

Product Data Sheet

MAT-1 Data Logger



Magnetometer - Accelerometer - Thermistor



Applications

- Oceanographic Tilt Current Meter
- Underwater Vehicle Heading
- Equipment Monitoring
- Vibration Analysis
- Animal Tagging
- Vehicle Dynamics
- Shipping Monitoring
- Mooring Orientation & Tilt

Feature	Benefit
3-axis Magnetometer	- +/- 5° nominal compass bearing accuracy - Temperature compensated
3-axis Accelerometer	- Resolve static orientation to 1° - Record dynamic acceleration at 64 Hz
Precision Temperature	- Accurate to +/- 0.1 °C from -5 to 30 °C - Accurate to +/- 0.2 °C from -20 to -5, 30 to 50 °C
Large Memory	- 8 GB microSD flash card, upgradable to 32 GB
Long Battery Life	- Hundreds of millions of records over a year+
Rugged Housing	- O-ring sealed PVC or Titanium housing
USB 2.0 Interface	- Connect with standard USB cable

Description

The MAT-1 Data Logger contains an integrated 3-axis magnetometer, 3-axis accelerometer and a precision temperature sensor. The logger includes a microSD flash memory card, a long-life lithium battery, an O-ring sealed waterproof housing and a USB communication interface. The logger is capable of recording hundreds of millions of magnetometer and accelerometer records at up to 64 Hz as well as temperature records at 1 Hz.

The MAT-1 is ideal for determining the static orientation of vehicles, packages and assets. The MAT-1 can also be used for vibration analysis and motion studies. The internal thermistor provides a detailed record of temperature in the target environment. The logger's large memory, high recording rate, long battery life and rugged design make it suitable for a wide range of applications.

The MAT-1 Data Logger includes Domino for Windows® to configure the logger for deployment. After the deployment is complete, the data file is transferred from the memory card via USB cable or SD card reader and the data are post-processed to text files for filtering, plotting and analysis.

Specifications

Sensors

	Magnetometer	Accelerometer	Thermistor
<i>Type</i>	3-axis magneto-inductive	3-axis MEMS Accelerometer	NTC Thermistor with 16-bit A/D Converter
<i>Filtering</i>	Hardware Averaging	1600 Hz averaging: up to 32 values per measurement	Hardware: low-pass filter
<i>Range</i>	+/- 10 Gauss	+/- 2 g standard +/- 4 g optional	-20 to 50 °C
<i>Accuracy</i>	+/- 5 degrees compass bearing typical	0.01 g, < 1 degrees of orientation	+/- 0.1 °C (-5 to 30 °C) +/- 0.2 °C (-20 to -5, 30 to 50°C)
<i>Resolution</i>	< 0.001 Gauss	< 0.001 g, 0.05 degrees of orientation	< 0.01 °C
<i>Maximum Rate</i>	64 Hz	64 Hz	1 Hz

Logger

Environmental

<i>Operating Temperature</i>	-20 to 50 °C	
<i>Depth Rating</i>	PVC: 300 m	Titanium: 4500 m

Electronics

<i>Memory</i>	8 GB micro SDHC flash card, hundreds of millions of magnetometer, accelerometer and temperature records
<i>Communications</i>	Full speed USB micro-B port, USB cable supplied
<i>Battery Type</i>	3.6 V, size "A", user replaceable lithium (from Lowell Instruments)
<i>Battery Life</i>	Months to years depending on operating mode
<i>Internal Clock</i>	+/- 1 minute per month

Operating Modes

<i>Recording Rates</i>	Magnetometer and Accelerometer to 64 Hz Temperature to 1 Hz
<i>Start and Stop</i>	Start and Stop at user defined times
<i>Burst Mode</i>	Variable rate logging at user defined interval

Mechanical

<i>Dimensions</i>	PVC: 27 mm (1.05") diameter x 213 mm (8.39") length	Titanium: 25.4 mm (1.00") diameter x 223 mm (8.78") length
<i>Weight</i>	PVC: 143 g (5.1 oz)	Titanium: 225g (8.39 oz)
<i>Construction</i>	Housing: Grey PVC or Titanium O-ring: EPDM (PVC) Buna (Titanium)	
<i>Mounting</i>	5/16-18 x 0.5" threaded mounting hole on axis 5/16" hole in end cap for zip ties Typically secured with hose clamps or zip ties.	

Other

<i>Software</i>	Domino, Windows® Compatible Software
<i>USB</i>	USB 2.0 compliant MSC and CDC Classes
<i>Firmware</i>	Field upgradable via USB cable

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