

SPOT5

User Guide



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About this Guide

This guide describes the SPOT5 tag. Interacting with the tag, deploying the tag, and transmitted data products are explained. We recommend new users visit wildlifecomputers.com for more information.

Before you begin

The list below shows what is required in order to configure and deploy a SPOT tag:

- A Windows computer with Tag Agent Software and USB Blue driver installed
- A USB Blue communications cable
- A magnet
- Argos account access
- A Wildlife Computers online account

Visit wildlifecomputers.com to download the required software and setup an account. At the end of this document, there is a list of key concepts to reference. We recommend new users review this list.

Anatomy of a tag

Wildlife Computers offers SPOT tags in many different shapes to suit specific applications. While the shapes may differ, all SPOT tags have several elements in common (Figure 1).

The communications port is where the USB Blue plugs into the tag. Prior to a deployment, this port should be sealed with the plug provided by Wildlife Computers. Apply a small amount of silicone grease to the port and press the plug into position. This prevents corrosion of the pins during the deployment; however, the plug is not required for the tag to function normally.

The wet/dry sensor is composed of several (2 or more) metal discs on the surface of the tag. None of the metal discs should be covered in any way. Covering any of the discs will interfere with the normal function of the tag. This includes anti-fouling substances and attachment adhesives (e.g. epoxy).

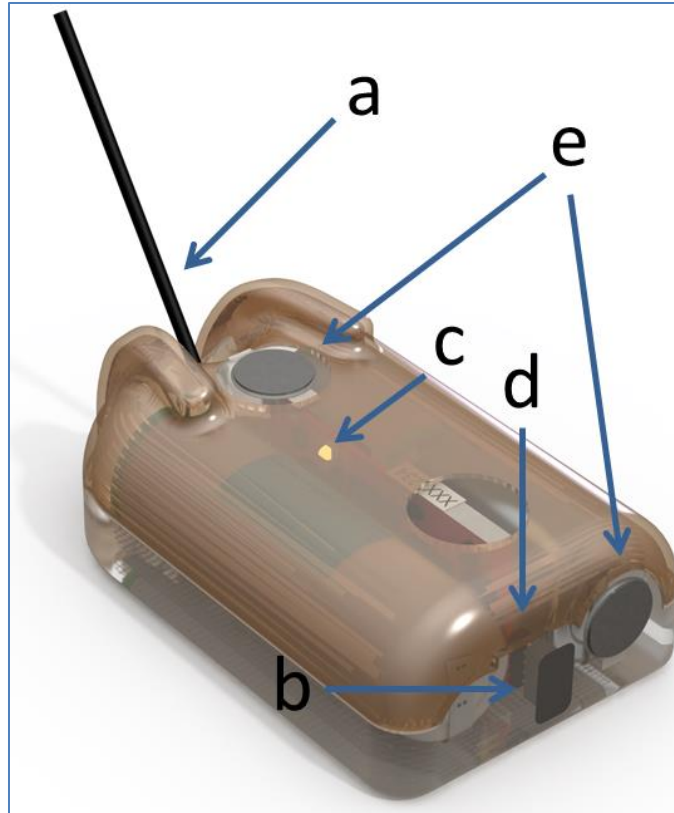


Figure 1- A typical SPOT tag showing the Argos antenna (a), communications port with plug (b), indicator light (c), magnetic switch (d), and wet/dry sensor (e). The magnetic switch is near the base of the communications port. Swiping the magnet across the communications port will activate the switch.

Interacting with a Tag

Tag Agent

Tag Agent Software can be used to put the tag in any one of the three modes: Start, Stop, or Auto Start. Tag Agent Software is also used to send configurations from the Tag Portal to the tag. The software and more information can be found at wildlifecomputers.com.

Stop, Auto Start, and Start

A tag can be in one of 3 states: Stop, Auto Start, and Start (Figure 2). When Started, a tag is running and will generate locations. Auto Start will allow the tag to Start by the swipe of a magnet or submersion in seawater. For use in brackish or freshwater please contact Wildlife Computers. In Stop, the tag will remain unresponsive unless connected to Tag Agent and swiped with a magnet.

