# NavView User Guide – 16 USBL Boxin and Calibration

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# 16. USBL BOXIN AND CALIBRATION

## 16.1 OVERVIEW

Depending on the version and modules present, NavView supports ultrashort baseline (USBL) and long baseline (LBL) acoustic systems to varying extents. This includes standard USBL positioning and USBL calibrations. This section details managing the beacons and executing USBL calibrations in NavView.

## 16.2 USBL CALIBRATION

USBL calibrations determine the error in the mounting of the USBL transducer relative to the vessel's local coordinate reference frame. The results are correction values for pitch, roll and heading with an option for scaling that are applied to USBL observations before they are used.

Calibrations are often carried out in the USBL system directly and the results applied in the same. With this approach all systems using the USBL system, e.g. DP and survey systems, benefit from the application of the calibration corrections at the source. However, there are instances where this is not feasible or desirable and an alternative is required. NavView provides an alternative with its USBL Calibration feature. This feature can also be used to load and process USBL calibration data collected with WinFrog and HiPAP systems.

The USBL calibration process involves the following operations.

1. Create an Active calibration and planning the calibration data collection with the Add USBL Cal wizard. See section 16.2.3
2. Review/Edit data collection setup. See section 16.2.4
3. Data collection. See section 16.2.5
4. Finalize the Active calibration so it can be processed. See section 16.2.6
5. Process to solve for the Boxin and USBL Calibration values. See section 16.2.7

If Roles and Privileges are enabled, the following are what is allowed for each role:

| Roles | Privileges |
|---|---|
| Not Logged In/User | Cannot add or remove a calibration, can process completed calibration |
| Online/Supervisor/Administrator | Can add or remove a calibration, can process completed calibration |

### 16.2.1 ACCESSING THE USBL CALIBRATION FEATURE

The USBL Calibration feature is part of the Database Services. Configure these as per the Database Services section in the User Guide ensuring that that the USBL Calibration service is enabled (Enabled check box is checked) and active (Loaded icon is green) as shown in Figure 16-1.

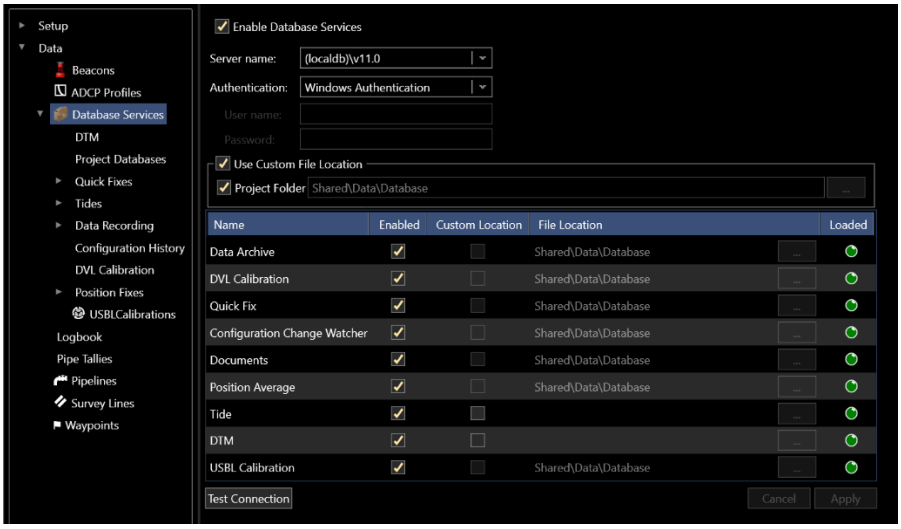



FIGURE 16-1 DATABASE SERVICES - USBL CALIBRATIONS ENABLED

The USBL Calibration feature is accessed from the Explorer view by selecting the USBL Calibration under the Database Services item (see Figure 16-2).

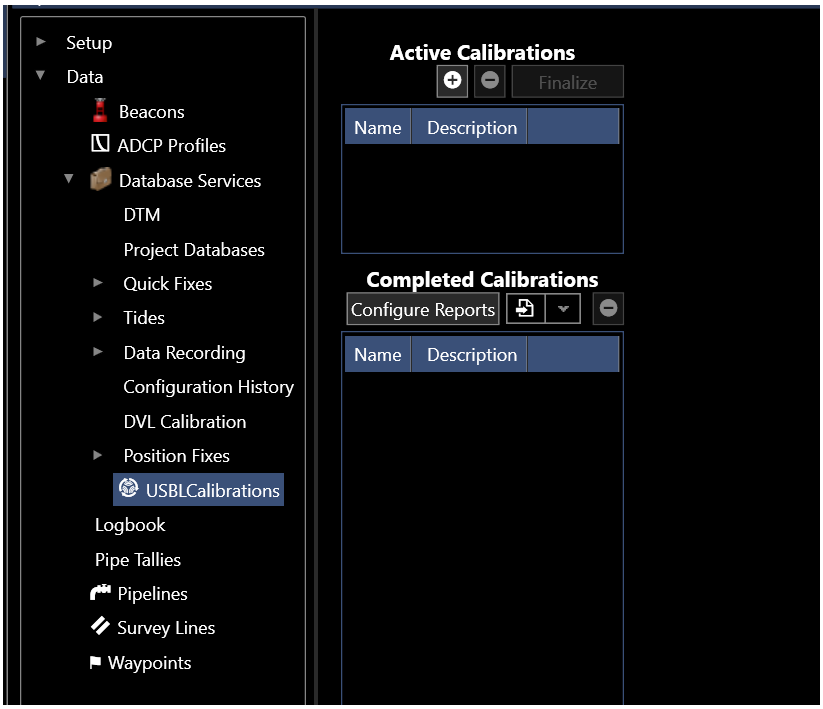



FIGURE 16-2 DATABASE SERVICES - USBL CALIBRATION FEATURE

### 16.2.2 USBL CALIBRATION STATES: ACTIVE & COMPLETED

Active Calibration is one that the data collection has not been completed. While in this state, the data collection settings can be edited and data can be collected but it cannot be processed to determine the USBL calibration values. Once the data collection is complete, the calibration is Finalized and set to Completed. In this state, the calibration can be processed.

### 16.2.3 USBL DATA COLLECTION PLANNING

NavView uses a wizard to step the user through the planning stages to create an Active Calibration.

1. Access the **USBL Calibration** feature in the Explorer view.
2. In the **Active Calibration** section (see Figure 16-2) click the ⊕ button to launch the Add USBL Cal wizard.
3. **USBL Calibration Properties** page (see Figure 16-3)

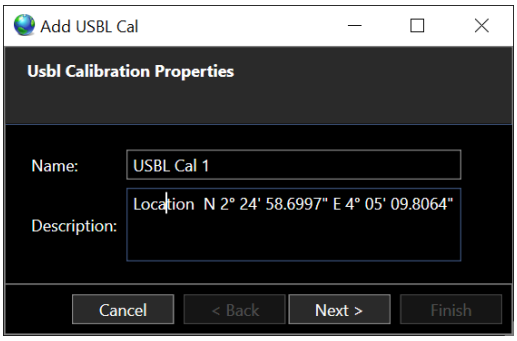



FIGURE 16-3 USBL CALIBRATION PLANNING WIZARD - CALIBRATION PROPERTIES

- **Name:** Enter a name for the calibration, recommend a brief name but providing sufficient information to identify the calibration, e.g. USBL Cal 1
- **Description:** Enter a description of the calibration, e.g. calibration location (optional)

4. Click **Next**
5. **Plan Beacon References** page.
    I. Select the beacon from the dropdown menu that will be used for the box in and click the ⊕ button

