

Denali User Guide

This user guide will give you all the essential information needed to interact with and deploy a Wildlife Computers Denali tag.



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Before you Begin

The information contained in this guide is designed to help you get the most from your deployment. In the guide, you will see the yellow icon highlighting information where special attention should be paid.

We recommend inexperienced users read this entire manual and take special care to follow the guidance in the section [Preparing a Tag for Deployment](#).

A Wildlife Computers Data Portal (Portal) Account is required to view and manage your deployment data. Review the Portal and Tag Agent User Guide for instruction or visit wildlifecomputers.com to setup an account. At the end of this document, there is a list of key terms and concepts for reference.

About the Denali

The Wildlife Computers Denali tag generates locations and transmits to any Argos-enabled satellite. Learn more about Argos here: <https://wildlifecomputers.com/data/technologies/argos/>. Consecutive transmissions received in a single satellite pass are used to calculate the location of the tag and its host animal. See <http://www.argos-system.org> for more information on Doppler locations.

Denali operates using solar energy. Tag operations are fully automated, and no tag setup is needed. The Argos effort, or transmissions per day, is automatically adjusted based on the solar energy captured.

Anatomy of a Denali

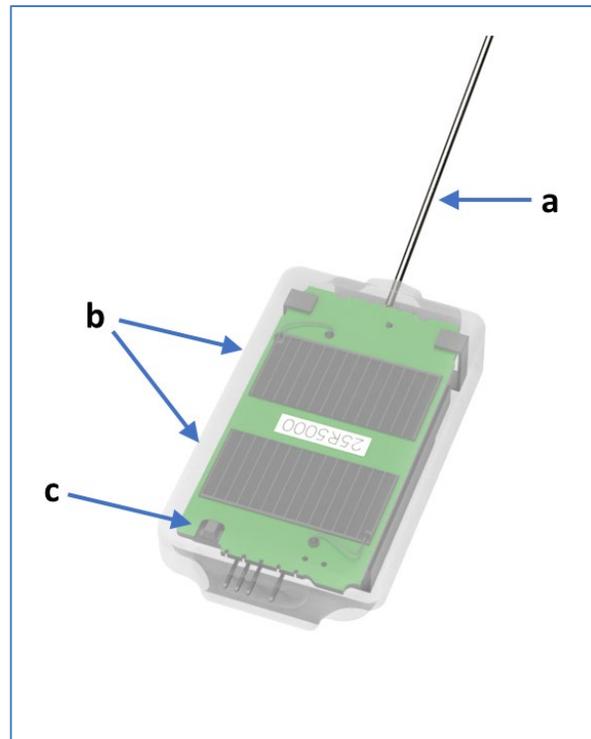


Figure 1—A Denali tag showing: (a) Argos antenna, (b) solar panels, and (c) LED indicator light.



The Argos antenna is suitable for many bird species with a good combination of toughness and strength. **But the antenna is susceptible to curling or bending if handled roughly.** Do not bend or drag a hard edge along the antenna. This will cause the antenna to permanently curl or bend.



DO NOT cover the solar panels with anything including tape or glue. Sunlight is essential for the tag to function normally.

The communications port and metal pins are where Wildlife Computers communicate with the tag during tag construction; the port **is NOT used for normal operation**. The metal pins can be covered when attaching the tag.

On the bottom surface of the tag, you may see a number beginning with the letter 'N.' This identifier is used only during tag construction and must not be used to reference the tag. To identify a tag and its deployment correctly and uniquely, always use the serial number—located between the two solar panels—and the Argos PTT ID (Platform Transmitter Terminal).

Tag States

Denali tags have two states: Start and Stop. Both are controlled with a magnet.

Magnet-On / Stop Mode — Placing a magnet on the tag puts it into **STOP** mode. The tag will display one slow red fade followed by one to three slow blinks or “breaths” to show its current charge level (see Figure 2).

Stop mode is used for storage and shipping. In this mode, the tag does not transmit, and the battery can only be charged up to a maximum of 60%. This limit is intentional — maintaining a 60% charge protects battery health, maximizes long-term storage life, and is required for safe shipping.

