

# CATS – Flight - Diary

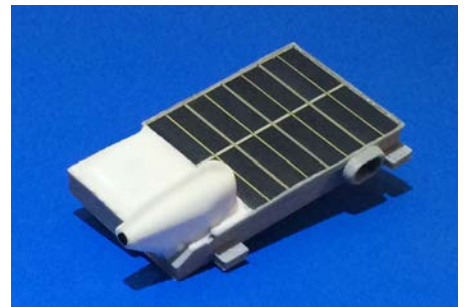
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Multi-sensor high-resolution data recorder

Data sheet

Highlights:

- 14-channel high-res recording
- Extended deployment period (solar)
- Reciprocal sensor control
- Very small footprint (from 6g)
- RAW/NAV GPS solution (10Hz)
- CATS Visualizer analysis software
- Pitot sensor
- Up to 800Hz sampling rates



CATS-Flight-Diary with optional solar re-charge

CATS  
Customized Animal Tracking Solutions  
[www.cats.is](http://www.cats.is)  
[info@cats.is](mailto:info@cats.is)

**Australia**  
7 Marlua Ave  
Moffat Beach 4551  
Skype: cats-australia

**Germany**  
Rohrmooserstrasse 20  
87561 Oberstdorf  
Skype: cats-germany

**Document Information**

<i>Title</i>	<b>CATS-Flight-Diary</b>
<i>Subtitle</i>	Multi-sensor high-resolution data recorder
<i>Document type</i>	Data Sheet
<i>Document number</i>	CFD-3.4.r2. -DS
<i>Revision and Date</i>	17- October - 2015
<i>Document status</i>	Early Production Information

**Document status explanation**

<i>Objective Specification</i>	Document contains target values. Revised and supplementary data will be published later.
<i>Advance Information</i>	Document contains data based on early testing. Revised and supplementary data will be published later.
<i>Early Production Information</i>	Document contains data from product verification. Revised and supplementary data may be published later.
<i>Production Information</i>	Document contains the final product specification.

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## 1. Overview

The CATS-Flight-Diary is the most advanced flight recorder available on the market. After 2 years of intensive development the resulting logger has the ability to record bird flight and other animal behaviour with an accuracy rarely achieved before. The most promising advancement has been in the post-processing and analysis of the recorded data. Collaborating with the University of Karlsruhe (IAF), CATS has managed to provide an interface, which allows the direct use of the award-winning NAVKA software. This enables the user to recreate the entire three-dimensional movement of the animal.

## 2. Product features

Model	Sensors	Supply	Interfaces	Features	User level
CATS – Flight - Diary v3.4.r2.	Pressure (Depth, 300m, 500, 1000m, 2000m) Barometer Accelerometer Gyroscope Magnetometer (compass) Pitot (Air pressure) Temperature Light Speed (speed wheel) Conductivity Sound GPS (RAW) GPS CATS Visualizer 3-D IMU analysis possible GSM Video	Primary cells Li-Ion Primary cell or Li-Ion	USB Wireless USB and wireless (optional)	Choose your own sensors Pre-defined set of sensors Infrared (IR) capable IR LEDs (optional) Visible light LEDs (optional) Solar-recharge (optional)	Professional Advanced Beginner
included	• • • • • • • • • •	•	•	• •	•

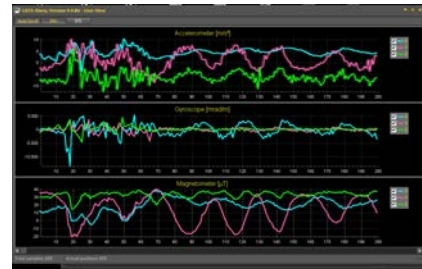
## 3. Pricing

The basic CATS-Flight-Diary with the standard sensors starts at a price of 3200 Euro. This does not include any customization or larger capacity devices (i.e. more battery). The optional solar re-charge version adds another 250 Euro.

In order to analyse the obtained data with the CATS Visualizer software please contact CATS for the stand-alone off-line version.

## 4. Detailed description

The CATS-Flight Diary is high-precision all-in-one multi-sensor data recorder, which is designed to obtain data of up to 800Hz. It is equipped with a GPS, sampling at up to 10Hz with an accuracy down to 5-20cm. It combines the GPS, IMU (Accelerometer, Gyroscope, Magnetometer) and a Barometer to output in SIMA format in order to re-create a precise 3-dimensional movement of the recorded behaviour with the NAVKA® software. This graphic analysis makes the difficult and often arduous post-processing of the IMU data obsolete and provides even the less-experienced user with a powerful tool.



It contains a high-sensitivity temperature probe that is capable of measuring changes within a fraction of a second. In addition it sports a pitot sensor measuring actual air pressure, making it possible to estimate wind speeds in contrast to speed over ground (GPS). A light sensor plus another temperature sensor are rounding off the array of sensors.



The user interface includes a live view of selected sensors with a special option to visualize the 9-axis IMU output live at 20Hz, enabling the user to verify its functioning and identify the correct orientation of the axis. In addition, no matter how you place the device on the animal, it is possible to choose the orientation in the UI. The CATS-Flight-Diary starts at an incredible 20g (without solar re-charge) and lets you record behaviour resulting in about 300GB! of files (.csv format).

As the CATS-Flight-Diary is a high-performance logger, it uses a relatively large amount of power, hence its usage is limited to hours or days (depending to battery size and/or solar configuration). Longer deployments are possible due to the duty-cycling utilizing the solar re-charge option.

## 5. Sensor performance

Sensor type	Max. sampling rate (Hz)	Range	Accuracy	Resolution (bit)	Comments
Accelerometer	800 (3-axis)	2 g - 16 g	0.0000061 g	16	User adjustable
Gyroscope	800 (3-axis)	250 - 2000 dps	0.00763 mdps - 0.06 mdps	16	User adjustable
Magnetometer	100 (3-axis)	±4800µT	15 µT /LSB	16	
GPS	10	-	NavSol +/- 5-20cm	-	
Barometer	100	10 - 2000 mbar	+/- 0.024 mbar (19 cm)	24	
Temperature	100	(-45°C) - (+85°C)	+/- 0.8°C	24	
Pitot	50	+/- 68 mbar	+/- 0.17 mbar	14	
Light	10	500 lux	-	16	Not calibrated, relative values
High-sensitivity temperature (K)	50	(-100°C) - (+400°C)	TBA	8	Not calibrated, relative values

## 6. Application examples

Application (mode)	Deployment duration	Example
Eagle	8 hours	
Albatross	1 week	
Goose	1 day	