SEATRACK
Seabird Tracking

GPS-GSM protocol for 2026

Important information on GPS-GSM transmitters !!!

NEW!!!

New content for 2026 in the protocol is marked with this symbol – please read carefully!

Table of content

These protocols are meant to serve as guidelines for field work carried out in cooperation with SEATRACK in 2026.

Please distribute them as whole or in part to field teams as you see fit. If any questions arise, please contact Svenja.Neumann@npolar.no .

General information

This document contains important information about the GPS-GSM transmitters for deployment on large gulls as part of SEATRACK. The protocol is based on advice from Ornitela and previous experience of SEATRACK partners. For detailed instructions, please consult the Ornitela user manual.

This year, we aim to deploy a total of 70 devices on Lesser-black-backed gulls, Herring gulls and Glaucous gulls.

GPS-GSM transmitters which were not deployed should be fully charged (battery level 100%), turned off (on magnetic pad) and sent back to:

Norsk Polarinstitutt
Att: Svenja Neumann
Post box 6606 Stakkevollan
N-9296 Tromsø
NORWAY

Precautions

- Make sure the transmitter does not overheat (*i.e.* temperature should not exceed 50°C). For example, do not keep transmitters in direct sunlight on the car dashboard and avoid sudden temperature changes.
- Avoid strong magnetic fields near the device.
- Do not drop or disassemble the device.
- Do not turn on and use the transmitter in areas with poor GPS conditions (e.g. indoors), this may lead to rapid battery depletion.

Photo: Roos Kentie & Kees Camphuijsen

GSM subscription and data fees

GSM service subscription and actual data transfer costs are paid for by SEATRACK.

IMPORTANT: Please notify us (providing serial number) in the following situations:

1. The transmitter is not deployed in the 2026 season.

We will evaluate if the GSM service subscription can be suspended until the next field season.

NEW!!!

2a. The transmitter is lost and cannot be recovered.

2b. The transmitter has stopped working.

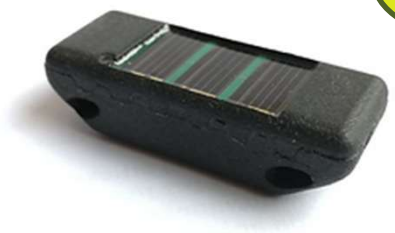
In these cases, Ornitela will be asked to terminate the GSM subscription and service fees. Please consider carefully if the transmitter has stopped working or if sending positions is temporarily interrupted. Transmitters may stop sending data for extended periods of time, for example when a bird migrates to an area without GSM coverage and stays there for months, or when battery discharges during poor light conditions (e.g. winter at high latitudes). The transmitter will start sending data again when the bird enters an area with GSM coverage and/or light conditions improve. If GSM subscription is terminated, it cannot be reactivated.

GPS-GSM transmitter models

OrniTrack 10 - solar powered GPS-GSM

Standard model with 3-point attachment

NEW!!!

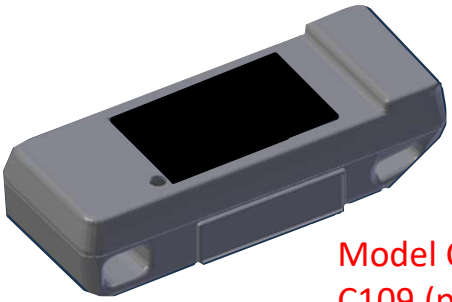


OrniTrack 15 - solar powered GPS-GSM

Standard model with 3-point attachment

OrniTrack 10 - solar powered GPS-GSM with 4-point attachment

NEW!!!



Model C97 and C109 (pictured)

OrniTrack 15 - solar powered GPS-GSM with 4-point attachment

NEW!!!

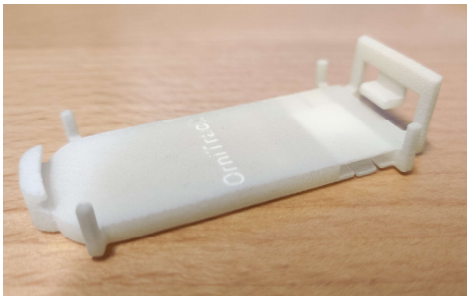
Model C62

In 2026 we supply four types of GPS-GSM transmitters: OrniTrack 15 and the smaller Ornitrack 10. Both come with 4-point attachment (suitable for leg-loop harness) or 3-point attachment (suitable for chest harness).

Equipment provided with GPS-GSM transmitters

Magnetic pad

Used to switch the GPS-GSM ON/OFF



Attachment of the GPS-GSM transmitter:

- Aluminium clamps
- Light foam pad to place under the device
- 6.35 mm Spectra band
- Super glue

NEW!!!

Note on GPS-GSM models C109 and C97:

Unlike model C97, model C109 does not have an extension at the back of the transmitter (see picture on page 6). For the deployment of model C109, we recommend using a slightly larger foam pad that sticks out from under the device so that it provides cushioning for the attachment knot / clamp on the back of the bird.