**Note:** The beacon being used in the calibration must be added to Beacons, see section on Configure Beacons.

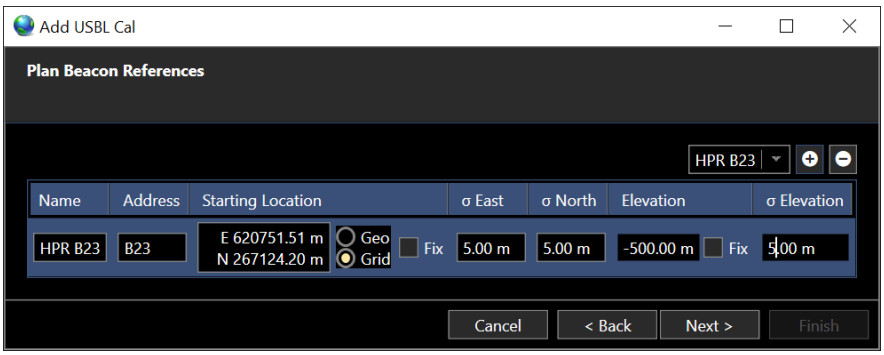



FIGURE 16-4 USBL CALIBRATION PLANNING WIZARD - BEACON REFERENCES

- **Name:** Name of the beacon in the software (from Configure Beacons window)
- **Address:** Channel of the beacon in the system (from the Configure Beacons window)

- **Starting Location:** Enter the installed position of the beacon (Position average of beacon location if taken). If the **Fix** checkbox is checked, the position entered will be held and not adjusted during calibration
- **σ East:** Accuracies of USBL system on board vessel. If the box in is being performed in 500m of water depth and the accuracy of the USBL system is 1% of water depth, enter 5m here
- **σ North:** Accuracies of USBL system on board vessel. If the box in is being performed in 500m of water depth and the accuracy of the USBL system is 1% of water depth, enter 5m here
- **Elevation:** Elevation of the installed beacon. If the **Fix** box is checked, the elevation value entered will be held and not adjusted during calibration
- **σ Elevation:** Accuracies of USBL system on board vessel. If the box in is being performed in 500m of water depth and the accuracy of the USBL system is 1% of water depth, enter 5m here

6. Click **Next**
7. **Plan USBL Calibration** Data Collection page.

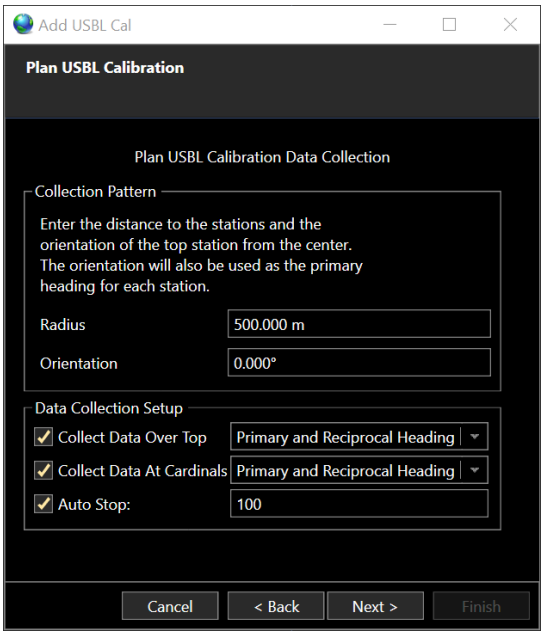



FIGURE 16-5 USBL CALIBRATION PLANNING WIZARD – COLLECTION PATTERN

- **Collection Pattern:**
  - **Radius:** Enter the radius of the circle about the calibration beacon the data collection points will be located on
  - **Orientation:** Enter the orientation angle (azimuth) to base the data collection pattern on, this will be the primary vessel heading at each collection point and used to calculate the **Top** collection point relative to the calibration beacon

- **Data Collection Setup:**
  - **Collect Data Over Top:** If data is to be collected directly over the calibration beacon check this box and select the heading option:
    a. **Primary and Reciprocal Heading**: Data collected with vessel on primary heading (pattern orientation) and 180° from this heading
    b. **Primary Heading only**: Data collected with vessel on primary heading (pattern orientation) only
    c. **Four Quadrant Headings:** Data collection with vessel on the primary heading (pattern orientation) and primary heading plus 90°, 180° and 270°
  - **Collect Data at Cardinals:** Check if data is to be collected at the cardinal points, i.e. the four data collection points generated from the calibration beacon, the radius and the orientation, orientation + 90°, orientation + 180° and orientation + 270° and select the heading option (see above)
  - **Auto Stop:** Check if the data collection at each location is to stop automatically after a specified number of USBL epochs are collected and enter the number to collect

8. Click **Next**
9. **USBL Calibration Data Sources** page.

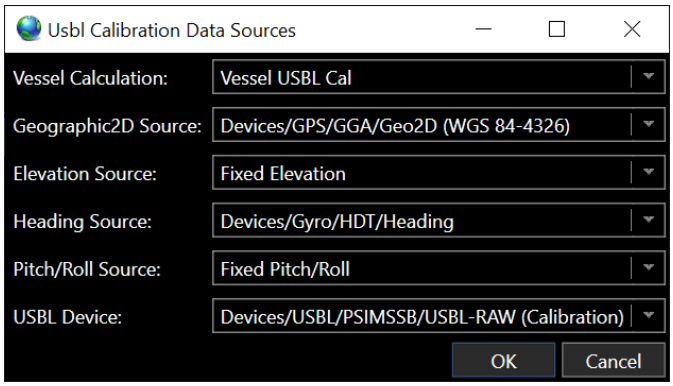



FIGURE 16-6 USBL CALIBRATION PLANNING WIZARD - DATA SOURCES

- **Vessel Calculation:** Select the vehicle calculation assigned to the vessel that will be performing the box in. This will auto populate all the primary data sources assigned to the vessel: Position, Elevation, Heading and Pitch/Roll
- **USBL Device:** Select the USBL-Raw observation data source from the available USBL devices listed in the drop down list

**Note:** All data source fields and USBL device must have a valid data source selected. This includes the Pitch/Roll Source. If the respective Calculation does not have a suitable Pitch/Roll device source available, it must be set to Other > Fixed.

**Note:** The USBL system must be outputting bow referenced Cartesian XYZ data in order for the data to be valid and available for use in a USBL Calibration.

10. Click **Finish**.

The USBL calibration plan setup is now added to the list of Active Calibrations and displayed in the right panel and is ready for review and data collection.

### 16.2.4 EDIT AN ACTIVE CALIBRATION'S SETTINGS

Any active USBL calibration setup can be reviewed and edited, including one just completed with the USBL Planning wizard. This can be done prior to and during the data collection.

1. Access the **USBL Calibration** feature in the Explorer view.
2. In the **Active Calibration** section (see Figure 16-2) select the calibration to edit.
3. Review and edit as required.

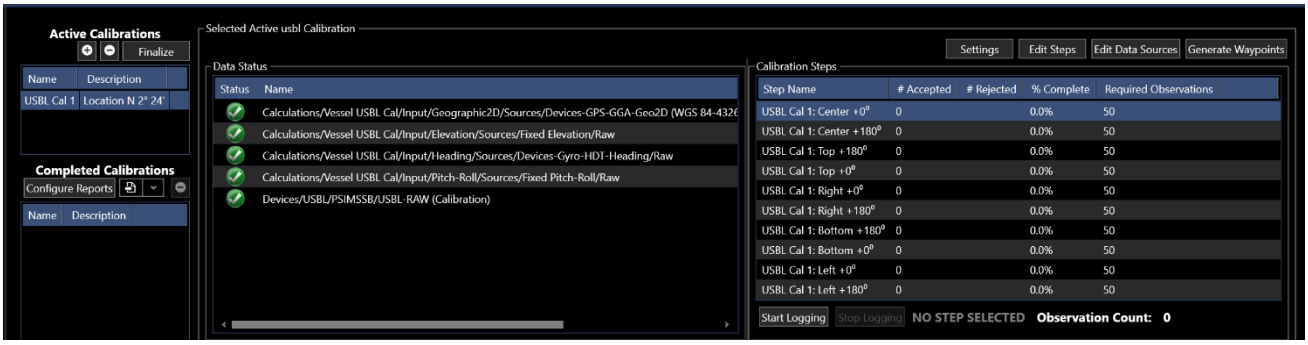



FIGURE 16-7 ACTIVE USBL CALIBRATION

II. **Data Status:** The status of the data sources is indicated by the LED, a  indicates the data source is valid and providing data, a  indicates the data source is either invalid or not receiving data and must be investigated, all must be  before data collection can be executed

III. **Settings:** Click to open USBL Calibration Control Settings dialog

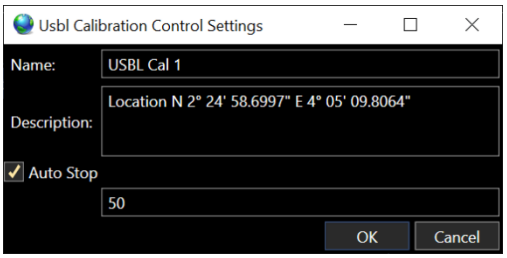



FIGURE 16-8 USBL CALIBRATION CONTROL SETTINGS DIALOG

- **Name:** Edit as desired
- **Description:** Edit as desired
- **Auto Stop:** Edit as desired

**Note:** If **Auto Stop** is enabled and data has been collected for a step but must be recollected, the Auto Stop must either be disabled and the starting and stopping to recollect at this step be done manually; or the number of observations to collect increased accordingly and the data collection started again. The Auto Stop can then be reconfigured before proceeding with the data collection at subsequent steps.

