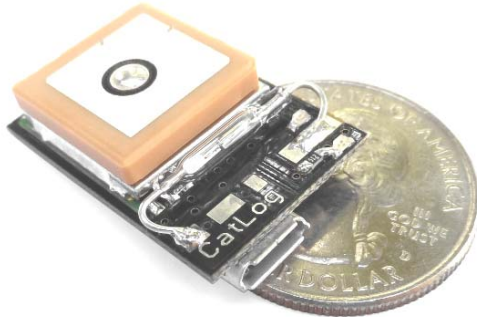


## Overview



Used in thousands of GPS tags around the world CatLog became the standard GPS data recorder for wildlife bio-tagging.

The device will record the position in an adjustable time interval. The movement profile can later be displayed on a map or exported to use with other software.

Generation 2 of the CatLog has been specifically optimized for scientific use while still maintaining an excellent performance to cost balance.

Its low power consumption combined with small dimensions, low weight and high accuracy makes it an ideal device for domestic and wildlife animal observation.

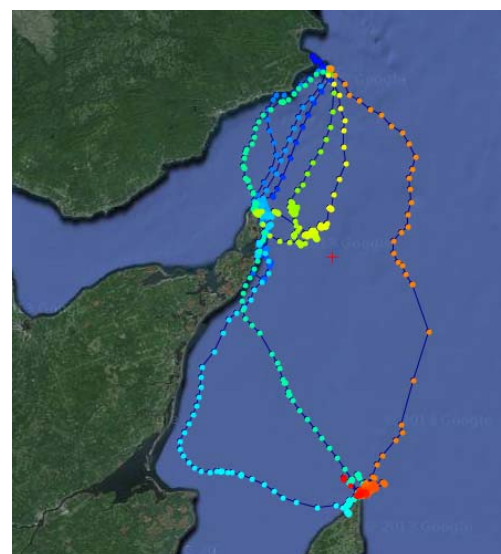
Optimized for scientific use, CatLog offers the following features:

- Magnetic switch to activate and deactivate it
- Choice of different enclosures to withstand seawater and tough conditions
- Optimized weight and operation time by scalable battery size
- Lots of configuration options to get the best results for your project needs.
- Retrieval option
- Advanced scheduler (dual time table)
- Ready for alternative energy supply (self containing system)



The recorded data is stored in an open text format that can be used by most 3<sup>rd</sup> party programs.

However, CatLog has also its own visualization software. This allows the user to analyze the recorded data as well as to apply multi-level filters or export only certain portions of the whole data set. It also allows visualizing position accuracy estimates which is one specific feature of the Gen2 CatLog.



### Functional Features

The CatLog GPS logger offers a large number of features to get a maximum of field operation time and handling convenience:

**Logistics** Each device can be named by the user – no more confusion with lost markings

Simplified setup - copy one configuration to all your devices.

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**Handling** Option to prevent device from getting manually turned off improves reliability in the field.

Automatic start at defined date – the device will be in energy conserving deep sleep mode until a certain date.

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**Energy supply** Works with different battery chemistries with adjustable shutdown thresholds.

Advanced power management allows operating from renewable energy sources. The device will automatically resume operation once batteries are recharged.

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**Logging** Asynchronous (standard) or synchronous logging mode. Synchronous logging is required if positions of multiple devices need to be considered at the same time.

Logging of additional data (temperature, time to position fix [TTF], PDOP, velocity)

---

**Operation** Advanced scheduler function that defines operation in hourly or daily patterns. It also enables the use of different recording intervals, e.g. have an energy conserving recording during the night and a higher recording interval during daytime.

Adjustable timeout in case of unfavorable reception conditions will help preserve energy. Handy for animals that are under water or underground for certain times. Backup logging event is possible in such cases to not miss a position. Or the device can be turned off for a certain period after detecting problematic reception conditions.

Options to balance accuracy versus energy consumption.

Speed triggered logging interval. Switches to a fast interval when an adjustable speed threshold is exceeded.

---

**Recovery** Recovery feature after defined date – allows easy retrieval in a colony or in a known migration area. This function can also trigger a separation unit.