Turning the device on and off

Start up: The transmitters are supplied turned off and charged (> 90% battery). To turn the transmitter on, take it out of the holding pad that contains a magnetic ON/OFF switch. After removing the transmitter, you will see a flashing red LED:

✓ The red LED flashes several times and at a slow rate: the transmitter is turned on.

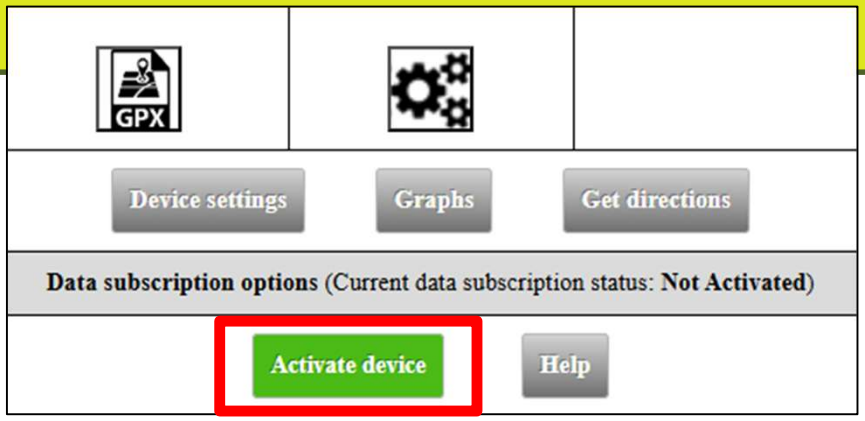
X The red LED flashes briefly and at a high rate : complete discharge of the battery.

Shut down: When the transmitter is placed back into the holding pad, the LED will light-up once, indicating that the transmitter was successfully turned off.

NEW!!!

Activation:

New transmitters that come from the producer are inactive. When you are ready for testing or deployment, you need to activate the device from the control panel by clicking the green 'Activate device' button, which appears when the inactive transmitter is selected.



Initial test of the device

To verify correct operation of the unit new devices are supplied with pre-defined GPS and GSM test settings (GPS fix interval – 900 s, data transmission interval – 14400 s).

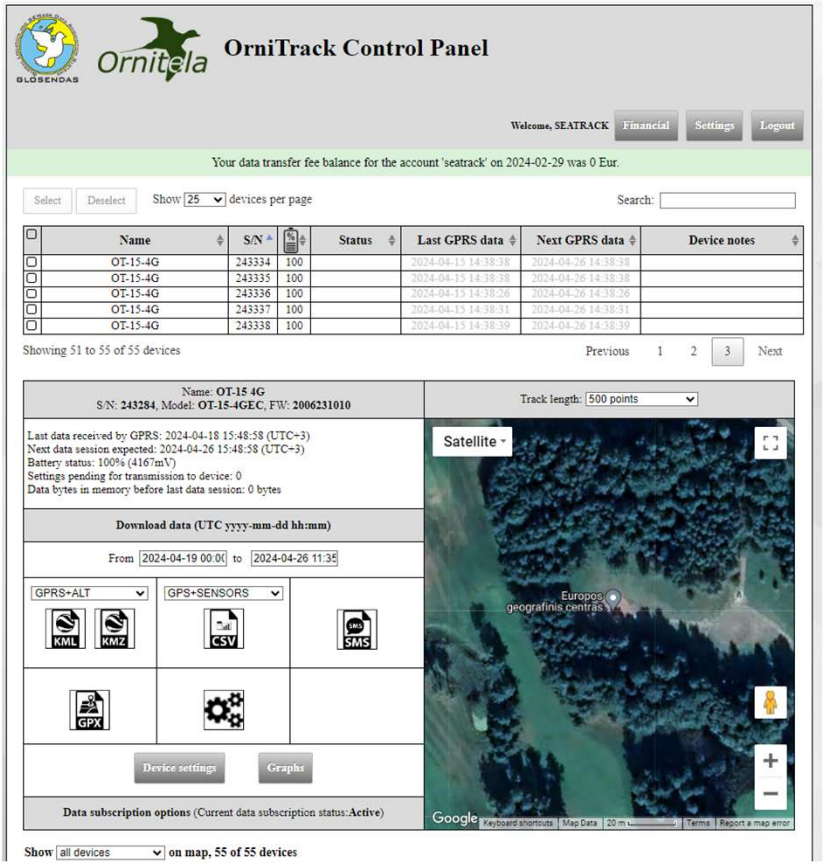
Please test the device as follows:

1) Remove the transmitter from the holding pad and place it on a level surface in an outdoor area with an open view of the sky and good GSM coverage.
2) With the pre-defined settings, the standard test should last a little over 4 hours.
3) After a 4+ hour test period, re-insert the transmitter into the magnetic holding pad and the transmitter will turn off.
4) Access the online control panel for the transmitters here: https://cpanel.glosendas.net/.