IV. Click **OK** to accept changes

V. **Edit Steps** (If required)

- **Plan Beacon References:** Edit as required (see step 5 in **Error! Reference source not found.**)
- Click **Next**
- **Plan USBL Calibration Data Collection:** Review and edit as required (see step 7 in **Error! Reference source not found.**)
- Click **Finish**

VI. Edit Data Sources (If required)

- **USBL Calibration Data Sources:** Edit as required (see step 9 in **Error! Reference source not found.**)
- Click **OK** to accept changes

VII. **Generate Waypoints:** Click to generate waypoints at the location of the data collection points

- Review/Edit **Center Point** position, this being the calibration beacon initial position, see Figure 16-9

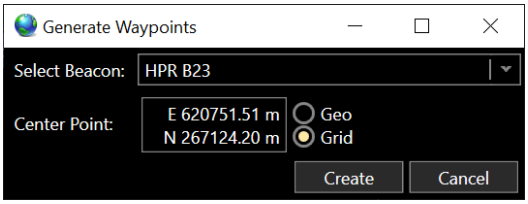



FIGURE 16-9 GENERATE WAYPOINTS

- Click **Create** to generate the waypoints, these will be displayed on map view see Figure 16-10. These are then available to assist navigating between locations to optimize transiting. The waypoints are added to the waypoint manager which then can be edited. See Waypoints section in this User Guide

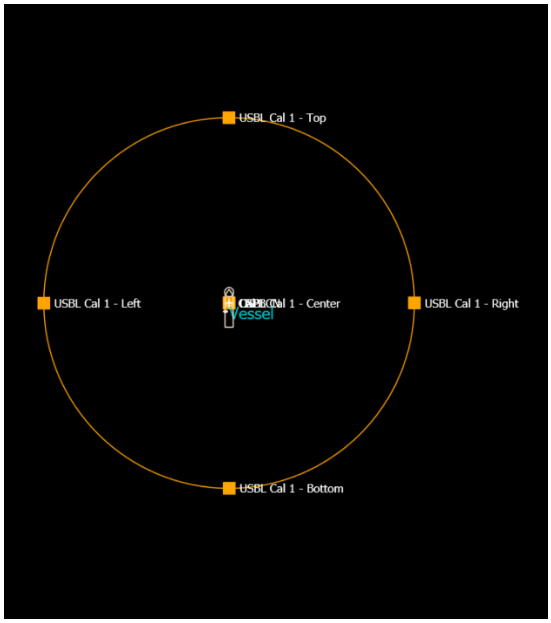



FIGURE 16-10 CALIBRATION STEPS - MAP VIEW

4. **Calibration Steps:** The calibration data collection steps are listed in the data grid and are updated as data is collected.

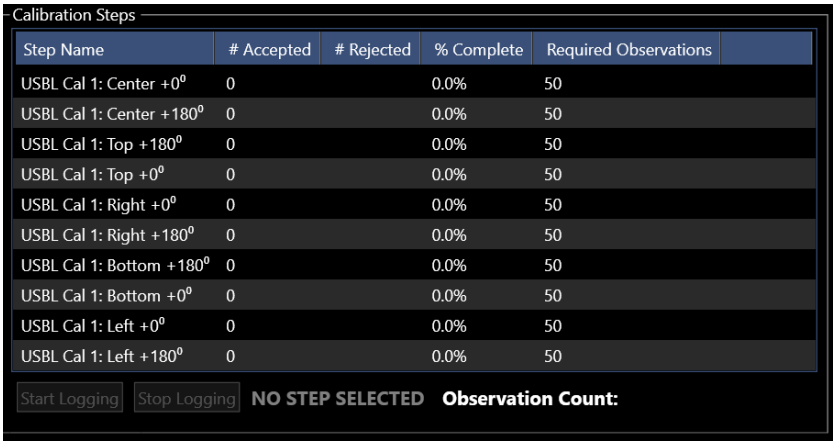



FIGURE 16-11 CALIBRATION STEPS – DATA COLLECTION

- **Step Name:** Name of the step assigned by the wizard
- **# Accepted:** Number of data epochs collected accepted
- **# Rejected:** Number of data epochs collected rejected
- **% Complete:** Percentage of Required Observations collected
- **Required Observations:** Total number of observations to collect

### 16.2.5 USBL CALIBRATION DATA COLLECTION

Data can be collected for any Active Calibration, whether one just created or one where the data collection has previously been started. The following details the collection process for one for which the data collection has not yet started.

During the data collection process, the data can be monitored graphically in time series, histogram views and in map views.

1. Access the **USBL Calibration** feature in Explorer view.
2. In the **Active Calibrations** section (see Figure 16-2) select the calibration for data collection.
3. To start logging data, in **Calibration Steps**.
    I. Select the **Calibration Step** to log data for (it is recommended that the steps be executed in the order they are listed because these have been ordered to minimize transit times, but it is not mandatory)
    II. Click the **Start Logging** button

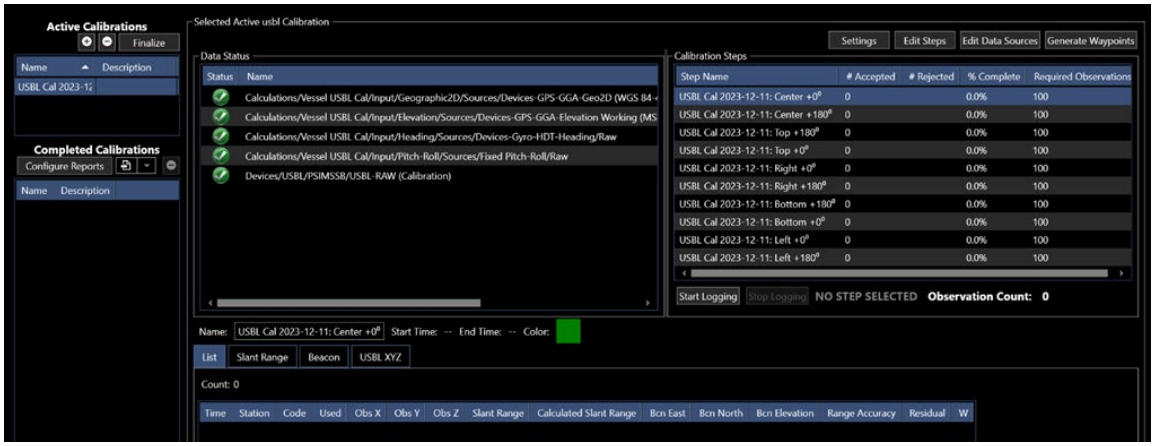



FIGURE 16-12 ACTIVE CALIBRATION - DATA COLLECTION DIALOG

a. The **Start Logging** button will be disabled and the **Stop Logging** button will be enabled (see Figure 16-13)