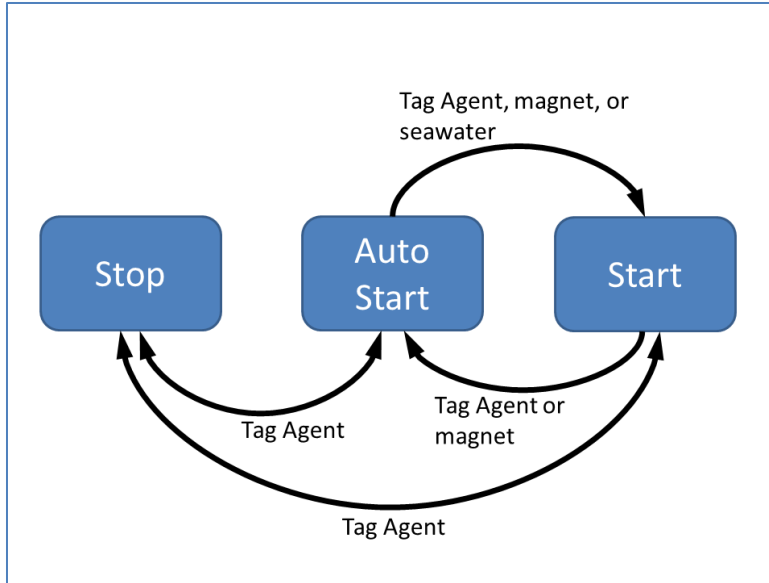


Figure 2 - Methods for changing a SPOT tag's state.

Magnet

Passing a magnet near the communications port will cause the tag to blink the indicator light. Two blinks and a pause repeated 6 times means the tag is in Auto Start. Ten rapid blinks indicate the tag is Started. No blinks indicate the tag is Stopped.

Passing a magnet near the communications port can also toggle the tag between Auto Start and Start. First, swipe the magnet and wait for the tag to indicate its current state. Then wait for the indicator light to remain on. Then simultaneously swipe the magnet a second time. The second swipe needs to happen in the 2 second window that the light is on (Figure 3).



Figure 3 - Magnet and indicator light sequence to switch from Auto Start to Start. After an initial swipe of a magnet near the communications port, the indicator light will show a double blink 3 times when in Auto Start. Then the indicator light will remain on for 2 seconds. Simultaneously swiping the magnet again with the light on will Start the tag. The tag will blink 10 times rapidly and then remain lit for 2 seconds to show the tag is Started.

SPOT5 Configuration in the Portal

Tag Portal

The Tag Portal at wildlifecomputers.com is used to configure a tag. A Wildlife Computers online account is required access the Tag Portal.

Tag Information

Tag Details & Argos Settings

Tag type, serial number, tagware and Argos ID are displayed on the Tag Details tab. The “Tag Name” field is an optional user-definable field which makes a tag or tags easy to find in the Tag Portal using the Filter.

Wet/Dry Sensor Settings

This is the threshold value that the SPOT5 uses to determine “wet” vs. “dry.” The default value is appropriate for most marine applications. This threshold may need to be changed if the SPOT5 is being deployed in an area of low salinity (e.g., an estuary, the Baltic Sea). In such instances you will need to check what the SPOT5’s wet/dry sensor reads when immersed in that water. Check the Wet/Dry sensor on the Tag Agent Software interface and *carefully* dip the SPOT5 in a bucket of water from the study area, taking care not to allow water to reach the communications port. Note the wet/dry sensor reading. The threshold should be set to double the value, but to no less than 40. Different sensor sizes will have different default values.