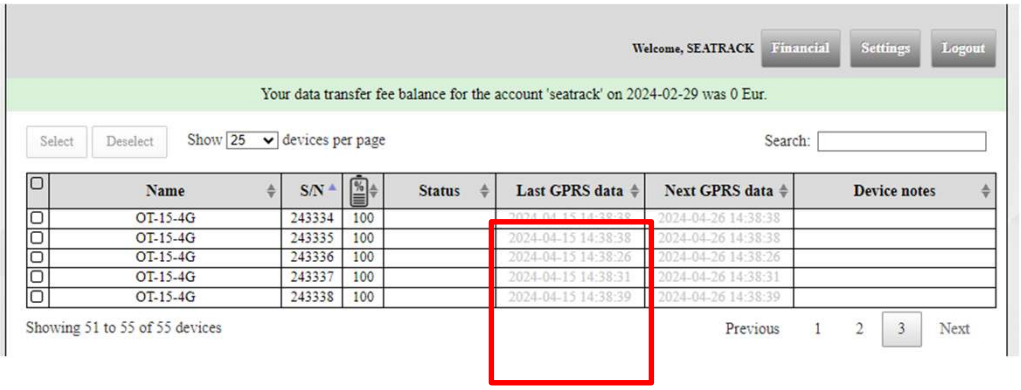

Photo: Svenja Neumann

Initial test of the device

5) Enter your username and password (will be send out via email), which will take you to the OrniTrack devices main page:



6) On the OrniTrack devices main page, you will see that the tested transmitter has transferred the acquired data (under last GPRS data).



Initial test of the device

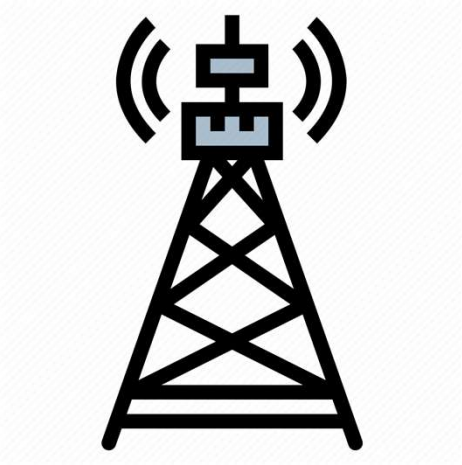
7) If the device continues to connect to the GSM network (as seen from the timestamp of the "Last GPRS data" on the main page of the OrniTrack Control Panel) this may indicate incorrect placement of the transmitter in the magnetic holding pad.


Photo: Svenja Neumann

Important:

- Before deployment, GPS and GSM settings should be changed to the **recommended species-specific settings** as the pre-programmed test-settings are rather intense and will drain battery power.
- Information on how to adjust the GPS and GSM settings is provided on the following pages.

Transmitter settings: background

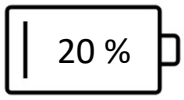


- Under optimal GPS conditions and a GSM schedule of one data upload per day, a fully charged OrniTrack-10 or OrniTrack-15 can record ca. 800 GPS positions.
- Connection to the GSM network and data upload is energetically expensive.
- Therefore, the GSM module is turned off most of the time and activated only at predefined intervals, when it searches for a network, connects, receives pending new settings and uploads the collected data.
- If no network is available, the GSM module switches off after a timeout until the next scheduled connection attempt.
- Battery consumption of a single GSM session is equal to logging approximately 25 GPS positions, depending on GSM signal strength and the amount of data uploaded.

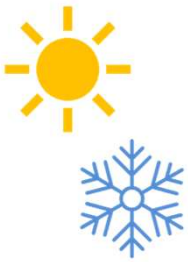
Transmitter settings: background

To prevent excessive battery discharge, GPS position logging is discontinued when the battery is depleted.

However, the battery retains a certain energy reserve, used for data transmission and basic functioning of the device until it is recharged by the solar panel.



