UAV / drone magnetometer survey kit

MAGDRONE R3

Applications
➢ Survey & Surveillance
➢ Mine exploration / tracking / monitoring at flexible heights
➢ UXO detection on unreachable, flooded or mined areas

Features
➢ Autarkic system with GPS, accelerometer and power supply
➢ Attachable to any UAV with 1+ kg payload
➢ 8 GB internal memory
➢ 250 Hz recording rate
➢ 2 Hz live data output
➢ USB interface
➢ Data processing tool

The MagDrone R3 is an ultra portable survey kit to be attachable to any UAV / drone with a 1+kg payload only.

The kit consists of Carbon fiber sensor tube with two built-in 3-axis Fluxgates, a 1-button data logger, rechargeable batteries, integrated GPS as well as a serial live data output. The MagDrone R3 is made and optimized for small and mid size survey UAVs that are shaped for less payload and longer flight times.

The survey kit can be used for general purpose surveys, science related magnetic cartographies, mine exploration or sensitive applications like UXO detection or surveillance.

The MagDrone DataTool helps to identify flown tracks, cut, filter and compensate the raw data, generates a preview and exports into various formats to further process the recorded values i. e. using the MAGNETO® software, GIS tools or in Matlab.

R3: ALL UNIQUE SELLING POINTS AT HAND

Your benefits with our solution

✓ **Universal usage**
- UXO Search
- Exploration
- Surveillance

✓ **Lowest payload**
With only 900g, the R3 gets on board any professional UAV easily.

✓ **1-piece design**
No hazzle with cabling. The R3 is an autarky system that needs no interfaces.

✓ **Most simple installation**
Take 4 cable ties and strap it on your UAV landing gear.

✓ **1-button operation**
You can't go wrong – the R3 has only one button to make operation as simple as possible!

✓ **Noise cancellation**
Due to a high sampling rate, UAV motor noise is accepted, detected and can be filtered out during raw data export.

✓ **Powerful DataTool**
The free MagDrone DataTool lets you delete tracks, compensate, filter, … and allows various exports!

Most frequent questions

➢ **What can it detect?**
The magnetometers detect everything ferrous (iron) – but i.e. not Aluminum or Gold as they are conductive only.

➢ **How deep can it sense?**
It depends. The R3 sees a harvester machine from 40 m distance; but a hand grenade from only a few centimeters.

➢ **Ideal flight height?**
For compact objects: as close as possible – 50 cm above ground. Can be dozen of meters for soil structures.

➢ **Does it work over water?**
Yes. Water doesn't affect sensor operation or damping the magnetic field strength (to be detected).

➢ **Sensitivity of the sensors**
The sensitivity of the default sensor (FGM3D/100) is 0.1 V/µT, the resolution is better than 150 pT.

➢ **Interference from UAV**
Constant noise (motors) is ok and is filtered out, but don't use a camera gimbal with the R3.

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R3: TECHNICAL

General Technical Data

Power Supply	11.1 V; 1,950 mAh Li-Ion accumulator
Operating Temperature	-20°C to + 50°C
Weight / with Li-Ion battery	690 g / 820 g
Overall power consumption	500 mA
Sensor tube dimensions (W x D x H)	1,070 x 22 mm

FGM3D/75 Fluxgate

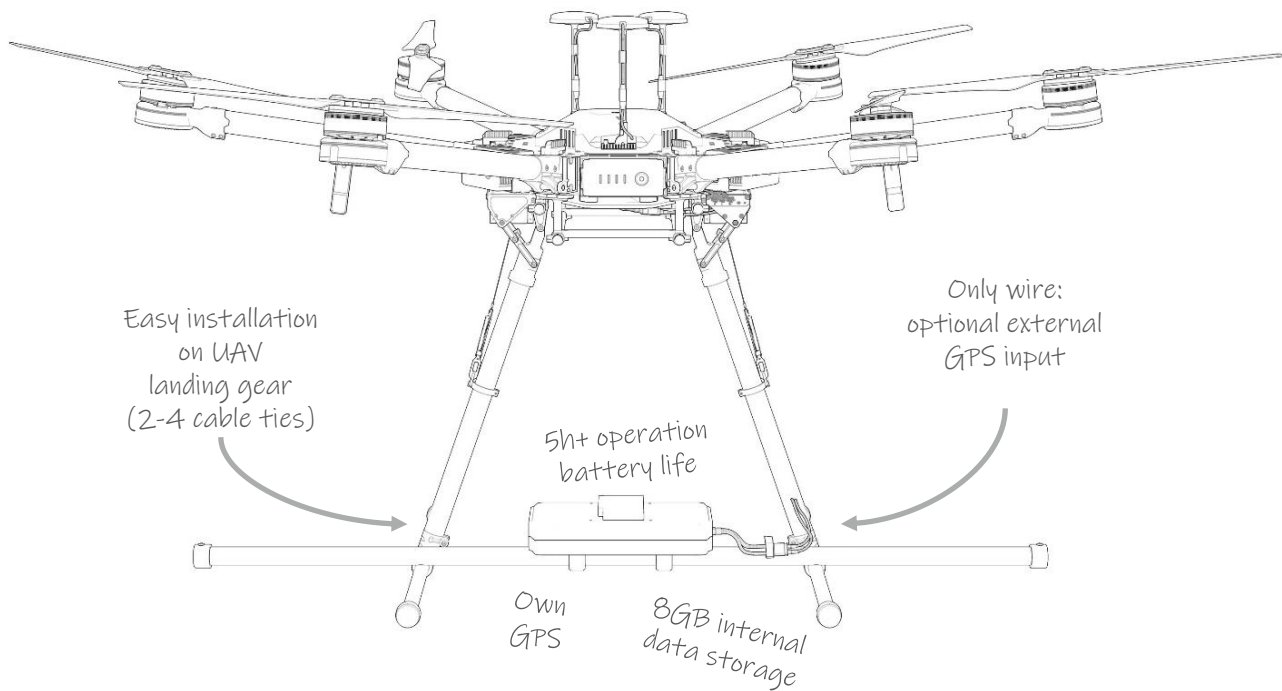|	
Number and orientation of sensors	2 pieces, laid horizontal, parallel
Specified measurement range	±75,000 nT (other ranges on request)
Number of sensor axis	3
Distance between sensor center points	1,000 mm
Noise level @1Hz [pT/ (Hz)]	10 pT < sensor M1= 50 pT* 10 pT < sensor M2= 30 pT