Data Product Settings

Summary Period Data

Time-at-Temperature

This histogram reports the amount of time that the animal spent within each temperature bin. The amount of time is reported as a percentage of the histogram summary period. The summary period can range from 1 hour to 24 hours but the chosen period must divide the day evenly. The summary periods begin immediately after midnight UTC by default and runs to the end of the UTC day. Selecting a 6 hour summary period will cause the tag to generate 4 histograms from 00:00hr to 06:00hr, 06:00hr to 12:00hr, 12:00hr to 18:00hr and 18:00hr to 24:00hr. This pattern will repeat on the next UTC day. Note that choosing a 1 hour summary period will cause 24 times more data to be generated than choosing a 24 hour summary period.

Be aware that the temperature sensor is buried in the tag and has a response time of approximately 30 minutes.

Daily Data

Percent-Dry Timelines

This timeline reports the amount of time the tag was dry. The amount of time is reported as a percentage of each hour in the day and it is reported to the nearest 10%. The timeline will also indicate when the tag was wet for the entire hour and when the tag was completely dry for the entire hour.

Transmission Settings

Transmission Hours

The Transmission Hours tab allows you to set the hours the SPOT5 should transmit. In a given location, the orbits of Argos satellites cause consistent gaps in satellite coverage. This feature is used to save battery power by preventing the tag from attempting Argos uplinks during hours of poor satellite availability, regardless of the uplink schedule. All hours are UTC.

For example, in Hawaii the hour starting at 10:00UTC does not have any Argos satellite coverage and should be disabled (Figure 5). Leave all hours enabled if you expect your tag to move more than 500 km.

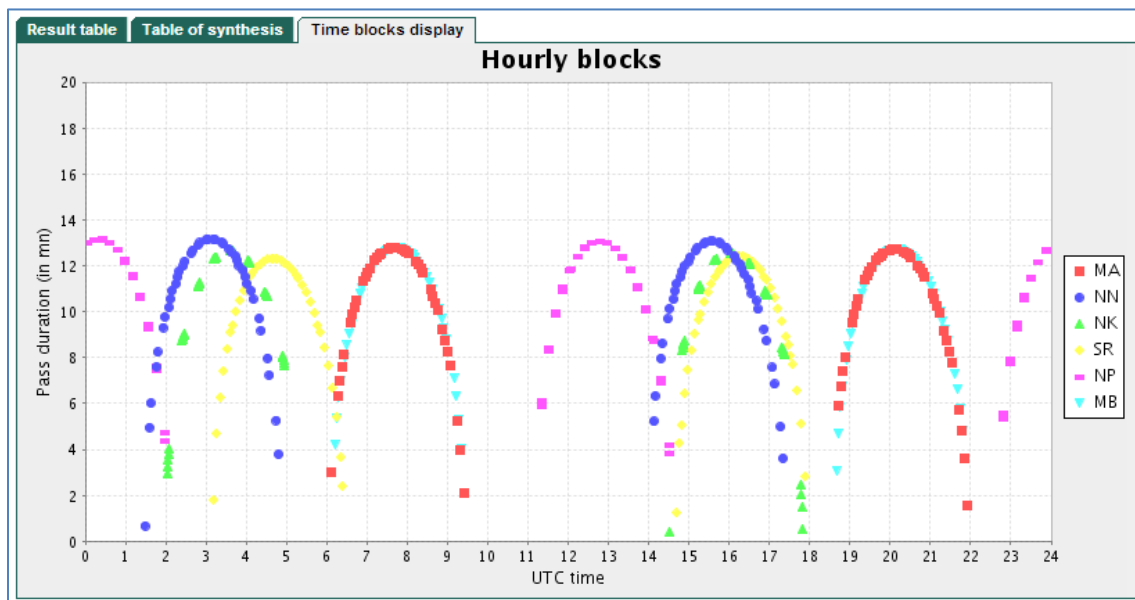


Figure 5 - Time Blocks display from ArgosWeb Satellite Pass Prediction for Honolulu, Hawaii, USA. Note the gap in satellite coverage in the 10:00 UTC hour.