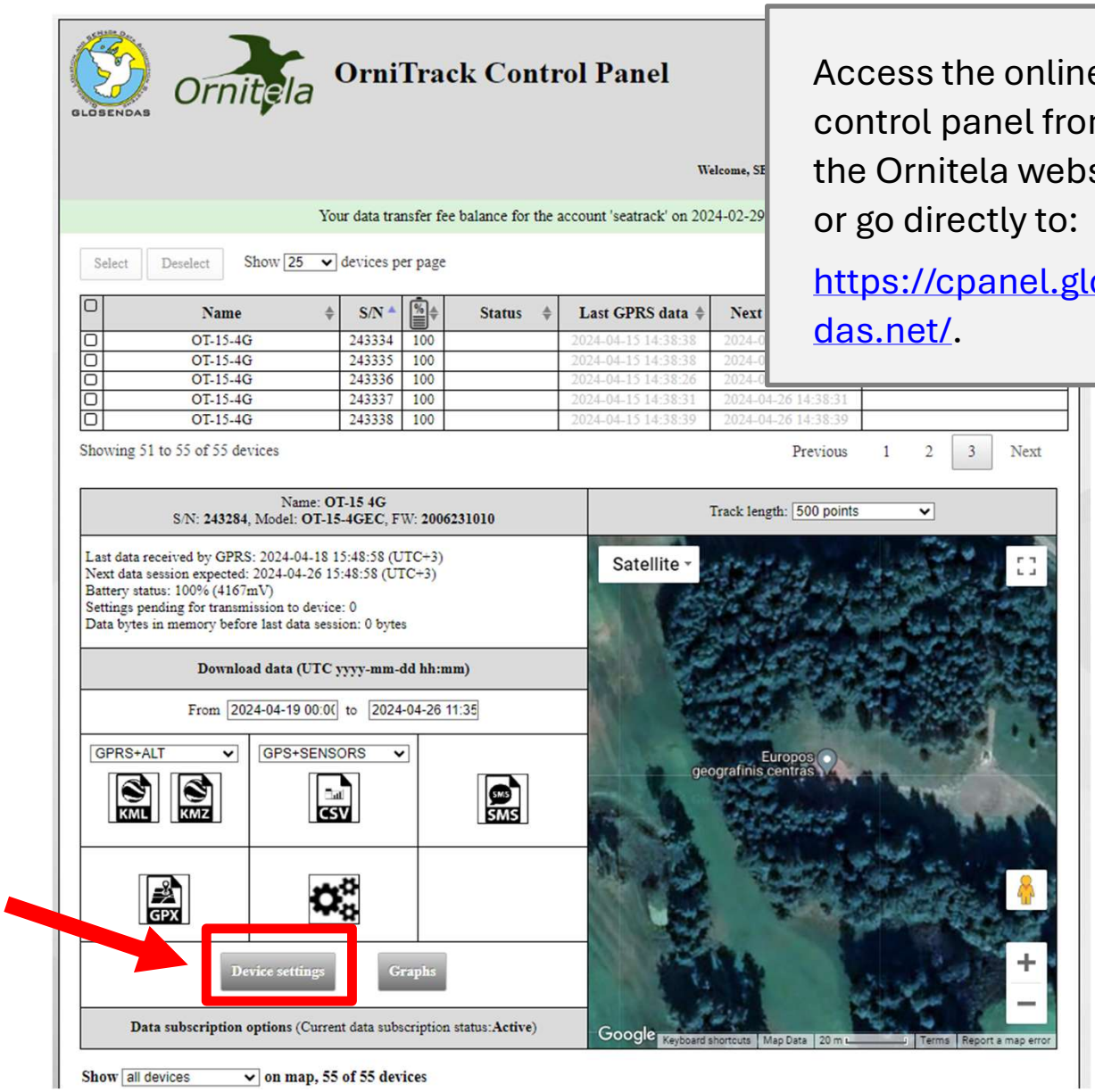
It is recommended to always maintain battery charge above 20%. This is done by managing device settings considering light conditions (e.g. polar night) and GSM coverage (e.g. poor GSM coverage far out at sea).



Different settings are needed in summer and winter for migrating birds.