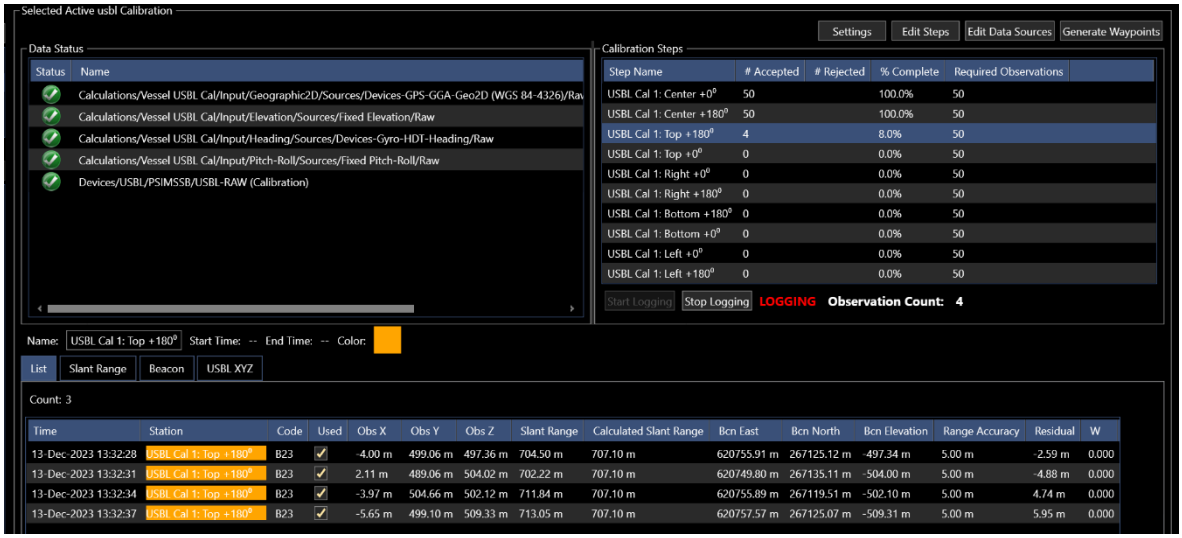



FIGURE 16-13 ACTIVE CALIBRATION - DATA LOGGING

b. The status will change from **NOT LOGGING** to **LOGGING**
c. The **Observation Count** will increment as observation epochs are collected
d. The **Calibration Steps** data grid will become inactive preventing changes to the selected step being made while data is logged
e. The data grid columns # Accepted and % Completed will update with each observation epoch collected
f. The data tabs (List, Slant Range, Beacon and USBL XYZ) at the bottom of the panel will populate with the collected data providing the means to monitor the data quality, see Figure 16-13
g. The calculated beacon position based on the selected data sources will plot in any open Map views in the color indicated in Figure 16-14

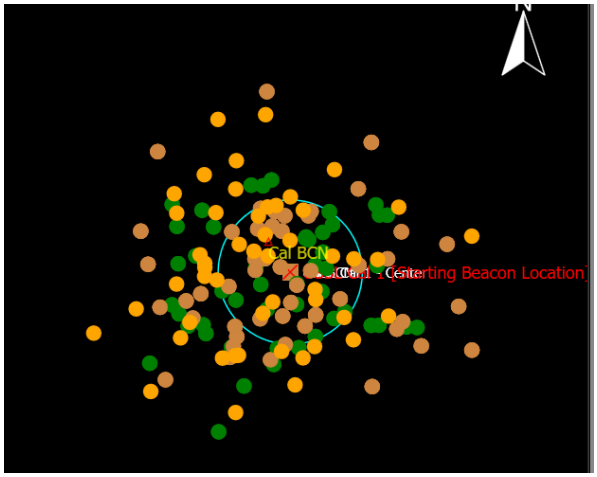
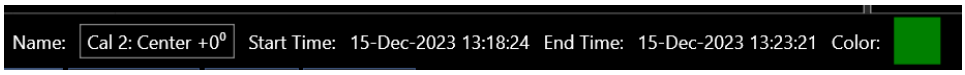



FIGURE 16-14 BEACON POSITIONS IN MAP WINDOW

4. To stop logging manually, in **Calibration Steps.**
    I. Regardless of the Auto Stop setting, data collection can be stopped/paused at any time by clicking the Stop Logging button
        - The **Stop Logging** button will be disabled and the **Start Logging** button will be enabled
        - The status will change from **LOGGING** to **NOT LOGGING**
        - The steps in the data grid will become active allowing changes to the selected step to be made
    II. To continue logging data at the same location, click the **Start Logging** button
    III. To collect data for the next step
    IV. Select the next step to log data for
    V. Wait for the vessel to complete required move/rotation
    VI. Click the **Start Logging** button
5. To stop logging based on **Auto Stop**, in Calibration Steps.
    I. When the specified number of observations has been collected, logging will automatically stop
        - The **Stop Logging** button will be disabled and the **Start Logging** button will be enabled
        - The status will change from **LOGGING** to **NOT LOGGING**
        - The steps in the data grid will become active allowing changes to the selected step to be made
6. To continue logging data at the same location
    I. Click the **Settings** button and either
    II. Disable the **Auto Stop** feature; or
    III. Increase the number of observations to collect
    IV. Click **OK**
    V. Click the **Start Logging** button

**Note:** After completing the data collection for this same point, do not forget to click the Settings button and reset the Auto Stop option accordingly before proceeding with the data collection at the next step.

7. To collect data for the next step.
    I. Select the next step to log data
    II. Wait for the vessel to complete required move/rotation
    III. Click the **Start Logging** button
8. To monitor and review data during collection
    I. Select the step, this can be a step already completed or the step that data is currently being collected
    II. If a step already completed is selected, the Start Time and End Time will be displayed




    III. Review the data using the tabs in the lower panel


### 16.2.6 FINALIZING AN ACTIVE CALIBRATION

Once the data collection for a calibration is completed and the data considered acceptable, it must be Finalized in order to proceed with the processing.

1. Access the **USBL Calibration** feature in Explorer view.
2. In the **Active Calibrations** section select the calibration to finalize.
3. Click the **Finalize** button in Active Calibrations section.
4. The selected calibration will be moved from the Active Calibrations list then added to the **Completed Calibrations** list where it can now be processed.

### 16.2.7 USBL CALIBRATION PROCESSING

A completed calibration can now be processed to solve for the Boxin position and USBL calibration values. The calibration values can then be applied in NavView for the respective USBL device. The following details the steps to follow to process the data.

1. Access the **USBL Calibration** feature in Database Services.


FIGURE 16-15 SELECTED USBL CALIBRATION

2. In the Completed Calibration section

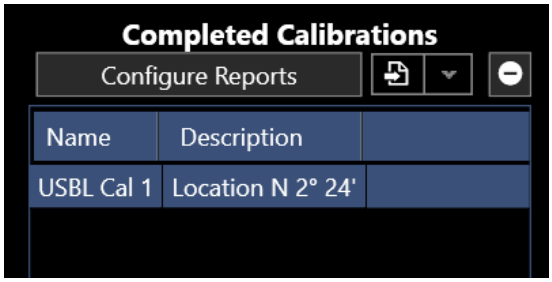



FIGURE 16-16 COMPLETED CALIBRATIONS SECTION

I. Select the Completed Calibration from the list to process or import data using import button. Supported formats are Hipap File, Winfrog File, User Defined or Load from DB

