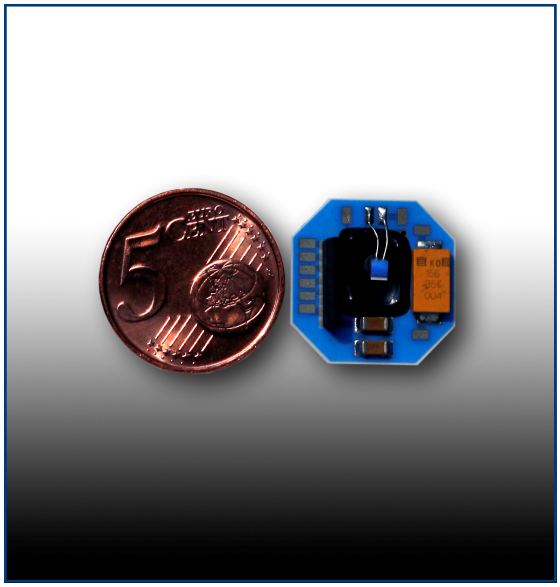
Magnetometer

The design of the tri-axial magnetometer utilises Anisotropic Magneto-Resistance (AMR). The AMR sensors are co-located with drive electronics in a potted sensor head - ideally at the end of a rigid boom. Closed loop control improves the overall linearity and limits sensitivity drift.

The AMR driver ensures the sensor maintains low noise operation by holding the sensor at its optimum position on the sensor transfer function. The sensor delivers the three components of the magnetic field plus a temperature measurement.

In cubesat applications the magnetometer comes as part of the SSBV ACS board which can also host additional ACS sensors and actuators. The sensor connects to the mezzanine via a lightweight harness. The interface of the ACS board to the cubesat is I2C.

In microsat applications, the additional electronics is integrated with the sensor head resulting in a very compact unit that is simple to accommodate. Power requirements are a 5V line only. Outputs are either 0-5V analogue per channel, or a fully digital serial interface can be used if required.



Applications

- Low cost magneto-resistive magnetometer designed for use in LEO smallsats and cubesats
- Can be used for the calculation of magnetorquer control torque levels
- Attitude determination sensor, when used with an IGRF reference model
- Angular rate determination sensor by comparing successive measurements

Features

- Small size
- Low mass
- Simple and flexible interface options
- Fully calibrated

Qualification

The magnetometer has been developed in collaboration with the Space and Atmospheric Physics Group of Imperial College London, which has flown many scientific magnetometers over the last 30 years. Three flights of this unit are planned for 2011/2012.

About SSBV

SSBV Space & Ground Systems is a member of the SSBV Aerospace and Technology Group which has 27 years of experience in providing systems to the Space industry.

Specifications

Functional Characteristics	
	Orthogonality: better than +/- 1 degree
	Measurement range: +50,000nT to -50,000nT
	Resolution: 13nT
	Update rate: up to 10Hz
	Noise density: < 150pT RMS/Hz @1Hz
	Frequency response: 3dB @ >200Hz
Physical Characteristics	
	Analogue output impedance: 100 Ohm +/-5%
	Sensor only: 20x12x5mm
	Electronics (including sensor): 85x36x17mm
	Mass: 20g sensor; 180g electronics
	Power consumption: 400mW
Environmental Characteristics	
	Operating temperature: -35°C to +75°C
	16g rms random vibration (Qualification levels)
	10krad total dose (component level)
Interfaces	
	Power supply: +5V DC
	3-axis analogue output : 0-5V, temperature output 0-5V. or digital serial (RS422/485 or I2C) options
	Connector (stand alone version): 9-pin micro-D

Contact information

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