EIVA

NAVISCAN / NAVIPAC

WITH EDGETECH 6205

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Contents

1 Introduction

This document includes information on the configuration of **NaviPac/NaviScan** in a combined solution in support of acquisition of multi-beam and sidescan data from an EdgeTech 6205 swath bathymetry (multi-beam) and dual frequency sidescan sonar system. Information about settings in the EdgeTech soft- and hardware are not included, please consult EdgeTech (6205: Combined Bathymetry & Side Scan Sonar) for further information.

2 NaviScan Configuration

The **NaviScan/NaviPac** configuration to support acquisition of multi-beam and sidescan data from an EdgeTech 6205 system is slightly different from what we normally see.

Normally the attitude and navigation-based sensors are interfaced into **NaviPac** and distributed to **NaviScan**.
In this configuration, it is the other way around, the instruments coming from the EdgeTech system are interfaced with **NaviScan**, from which data is distributed to **NaviPac**.

The following sections describe the configuration in detail.

2.1 Configuring the instruments from EdgeTech

The sonar data flow between the EdgeTech hardware and software and third-party software (**NaviPac/NaviScan**) is depicted below in Figure 1 (taken from the EdgeTech 6205 Hardware User Manual). Data available for the third-party software is output from the Discover software, all time-tagged in accordance with the **Time** input into the sonar interface box:

- Range/angle data (raw multi-beam datagrams)
- Auxiliary data
    - Position data
    - Heading data
    - Motion data
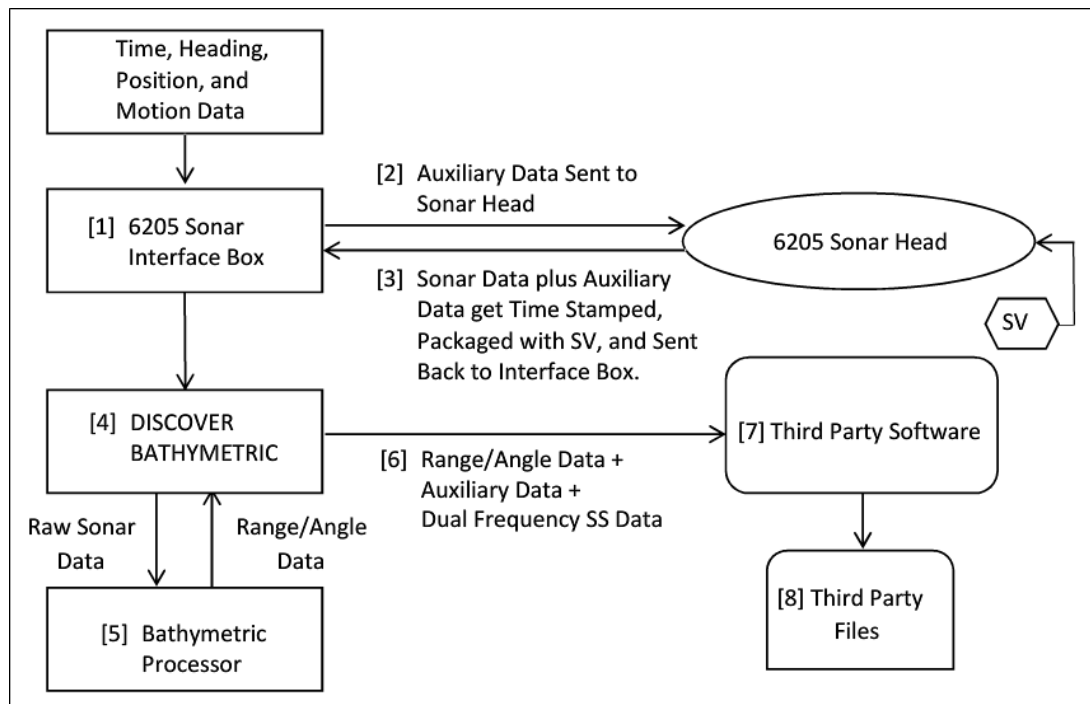- Dual-frequency sidescan data

Figure 1 Dataflow in the EdgeTech 6205 system (from 6205 Hardware User Manual)

Five different instruments originating from the EdgeTech system must consequently be configured in **NaviScan**:

- Navigation
- Gyro
- Motion
- Multi-beam
- Sidescan

A few other instruments might be relevant to define in **NaviScan**. It all depends on the characteristics of the project in question. The most important ones are also described here:

- Bathymetry sensor (from **NaviPac**)
- Runline control (from **NaviPac**)
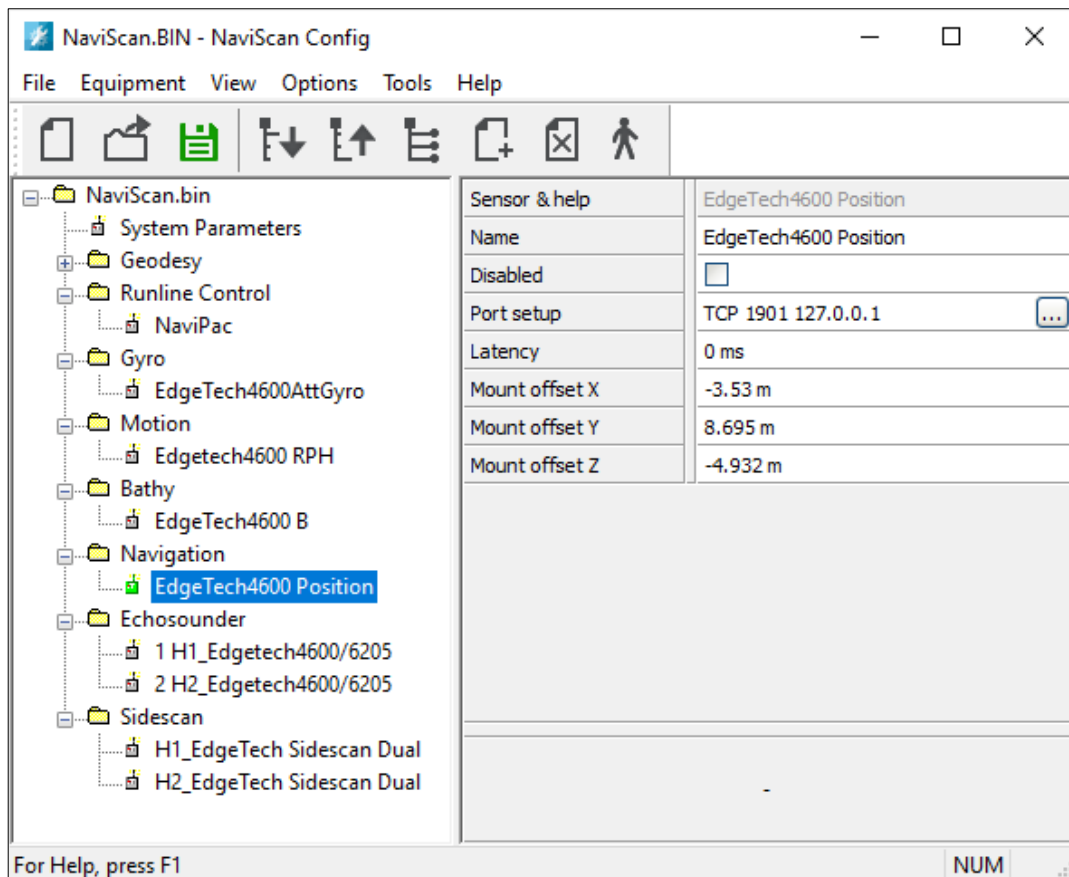
2.1.1 Navigation

