

Downhole Orientation Sensor and Data Logger



Introduction

The 3DM-DH3™ is a downhole orientation sensor and datalogger. It incorporates acceleration sensors, magnetic field sensors, and temperature sensors, together with an on-board microprocessor, embedded software algorithm, non-volatile memory for configuration, flash datalogging memory, and serial communication interface. Its form-factor, rated temperature range and power supply requirements are optimized for downhole applications. The 3DM-DH3™ provides accurate drill path measurements including Inclination, Azimuth, GTF, MTF, Dip Angle, sensor temperatures, G-TOT and H-TOT.

Features & Benefits

- optimized specifically for downhole requirements
- fully temperature compensated over -40° to +125° C operating range
- non-volatile flash data-logging memory contains up to 32,768 data records
- RS-422 serial communication interface for configuration, logged data downloading, and direct sensor readings
- power saving features for optimized battery life in data logging mode
- user-adjustable sample rate up to 8Hz
- outputs drill path measurements including Inclination, Azimuth, GTF, MTF, Dip Angle, G-TOT and H-TOT
- timestamp and device temperature are included with each data record
- easily mounted in the drill string
- user programmable

Applications

OEM sensor for use in downhole probes for borehole profiling in these industries:

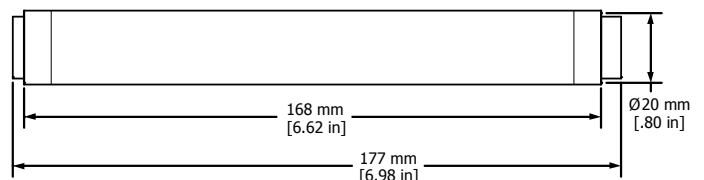
- oil and gas exploration
- water well drilling
- geomechanics
- civil engineering

Product Overview

The 3DM-DH3™ can be deployed out of the box for immediate use in downhole operations, integrated into an existing system to provide an electronic measurement component, or incorporated into an OEM product.

Physically, the 3DM-DH3™ is easily mounted into the drill string using its body's threading attachments. It can be tethered to an RS-422 communication cable for continuous real-time measurements to a host computer during drilling operations, or it can be remotely deployed and run as a datalogger, with data retrieval after it has been run through the drill path. The unit can be powered through the communication cable tether from a platform source or by batteries.

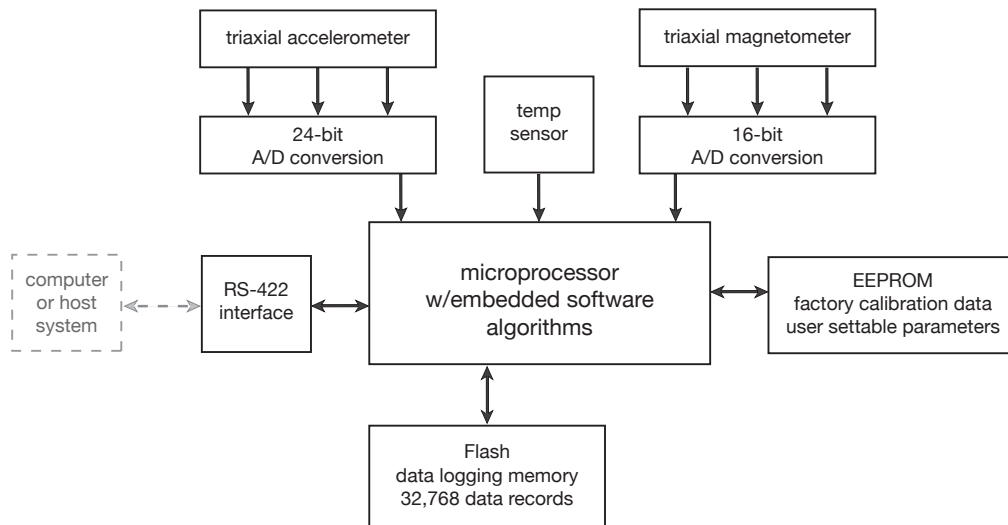
The unit is factory calibrated and ready for use with power-up. The unit ships with easy-to-use PC software which allows the user to configure and operate the instrument, view real-time measurements or download logged data for post-processing. For those users, integrators or OEMs who develop their own applications, the 3DM-DH3™ is shipped with a complete Data Communications Protocol manual which provides the developer with a complete instrument command set. Applications of your own design can readily be developed in any coding language and on any computing platform including microprocessors.





Specifications

Orientation range	360° all axes (orientation angles); inclination, azimuth, GTF, MTF, Dip Angle, G-TOT, H-TOT
A/D resolution	24 bits accelerometer; 16 bits magnetometer
Angle resolution	0.02°
Accuracy	± 0.2° inclination ± 0.5° azimuth
Angle measurement repeatability	0.1 °
Digital output rate/logging rate	up to 8 Hz
Output modes	acceleration and magnetic field vectors plus temperature; orientation angles plus temperature
Digital output	RS-422 serial (four-wire full-duplex) standard
Serial data rate	115200 baud
Datalogging capacity	up to 32,768 data records
Supply voltage	+6.0 VDC min, +10.0 VDC max
Supply current	50 mA typical when connected to host 16 mA typical when logging at 8Hz 500 µA typical when logging at 1/4 Hz 50 µA typical in deep sleep mode
Connectors	through hole PCB pads (solder-in) 2 mm pitch, 2 row 16 pin header
Operating Temperature	-40 °C to 125 °C (-10 °C to 125 °C with recommended batteries)
Dimensions	177 mm x 21 mm diameter
Weight	91 grams
Shock limit	500 g
Enclosure material	anodized aluminum
Software	Windows XP, Vista, 7



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Patents Pending