Transmitter settings: device settings

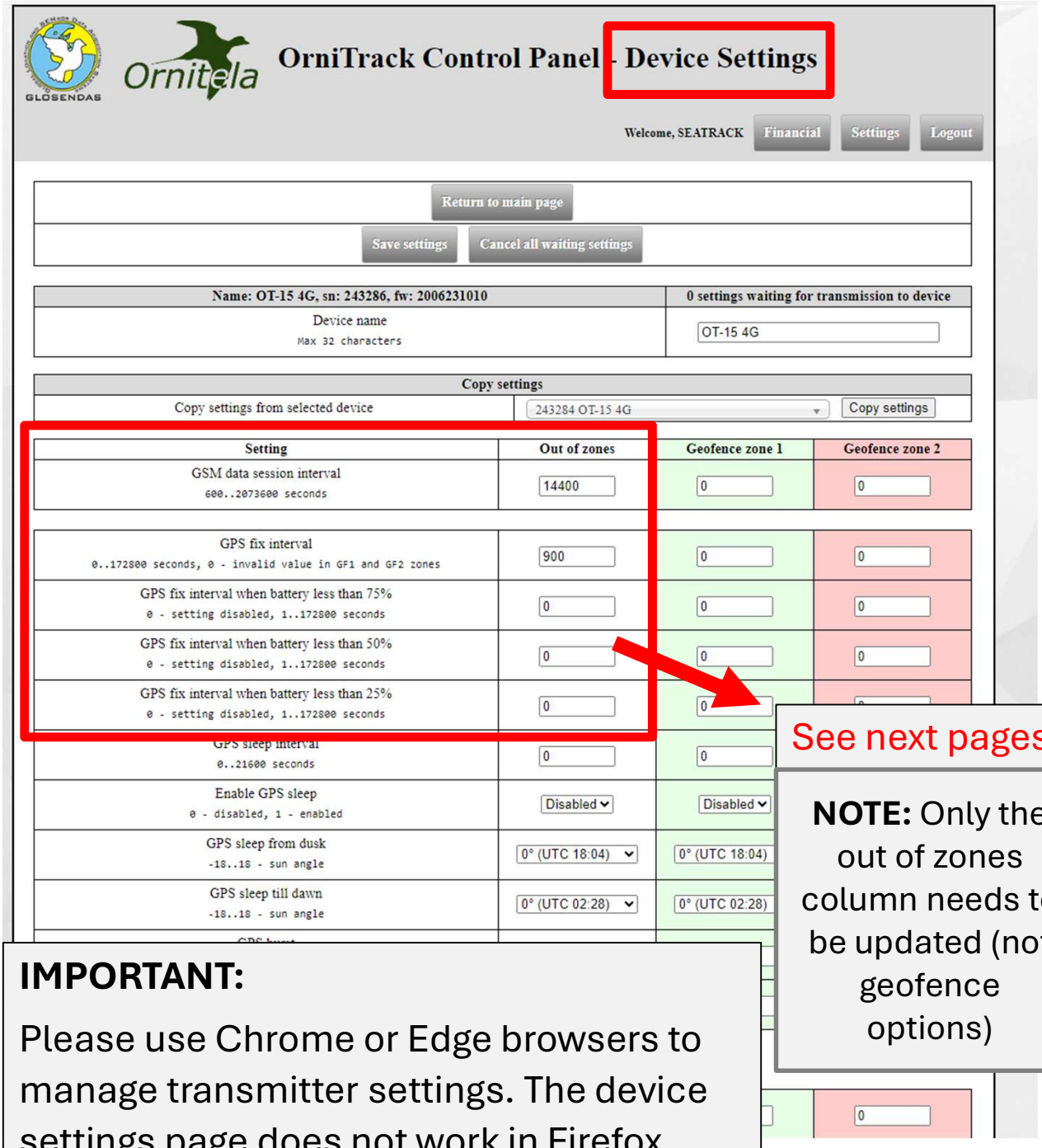
Based on previous experience and advice from Ornitela we recommend species-specific minimum settings. These settings can be entered in the **device settings page**, which is accessed by clicking the ‘Device settings’ button on the main page of the online control panel.



Access the online control panel from the Ornitela website or go directly to: https://cpanel.glosendas.net/.

Transmitter settings: device settings

On the following pages you will find the species-specific transmitter settings that SEATRACK recommends.



See next pages

NOTE: Only the out of zones column needs to be updated (not geofence options)

IMPORTANT:

Please use Chrome or Edge browsers to manage transmitter settings. The device settings page does not work in Firefox.

Transmitter settings: seasonal changes

Seasonal changes in device settings:

- Due to varying light conditions, most species need different summer and winter settings.
- Seasonal settings must be set manually by changing values in the online control panel (Please see species-specific settings on the next pages).

Winter

Summer

! IMPORTANT: We will change devices to winter settings (and back to summer settings) on the given dates. !

Transmitter settings: start with summer settings

Before deployment, please program your devices with summer settings.

Setting	Out of zones
GSM data session interval 600..2073600 seconds	604800
GPS fix interval 0..172800 seconds, 0 - invalid value in GF1 and GF2 zones	43200
GPS fix interval when battery less than 75% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 50% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 25% 0 - setting disabled, 1..172800 seconds	0

- Note that it is not necessary to repeat a value if the GPS interval remains the same for different battery charge levels. A value of zero means that GPS logging interval remains unchanged. This way there are fewer settings to send to a transmitter when it connects to the GSM network, which gives less room for error.
- After entering the settings in the online control panel and before going into the field, make sure that the transmitter has **accepted the new settings**. This is done by turning the device on and off using the magnetic pad.

Lesser black-backed gull

IMPORTANT: We will change your devices to winter settings (and back to summer settings).

SUMMER : 1 March – 30 August

Setting	Out of zones
GSM data session interval 600..2073600 seconds	21600
GPS fix interval 0..172800 seconds, 0 - invalid value in GF1 and GF2 zones	900
GPS fix interval when battery less than 75% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 50% 0 - setting disabled, 1..172800 seconds	7200
GPS fix interval when battery less than 25% 0 - setting disabled, 1..172800 seconds	14400

WINTER: 1 September – 28 February

Setting	Out of zones
GSM data session interval 600..2073600 seconds	86400
GPS fix interval 0..172800 seconds, 0 - invalid value in GF1 and GF2 zones	900
GPS fix interval when battery less than 75% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 50% 0 - setting disabled, 1..172800 seconds	7200
GPS fix interval when battery less than 25% 0 - setting disabled, 1..172800 seconds	14400

Herring gull

IMPORTANT: We will change your devices to winter settings (and back to summer settings).