Figure 2 Configuring the EdgeTech4600 navigation instrument

To configure the navigation information arriving from the Discover software, the following settings must be applied:

- **Driver**: EdgeTech4600 Position
- **Port setup**: TCP 1901, IP address 127.0.0.1 (IP address of computer where Discover is executed)
- **Mount offsets**: related to the antenna offsets determined in the local coordinate system defined in **NaviPac/NaviScan**
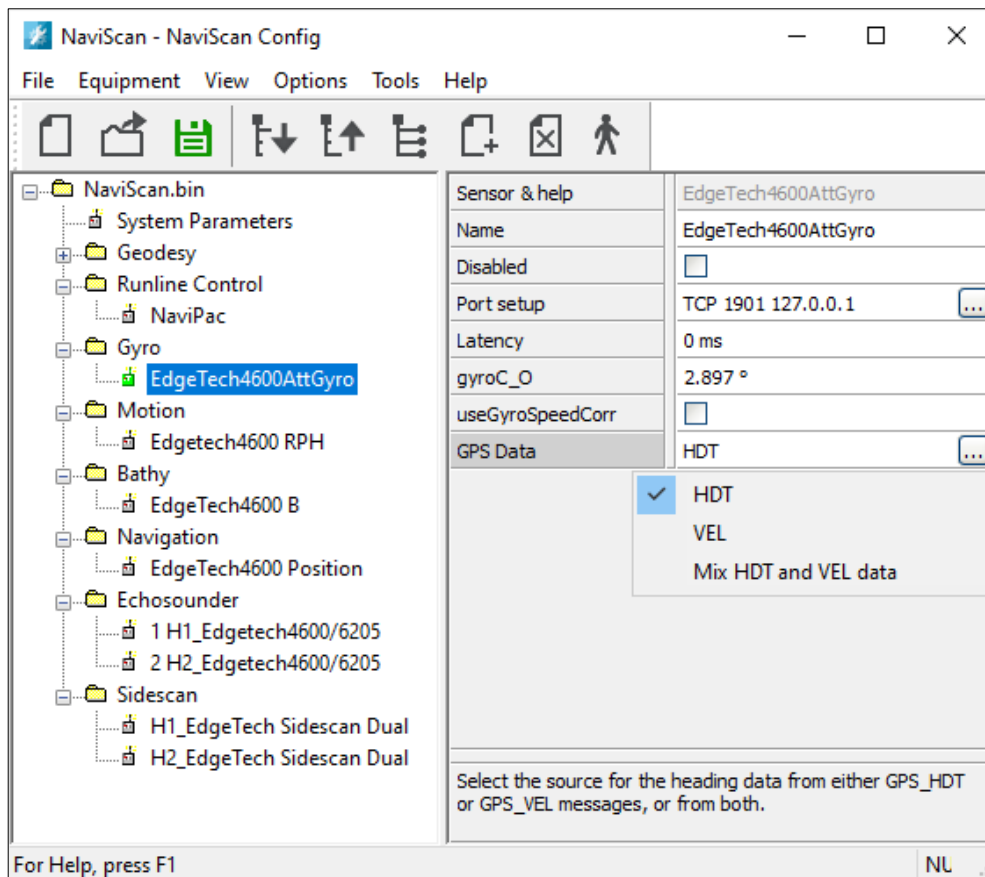
2.1.2 Gyro

Figure 3 Configuring the EdgeTech4600 gyro instrument

To configure the gyro information arriving from the Discover software, the following settings must be applied:

- **Driver**: EdgeTech4600AttGyro
- **Port setup**: TCP/IP 1901 (port) and IP address 127.0.0.1 (IP address of computer where Discover is executed)
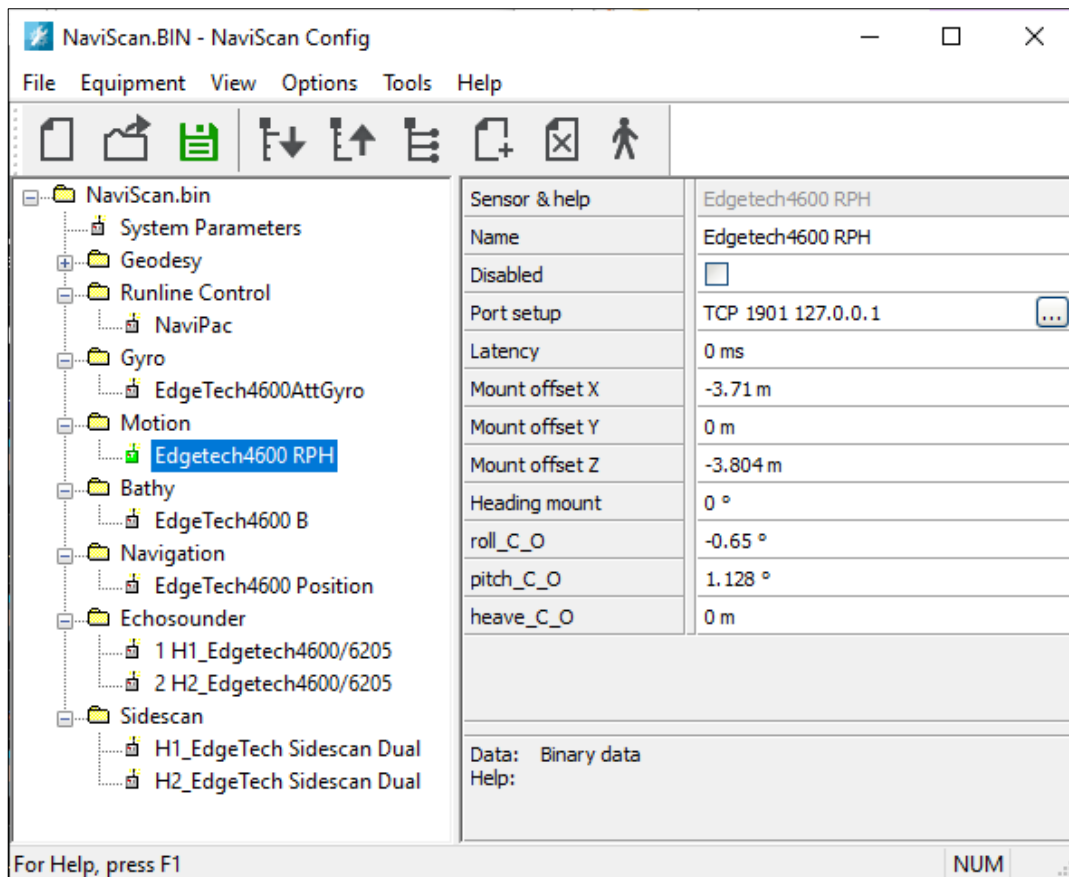
2.1.3 Motion