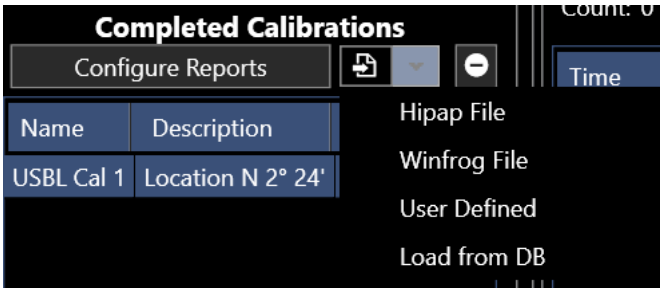



FIGURE 16-17 IMPORT DATA FILE

II. Click the **Load** button, see Figure 16-15. This will load the logged data set for the selected calibration

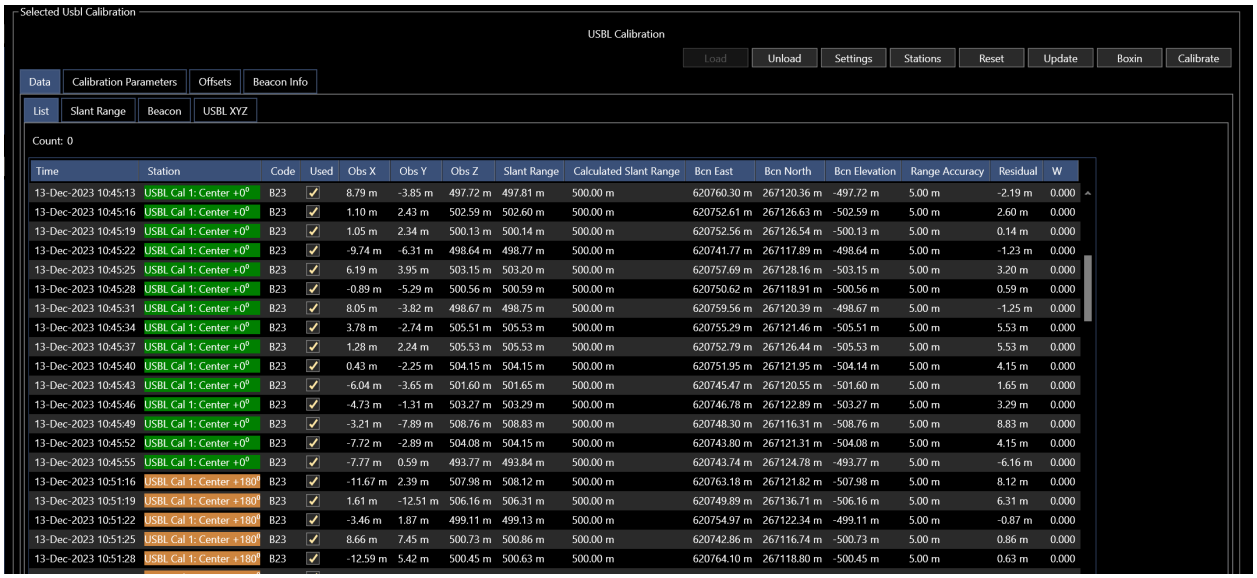



FIGURE 16-18 LOADED CALIBRATION DATA SET

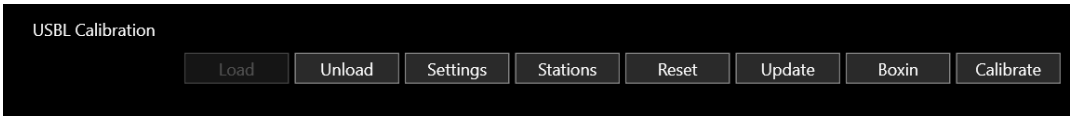



FIGURE 16-19 USBL CALIBRATION TOOLBAR


Click to load logged data set for selected calibration


Click to unload logged data set for selected calibration


Click to open Calibration Settings dialog to edit the Calibration name and/or description


Click to open Stations window which displays the logged steps. The name and color for each step can be edited also the data can be used or not used in the calibration by checking or unchecking the Used box at each step


Click to set calibration parameters to zero


Click to apply the current calibration parameters to the data and then updates the results on screen


Click to open the Boxin Setup dialog to run the boxin calculation


Click to run the calibration

#### 16.2.7.1 USBL CALIBRATION DATA VIEW

The Data view presents the data collected for a calibration for review and editing. This view is available for both Active and Completed calibrations. In the case of an Active calibration only the data for the selected step is displayed which can be edited even while the data is being collected. When viewing a Completed calibration, the Data view contains all recorded calibration data that can be viewed and edited.

**Note:** Collected data can be edited in the List view or graphically in Slant Range, Beacon and USBL XYZ tabs. Data can be edited out graphically by clicking on the individual epoch. Data edited out graphically will be reflected in the Data List tab.

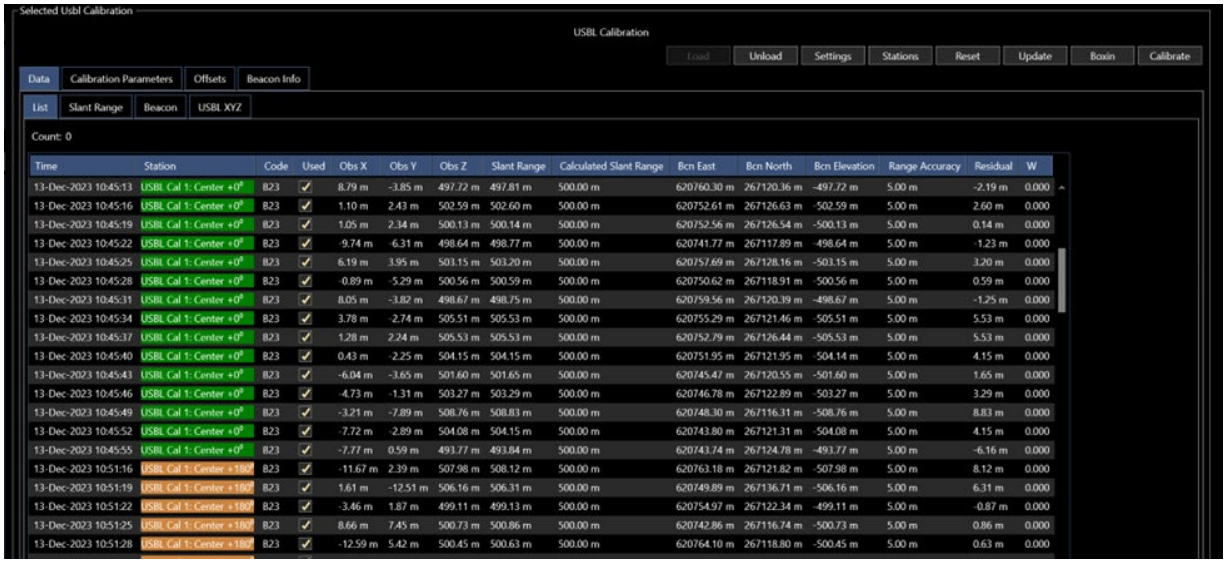



FIGURE 16-20 USBL CALIBRATION DATA VIEW - LIST TAB

#### 16.2.7.1.1 LIST TAB

Select the List Tab to Display the data in a data grid (see Figure 16-20)

- **Time:** Observation epoch
- **Station:** Data collection point, color coded
- **Code:** Calibration beacon code/channel
- **Used:** Checked if used in calibration, unchecked to not be used in calibration
- **Obs X/Obs Y/Obs Z:** Observed USBL XYZ values
- **Slant Range:** Slant range calculated from USBL observations
- **Calculated Slant Range:** Slant range calculated from initial entered calibration beacon position and transducer position (on vessel)
- **Bcn East/North/Elevation:** Calculated beacon position
- **Range Accuracy:** Standard deviation of USBL range data, taken from USBL device settings
- **Residual:** Slant range minus Calculated Slant Range
- **W:** Normalized residual for W test

**Note:** In the case of an Active calibration, if the calibration beacon depth has not been entered and the transducer position does not incorporate sensor offsets, the calculated slant range, beacon position and residual values are not valid.