SUMMER: 1 March – 30 August

Setting	Out of zones
GSM data session interval 600..2073600 seconds	86400
GPS fix interval 0..172800 seconds, 0 - invalid value in GF1 and GF2 zones	900
GPS fix interval when battery less than 75% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 50% 0 - setting disabled, 1..172800 seconds	7200
GPS fix interval when battery less than 25% 0 - setting disabled, 1..172800 seconds	14400

WINTER: 1 September – 28 February

Setting	Out of zones
GSM data session interval 600..2073600 seconds	604800
GPS fix interval 0..172800 seconds, 0 - invalid value in GF1 and GF2 zones	14400
GPS fix interval when battery less than 75% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 50% 0 - setting disabled, 1..172800 seconds	43200
GPS fix interval when battery less than 25% 0 - setting disabled, 1..172800 seconds	0

Glaucous gull

IMPORTANT: We will change your devices to winter settings (and back to summer settings).

SUMMER : 1 March – 14 August

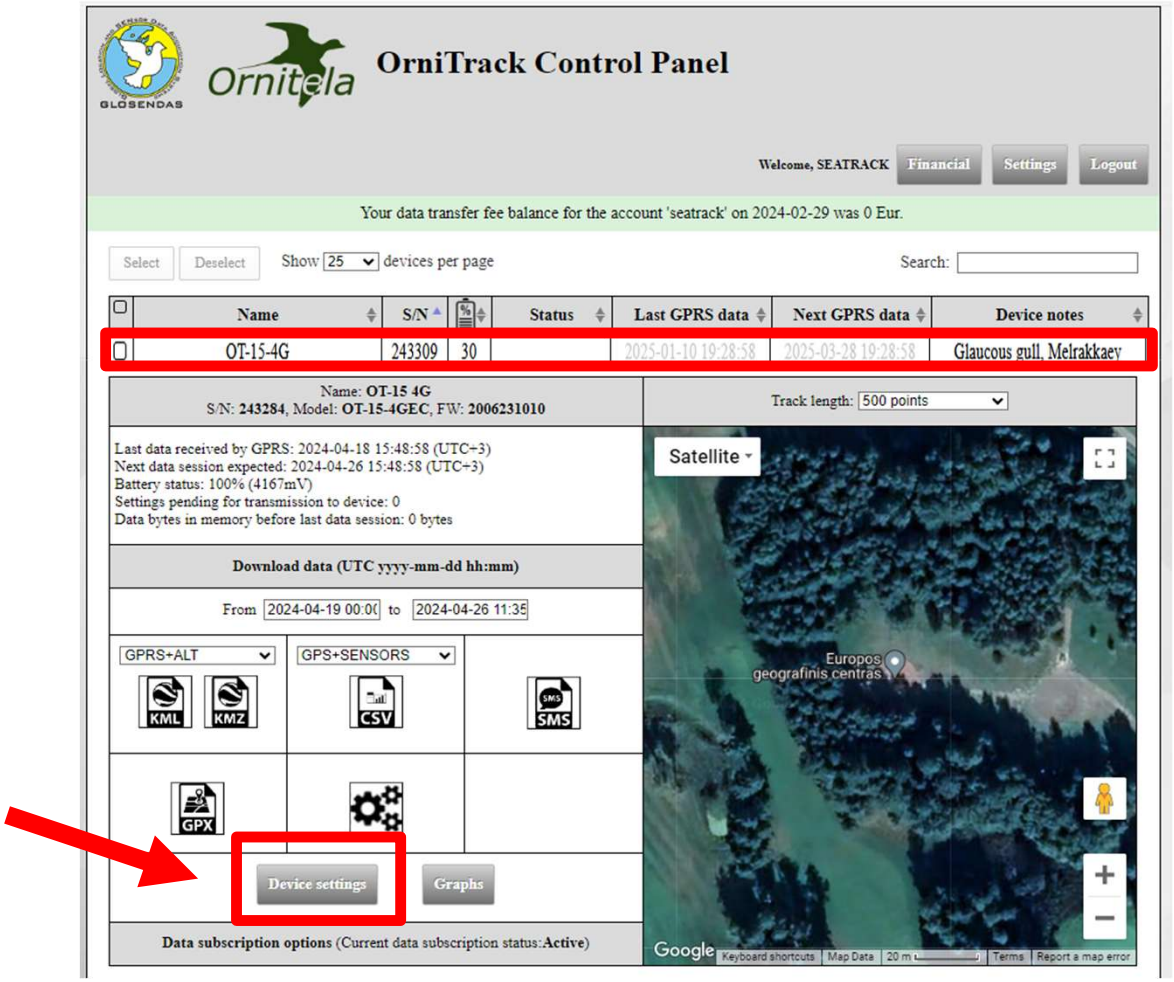
Setting	Out of zones
GSM data session interval 600..2073600 seconds	86400
GPS fix interval 0..172800 seconds, 0 - invalid value in GF1 and GF2 zones	900
GPS fix interval when battery less than 75% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 50% 0 - setting disabled, 1..172800 seconds	7200
GPS fix interval when battery less than 25% 0 - setting disabled, 1..172800 seconds	14400