Figure 4 Configuring the EdgeTech4600 motion instrument

The motion information arriving from the Discover software requires the following settings to be applied:

- **Driver**: EdgeTech4600 RPH
- **Port setup**: TCP/IP 1901 (port) and IP address 127.0.0.1 (IP address of computer where Discover is executed)
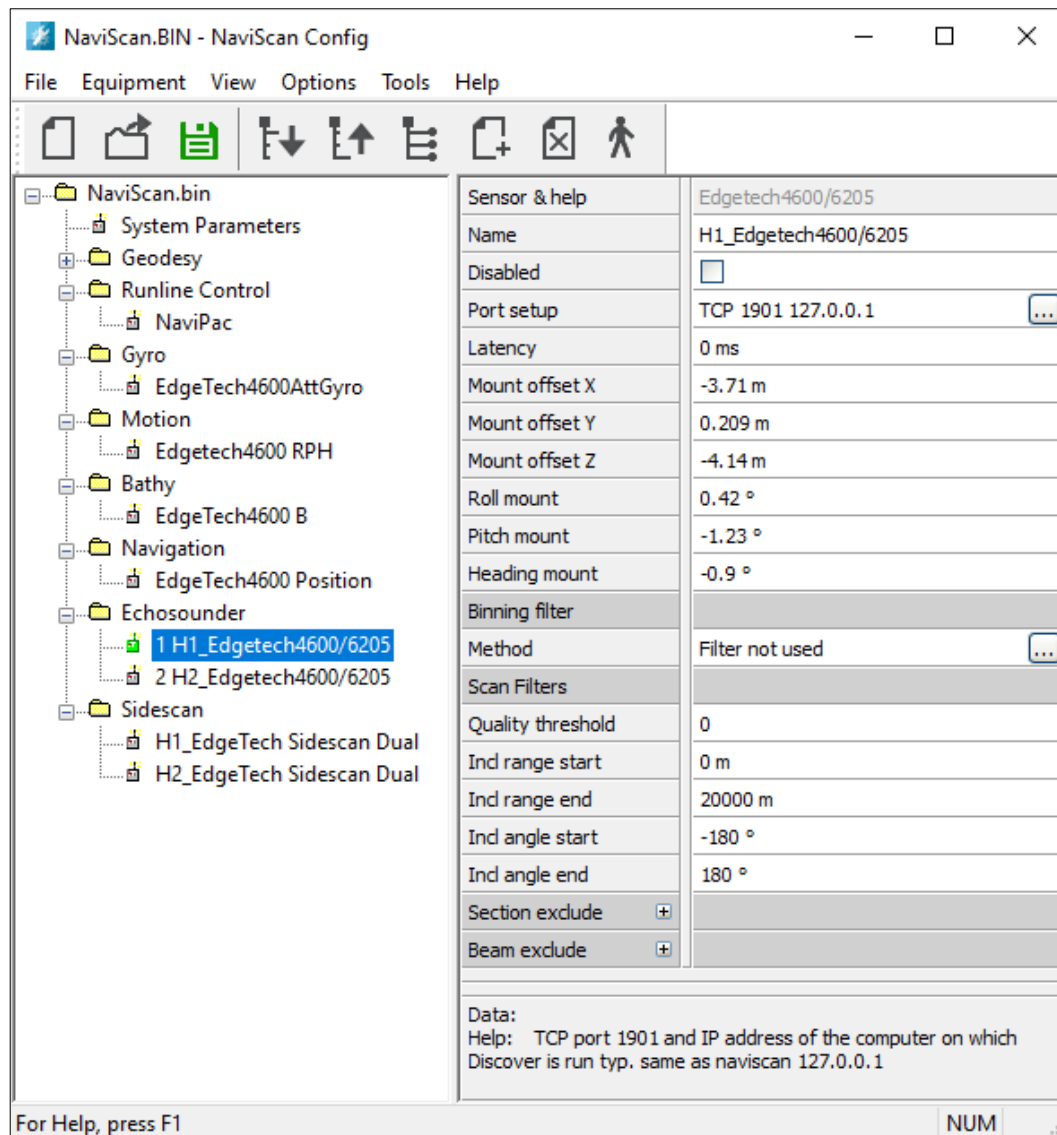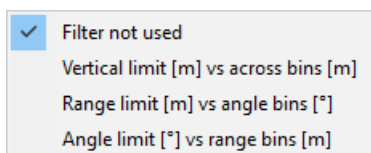
2.1.4 Multi-beam