## Enclosures

Our GPS solution is very modular. There is a selection of different enclosures to fit the project needs.



The **ThermoSeal** enclosure offers the best environmental protection for the least weight. It is a special heat shrink tubing with outstanding characteristics.

Since the whole device is hermetically sealed it is the top choice for seawater applications.



**Epoxy potting** is used for devices that are required to withstand high water pressure and/or mechanical stress like puncturing.

Due to the potting material the weight increases a bit.



**Dryboxes** are mainly used for larger battery sizes and cases where the increased weight is not a problem. These crush-proof and watertight boxes are easy to handle and good for larger animals like cows, sheep and horses.



**Application specific enclosures** are used for special requirements like being attached to harnesses or to fit a specific animal or where other enclosures simply do not fit the purpose. Shown in the example is a harness attached enclosure for wild cats.

### Specification

Device weight and dimensions	Electronics without battery and enclosure																												
	<table border="1"> <thead> <tr> <th>Antenna Type</th> <th>Weight</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>Patch antenna</td> <td>6g</td> <td>27 x 20 x 8 mm</td> </tr> <tr> <td>Chip antenna</td> <td>2.1g</td> <td>30 x 21 x 4mm</td> </tr> </tbody> </table>	Antenna Type	Weight	Size	Patch antenna	6g	27 x 20 x 8 mm	Chip antenna	2.1g	30 x 21 x 4mm																			
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Operation temperature	-10 to +60 degrees Celsius (based on Lithium Polymer chemistry)																												
Dive depth	10m using Drybox 100m using ThermoSeal 500m+ using Epoxy potting Note: no GPS position under water																												
Activation	Magnetic switch, automatic start timer, mechanical switch (optional)																												
Status visualization	2 LED lights (can be turned off for concealed operation)																												
GPS chipset	MediaTek 33 (66 Channel, -165dbm)																												
Satellite System	GPS, GLONASS (with chip antenna)																												
Position accuracy	5-10m																												
Position logging interval	Adjustable 5s – 24h. Weekly scheduling mode available. 2 different logging intervals																												
Recorded data	Time, position, altitude, HDOP, PDOP, temperature, TTFF, speed																												
Storage capacity	Up to 110.000 positions																												
Interface	Serial Micro USB																												
Operating system	Windows, Mac OS (using Windows VM)																												
Export data format	CSV (Excel)																												

### Internal parameters

Supply voltage	3.0 – 4.1V
Max. current draw	40mA
Charge current	Adjustable by hardware
Shutdown voltage	Adjustable by software

**Firmware Version and Supported Features**

Feature	Firmware version									
	<1.2	<2.3	2.3	2.4	2.5	3.0	3.1	Tbd	Tbd	Tbd
Scheduler with 2 different interval settings	-	✓	✓	✓	✓	✓	✓			
Delayed start, recovery mode after certain date	-	✓	✓	✓	✓	✓	✓			
Adjustable battery thresholds (shutdown, restart)	-	-	✓	✓	✓	✓	✓			
Blackout option if no position could be acquired		-	-	✓	✓	✓	✓			
Logging of additional data (temperature, time to position fix [TTF])	-	-	-	✓	✓	✓	✓			
Data logging enabled even if no position available	-	-	-	✓	✓	✓	✓			
Charge while in operation	-	-	-	-	✓	✓	✓			
Speed triggered interval	-	-	-	-	-	✓	✓			
Realtime Position Synchronization	-	-	-	-	-	-	✓			

We offer the service to update your devices to the latest firmware version (as far as hardware version permits)

**Recorded Positions vs. Battery Capacity**

tbd.

**Recorded Positions vs. Interval Rate**

tbd.

## Control Center Software

Have full control of your devices! CatLog Control Center runs on both Windows and Mac OS platforms (using Windows VM).

Load and save settings, optimized workflow if you have to deal with high number of devices. Sophisticated and Industry first battery simulator allows you to find the optimal settings for your project needs.