WINTER: 15 August – 28 February

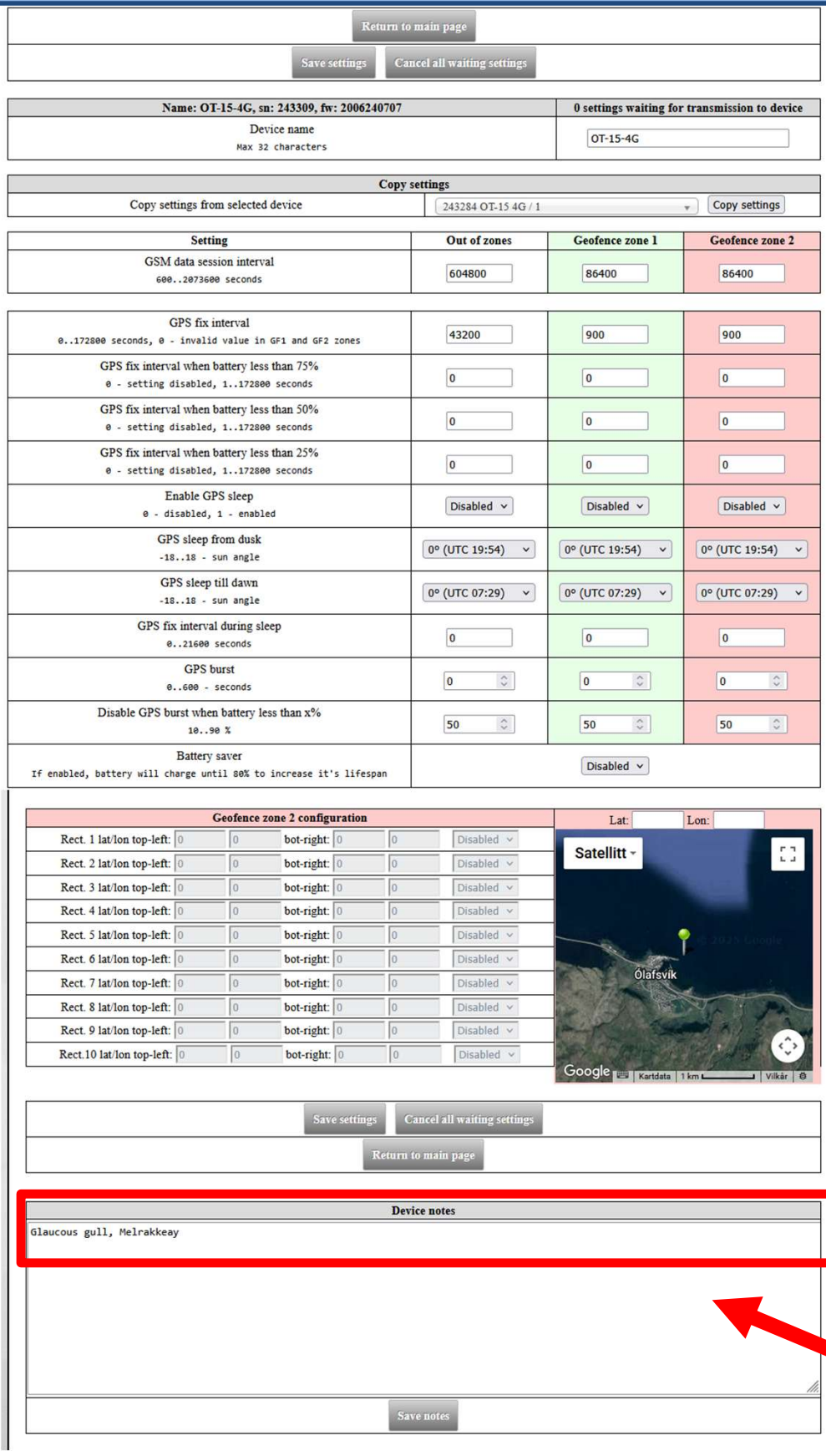
Setting	Out of zones
GSM data session interval 600..2073600 seconds	604800
GPS fix interval 0..172800 seconds, 0 - invalid value in GF1 and GF2 zones	43200
GPS fix interval when battery less than 75% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 50% 0 - setting disabled, 1..172800 seconds	0
GPS fix interval when battery less than 25% 0 - setting disabled, 1..172800 seconds	0

Important notes on transmitter settings

- SEATRACK partners have their individual user accounts, while the project group can see all devices via a master account. The master account is used to change device settings from summer to winter settings (and vice versa). To make this easier, **please add species and deployment site in the device notes on the OrniTrack Control Panel.**



Important notes on transmitter settings



Please add here:

- **Species**
- **Deployment site**

Important notes on transmitter settings

- SEATRACK partners are free to adapt the summer settings to their own interests as long as the **minimum summer settings** are taken care of.
- We don't recommend logging GPS positions in bursts or logging sensor data at higher frequencies independently from GPS position fixing. This will fill up the transmitter memory fast and quickly drain battery power.