If a single epoch is selected, a summary of that epoch's data is displayed to the right (see Figure 16-21)

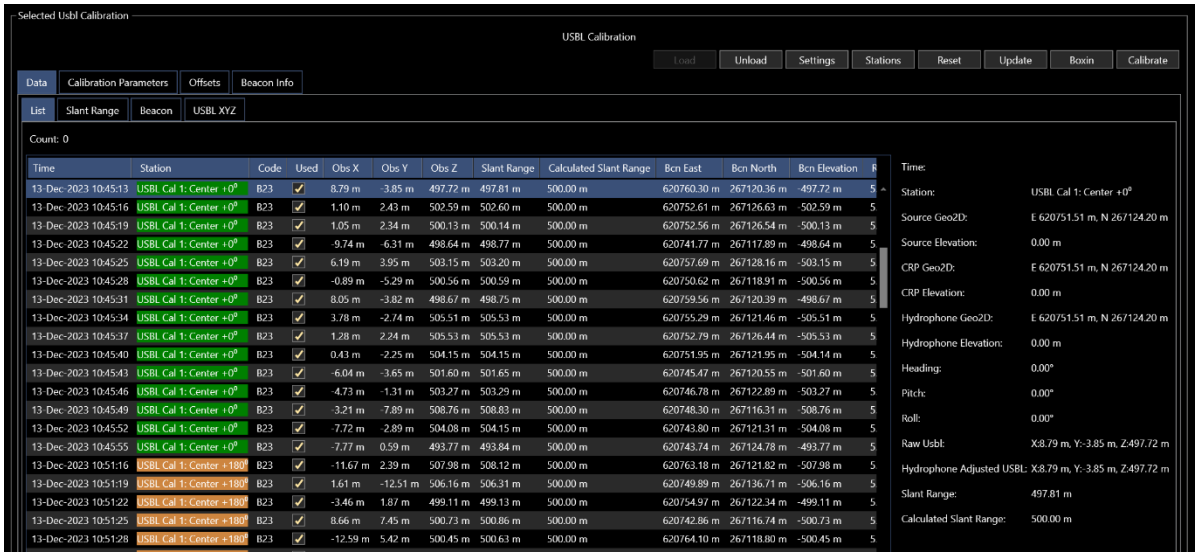



FIGURE 16-21 USBL CALIBRATION DATA VIEW -LIST TAB - SINGLE EPOCH SELECTED

The application of the data can be edited by selecting a single or group of epochs in the data grid, right mouse clicking and clicking on Properties to open the Edit USBL Range Epochs dialog (see Figure 16-22). Any changes made are applied to all selected epochs. The options are detailed below.

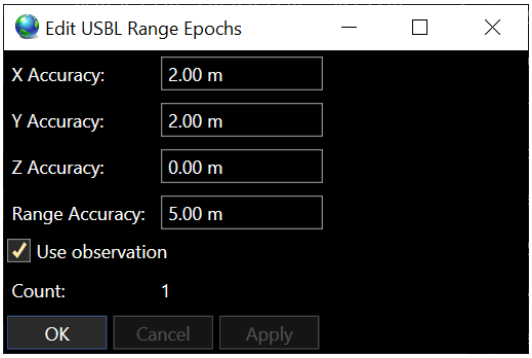



FIGURE 16-22 EDIT USBL RANGE EPOCHS DIALOG

- **X Accuracy:** Standard deviation of the reference position data X (Easting)
- **Y Accuracy:** Standard deviation of the reference position data Y (Northing)
- **Z Accuracy:** Standard deviation of the reference elevation data Z
- **Range Accuracy:** Standard deviation of the USBL slant range

**Note:** The initial standard deviation values originate from the respective data source either entered manually or decoded from the input.

- **Use observation:** Controls if the epochs are used in the calibration adjustments: checked they are used; unchecked they are not

### 16.2.7.1.2 SLANT RANGE TAB

The Slant Range Tab displays the slant range observations or slant range residuals in a time series view (see Figure 16-23 and Figure 16-24) or the Histogram Tab shows slant range residuals in a histogram (see Figure 16-25).

The Time Series Tab presentation and editing options are the same for both the observations and the residuals.


FIGURE 16-23 USBL CALIBRATION - DATA VIEW - SLANT RANGE TIME SERIES


FIGURE 16-24 USBL CALIBRATION - DATA VIEW - SLANT RANGE RESIDUALS TIME SERIES

The components that are common to both the observation and residual time series displays are as follows:

- **Points:** Data Used in the calibration is displayed as a square
- Data not Used in the calibration is displayed as an X
- **Observation:** Select this option to display the slant range
- **Residual:** Select this option to display the slant range residuals
- **Slider Control:** Vertical and horizontal slider controls can be used to set the vertical and horizontal viewing window
- **Mouse Control**
- **Zoom:** Use the scroll wheel to zoom in and out
- **Rectangle Zoom:** Left mouse click and drag to create a rectangle to zoom to
- **Mouse Over:** Mouse over a point to display the collection step the data is associated with
- **Edit Data:** Single left click on a point to toggle it enabled/disabled in the calibration
- **Apply:** Click to apply editing changes
- **Cancel:** Click to abort editing changes

The additional data presented on the residual time series display are:

95% confidence error

Standard deviation (1σ)

Average residual

The histogram view displays the slant range residuals only (see Figure 16-25). The histogram view includes the following text and graphical information:

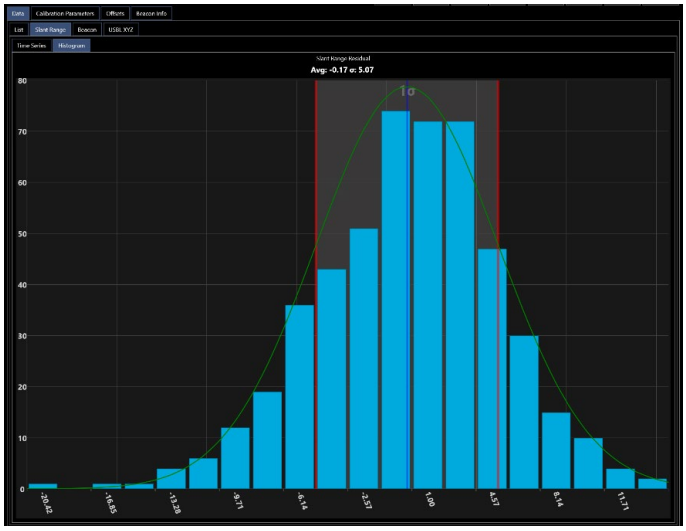



FIGURE 16-25 USBL CALIBRATION - DATA VIEW - SLANT RANGE HISTOGRAM

Average residual and 1 sigma standard deviation

1 sigma standard deviation

Normal distribution curve

Average residual

**Note:** The histogram display does not support editing of the data.

### 16.2.7.1.3 BEACON TAB

The Beacon tab displays the calculated beacon X/Y (Easting/Northing) and Z (Elevation) in time series (see Figure 16-26) and histogram (see Figure 16-27) views. The data displayed is selected using the radio buttons labelled X/Y and Z.

The display features and edit options are the same as those detailed for the Slant Range Tab.


FIGURE 16-26 USBL CALIBRATION - DATA VIEW TAB - BEACON XY TIME SERIES

The additional data presented on the Beacon X/Y and Z time series displays are:

95% confidence error

Standard deviation (1σ)

Average Beacon East/North/Elevation

Starting Beacon Location East/North/Elevation

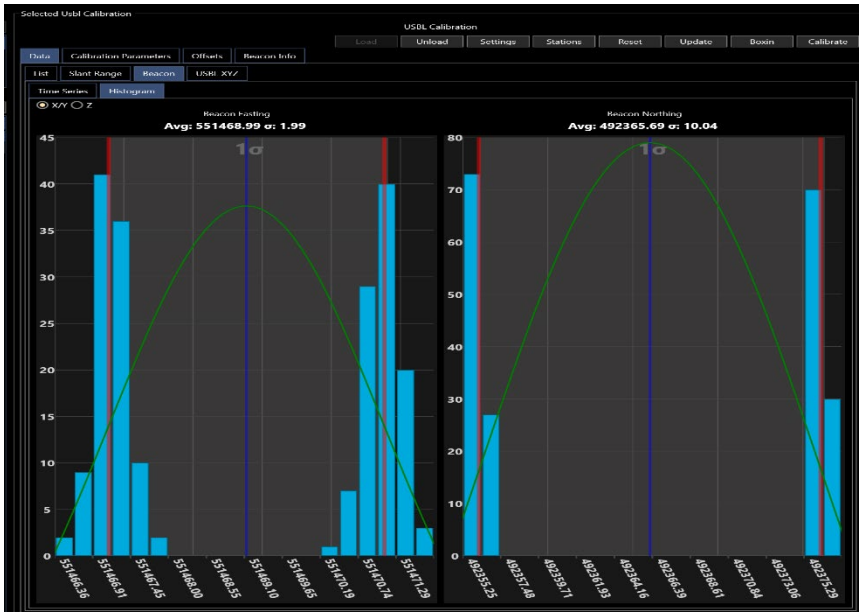



FIGURE 16-27 USBL CALIBRATION - DATA VIEW - BEACON XY HISTOGRAM

Average Beacon East/North/Depth and 1 sigma standard deviation

- 1 sigma standard deviation
- Normal distribution curve
- Average Beacon East/North/Depth

### 16.2.7.1.4 USBL XYZ TAB

The USBL XYZ tab displays the USBL observations and residuals in time series views (see Figure 16-28 and Figure 16-29) and the residuals in a histogram view (see Figure 16-30). The data displayed is selected using the radio buttons labelled X, Y and Z.

