
TAM-1 Satellite Magnetometer

Description

The **TAM-1** series of three-axis satellite magnetometers satisfies a broad range of spacecraft attitude determination and control applications. The basic **TAM-1** design has a long history of success in space. It has been used on numerous civilian and military satellites since the early 1970's. Its design has been modified throughout the years using the latest available technologies to enhance its performance and reliability.

The **TAM-1** uses three ringcore fluxgate sensors that are aligned at right angles to one another to measure the three components of the magnetic field vector. The sensors are mounted in a single package that is separate from its excitation and signal conditioning electronics. This arrangement allows the attitude control designer to mount the sensor on a boom outside the main body of the satellite and mount the electronics in the satellite's interior where the environment is less harsh.

The **TAM-1** design is very flexible. The magnetometer can provide three analog output signals per axis. One output is unbuffered and unbiased. The following full scale output voltage ranges are possible: ± 10.000 , ± 5.000 , ± 2.500 Volts and 0 to 5.000 Volts (2.500 Volts bias).

Each sensor includes an independent coil that can be used to apply bias fields, null the ambient field or perform in-flight checks.

The table on the following page provides a representative specification for the **TAM-1** series magnetometers. Request MEDA document 000192 *TAM-1 Series Three Axis Satellite Magnetometers* for a detailed description of the TAM-1 specification, Acceptance Testing, quality history and MEDA's Quality Assurance Program.



Features

- Three-Axis Fluxgate Sensor
- Sensor Separate from the Electronics
Allowing the Sensor to be Located Outside
the Spacecraft Body
- Fully Space Qualified
- Twenty Five Year Heritage of Reliable
Performance in Space
- Meets 'Class S' Level Reliability
Requirements
- Up to Three Outputs per Axis
- Flexible Choices of Scale Factor, Full Scale
Field Range and Voltage Range
- Independent Calibration Coils

SPECIFICATIONS

ELECTRICAL PERFORMANCE

Field Range*	±1000 mG
Voltage Range	
<i>Unbiased</i>	±10.000 VDC
<i>Biased</i>	0 to 5.000 VDC
Sensitivity	
<i>Unbiased</i>	10.0 mV/mG
<i>Biased</i>	2.5 mV/mG
<i>Accuracy</i>	±1% (Tmin to Tmax)
Zero Field Output (Tmin to Tmax)	
<i>Unbiased</i>	0.000±0.015 VDC
<i>Biased</i>	2.500±0.015 VDC
Linearity	0.05% of full scale
Frequency Response	DC to > 60 Hz
Noise (0 to 100 Hz)	< 1 mVrms
Angular Alignment	<0.1° typical, 0.25° max.

ENVIRONMENT

Temperature Range	
<i>Sensor</i>	-90° C to +80° C
<i>Electronics</i>	-34° C to +71° C

PHYSICAL

Sensor	
<i>Dimensions</i>	1.88"x2.63"x4.69" (4.76 cm x 6.68 cm x 11.9 cm)
<i>Weight</i>	0.79 lbs (0.31 Kg)
Electronics	
<i>Dimensions</i>	2.06"x5.52"x6.45" (5.23 cm x 14.02 cm x 16.38 cm)
<i>Weight</i>	1.7 lbs. (0.77 Kg)

POWER

Input voltage	21 to 36 VDC
Current	40 mA nom., 54 mA max.

* Full Scale field ranges from 100 mG to 1000 mG can be specified by the customer based on the application.

The parts and processes used to produce the TAM-1 series satisfy the highest quality requirements of both NASA and military programs (MIL-STD-975, Class S; Class B also available).

The TAM-1 series also satisfies electromagnetic specifications for airborne or spaceborne electronic equipment (MIL-STD-461C, MIL-STD-462 and MIL-STD-1541).

For more information

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