Figure 5 Configuring the EdgeTech4600 multi-beam instrument (head on port side)
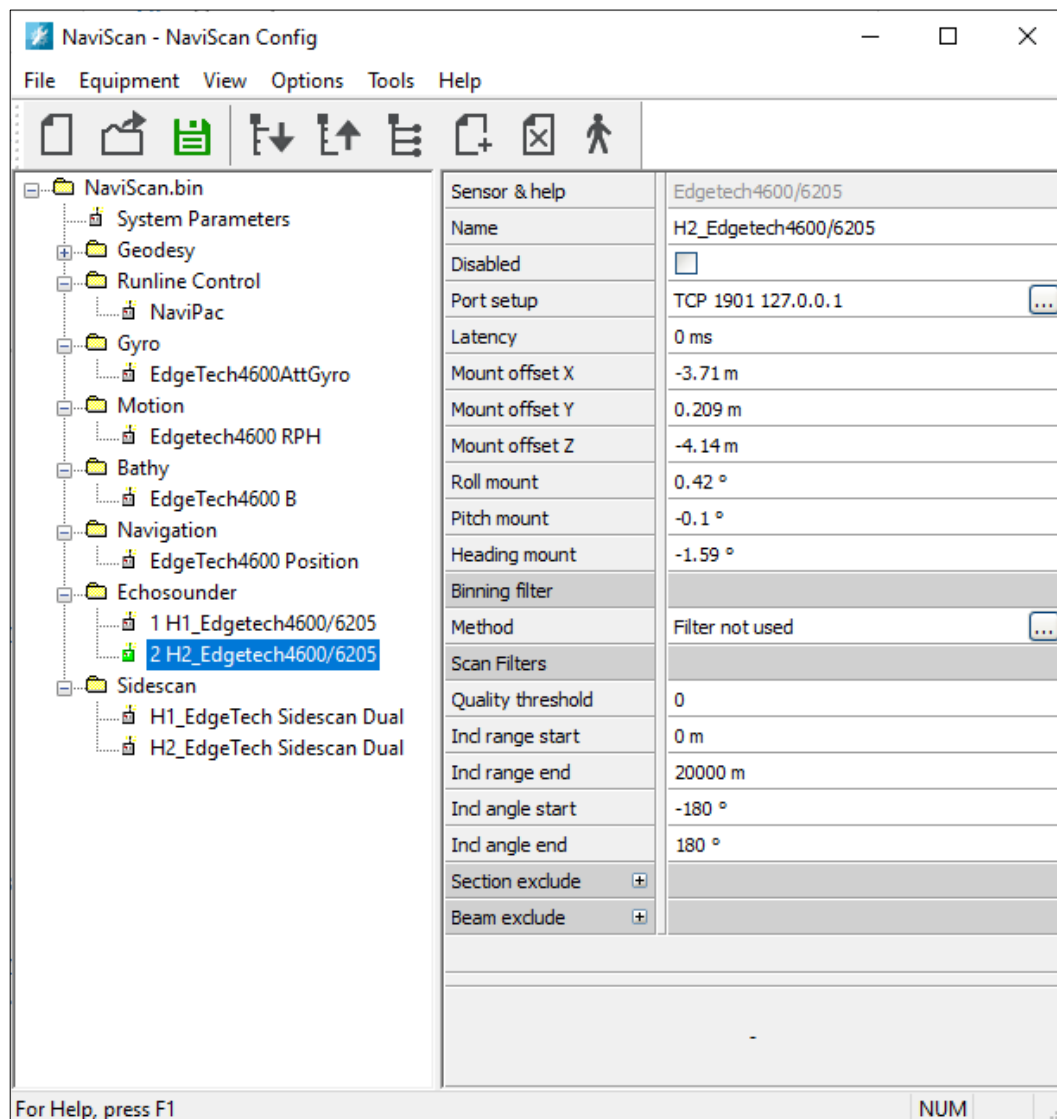
Figure 6 Configuring the EdgeTech4600 multi-beam instrument (head on starboard side)

To configure the multi-beam information arriving from the Discover software the following settings must be applied:

- **Driver**: Edgetech4600/6205.
- **Port setup for both heads**: TCP/IP 1901 (port) and IP address 127.0.0.1 (IP address of computer where Discover is executed).
- **Offsets for both heads**: related to the acoustic center determined in the local coordinate system defined in **NaviPac/NaviScan**. Note that the two individual acoustic centers converge at a single point (EdgeTech 6205 Hardware User Manual). The offsets are consequently identical for the two heads.

- **Mount angles**: result of a dual head patch test calibration,that will result in different (though similar) pitch, roll and heading values for the two heads.
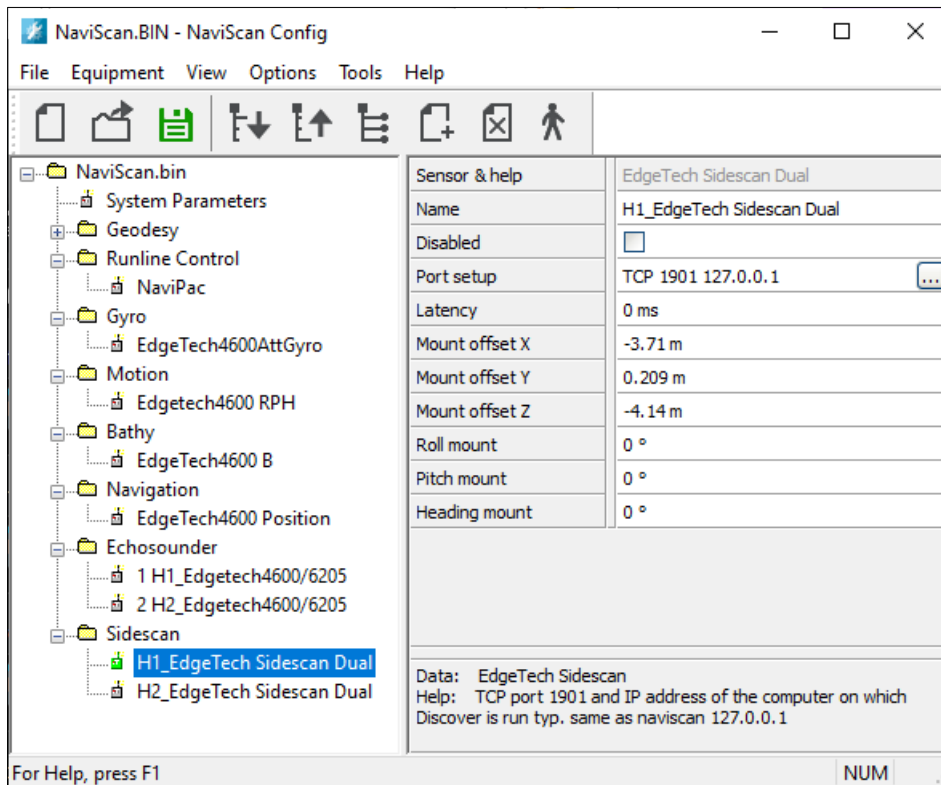

Figure 7 Configuring the EdgeTech4600 sidescan instrument

To configure the sidescan information arriving from the Discover software the following settings must be applied:

- **Driver**: EdgeTech Sidescan Dual.
- **Port setup**: TCP/IP 1901 (port) and IP address 127.0.0.1 (IP address of computer where Discover is executed).
- **Offset**(s): related to the acoustic centre determined in the local coordinate system defined in NaviPac/NaviScan.
- **Mount angles** (**Roll**, **Pitch**, and **Heading mount**): not relevant.