The screenshot displays the 'CatLog GPS Control' software interface. The main window includes a 'Connect' button, a COM port dropdown set to 'COM 4', and a 'Refresh' button. On the right, there are fields for 'Hardware Version', 'Software Version', and 'Serial Nr.', all showing 'n/a'. The central area is divided into several sections:

- Device Name:** 'CatLog'
- Capture Interval:** 0 h 2 m 30 s
- GPS Timeout:** 300 seconds
- Number of positions before log:** 0
- When no position available:**
  - 2nd chance after 0 seconds delay
  - Disable GPS for 0 seconds
  - Log also if no position
- Log additional:**
  - Temp
  - TTF
  - Speed
  - PDOP
- Scheduler Settings:** A grid showing availability for each day of the week (Su-Sa) and all days (All) for each hour (00-23). 'A' indicates availability, and 'B' indicates a break.
 

UTC	Su	Mo	Tu	We	Th	Fr	Sa	All
00	A	A	A	A	A	A	A	A
01	A	A	A	A	A	A	A	A
02	A	A	A	A	A	A	A	A
03	A	A	A	A	A	A	A	A
04	A	A	A	A	A	A	A	A
05	B	B	B	B	B	B	B	B
06	B	B	B	B	B	B	B	B
07	B	B	B	B	B	B	B	B
08	B	B	B	B	B	B	B	B
09	B	B	B	B	B	B	B	B
10	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-
17	A	A	A	A	A	A	A	A
18	A	A	A	A	A	A	A	A
19	A	A	A	A	A	A	A	A
20	A	A	A	A	A	A	A	A
21	A	A	A	A	A	A	A	A
22	A	A	A	A	A	A	A	A
23	A	A	A	A	A	A	A	A
- Log additional:**
  - No Turning OFF once enabled
  - LED lights disabled
  - Circular Logging
  - 3D Lock required
  - Enable Scheduler
  - Synchronous Mode
  - Speed triggered interval if speed > 20 knots then use interval 8 sec
  - Delayed start from date: 12 h 1 d 1 m 16 y
  - Stop recording after: 12 h 30 d 5 m 16 y
  - Recovery from date: 12 h 30 d 6 m 16 y
  - Recovery Action interval: 60 seconds
- Advanced Scheduler:**
  - Advanced Syncmode
  - Capture Interval Time A: 60
  - Capture Interval Time B: 300

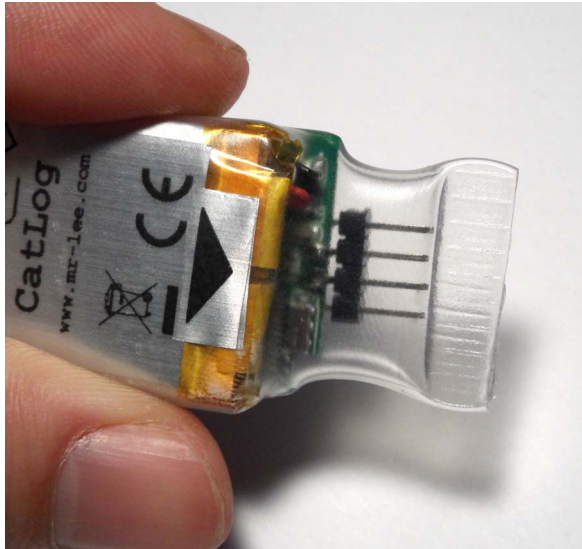
The 'Battery Simulator' dialog box is open, showing the following settings:

- Battery:** Capacity (nominal) 450 mAh, Lithium Polymer selected.
- Reception Condition:** Perfect (open sky all time) selected.
- Temperature:** Always above freezing temperature selected.
- Simulation:** Show realtime (slow) checked. Capacity remaining: 22 mAh, Time: 10 days, 7 hours, 45 minutes, Positions: 7320, TTF: 10s.

Buttons for 'Start' and 'Close' are visible at the bottom of the dialog box.