Transmission Days

Each day of the year can be set as “on” or “off.” This can be useful if you are more interested in locations during certain times of the year. For example, if you know your animal will be hauled out during March and April and begins its migration in May, you may want to set the SPOT5 to transmit every third day for March and April, and then transmit daily for the months following while the animal is at sea.

Relative Calendar

You can choose to force the tag’s internal calendar to January 1st upon deployment, which ultimately makes this a relative calendar. Example: You want the SPOT5 to transmit every day for the first month of deployment, and then switch to every other day for the remainder of the year, but you do not know exactly what day you will deploy the tag.

Transmission Parameters

Argos Transmission Settings

Repetition rates

These rates are set by the manufacturer. It is easier for transmissions to reach the satellite when the animal is hauled-out, thus the rate of transmissions is slowed to extend battery life. The rate is increased when the animal is at sea to increase the probability of a good transmission reaching the satellite. The maximum (fastest) rate is imposed by Service Argos.

Maximum number of transmissions per day

Generally 250 transmissions per day is sufficient for one location calculation a day in mid-latitudes.

Add any unused transmissions to the next day’s allowance

Select this option if your study animal does not surface frequently, and you wish to maximize the probability of a location when it does surface. Do not select this option if you are limiting the number of transmissions per day in order to extend the deployment duration.

Delaying transmission upon surfacing

The recommended setting is to transmit after 0 seconds of being dry. This ensures the tag will attempt to transmit as soon as possible after the animal surfaces. However, some users may want to delay slightly the initial attempt to transmit to allow water to sheet away from the tag. This is recommended only if you know that your study animal is a longer surfacing species.

Haul Out Settings

Enter haul out

Determine how long in seconds the tag should be dry to indicate the animal has hauled-out. Divide that number by the fast transmission rate for this value. Set to NEVER to disable haul-out and ensure transmissions will always be at the fast repetition rate.

Pause transmissions after being dry

You may wish the tag to suspend transmissions after the animal has been hauled-out for **N** hours to conserve battery life. Selecting “Never” hours will never pause transmissions.

Exit haul out

Ensure **N** is less than a typical dive duration, or else transmissions will never go back to the original transmission schedule.

Additional Information

Key concepts

- Argos ID – Uniquely identifies a transmitter for the Argos system. The ID consists of a decimal number and a hexadecimal (base 16) number.
- Argos location – A location generated by the Argos system from uplinks received during a satellite pass. Get more information about how the Argos system works here: <http://www.argos-system.org/web/en/391-faq-general-questions.php>
- Daily Data – Generated from sensors over a fixed 24-hour period.
- Data Products – The various types of data available from Wildlife Computer tags. These are locations, raw sensor data, and the result of processing raw sensor data on the tag.
- Deployment – The period when a tag is associated with an animal and actively collecting and sending telemetry data.
- Start/Auto Start/Stop – Tag states. When Started, will generate locations and/or collect sensor data. Auto Start will allow the tag to Start using a magnet or when reading wet. Stop causes the tag to do nothing until reconnected to Tag Agent.
- Summary Period Data – Generated from sensors during a defined number of hours.
- Tag Agent Software – The program used to connect a tag to the Wildlife Computers Tag Portal.
- Tagware – The software running on a tag.
- USB Blue – The Wildlife Computers communication cable required by Tag Agent.
- Tag Portal – The cloud-based service offered by Wildlife Computers for tag setup.
- Wet and dry – The state of the tag as determined by the wet/dry sensor which measures conductivity.

Contacting Wildlife Computers

U.S. and International

Members of the Wildlife Computers technical sales and support team are located in Redmond, WA, USA, and Havelock North, New Zealand, allowing us to cover promptly a wide range of time zones.

Mailing and shipping

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For Asian Clients

While we welcome your direct correspondence, we recommend that you contact our colleague, Yong Huang, for assistance. Mr. Huang understands the special purchase processes for your countries, and will provide you with the best service for the best price. He also is fluent in Japanese, Chinese, and English.

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