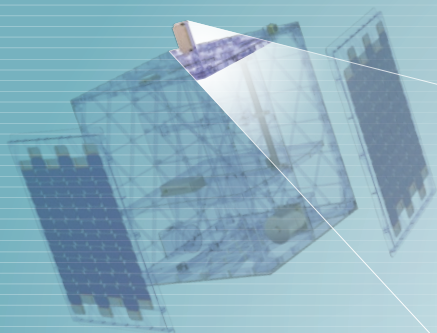


MAGNETOMETER



PERFORMANCE

	Magnetometer
FUNCTIONAL CHARACTERISTICS	
Orthogonality	better than +/- 1 degree
Measurement range	- 60,000nT to +60,000nT
Resolution	7.324nT
Update rate	up to 10Hz
Noise density	< 500pT RMS/Hz @1Hz
PHYSICAL CHARACTERISTICS	
Dimensions	96mm x 43mm x 17mm
Mass	85g
Power	725mW
ENVIRONMENTAL CHARACTERISTICS	
Thermal (operational)	-25°C to +70°C
Vibration (qualification)	14g rms
Radiation (TID)	10krad total dose (component level)
INTERFACES	
Power supply	+5V DC
Data	RS485
Connector	9-pin female Micro-D
Mechanical	4off M3

ACCEPTANCE TESTING: All parts undergo random vibration (10 rms) as well as thermal cycling (four cycle ambient pressure) to five degrees beyond operational thermal specifications. However, NewSpace can perform additional environmental testing if required by a client.

MAGNETOMETER



FEATURES

- Small size and low mass
- Flexible interface options
- Radiation tolerant COTS
- Supplied with calibration matrix

APPLICATIONS

- Can be used for the calculation of magnetorquer rods control torque levels
- Attitude determination sensor when used with an IGRF reference model
- Angular rate determination sensor by comparing successive measurements

QUALIFICATION

Developed in collaboration with the Space and Atmospheric Physics Group of Imperial College London; the sensor head first flew on the CINEMA mission and then as an integrated unit in July 2014. Since then the NewSpace magnetometer has had two further flights in 2015 and 2016 and is base-lined for three further missions. Additionally, a smaller hybrid version is being qualified in 2016.

UTILITY

The design of the tri-axial magnetometer uses Anisotropic Magneto-Resistive (AMR) sensors which are co-located with offset compensating circuitry. The offset compensating circuitry nulls the characteristic offset voltage of the AMR sensor and enhances the sensors performance. The sensor provides x-, y- and z-axes magnetic field component measurements, as well as a sensor temperature measurement which is used for the temperature compensation of the magnetic field measurement.

Ideally mounted outside the spacecraft at the end of a rigid boom the NewSpace magnetometer includes low noise, precision processing and analogue-to-digital conversion circuitry; all of which improves the linearity and reduces the drift sensitivity of the sensor head. The integrated processing circuitry and sensor head provides an accurate and stable magnetic field measurement at low power consumption. The power requirement is a regulated 5V DC supply while the measured x-, y- and z-axes magnetic field components are available as 0-5V analogue outputs or optionally on a digital serial interface.