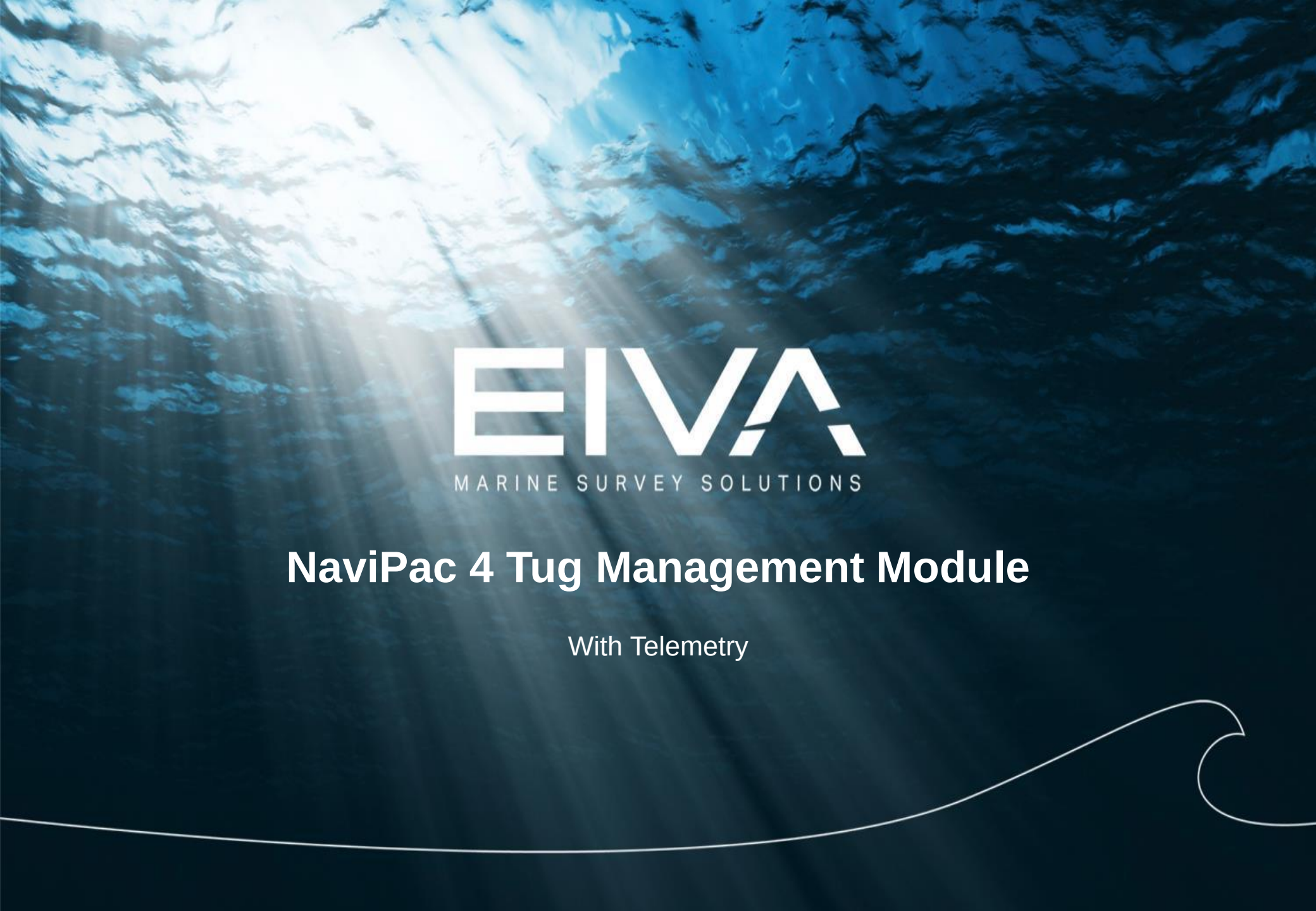