2.2 Configuring additional instruments
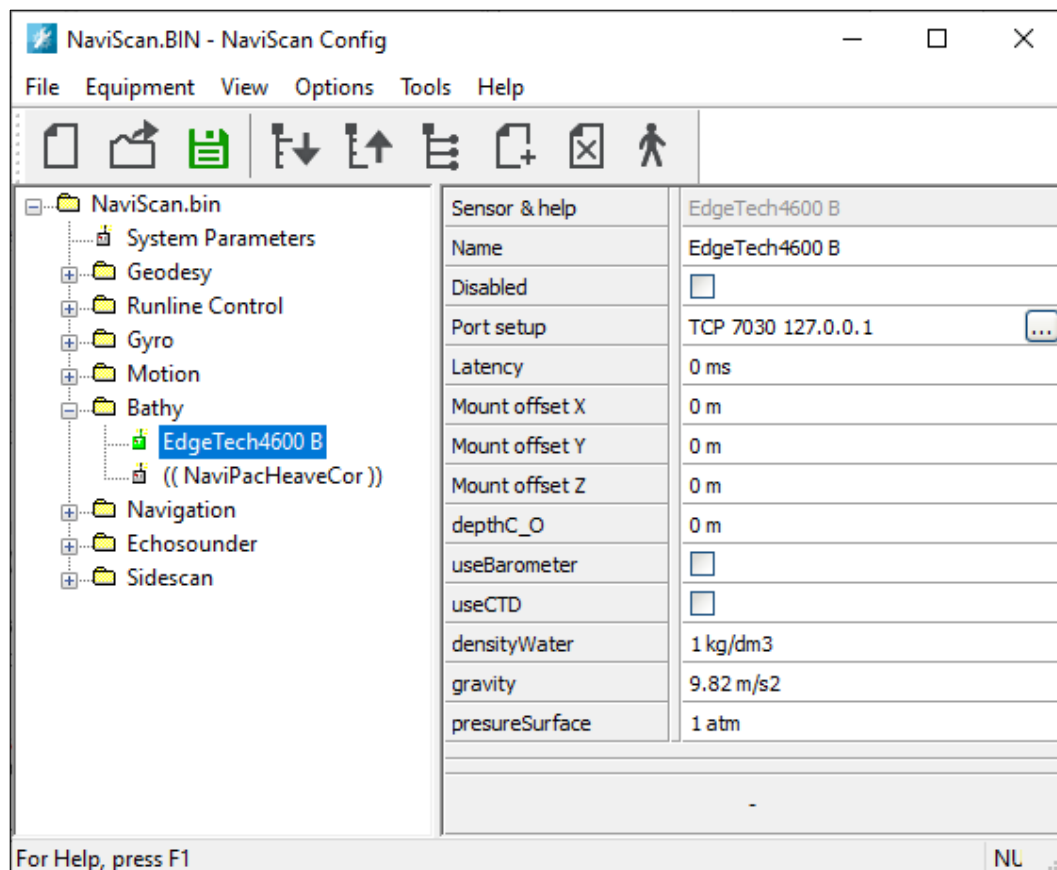
2.2.1 Bathy

Figure 8 Configuring the bathy instrument

A bathymetry instrument is only relevant when an RTK solution (or another solution that supplies adequately accurate height information) is available for the navigation.
At present, **NaviScan** cannot use the navigation information arriving from the Discover to extract the vertical component. Instead this information must be defined as an output in **NaviPac**. In **NaviScan** the following settings must be applied:

- **Driver**: Bathy
- **Port setup**: TCP 7030, IP address 127.0.0.1 (IP address of computer where **NaviPac** is executed)
- **Mount Offsets**: **NaviPac** will calculate the value associated with the CRP position, by default. Therefor values of 0,0,0 are used in **NaviScan**.
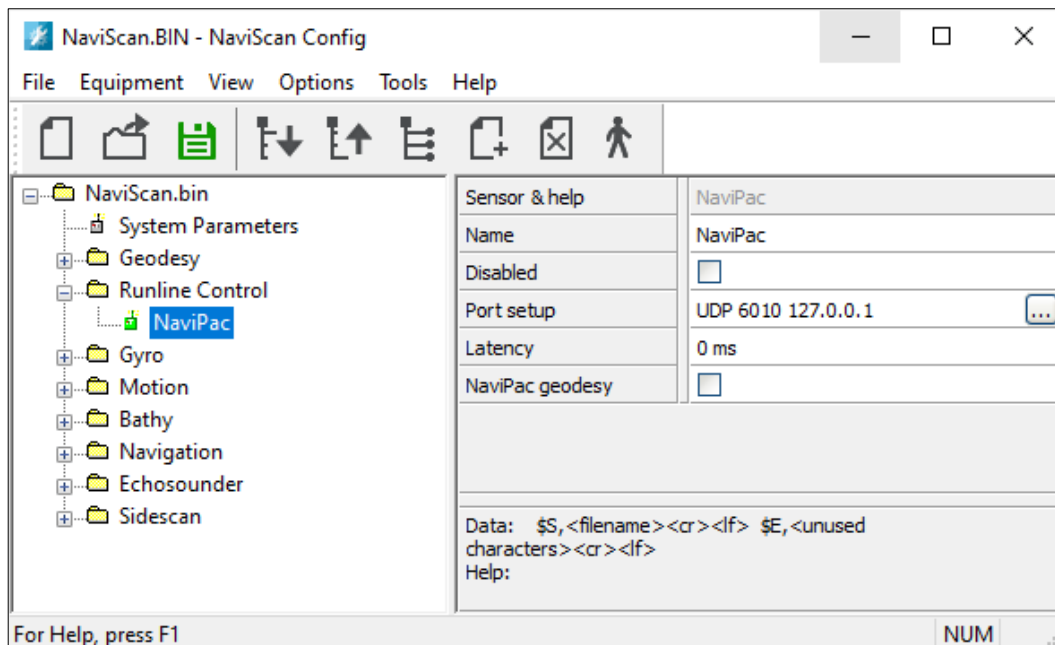
2.2.2 Runline Control

Figure 9 Configuring the runline control instrument

A runline control instrument is used to convey relevant information from **NaviPac** to **NaviScan**. This includes:

- A trigger to start and stop logging. Using this functionality makes it possible to synchronize logging in **NaviPac** and **NaviScan**.
- Runline information.
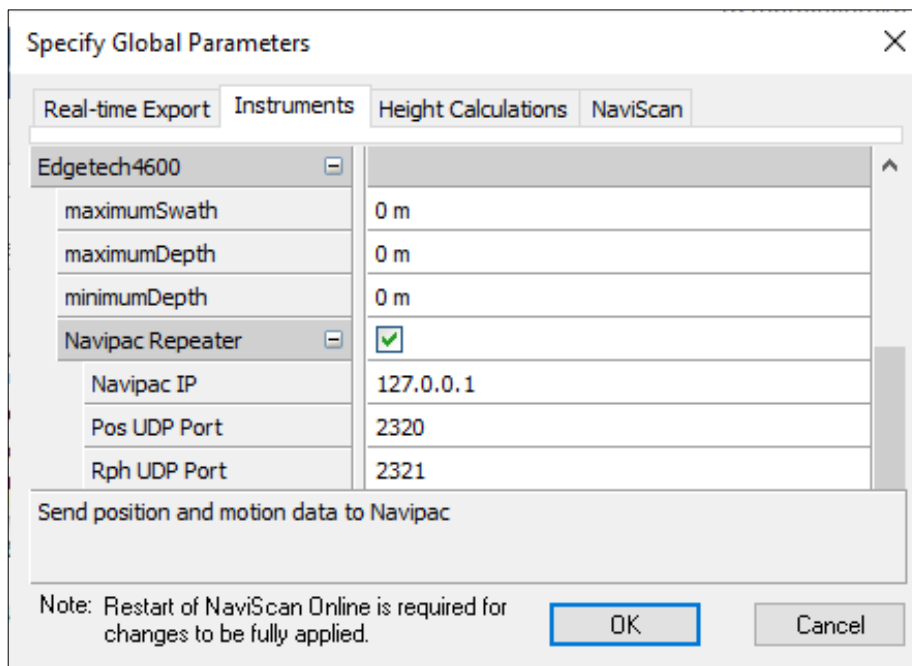- Geodesy information.

In **NaviScan** the following settings must be applied:

- **Driver**: NaviPac
- **Port setup**: UDP/IP 6010 (port) and IP address 127.0.0.1 (IP address of computer where **NaviPac** is executed). Note that the port number could be any port available.

2.3 The output to NaviPac

To facilitate the distribution of the EdgeTech auxiliary data from **NaviScan** to **NaviPac**, the following must be configured:

In **NaviScan Config**, activate the Global Parameters dialogue (Options – Global Parameters), go to the **Instruments** tab and define the settings under the **EdgeTech4600** headline:

Figure 10 Configuring the EdgeTech4600 Repeater

The settings are:

- Use the **NaviPac Repeater**
  Enable this option to facilitate the distribution to **NaviPac**
    - **NaviPac IP**
      Specify the IP address of the NaviPac computer here.
    - **Pos UDP Port**
      Specify the position output port here (2320 is default, but any available number could be used)
    - **Rph UDP Port**
      Specify the motion and gyro output port here (By default Port 2321 is set, but any available number could be used)

3 NaviPac Configuration

In **NaviPac**, the **NaviScan** configuration is reflected. Only the instruments relevant for the EdgeTech 6205 based **NaviPac/NaviScan** relationship are described here:

- Navigation
- Gyro
- Motion
- Bathy output
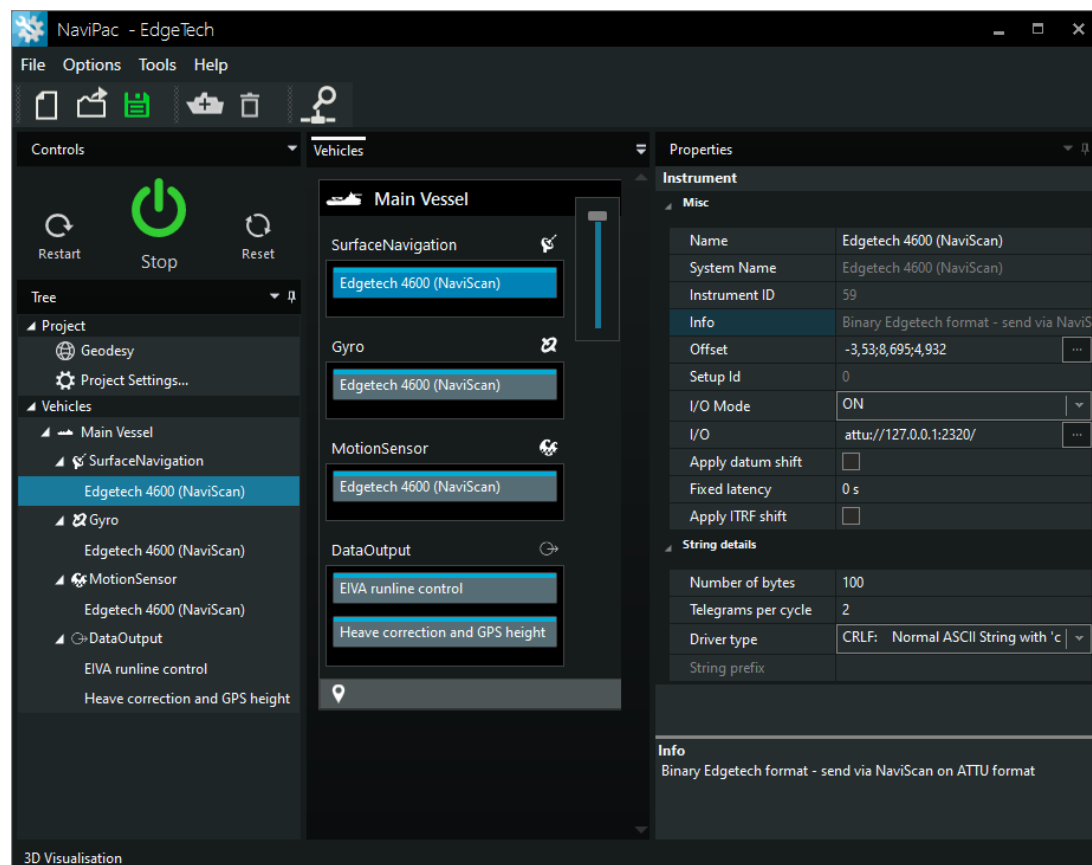- Runline Control

3.1 Configuring the Navigation instrument

Figure 11 EdgeTech 4600 navigation in NaviPac

The following settings are of significance for the navigation sensor:

- **Driver**: EdgeTech 4600 (NaviScan)