The display features and edit options are the same as those detailed for the slant range for the Slant Range Tab.

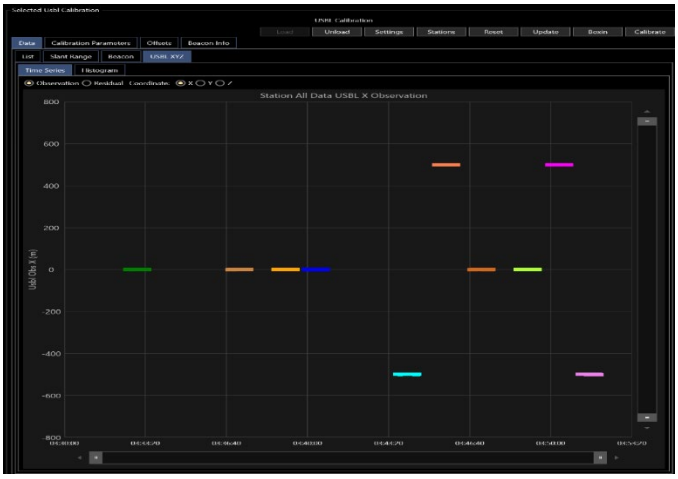



FIGURE 16-28 USBL CALIBRATION – DATA VIEW – USBL X TIME SERIES


FIGURE 16-29 USBL CALIBRATION – DATA VIEW – USBL X RESIDUALS

The additional data presented on the USBL/ X/Y/Z Residual time series displays are:

- 95% confidence error
- Standard deviation (1σ)
- Average X/Y/Z Residuals

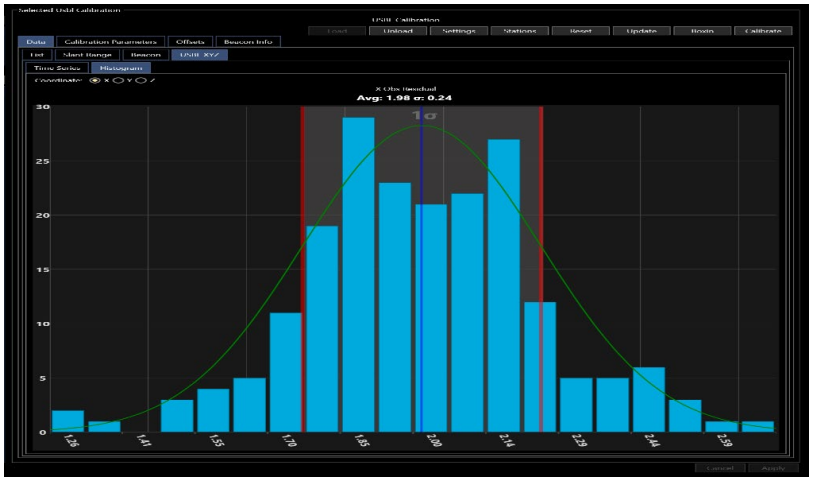



FIGURE 16-30 USBL CALIBRATION - DATA VIEW - USBL X HISTOGRAM

USBL XYZ Residuals and 1 sigma standard deviation

- 1 sigma standard deviation
- Normal distribution curve
- Average USBL XYZ Residual

### 16.2.7.2 CALIBRATION PARAMETERS TAB

Verify the Calibration Parameter Values by clicking the **Calibration Parameters** tab.

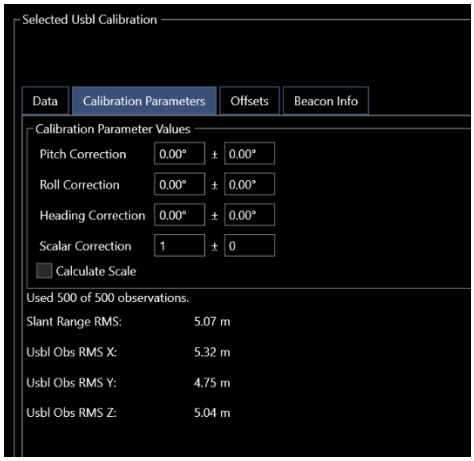



FIGURE 16-31 USBL CALIBRATION - CALIBRATION PARAMETERS TAB

- Calibration Parameter Values
  I. Confirm the USBL calibration parameters are at the initial values, i.e. pitch, roll and heading correction are 0.000°
  II. If they are not, click the Reset button
  III. Calculate Scale: Check if the USBL calibration adjustment is to solve for scale errors

**Note:** Calculate Scale generally not done because the scale correction determined will only be applicable to the current SVP in use.

### 16.2.7.3 OFFSETS TAB

Verify the offsets by clicking the **Offsets** tab.


FIGURE 16-32 USBL CALIBRATION – OFFSETS TAB

**Note:** All vessel offsets are automatically populated into the USBL calibration during initial setup. Verify all offsets are correct. If vessel offsets were edited after the calibration was already setup, they will have to be updated in the calibration offsets tab.

### 16.2.7.4 BEACON INFO TAB

Verify the Initial Beacon Position values by clicking the **Beacon Info** tab.

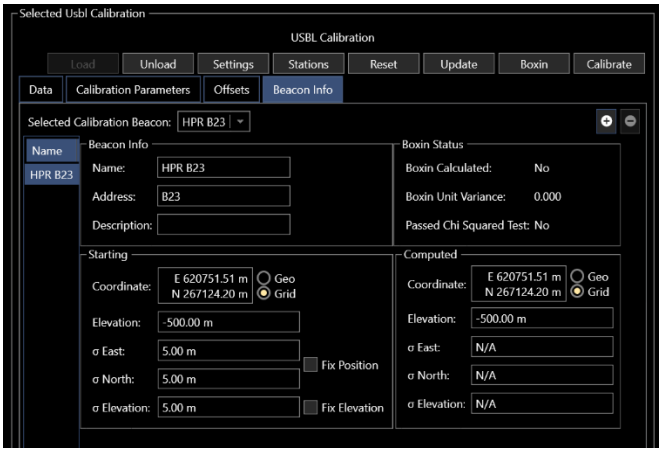



FIGURE 16-33 USBL CALIBRATION PROCESSING - BEACON INFORMATION TAB

- **Selected Calibration Beacon:** Confirm this is set to the beacon used for the data collection
- Beacon Info:
  I. **Name:** Edit if required
  II. **Address:** Edit if required
  III. **Description:** Edit if required
- Starting
  I. **Coordinate:** Edit if a better approximate position for the beacon than that entered during the planning process is known
  II. **Elevation:** Enter the best approximate for the beacon elevation
  III. **σ East:** Edit the initial beacon Easting standard deviation as required
  IV. **σ North:** Edit the initial beacon Northing standard deviation as required
  V. **σ Elevation:** Edit the initial beacon Elevation standard deviation as required
  VI. **Fix Position:** Check only if the beacon is at a known position, installed in a previously surveyed tripod or survey receptacle on a seafloor asset
  VII. **Fix Elevation:** Check only if the beacon is at a known elevation, installed in a previously surveyed tripod or survey receptacle on a seafloor asset

### 16.2.7.5 BOXIN ONLY

To calculate a Boxin position only for a beacon click the Boxin button.