## ThermoSeal Enclosure

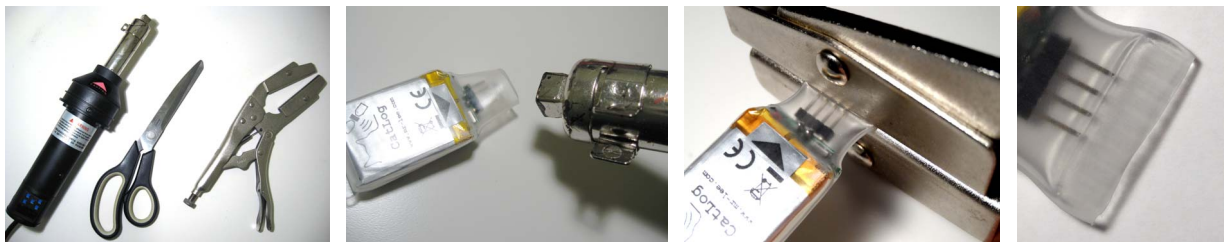
One key feature of the CatLog-S is the ThermoSeal enclosure that offers the best environmental protection for the least weight. It is a special heat shrink tubing with outstanding characteristics.



### ThermoSeal™ Features:

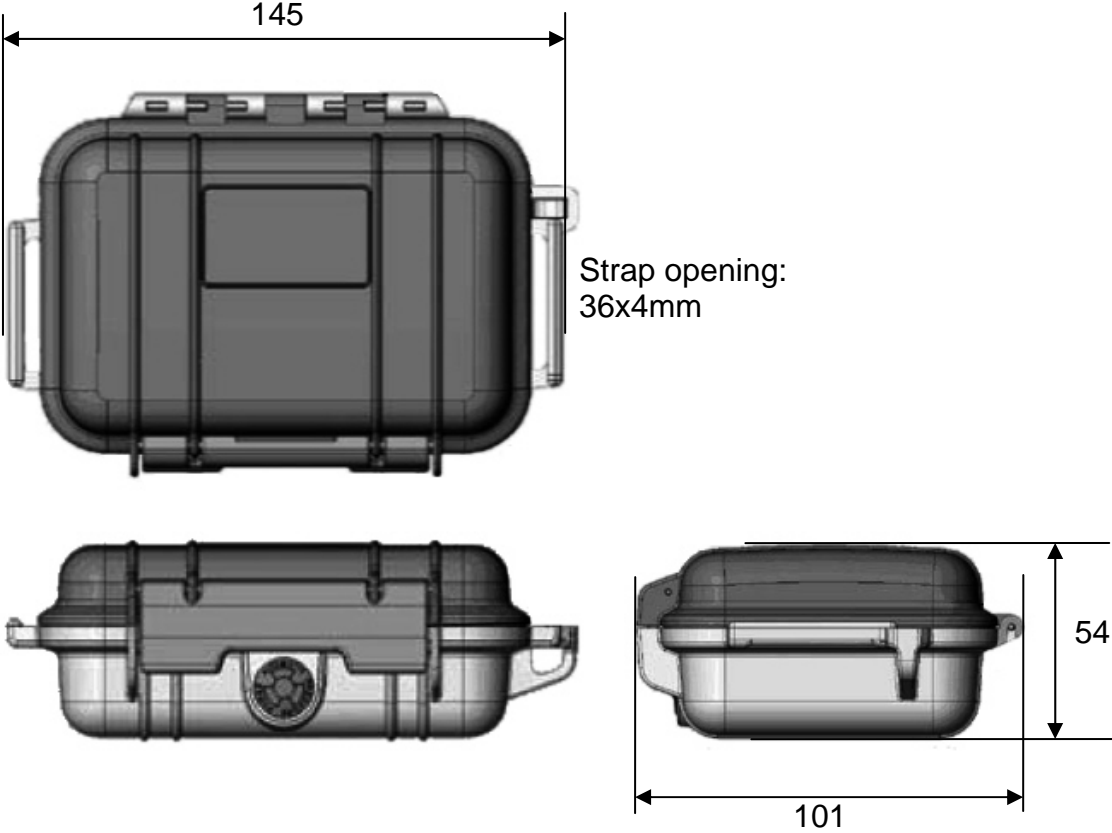
- Provides reliable water tightness and is absolutely corrosion and pressure resistant.
- Reusable seal, just heat it up to open it and seal it again with heat !
- Sufficient wall thickness to mechanically protect the device
- Sticks to tape for universal deployment
- Allows to create special attachment fixtures
- Cheap, clean, economic, simple !

