

CATS – GSM – Tag (2G/3G)

Multi-mode wireless GSM recorder/transmitter

Data sheet

Highlights:

- Region-dependent message transfer triggering
- Fully wireless charging/programming
- Programming via smartphone
- Extended deployment period (solar)
- Multi-sensor-controlled GSM triggering
- Very small footprint
- Multi-mode
- Extensive CATS-web portal
- On-board statistics
- Can be used as archival tag



CATS-GSM-Tag with optional solar re-charge

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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.
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1. Overview

The CATS-GSM-Tag represents one of the most sophisticated GSM data logger world-wide. It convinces through its fully wireless charging and programming, small footprint, its solar chargeable option, giving it deployment capabilities for months. It comes with a flexible set of sensors, depending to how it is utilized, its main focus, however, is on accurate positioning via GPS.

Three different modes allow the user to use it in different applications. The associated web portal allows the user to view the data as soon as it is sent by the device. The on-board algorithms make sure that the user-defined statistical analysis provide the reduced data stream needed to transfer the data per SMS.

2. Product features

Model	Sensors	Supply	Interfaces	Features	User level
CATS - GSM - Tag v1.0.r0.	Pressure (Depth, 300m, 500, 1000m, 2000m) Barometer Accelerometer Gyroscope Magnetometer (compass) Pitot (Air pressure) Temperature Light Speed (speed wheel) Conductivity Sound GPS (RAW) GPS NAVKA 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
•	• • • • • • • • •	•	•	• •	•

3. Pricing

The basic CATS-GSM-Tag with the use of the CATS-Web portal and standard sensors starts at a price of 1400 Euro. This does not include any customization or larger capacity devices (i.e. more battery). The optional solar re-charge version add another 250 Euro.

For GSM devices CATS charges a flat rate of 25 Euro for all messages sent per month.

4. Detailed description

The CATS-GSM-Tag is a very small data logger (starting at 25g) that is designed to send a limited amount of data via mobile networks to the CATS-Web portal. It can be run in 3 modes. Mode 1 is for simple long-term tracking of terrestrial animals (e.g. bear). In this mode the accelerometer helps to control GPS and GSM activation. At about 20-50 GPS fixes per day with a daily message the tag can last for many months with the solar cells. The CATS-Web portal shows the activity index, temperature and GPS locations.



Mode 2 is designed for high frequency tracking (e.g. every 5min for example), especially for terrestrial and avian animals, where GPS is the sole parameter of interest. Extensive duty cycling possibilities allows the optimization of power usage and effective data collection.

Mode 3 is used for medium-fast GPS and dive data acquisition (e.g. diving birds, seals, etc.). In this mode the solar-charged tag may run (in its smallest configuration) for several hours per day, needing another few hours to re-charge again before able to continue recording. It will collect raw data, does a (pre-defined) on-board analysis thereby reducing the raw data in order to be sent to the Web portal. The statistics show, for example. the average, maximum, minimum dive depth. Ascend and descend times as well as surface times. It also records how many shallow and/or short dives have occurred (user definable).

Parameter	Value	Action
Serial number:	CATS GSM TAG	SET
Version:	1.1.2	FU.
Voltage / Current / Capacity:	1.3E-5 V / 0.014 mA / 0.012 mAh	SET
System error / SMS count:	0x00000001 / 9	DEL
Operating mode:	1	SET
System time (UTC):	2016-09-22 08:35:08 UTC/GMT	SET
GSM state:	7, 20, 10	● (Green)
GPS state:	0, 0, 6	● (Red)
UTC offset [h]:	1	
GPS timeout [s]:	60	
GPS fix per session:	2	
Pressure debugging:	<input type="checkbox"/> enabled 60	SET
Pressure live:	11, 12	
Sea level offset:	9500 <input type="checkbox"/> auto adjust	
Top dive - pressure threshold:	0.3	
Long dive - time threshold:	7	
Long dive - min. pressure threshold:	2.0	
Long dive - max. pressure threshold:	2.3	

For long-term marine applications, mode 4 is able to record GPS locations over a long period. However, as in this environment, solar re-charge is only under certain circumstances useful, this mode usually is applied to animals that can carry a larger tag (> 80g), such as turtles or seals.

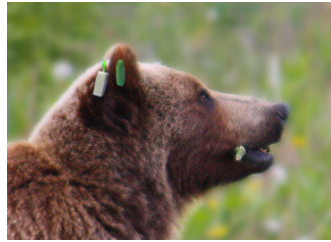

The CATS-GSM-Tag allows you to specify a restricted region in which the SMS transfer is permitted only. This is very useful for animals that return to a known site with network coverage, thereby reducing the futile attempts of connecting to the network. Also, all modes allow duty cycling of pressure, GPS and GSM activity.

Further is it possible to download the stored data manually in case the tag is retrieved. The CATS-Web portal has a upload function where the data can then be added and thereby integrated into the already existing profile, which had been sent via SMS earlier. The associated user interface permits the testing of the GPS and GSM function.

5. Sensor performance

Sensor type	Max. sampling rate (Hz)	Range	Accuracy	Resolution (bit)	Comments
Accelerometer	40 (3-axis)	2 g - 16 g	0.0000061 g	16	
Pressure (depth)	40	0-2000 m	+/- 20 cm	24	Various sensors
Temperature	40	[-45°C - (+85°C)	+/- 0.8°C	24	

6. Application examples

Application (mode)	Deployment duration	Example
Grizzly bear (mode 1)	12 months	
Turtle (mode 3)	3 months	
Goose (mode 1)	12 months	
Seal (mode 3)	12 weeks	