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MagArrow II Data Sheet

The Magarrow II (Fig.1) is the second-generation, high-performance magnetometer specifically designed for deployment on Unmanned Aerial Vehicles (UAV).

Its aerodynamic design and low weight (1.2kg) make the system suitable for deployment on medium sized UAVs with a payload capacity of 5kg. Typicall applications include, Mineral exploration, Archaeological investigation, Geological and Environmental land contamination projects.

MagArrow in flight. Image Courtesy of Geometrics Inc.

The MagArrow includes the latest MFAM laser pumped atomic dual sensors (1000Hz sample rate) housed near the rear of the frame. The orientation of the sensors can be adjusted to optimise the system low heading error or no dead zone. The low power MFAM sensor allows the system to run for up to 2 hours on a single 1800mAh battery. Batteries can be hot swapped in a couple of minutes, at the same time the UAV batteries are replaced, alternatively the MagArrow can be powered from an external power source for extended operations on a hybrid UAV. The sensor is completely self-contained with internal GNSS (RTK compatible) and IMU for precise measurement timing and measurement compensation respectively.

The Magarrow II has its own internal wireless access point permitting the instrument to be controlled via any mobile phone, tablet or laptop. Survey parameters can be pre-logged into the UAV mission control software in advance, simplifying field operations as the UAV can then guide the Magarrow in altitude-stable survey lines. The data can then be wirelessly downloaded.

Features

- **No Drop Outs** – Can obtain high quality data which is not dependent on the sensor orientation
- **Lightweight (1.2kg)**, enables users to keep airborne for longer.
- **Fully self-contained** system with GNNS, SD card storage, WIFI on board and no need for direct UAV

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connection

- **400Hz bandwidth & Fast Sampling rate** (1000Hz sample rate = fly at speeds of 10m/s and still collect data @ every 1cm
- Exceptional run time from small widely available battery (Hot swapable)
- **Operations can be carried out anywhere in the world**
- **Intuitive ASCII XYZ data format**
- **Simple web-browser based interface** - The instrument offers a web-browser based interface permitting users to use any wifi enabled device to set-up the instrument and download data.
- **External Power Button**

Magarrow II design and the Sensor Orientation

Product Dimensions

Physical	Dimensions (L x W x H)	Weight
(instrument only)	100cm x 15cm x 5cm	1.2 kg

Technical Specifications

Operating Principle:	Laser pumped caesium vapour (Cs133 non-radioactive) total field scalar magnetometer
Operating Range:	20,000nT to 100,000nT, with a gradient tolerance of 10,000nT/m
Operating Zones:	Configurable for operating anywhere in the world without dead zones.
Dead Zone:	60º Polar only
Noise/Sensitivity:	0.005nT/sq root Hzrms, typical (0.01nT/ sq root Hzrms guaranteed); (SX (non-export-controlled version) 0.02nT/ sq root Hzrms)

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Max Sample Rate:	1000Hz
Bandwidth:	400Hz
Heading Error:	±5nT over entire 360º equatorial and polar spins
Output:	WiFi data downloaded over 2.4GHz WiFi access point.
GPS:	50% CEP < 1.5M; 1.0M with SBAS
Connections:	Port for USB flash drive and MicroSD
Data Storage:	32 Gbyte Micro SD card, U3 speed class. Not field accessible.
Data format:	ASCII XYZ
IMU:	Bosh BMI160 Accel/Gyro - 200Hz sample rate Honeywell HML5983 Compass - 100Hz sample rate
Power:	Non-Magnetic 1800mAh Lithium polymer battery
Battery Connection:	2 x XT60 connectors, recommended Non-magnetic 1800mAh or 2200 mAh Lithium Polymer, 3 cell 11.1v Hot swapable
Operating Temperature:	Non-condensing; -20°C to +40°C
Altitude:	up to 3,000m, typically limited by UAV

Videos

https://youtu.be/4ukgd8Dgkos
https://youtu.be/4ukgd8Dgkos

https://youtu.be/jo92wmVCuUo
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