 or CM-321 depending on magnetometer model.

G-823

The G-823 (a variant of the G-822) includes the CM-201 counter and is frequently used by UAV operators. The basic specifications for this instrument are a user selectable sample rate (typically run at a 20 Hz sample rate), 0.004 nT/ Hz RMS sensitivity and RS-232 data output. The G-823 is supplied in two different versions (A and B). The G-823A system are selected on the basis of their low heading error performance goes through rigorous sensor heading error testing procedure (less than 0.15 nT Peak to Peak over 360 degrees spin), while the B sensor heading error is less than 1.0 nT Peak to Peak but otherwise unspecified. The B version is intended for base station operation, or on moving platform installations where active magnetic compensation will be applied. We will expand on this in the following paragraphs. The B sensor is also offered at a lower price than the A sensor. In most cases the UAV will have magnetic influence on the magnetometer readings which will likely be the dominant source of noise in the data, possibly many times greater than the noise from the heading error of the sensor. In situations where the platform s contribution to the total heading error is high we suggest using the economical B sensor because its influence on the compensated results will not be distinguishable from the performance provided by the A system.

The G-823 (A or B) requires power from a 24 to 33 VDC source and will draw 1 amp at 24 V on start. Then, after a few minutes (perhaps 3 minutes depending on outside temperature and guaranteed to be no more than 15 minutes at an ambient temperature of -30 C), the current draw will drop to about 500 mA. The sensor and electronics bottle weight 2 kg in total. Data is output via RS-232, typically at 20Hz. The G-823 does not store the data it generates and so it must be connected to the system s data logger. The G-823 also provides the ability to convert analog signals provided by other devices and convert these to digital values at the same rate it measures the magnetic field and report those values along with the magnetic field measurements. External analog signals can be digitized using one of the 6 available 12 bit (4096 steps over 5VDC) A/D channels provided.

* See Attachment for complete Answer - more information on G-824, G-862, RBS Datalogger Box, MagComp and MFAM

http://support.geometrics.com/kb/questions.php?questionid=61