

Examples of what this documents describes:

- How BoatLogger creates logbook segments and logbooks
- Why sometimes one trip is divided on several segments
- How to tweak the settings of the automatic logbook segment creation
- How to merge segments if they belong to the same trip

1. Background

BoatLogger is unique in that the data send to BoatLogger can be coming from any source. That includes apps, instruments on board, offline GPS loggers, GSM trackers, special loggers, Satellite loggers, manual input and many more.

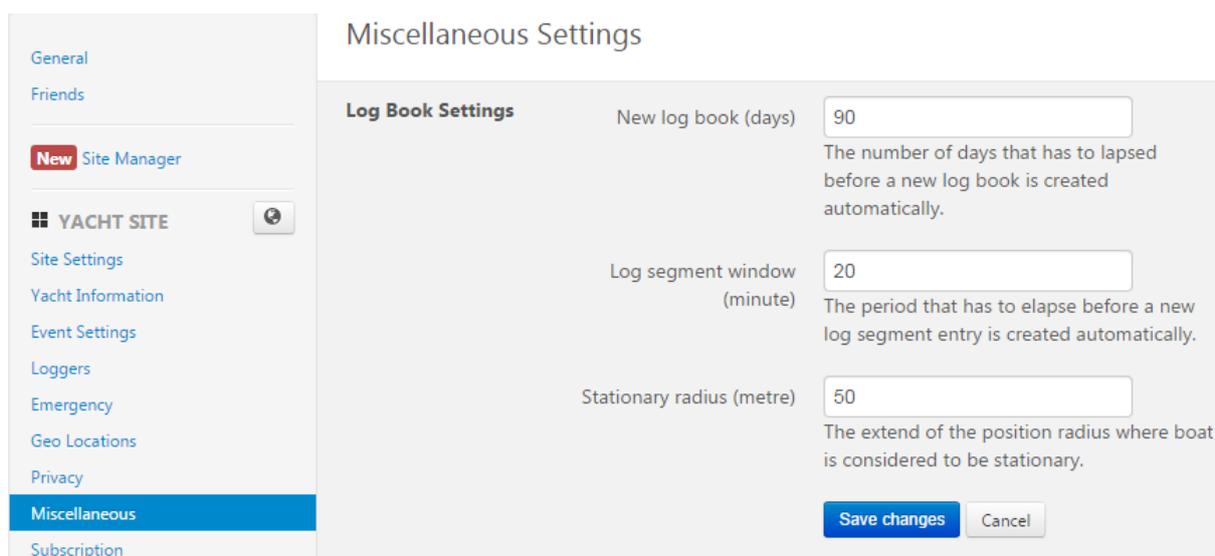
If we would simplify things and just accept positions from user controlled sources such as apps the situation would be very easy as the user himself could say that “Now I start a new trip” and “Now my trip is over”. We do however see that many users want much more than this and many want the logbooks to be recorded without any user input, day after day, week after week and year after year.

Some of these data and position sources are logging positions without any user input and do it 24/7 whether the boat is moving or not. BoatLogger has algorithms to make sense of those positions that are coming in and is dividing the incoming data into logbooks, and logbook segments (trips).

2. Algorithm

When positions are parsed by BoatLogger servers, BoatLogger decides whether the boat is stationary or not. If the boat has started moving and no ongoing logbook segment exists, BoatLogger starts a new logbook segment. Positions are constantly logged and when the boat becomes stationary, BoatLogger closes the segment which indicates that the trip is over.

The site owner himself can control how the algorithm behaves by going to his settings at <http://www.boatlogger.com/YachtOwnerSettings?section=logbook> which looks as:



The screenshot shows the 'Miscellaneous Settings' page for BoatLogger. On the left is a navigation menu with options: General, Friends, New Site Manager, YACHT SITE (with a refresh icon), Site Settings, Yacht Information, Event Settings, Loggers, Emergency, Geo Locations, Privacy, Miscellaneous (highlighted in blue), and Subscription. The main content area is titled 'Miscellaneous Settings' and contains the 'Log Book Settings' section. This section has three settings, each with a text input field and a descriptive text below it:

Setting Name	Value	Description
New log book (days)	90	The number of days that has to lapsed before a new log book is created automatically.
Log segment window (minute)	20	The period that has to elapse before a new log segment entry is created automatically.
Stationary radius (metre)	50	The extend of the position radius where boat is considered to be stationary.

At the bottom right of the settings area are two buttons: 'Save changes' (in blue) and 'Cancel' (in grey).

Hence, with the settings as per the above picture, if the boat is stationary for more than 90 days, a new logbook is created next time the boat starts moving.

Furthermore, with the above settings, a boat is considered stationary if it does not move outside a circle with 50m radius during a period of 20 minutes. Hence, a boat that starts in the morning and

makes a lunch stop for an hour and then continue again will have that day's trip recorded as 2 segments.

We would recommend that someone who often uses long anchor chains when swinging at anchor should increase their "Stationary radius (meter)" setting to avoid having new segments created just because the boat swings around the anchor.

3. Real world situations

In an ideal world, data would constantly come in to the server without errors and without interruptions in the data stream. They would also come in in the order they were recorded. This does not happen in a real world for several reasons. Among those reasons are:

- Internet connections are not always available. Hence, data is logged on board at one time, but send much later
- Transmission errors occur
- Some loggers are not "always connected", but require a manual step of uploading data once ashore.

Hence, data could arrive to BoatLogger servers immediately, but also days or weeks later. It could also be that some data comes in fast and other takes longer time and hence it arrives out of order.

BoatLogger deals with this by buffering all data until it is needed. Hence, if no one is watching the webpage or accessing it through the api, the data is just stored on our servers. As soon as someone want to access the data, the algorithm is started and all data recorded is parsed. If we are "unlucky" someone is requesting to view this data, but all data has not arrived to the server. This could make the algorithm behave differently from what it would have done if all data had already arrived.

Say that someone requests the data, but not all data has yet arrived. The algorithm might detect this as a gap in the trip longer than the "Log segment window (minute)" and therefore closes the ongoing log segment. When new data then comes in a new log segment is then created and a trip that should be in one segment now appears in two segments.

4. Prevention

To make the algorithm less susceptible to late data, the "Log segment window (minute)" setting could be increased. A setting that still creates a trip per day (when stopping overnight) could be about 480 minutes (8 hours).

5. Fix, when one trip appears in several segments

Fortunately it is very easy to merge several segments into one logbook segment. From the logbook overview, just mark the segments that you want to merge. Then select "Edit" from one of the segments and choose "Merge Selected Segments" as per the attached picture.

