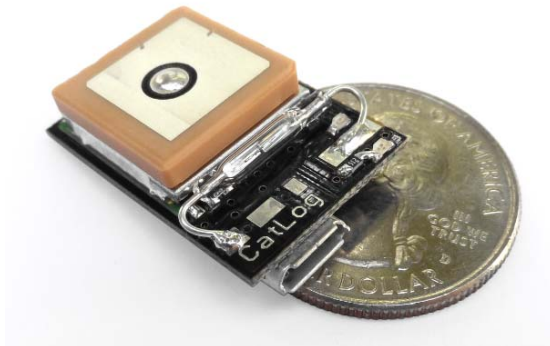## Overview

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

Generation 2 of the CatLog-S has been specifically developed 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.
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.
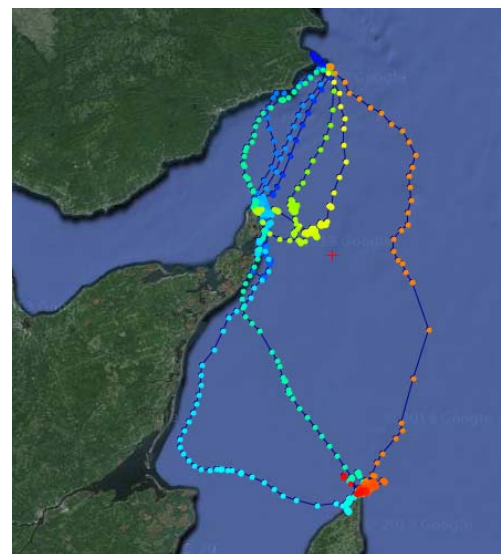
Optimized for scientific use, CatLog-S offers the following features:

- Magnetic switch to activate and deactivate it
- ThermoSeal™ protection withstands 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 3rd party programs.

However, CatLog has also it's 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.
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.
Energy supply	Works with different battery chemistries with adjustable shutdown thresholds. Advanced power management allows to operate from renewable energy sources. The device will automatically resume operation once batteries are recharged.
Logging	Asynchronous (standard) or synchronous logging mode. Synchronous logging is required if position of multiple devices need to be considered at one point in time. (*) Logging of additional data (temperature, time to position fix [TTF])
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.
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.

Firmware Version and Supported Features

Feature	Firmware version					
	< 1.2	**< 2.3**	**2.3**	**2.4**	**2.5**	**Tbd**
Scheduler with 2 different interval settings	-	Yes	Yes	Yes	Yes	
Adjustable battery thresholds (shutdown, restart)	-	-	Yes	Yes	Yes	
Blackout option if no position could be acquired		-	-	Yes	Yes	
Logging of additional data (temperature, time to position fix [TTF])	-	-	-	Yes	Yes	
Data logging enabled even if no position available	-	-	-	Yes	Yes	
Charge while in operation, supporting renewable energy sources	-	-	-	-	Yes	

Specification

Device dimensions w/o bat	27x 20 x 8 mm
Device weight w/o battery	6 grams
Battery	Rechargeable Lithium Polymer

Capacity	Operation**	Dimension	Weight
160mAh	30h	30 x 20 x 4mm	+4g
380mAh	84h	35 x 25 x 5mm	+7g
450mAh	100h	50 x 25 x 5mm	+9g
750mAh	160h	40 x 30 x 7mm	+16g

** based on 30s capture interval, 3D lock, LED on

	Type	Protection	Weight***
Enclosure	Sealed shrink tubing (ThermoSeal)	Water, corrosion and scratch resistant	+2 g
	Epoxy resin	Water, corrosion, piercing resistant, extended resistance to water pressure	+11g (380mAh) +14g (750mAh)

*** will vary with battery size

Operation temperature	-10 to +60 degrees Celsius (based on Lithium Polymer chemistry)
Dive depth	100m using ThermoSeal 5000m 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)
GPS antenna	Ceramic patch 15x15x2mm
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
Storage capacity	Up to 110000 positions
Interface	Serial Micro USB
Operating system	Windows
Export data format	CSV (Excel)

Internal parameters

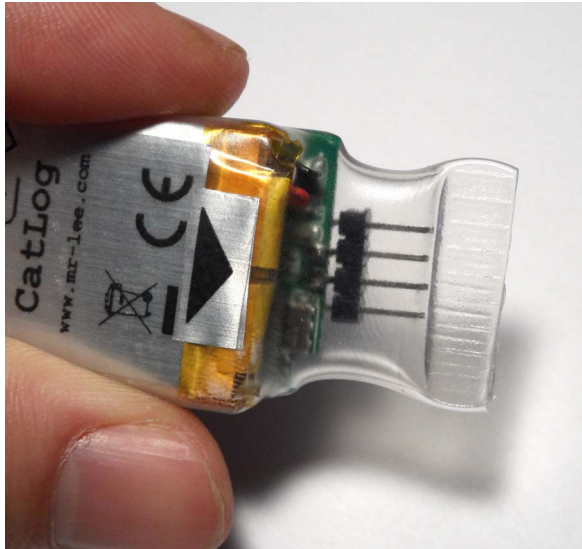|	
Supply voltage	3.0 – 4.1V
Max. current draw	40mA
Charge current	Adjustable by hardware
Shutdown voltage	Adjustable by software

Recorded Positions vs. Battery Capacity

tbd.

Recorded Positions vs. Interval Rate
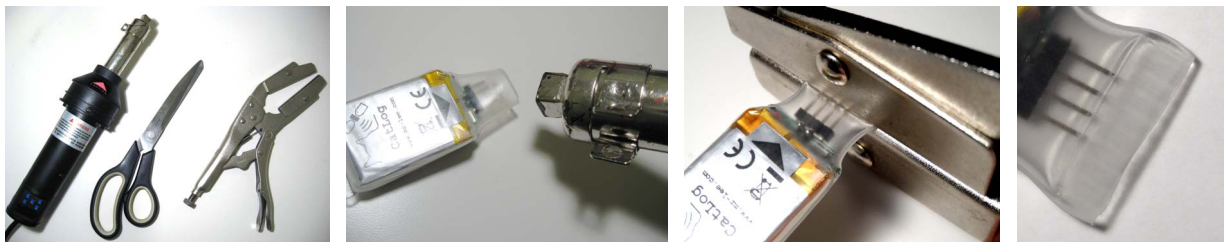
tbd.

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.