



Small Devices – Great Benefit

Magnetometers for S/C Attitude Determination

Magnetometers measure the external magnetic field for the purpose of attitude determination and for the prediction of the torque to be applied by magnetic torquers. Magnetometers have been part of the attitude determination and control system (ADCS) of satellite missions since the beginning of space flight.

Two different sensor concepts for magnetic field measurement onboard the satellites are available: **Fluxgate instruments** with noise below one nT, with high reliable components and **Anisotropic Magneto-resistive (AMR) based instruments** with lower resolution but compact size and low mass.

Intelligent Solutions to Reduce Space Mission Costs: We Provide Simply the Best

Magnetometers produced by ZARM Technik AG are robust and provide a high accuracy for magnetic flux vector measurement.

Performance

- Low power consumption
- Low mass and size
- Good linearity and accuracy
- Radiation tolerant > 50 kRAD
- Adaptation to specific mission requirements is available

Design Features

- Aluminium-alloy housing
- Encapsulant protects the sensor and electronics inside the housing
- Space-grade materials and qualified EEE parts
- ESCC D-subminiature or MDM-type non-magnetic connectors

Our Service

- Magnetometer system engineering and attitude control subsystem design support
- Fabrication and testing of high-performance magnetometers
- High-precision ACS system simulations
- Development of the overall solution of your project

Due to our experience we are specialised in both, hardware definition as well as production. Our production processes meet the highest standards for performance and workmanship. ESA based quality control assures excellent quality.



Off-the-Shelf Models	FGM analogue	AMR digital
Electrical Performance		
Field Range *	± 64 µT	± 250 µT
Scale Factor *	100 µV / nT	10 nT / bit
Noise/Resolution	< 100 pT @ 1Hz	16 bit, < 10 nT
Power Consumption	< 1W@±15 V	< 0.6W @15 V
Power Supply	± 15 V	+ 5 V to + 16 V
Accuracy	< ± 1 % of full scale	< ± 1 % of full scale
Linearity	< 0.3 % of full scale	< 0.1% @ ± 100 µT
Frequency Response	> 3 dB@50 Hz	50 to 240 Hz, selectable
Axial Alignment	< 1°	< 1.5°
Connector	15 pin male D-Sub	9 pin male MDM
Environment		
Temperature Range	- 40°C to + 85°C	- 40°C to + 85°C
Radiation Tolerance	> 50 kRAD	> 30 kRAD
Dimensions		
Size	82 x 82 x 31 mm	56 x 36 x 17 mm
Mass	250 g	55 g
Options		
* adaptable to customer requirements	Temperature outlet	Temperature outlet





DLR | EADS Astrium | IRS University · Stuttgart
Keldish IAM · Russia | MIPT · Russia | NTU · Singapore
OHB-System | RedShift · Belgium | University of Bremen

esa

Magnetometers for S/C Attitude Determination Improve Your Attitude!

Based on a decade of experience of manufacturing satellite equipment, ZARM Technik provides magnetometers for fast attitude determination that are robust and reliable. With ZARM Technik magnetometers the loop to attitude control actuators is closed.

ZARM Technik AG is one of the leading suppliers for attitude control equipment. It was founded in 1997 as a spin-off company and commercial branch of the university institute ZARM.

ZARM Technik AG is specialised in providing customised attitude determination and control system solutions covering special hardware and software developments. Today ZARM Technik AG produces and delivers space technology products for small low cost satellites as well as for large scale constellations. Test and engineering services can be offered in cooperation with ZARM and other organisations.

ZARM, Center of Applied Space Technology and Microgravity, is a scientific institute at the University of Bremen, established in 1985. Being the largest university space research center in Europe, it concentrates on the investigation of fluid mechanic phenomena and fundamental physics in particular under microgravity conditions, and questions related to space technology.

The most outstanding facility is the **Drop Tower Bremen**, which provides up to 9.3 seconds of microgravity in an earthbound laboratory.

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