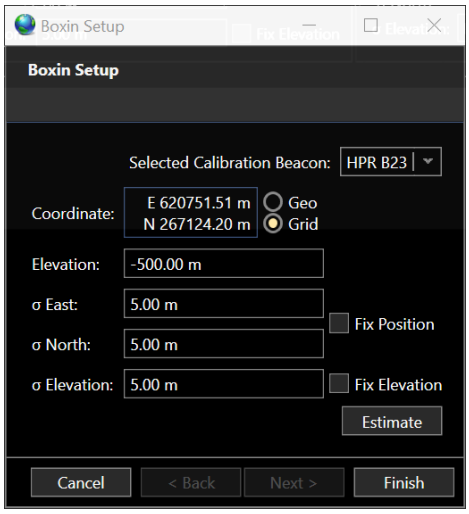



FIGURE 16-34 USBL CALIBRATION – BOXIN SETUP

1. Review beacon initial information. Edit if required.

**Note:** The Estimate button generates an initial estimate of the boxin position.

2. To calculate the final Boxin position click Finish.

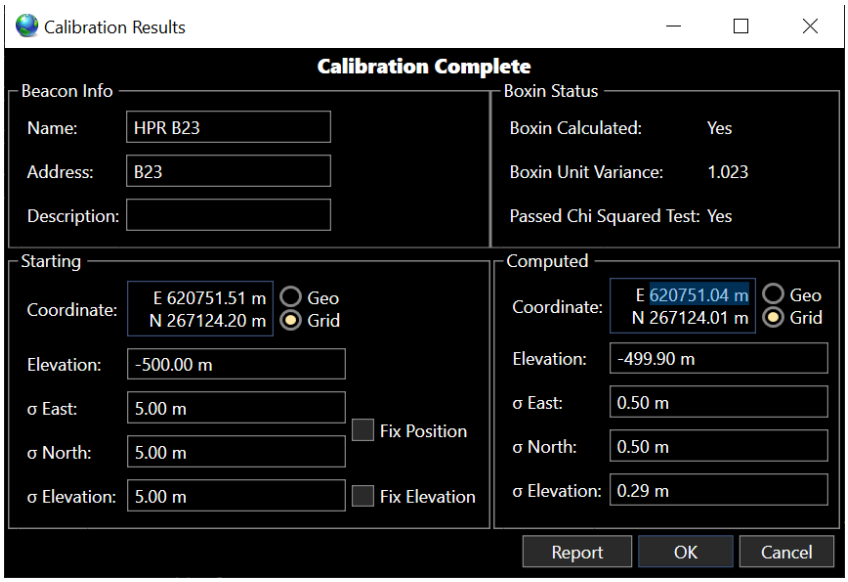



FIGURE 16-35 USBL CALIBRATION – BOXIN RESULTS

To generate a Boxin report, click Report, the resulting PDF document will be displayed and can then be exported as a PDF, XPS or an Excel document. The contents of the report will contain the items selected in **Configure Reports.** See Figure 16-36

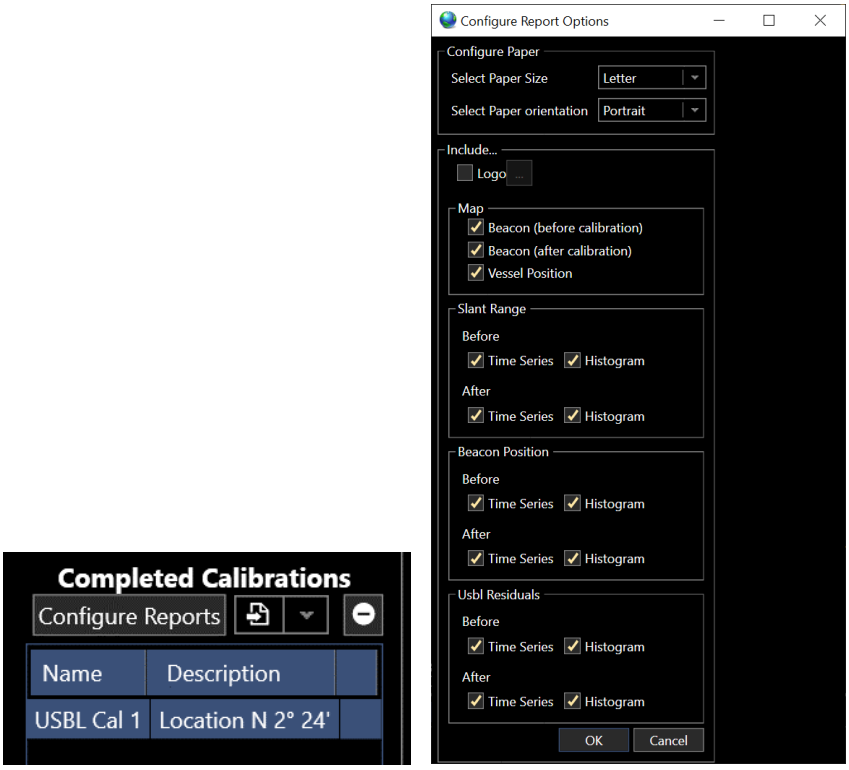



FIGURE 16-36 CONFIGURE REPORTS

### 16.2.7.6 SOLVE FOR USBL CALIBRATION VALUES

To solve for the USBL calibration values that can then be applied in NavView for the respective USBL device.

1. Click the Calibrate button. The Computed Boxin and Calibration Parameter Values are calculated.

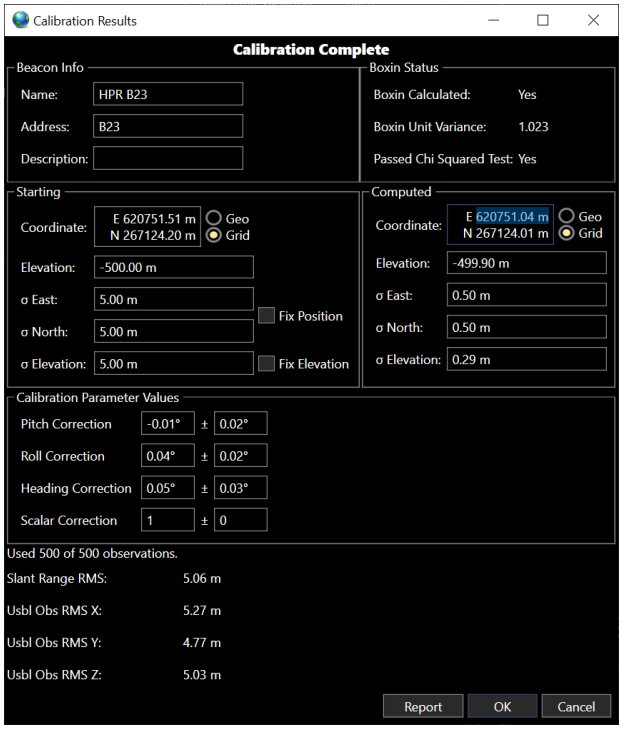



FIGURE 16-37 USBL CALIBRATION – CALIBRATION COMPLETE RESULTS

2. To generate a Calibration report, click Report, the resulting PDF document will be displayed and can then be exported as a PDF, XPS or an Excel document. The contents of the report will contain the items selected in **Configure Reports.** See Figure 16-36

**Note:** The beacon positions scatter plot after calibration can also be viewed in Map as a QC tool.

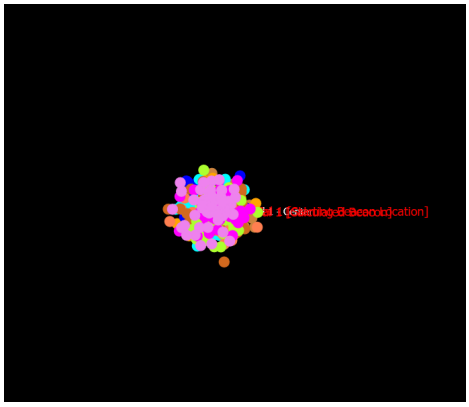


FIGURE 16-38 USBL CALIBRATION – CALIBRATION COMPLETE – MAP VIEW