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## SPLASH10-F FASTLOC® GPS TAGS PRODUCT SHEET

The SPLASH10-F combines Fastloc® technology with the standard Mk10 archival tag. Fastloc is the most accepted and proven technology for fast location acquisition—appearing in over 700 research publications and deployed on more than 3,000 tags. Wildlife Computers is the exclusive provider of Fastloc technology.



SPLASH10-F-344

The tag works by taking a quick snapshot (milliseconds) of the radio signals. The signals are processed and compressed onboard the tag and optimized for sensor readstransmission over Argos or stored on the tag's archive. The SPLASH10-F has the standard complement of sensors to measure depth, temperature, Argos, light-level, wet/dry and archival capabilities up to 1 GB of memory.

### Controller features

The controller in the SPLASH10-F is a low-power design optimized for long battery life. It contains a real-time clock, up to eight 12-bit analog-to-digital converters, 512 kB of low-power static RAM, support for FLASH data memory, and 128 kB of program FLASH memory. The operating code resides in memory and can be upgraded to the most up-to-date version of on-board software.

### Sensors Different cha

The SPLASH10-F is configured with multiple sensors. One or two bytes of memory are required to store each sensor reading depending on how the data compress.

**Depth**—A 12-bit analog-to-digital converter is used, which provides highly accurate measurements from  $-40$  to  $+1000$ m, with 0.5m resolution and

an accuracy of  $\pm 1\%$  of the reading. In addition, measurements from 1000 to 1500m are made with a lesser degree of accuracy.

**Internal Temperature**—A 12-bit analog-to-digital converter is used, providing an actual measured range of  $-40$  to  $+60^{\circ}\text{C}$ , with  $0.05^{\circ}\text{C}$  resolution and an accuracy of  $\pm 0.1^{\circ}\text{C}$ .

**Light Level**—The light sensor measures blue light on a logarithmic scale. It is a relative measurement of light intensity with bright sunshine reading approximately 225. Tests have shown that we can determine dawn/dusk events from light readings taken by this sensor as deep as 300 m in clear ocean waters.

**Wet/Dry**—The wet/dry sensor allows the tag to recognize when it is dry to control sampling and transmissions.

**External Temperature**—A 12-bit analog-to-digital converter is used, providing an actual measured range of  $-40$  to  $+60^{\circ}\text{C}$ , with  $0.05^{\circ}\text{C}$  resolution and an accuracy of  $\pm 0.1^{\circ}\text{C}$ . Response time is less than 1 second.

### User-programmable sampling protocols

Sampling is controlled by a user-specified protocol. The researcher programs the rate at which each sensor is sampled, and whether or not sampling is suspended when the wet/dry sensor reads dry. Different channels can be sampled at different rates, so



SPLASH10-F-296

*This is a small representation of our available tags. Tag features and specifications subject to change without notice.*

# SPLASH10-F Fastloc<sup>®</sup> GPS Tags Product Sheet – continued

that slowly-changing sensor readings can be sampled less frequently than fast-changing sensor readings.

## **Memory and data retention**

Collected data are stored in non-volatile FLASH memory. Data are maintained for at least 25 years, even if the battery is exhausted. The amount of memory available for data storage is 1 GB, which allows the SPLASH10-F to store at least 50 million samples (sensor readings). Each sample occupies one or two bytes of memory, depending on how the data compress. The memory will allow at least 5 years of data to be stored when sampling depth, temperature and light-level every 10 seconds.

## **Transmitter**

The SPLASH10-F incorporates a specialized Argos transmitter developed by Wildlife Computers. It generates 0.5W of radiated power output. The high-efficiency and frequency stability of this transmitter maximize the quantity and quality of messages.

## **Transmitted data**

Researchers can program the SPLASH10-F to selectively transmit time-at-depth, time-at-temperature, maximum depth and dive duration histograms, depth-temperature profiles, timelines, behavior and light-level curves. For the histograms, the researcher can configure the histogram collection period (1 to 24 hours) and bin ranges (up to 14 bins).

Many other parameters are user-programmable and provide the flexibility to customize data collection to best achieve different experimental objectives. The SPLASH10-F also transmits data collected from the Fastloc module. Each Fastloc location fits into a single Argos message.

## **Location accuracy**

Service Argos provides the locations with best accuracy as good as  $\pm 250\text{m}$ . Additionally the data from the Fastloc module can be post-processed (with supplied software) to generate locations with GPS precision and typical accuracy of less than 50m.

## **Battery Life**

Actual battery life depends on the sampling regime and temperature conditions. In calculating the power budget for the Wildlife Computers SPLASH10-F Argos/Fastloc GPS tags, the researcher needs to allow for both the Argos transmissions and Fastloc acquisitions. Since each deployment situation is different, we provide instructions for budgeting the available power to best benefit your application.

## **Tag activation**

The SPLASH10-F will auto-deploy. The tag senses its environment using the wet/dry sensor. When in standby mode, tags will “auto-start” when the depth sensor reads a 20m change in depth or the wet/dry sensor senses a pre-set minimum change in conductivity. As with other Wildlife Computers tags, a magnet can be used to change or indicate the mode of the tag. The LED flash sequence indicates the current mode.

## **Communication**

Wildlife Computers provides an interface to the SPLASH10-F that runs on a PC. This interface allows the user to set up the tag for deployment, and download the data after recovery.

## **Data decoding and analysis**

Wildlife Computers-designed PC-based WC-DAP software helps collect, prepare, and analyze the data returned from the tag through Argos or from the tag's archive. DAP can automatically collect Argos data from the Argos servers, decompress the messages into readable data, generate CSV files of the data, generate KML files of the track for Google Earth, and generate PXP files for visualization and further processing by Igor Pro (Wavemetrics).

**To learn which configuration is right for you, contact our technical sales consultants at [tags@wildlifecomputers.com](mailto:tags@wildlifecomputers.com) or + (425) 881-3048**