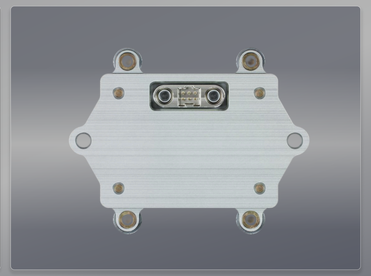
MSS PACKAGE

UMBRA

THE UMBRA MAGNETOMETER + SUN SENSOR (MSS) PACKAGE is a low-size, weight, and power (SWaP) solution for precise attitude determination. The integrated tri-axis magnetometer and dual-axis sun sensor provide essential magnetic field and solar orientation data for small satellite GNC systems. This sensor delivers flight heritage and competitive performance with respect to accuracy, reliability, and ease of integration. Its compact size and minimal power consumption make the MSS ideal for demanding missions requiring high-performance attitude knowledge in resource-constrained environments. Ready for rapid integration across diverse platforms.

LOW SWaP | HIGH ACCURACY | COMPACT FOOTPRINT



GENERAL SPECIFICATIONS

MAX DIMENSIONS	2.02 in x 1.47 in x 0.91 in
MASS	< 65 g (with standard mount)
INPUT VOLTAGE RANGE	5 +/- 1V (tolerant up to 36 V)
INPUT VOLTAGE NOMINAL	5 V
PEAK POWER	< 170 mW (at 5 V)
AVERAGE POWER	< 170 mW (at 5 V)
ELECTRICAL INTERFACE	15-Pin Micro-D Connector
DATA INTERFACE	RS-422
INTENDED SPACE ENVIRONMENT	LEO
HERITAGE	Acceptance tested and Fight Heritage
DESIGN LIFE	5+ Years
PRODUCTION	Assembled and tested in the USA
FIELD OF VIEW	110° x 110°
ACCURACY OF BORESIGHT	< 1°
ACCURACY OF FOV EDGE	8°
SOLUTION RATE	> 10 Hz
MEASUREMENT RANGE SINGLE AXIS MAGNETIC	+/- 4 Gauss
SENSITIVITY SINGLE AXIS MAGNETIC	1 mGauss
ACCURACY SINGLE AXIS MAGNETIC	± 50 mGauss

ENVIRONMENTAL SPECIFICATIONS

RANDOM VIBE	Qualified to 14.16 G_{rms} profile enveloping GEVS, Falcon 9, SpaceX Rideshare, and Electron levels
SHOCK	Qualified to 1000g peak profile enveloping GEVS, Falcon 9, SpaceX Rideshare, and Electron levels
OPERATING TEMPERATURE	-40°C to 80°C
SURVIVAL TEMPERATURE	-40°C to 100°C
TOTAL IONIZING DOSE DESIGN CAPABILITY	Designed to withstand at least 30 krad TID

CONFIGURATIONS

TYPE	DESCRIPTION & DETAILS	SPACE READY	TYPICAL LEAD TIME	COST
EDU	Suitable for Hardware-in-the-Loop testbeds	No	< 4 Weeks	CONTACT
FLIGHT	Acceptance Tested	Yes	< 8 Weeks	CONTACT
CUSTOM	Umbra Space Systems offers custom modifications. Please contact.	Inquire	Inquire	CONTACT

FEATURES

RS-422 OUTPUT | BROAD COMPATIBILITY

The Umbra MSS boasts minimal power consumption for its accuracy and precision capability. The combination of high performance and low power consumption the Umbra MSS provides is ideal for power-constrained small satellite missions.

ULTRA-COMPACT | LIGHTWEIGHT DESIGN

At less than 65 grams and with a minimal footprint, the Umbra MSS significantly reduces SWaP burden on small satellite platforms. This compact design enables easier integration in constrained spaces and maximizes payload capacity without sacrificing performance.

SPACE-GRADE RELIABILITY | RIGOROUSLY TESTED

Built to withstand the demanding space environment, the MSS undergoes extensive qualification testing exceeding industry standards for vibration, shock, thermal cycling, and radiation (>30 krad). This proven resilience ensures dependable operation and mission confidence throughout its multi-year design life.

HIGH ACCURACY | SMALL PACKAGE

The Umbra MSS provides fine dual-axis sun sensor accuracy (<1° at boresight) with tri-axis magnetometer readings, offering superior attitude determination compared to coarse sun sensors alone. This enhanced accuracy enables precise pointing and control for demanding and agile small satellite missions.

DATA SHEET 5041D0002 REV 02
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