- **Please do not push the transmitters too hard towards the end of summer.**
- It is important that the battery is well charged at the start of winter, especially for species wintering in areas with limited solar recharge.

Please get in touch with Svenja Neumann if you wish to discuss device settings (Svenja.neumann@npolar.no).

Deploying GPS-GSM transmitters

IMPORTANT:

- SEATRACK partners should ensure that device attachment is safe and secure without harmful effects on the birds.
- SEATRACK partners are encouraged to seek advice from each other concerning attachment techniques.
- **Transmitters should be fully charged prior to their deployment on birds.**


Photo: Mads Bjarke Salling

For more information on harness technique see the papers below or consult individual SEATRACK partners.

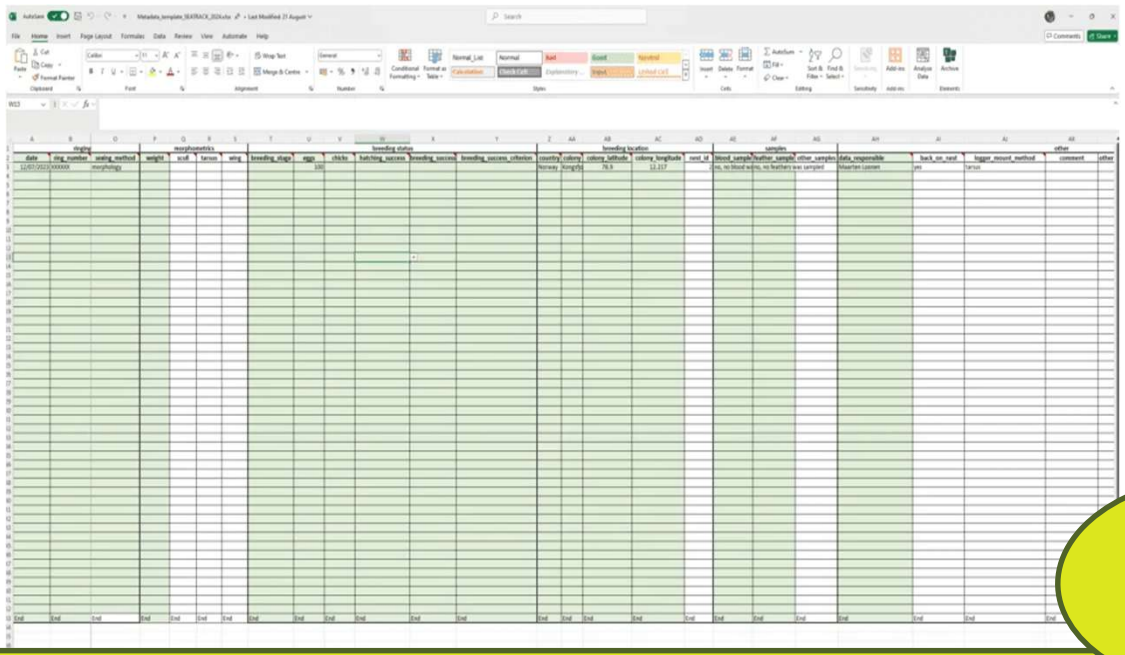
Thaxter, C. B., Ross-Smith, V. H., Clark, J. A., Clark, N. A., Conway, G. J., Marsh, M., Leat, E. H. and Burton, N. H. K. (2014). A trial of three harness attachment methods and their suitability for long-term use on lesser black-backed gulls and great skuas. Ringing & Migration 29: 65–76. Doi: 10.1080/03078698.2014.995546.

Clewley, G. D., Clark, N. A., Thaxter, C. B., Green, R. M., Scragg, E. S and Burton, N. H. K. (2021). Development of a weak-link wing harness for use on large gulls (*Laridae*): methodology, evaluation and recommendations. Seabird 33: 17-22.

Field notes and Metadata

Please bear in mind that one of the key aspects to success of a large-scale operation such as SEATRACK is standardized procedures. That is especially true when it comes to filling in the metadata-sheet.

Reminder: Please fill in the metadata sheet in the same way as for the other devices, i.e., GLS and GPS.



NEW!!!

Important notes on filling in the metadata:

- For changes in the 2026 metadata sheet, see the last pages of the GLS field protocol under “field notes and metadata”.
- Please indicate in the metadata sheet if GPS-GSM devices are taken off and re-deployed on a different individual.
- Thank you for returning the metadata sheet ASAP after the end of the field season !!!