- **I/O**
  Format is ATTU (data is time tagged in the EdgeTech system. **NaviScan** is taking this time tagging into account and supplying **NaviPac** with similar information via the ATTU format. Timing in **NaviPac** and **NaviScan** are consequently identical for all instruments arriving via the distribution from **NaviScan**), port (2320) is as defined as part of the EdgeTech 4600 repeater settings in **NaviScan.**
- **Offsets**
  Similar to the ones defined in **NaviScan.**
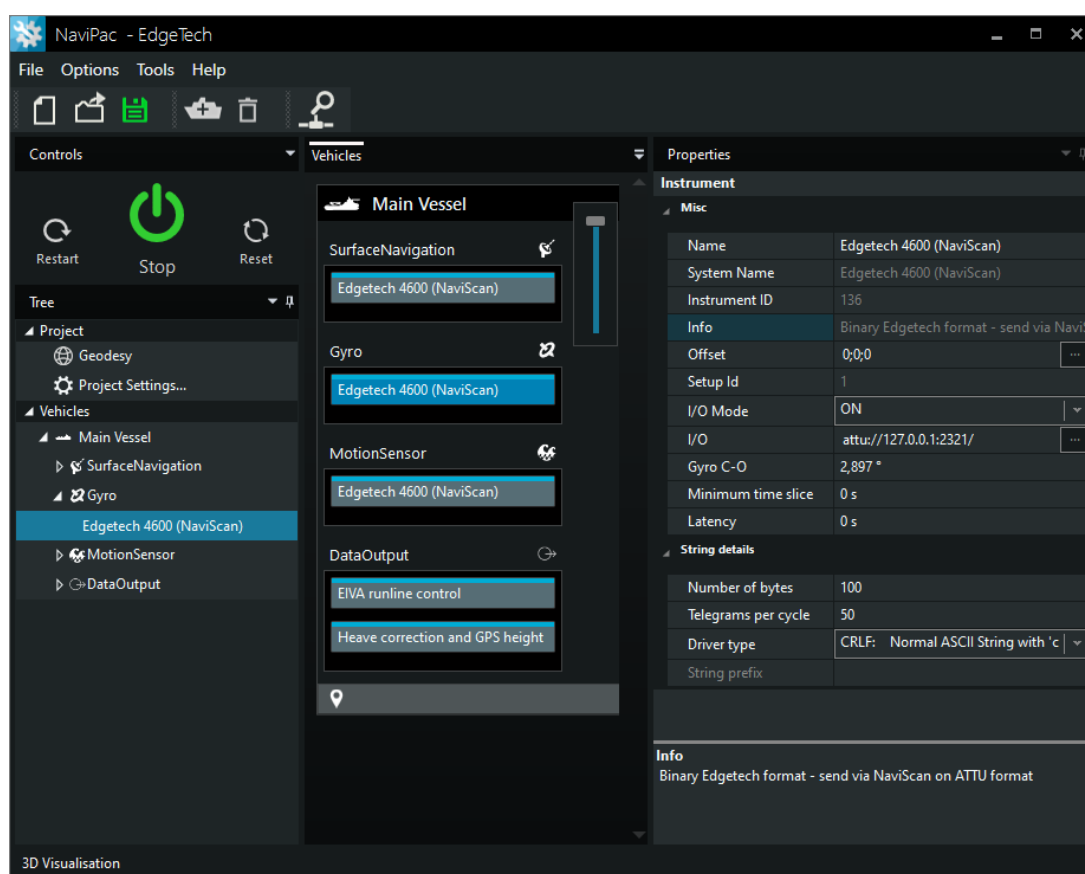
3.2 Gyro

Figure 12 EdgeTech 4600 gyro in NaviPac

The following settings are of significance for the gyro instrument:

- **Driver**: EdgeTech 4600 (NaviScan)
- **I/O**
  Format is ATTU (see above under 'Navigation instrument' for details), port (2321) is as defined as part of the EdgeTech 4600 repeater settings in **NaviScan.**

- **Gyro C-O**
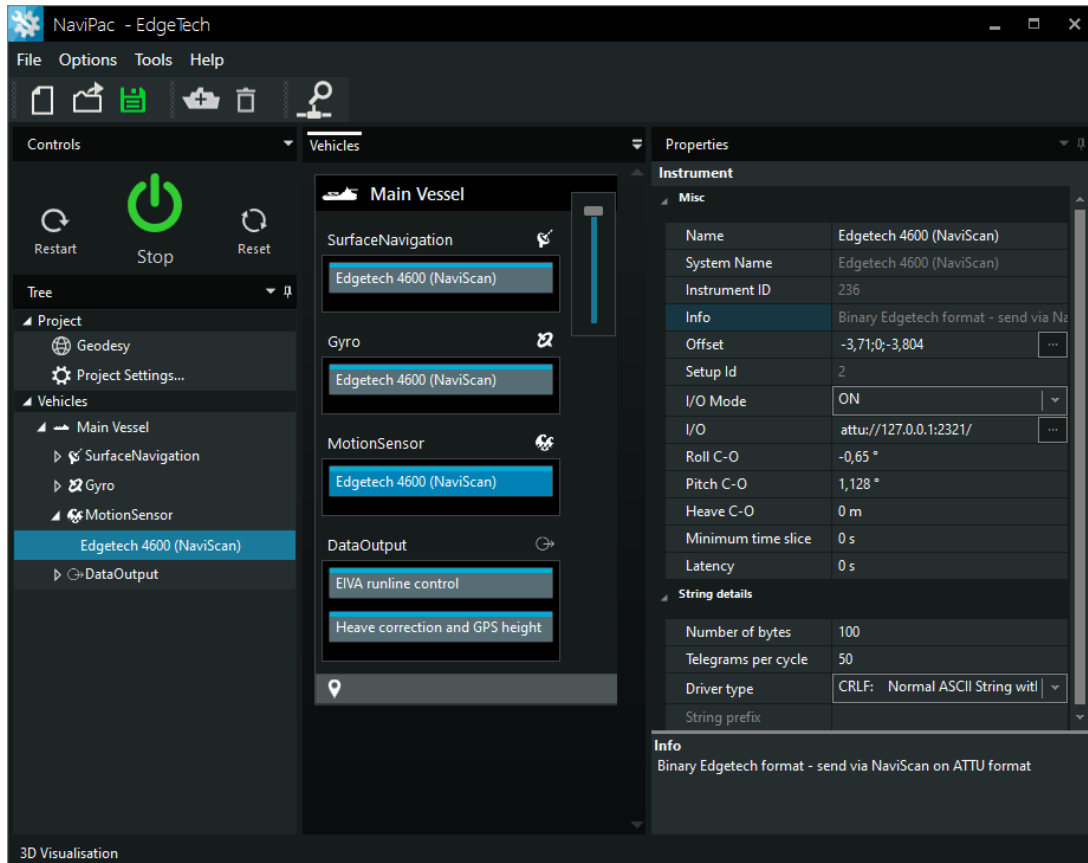 Similar to the value used in **NaviScan**

3.3 Motion

Figure 13 EdgeTech 4600 motion in NaviPac

The following settings are of significance for the motion sensor instrument:

- **Driver**: EdgeTech 4600 (NaviScan)
- **I/O**
  Format is ATTU (see above under 'Navigation instrument' for details), port (2321) is as defined as part of the EdgeTech 4600 repeater settings in **NaviScan**
- **Offsets**
  Similar to the ones given in NaviScan
- **C-O values for roll and pitch**
  Similar to the values used in **NaviScan**
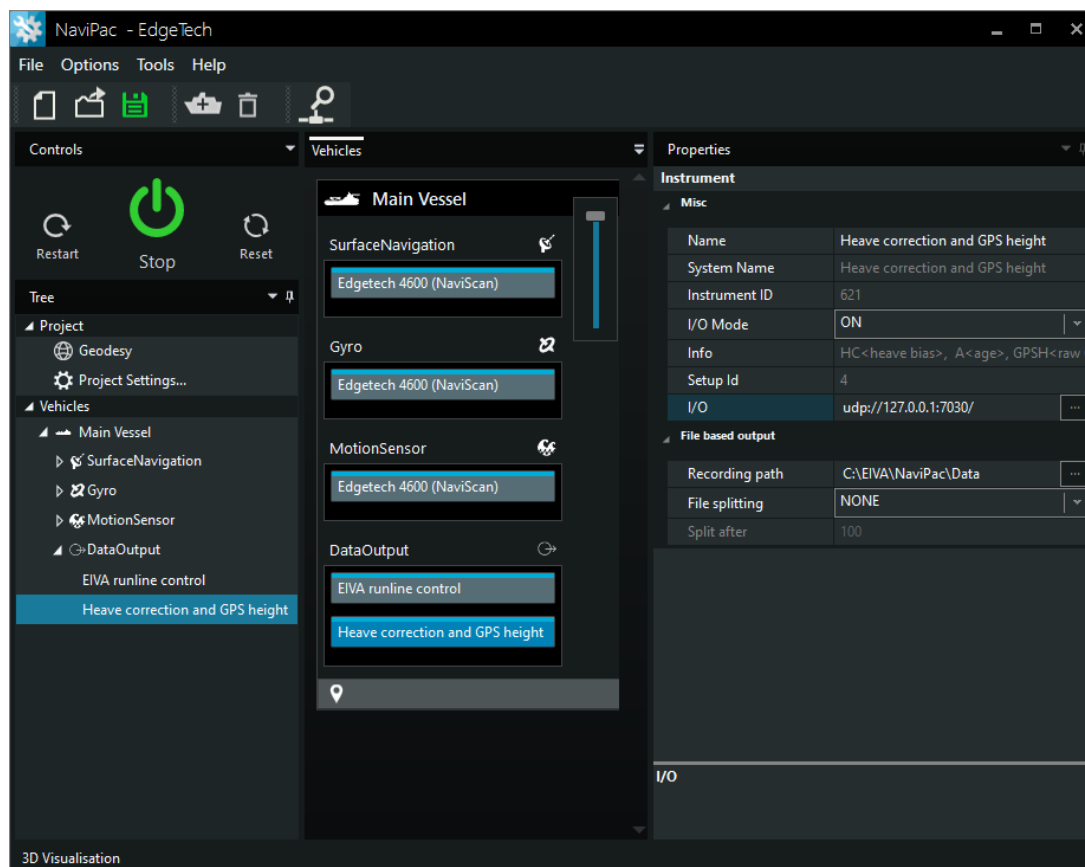
3.4 Bathy output

Figure 14 Bathymetry sensor in NaviPac

The following settings are of significance for the navigation sensor (remember that this instrument is only relevant in case of a surface-based system with a significant (accurate (RTK based)) height component):

- **Driver**: Heave correction and GPS height
- **I/O**
  Protocol is UDP/IP, IP address is local (**NaviPac** and **NaviScan** are executed on the same computer), port is similar to the one given in **NaviScan**
- No offsets, since **NaviPac** per definition is calculating the values to the CRP position
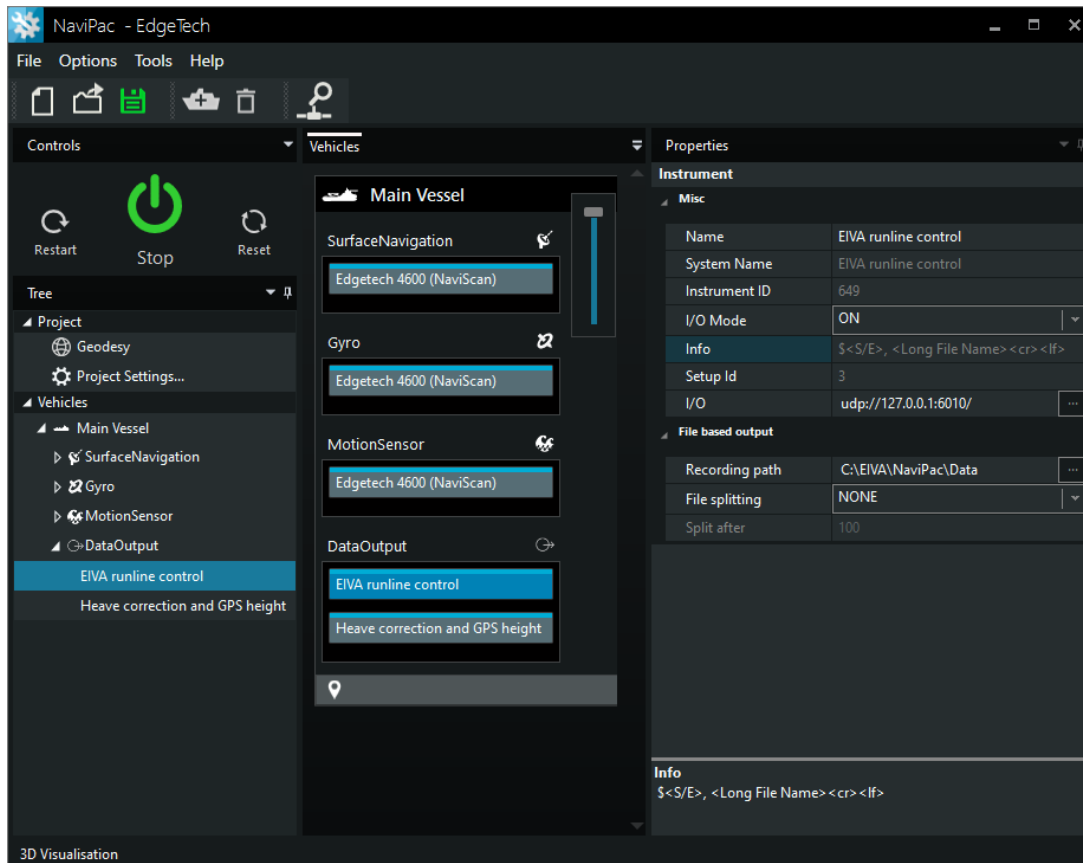
3.5 Runline Control

Figure 15 EIVA runline control instrument

The following settings are of significance for the Runline Control instrument:

- **Driver**: EIVA runline control
  I/O: Protocol is UDP/IP, IP address is local (**NaviPac** and **NaviScan** are executed on the same computer), port is similar to the one given in **NaviScan.**

4 Version descriptions

Version	Date	Author	Description
0.9	18-11-2015	LDA	Initial document
4.5	16-04-2021	ANS	Updated to NaviPac 4.5