Complete Instrumentation Solutions

PENTAMAG

UAV DEPLOYABLE FIVE MAGNETOMETER ARRAY

MOBILE GEOPHYSICAL TECHNOLOGIES GmbH

DESCRIPTION

The PENTAMAG is the next generation of magnetic field sensors designed by Mobile Geophys- ical Technologies GmbH of Germany specifically to be carried by a custom-designed UAV in a sur- vey pattern close enough to the ground to detect and accurately locate small objects, e.g. UXO. This system carries an array of five fluxgate total field magnetic sensors in a linear array. An earlier model, with a 2-fluxgate magnetometer array, has already been shown as a tool that can be
useful to detect and locate UXO. The PENTAMAG system is specifically designed with RTK location accuracy and for operation close to the ground to sense small metal objects. The magnetometer system is integrated into a specifically-designed octocopter that can operate in survey mode for 25 minutes. Standard operational procedure is to specify a series of GPS locations to represent a regular survey, including both location and elevation above grade, based on a lidar system to guide elevation control.

The PENTAMAG consists of five light-weight sensors, and a GPS receiver. Operation in the field is simple. Survey details are programmed into the user's UAV software of choice. The PENTAMAG is turned on, and once airborne, preprogrammed GPS waypoints carry the PENTAMAG in altitude stable survey lines. Once work is completed, data from the PENTAMAG can be downloaded to a computer.

The PENTAMAG can be attached to a wide variety of enterprise UAVs, and the PENTAMAG's 100 Hz sample rate allow it to function independently of the UAV and the UAV software. With such a fast sample rate, surveys can be completed at speeds up to 10 m/s with samples collected every 10 cm.

FEATURES AND BENEFITS

- Simultaneous recording of five magnetic tracks
- Unprecedentedly dense measuring grid
- 100% coverage of an survey area
- Spacing between tracks adjustable to 25cm (10inch) and 50cm (20inch).

- No Drop-outs. Reliable high-quality data, no matter the sensor orientation.
- UAV Agnostic: Attachable to most enterprise UAVs
- Lightweight: Five Sensor System Weighs only 3.600 g for easy deployment.
- Self-Contained: GPS, storage on board. No data connections to UAS needed.
- Fast Sampling Rate: Fly faster and eliminate UAV motor noise.
- Long Battery Life: 2 hours of battery life will outlast multiple UAV flights.
- Software: Synchronization of magnetic data and position data, calibration, outputs Total Magnetic Intensity vs position data

TECHNICAL DETAILS

Operating Principle: Self-supporting Helmholtz coil system

Operating Range: ±65µT

Operating Zones: operate anywhere in the world without dead zones

Power Rating: low power consumption

Noise Sensitivity: typical 0.010nT/$\sqrt{Hz}$ @ 1Hz, adjustable to allow export to specific countries

Sample Rate: 10, 20, 50, 100 Hz

Temperature Range: -20 to +75°C

Heading Error: 1-5nT, after calibration

Calibration: in-flight calibration in special mode

Data Logger: built in datalogger

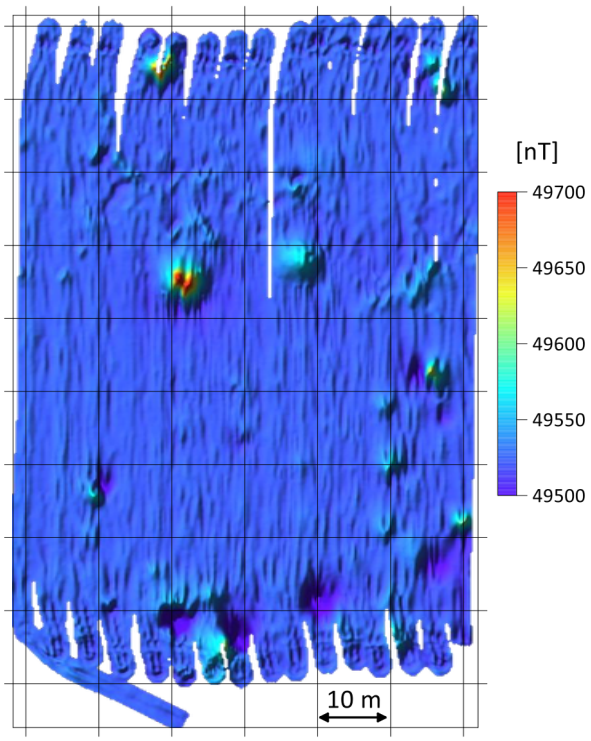
Output: Bx, By, Bz, latitude, longitude, altitude

GPS: GPS raw data, 2 GPS bands

GPS accuracy: <10cm, after post-processing

Data Storage: 5 days continuous recording

Total weight: 3.600 g (5 sensors, datalogger), without batteries



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