Tape or a rubber band can be used to secure a magnet to the tag. For charging in Stop mode, do not obscure solar panels.



Denali tags are shipped with magnets attached. You must keep all unnecessary magnets away from the tag. A second magnet will cancel out the first magnet and cause the tag to start. Keep all magnets at least 5 cm apart

Magnet-Off/Start Mode—when a magnet is removed from the tag, the tag enters **START** mode. In Start mode, a Denali tag is running and will uplink/transmit to Argos-enabled satellites. When the magnet is removed, ten rapid blinks indicate the tag is in Start mode. See Figure 2.

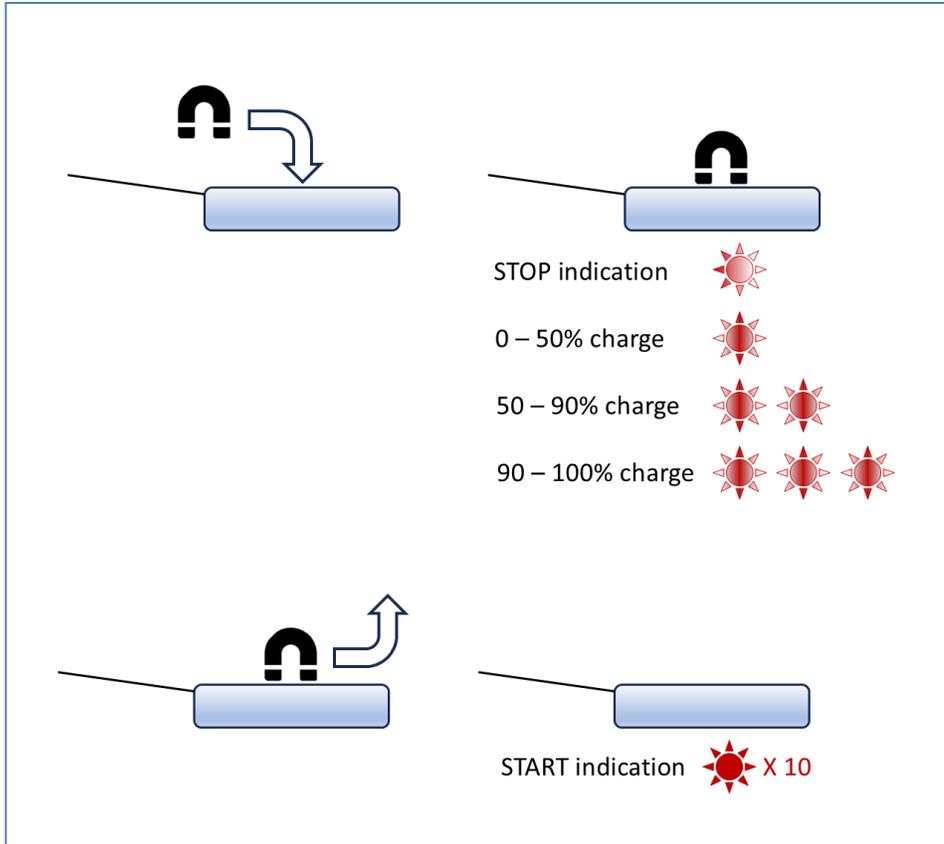


Figure 2—light patterns.

For the first 24-hours of deployment, with a charge state of two blinks or “breaths” (see [Preparing a Tag for Deployment](#)), the tag has enough battery capacity to transmit for a full day.

When a tag is in Start mode, it distributes its transmissions throughout the day. The total number of transmissions is automatically adjusted based on the tag’s available battery charge over each twenty-four-hour period.

If the battery charge drops below five percent, the tag switches to a reduced-transmission pattern. These limited transmissions confirm the tag is still functioning, but they usually are not sufficient to produce location data.

Low-charge situations can occur when feathers cover the solar panels, preventing charging, or when daylight hours are short.

Preparing a Tag for Deployment

Before you deploy your tags, review the [Denali Pre-Deployment Checklist](#).

Battery Charge

Denali tags arrive in **STOP** mode. Stop mode has a maximum allowed charge of 60 percent which maximizes storage life and is required for shipping. At 60% charge, the tag will transmit for 24 hours. This is sufficient for collecting locations at the beginning of the deployment. Once the tag is started, the tag will maintain a full charge (100%) with several hours of sun exposure per day.