Datalogger

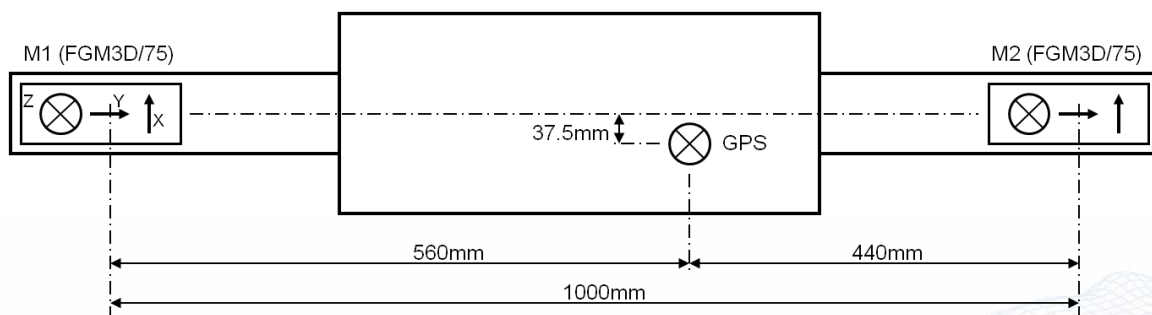|	
Power	50 mA
Sensor input	Internal wired
User Interface	On/Off + Start/Stop button; status LED
Survey mode	Recording when start/stop pressed
Sampling rate	250 Hz (higher rates on request)
Live data output	2 Hz (via Bluetooth)
Internal memory	8 GB
Datalogger dimensions (W x D x H)	230 x 128 x 43/73 mm

Data Processing

Raw data filtering, track & flight direction detection, noise compensation, MagBase referencing, export, preview	MagDrone DataTool (included)
Data interpretation, visualization, object calculation, etc.	MAGNETO® Software
Live output	via Bluetooth

*due to closer proximity to active components on electronics board

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R3: INSTALLATION SCHEME

Easy installation
on UAV
landing gear
(2-4 cable ties)

Only wire:
optional external
GPS input

5h+ operation
battery life

Own
GPS

8GB internal
data storage

R3: DEVICE SCHEME

M1 (FGM3D/75)

M2 (FGM3D/75)

Z — Y — X

37.5mm — GPS

560mm

440mm

1000mm

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R3: IN OPERATION WITH OUR CLIENTS

## MagDrone R3 in Italy - 20 ha in 14 hrs.

In cooperation with Tech Gea S.r.l. and our esteemed reseller Enrico Farinatti, the R3 was one of the first survey systems to be fixed to the latest drone model DJI Matrice 300 RTK. It flew over a large, almost unmanageable corn field in search of explosive ordnance. 14 hours survey generated 20 hectare of data!

Volcanological field studies

The Lancaster Environment Centre of the Lancaster University together with University South Florida were using the MagDrone R3 to generate a magnetic foot print of the volcano Little Cones, Amargosa Valley, Nevada, USA and the area around for their scientific studies. The team was impressed by the easiness of operation and the quality of the data!
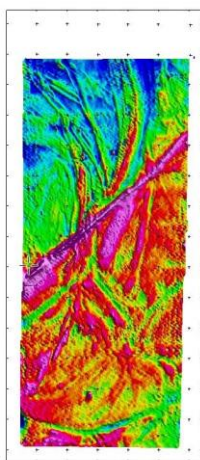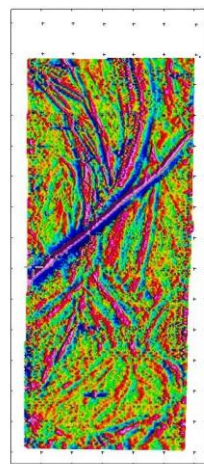
1,000 km coal mine survey

The Australian based Rada Engineering achieved 1,000 line kilometers with the MagDrone R3 for coal mine research in Down Under.

"I think this is exceptional data, and proves that a correctly calibrated and magnetically clean fluxgate system can produce good data that can compete with cesium and MFAM sensors.", Anton Rada stated.

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R3: STANDARD PACKAGE AND OPTIONS

Standard package

MagDrone R3 Survey kit with 2 triaxial Fluxgates	Ask for prices
• 2x FGM3D/75 at 1m distance • CFRP sensor tube • Data logger with internal storage • Internal GPS and rechargeable battery • External GPS input • Spare battery and wall charger • USB cable • Mounting plate and screws • USB memory clip with MagDrone DataTool • Manual / Certificate • 2x Accessories bags • Transport hard case	

Options

MAGNETO® Software	Ask for prices
• For data interpretation, visualization, object calculation, etc.	

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