Seal temperature range: 160-200 degrees Celsius (320 – 390 Fahrenheit)



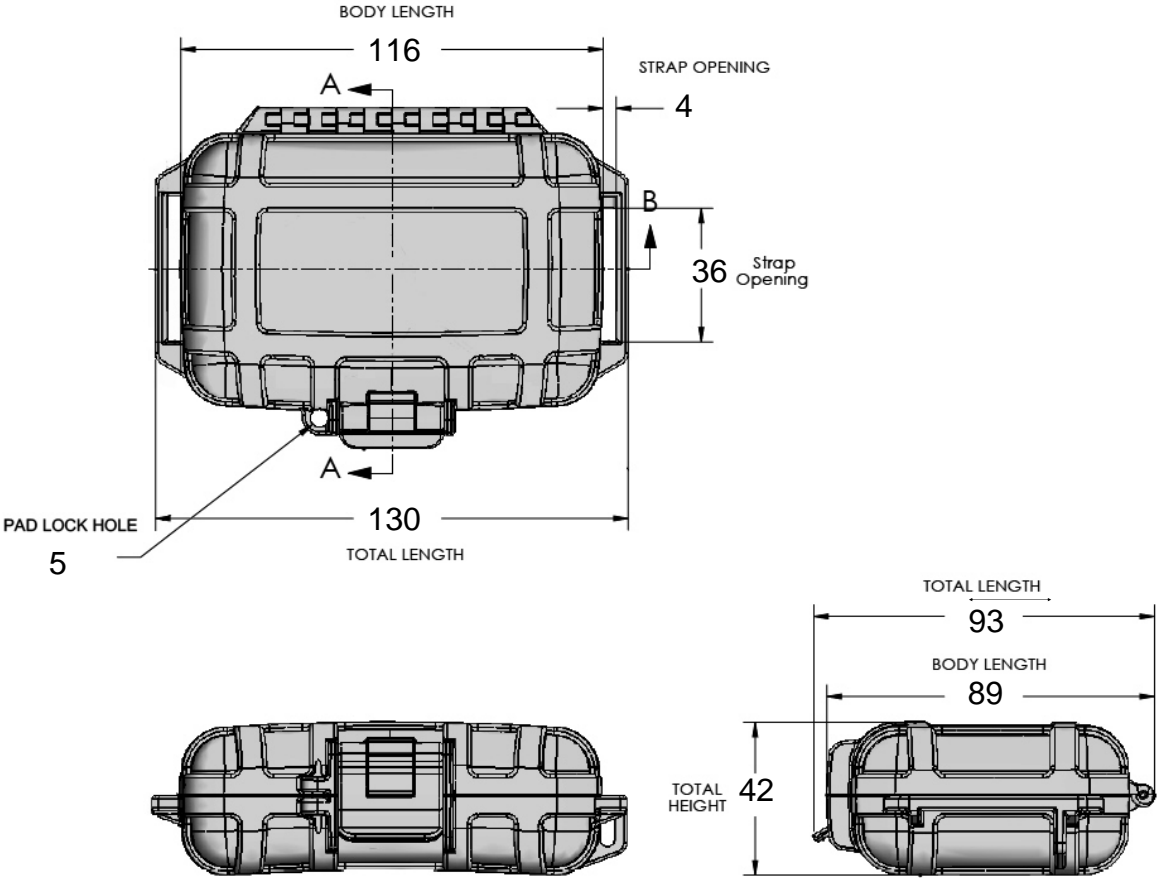
Process description is part of the CatLog-S User Manual.

Drybox Enclosure Type 1010 Drawings





Drybox Enclosure Type 1000 Drawings



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