To ensure tags are at 60% charge before deployment, they can be charged in STOP mode and placed outside in the shade. Do not place tags in direct sunlight to charge them. This can overheat and damage the batteries. While on birds, they will stay cooler, and the batteries are not in danger of overheating even in full sun.

Tag Attachment

The mounting holes can be used for harness or suture attachment. A baseplate can be taped or glued to the bottom of the tag for attaching the tag to feathers. Keep the solar panels clear of any attachment material to ensure good solar charging.

Argos PTT ID

The PTT ID is used to identify the tag within the satellite system. The Denali tag was pre-programmed with a PTT ID at Wildlife Computers. Be sure to save the PTT ID or serial number to link the tagged bird to its locations.

Pre-deployment Test



We strongly recommend conducting an Argos transmission test before deploying the tag on a bird. To perform the test, remove the shipping magnet from the tag and place the tag outdoors in a shaded area for about three hours. This allows time for several satellite passes, which occur every 30 minutes. The tag does not need full sky exposure—placing it under a tree or beside a building is fine.

After the test period, verify that the tag successfully transmitted by checking for received messages in the Wildlife Computers Data Portal or through the CLS web portal.

Viewing Tag Locations

The Wildlife Computers Data Portal is a cloud-based service for accessing, storing, and managing deployment data. In the Portal, you can view maps of the tag locations and download the locations for additional analysis. More information on using the Portal can be found in the “My Data” section of the [Wildlife Computers Data Portal & Tag Agent User Guide](#).



Tag Storage and Battery Maintenance

Proper tag storage is important to maximize the life and performance of the battery.

Denali tags should be stored in Stop mode.

- Place a magnet on each tag with tape or rubber band to place in Stop mode.
- Store tags in a cool, dry place.
- Let the antenna sit naturally straight or a permanent bend may occur.
- Every 3 months, put the tags outside, in the shade for a total of eight hours of daylight.
- Confirm the tag has 50% – 90% charge (2 slow blinks) before returning to storage.

This will keep the batteries at the proper charge level for long term storage of 2 years or more.



We strongly recommend doing a pre-deployment Argos test after any extended storage. Contact Wildlife Computers for more information on proper storage, alternative lighting, or tag performance after long term storage.

Remember to read the Denali deployment checklist to prepare for your deployment.

Additional Information

Technical Specifications

Below are general specifications of Denali tags. See the specific data sheet for your tag.

Tag Weight (excluding neoprene)	7.4 grams
Dimensions (LxWxH)	36 mm x 19 mm x 8 mm
Pressure Rating	Tested to 400 m depth
Operating Frequency	401.678 MHz
Operating Life	Unlimited with solar
Sensors	Temperature, battery voltage, solar
Operating Temperature Range	-5° C to 60° C as specified by battery manufacturer
Charging Temperature Range	0° C to 45° C as specified by battery manufacturer
Battery Charging	Solar
Battery	Lithium polymer rechargeable battery
RF Power Output	Maximum 500 mW, typically 200 mW when deployed
Tag On/Off Protocol	Using a magnet

Glossary of Terms

- Argos location—a location generated 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>
- Argos uplink/transmit—a radio transmission intended for the Argos satellite system.
- Breath—one complete LED pulse in which the light smoothly increases in brightness to its maximum level and then gradually dims back to off.
- Location uplink—a transmission intended to generate an Argos location. These uplinks can also carry a data message payload. Multiple uplinks are required to generate an Argos location.
- PTT (ID)—the Platform Transmitter Terminal ID uniquely identifies a transmitter for the satellite system. The ID comprises a decimal number and a hexadecimal (base 16) number.
- Satellite pass—The time when a particular satellite travels overhead and in-view of the tag.
- Start/Stop—tag states. When started, the tag will generate locations and/or collect sensor data. Stop is used to store and/or charge the tags.
- Tag Portal—the cloud-based service offered by Wildlife Computers for data viewing and remote tag setup.

Contacting Wildlife Computers

U.S. and International

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

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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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