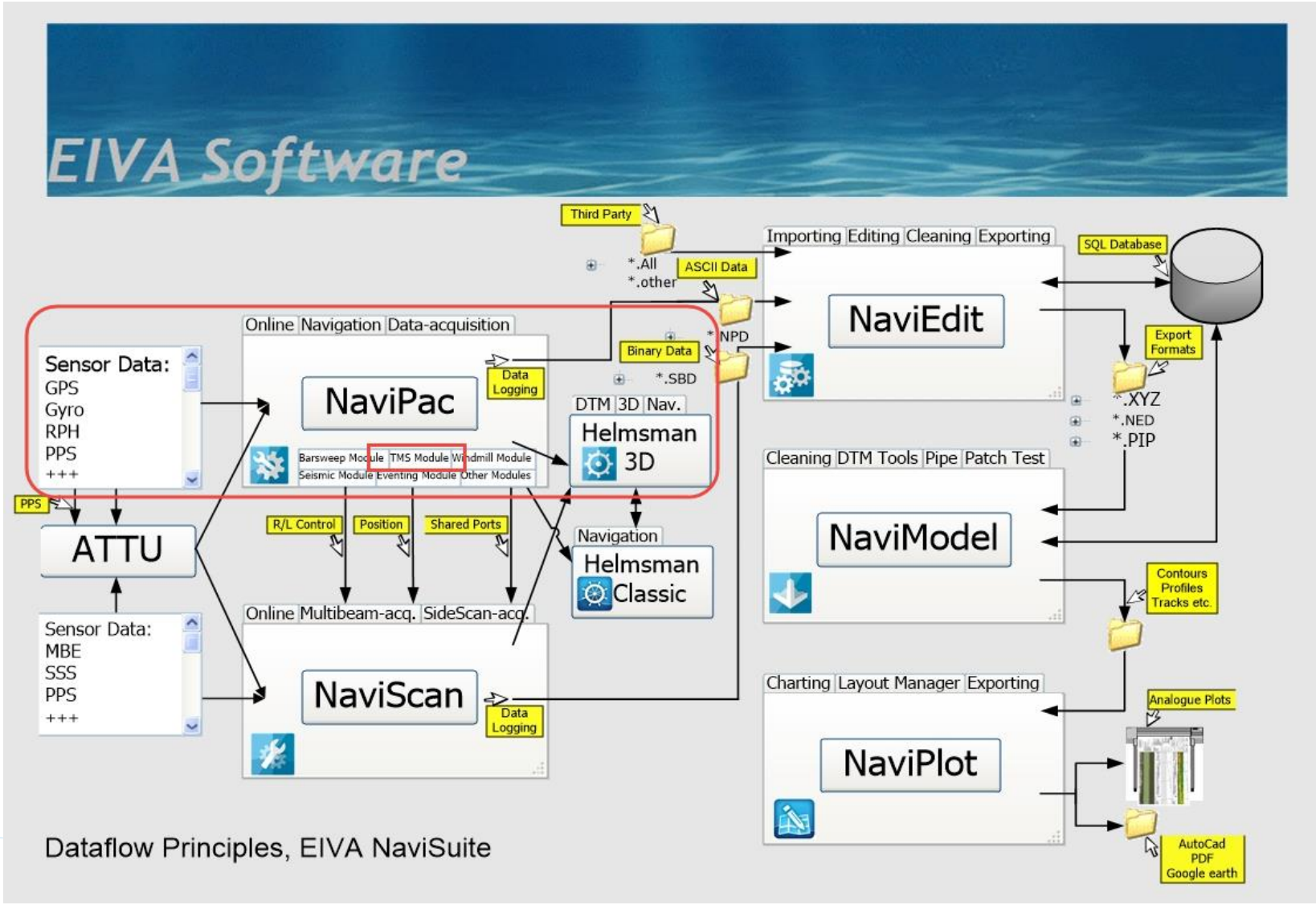


NaviPac 4 Tug Management Module

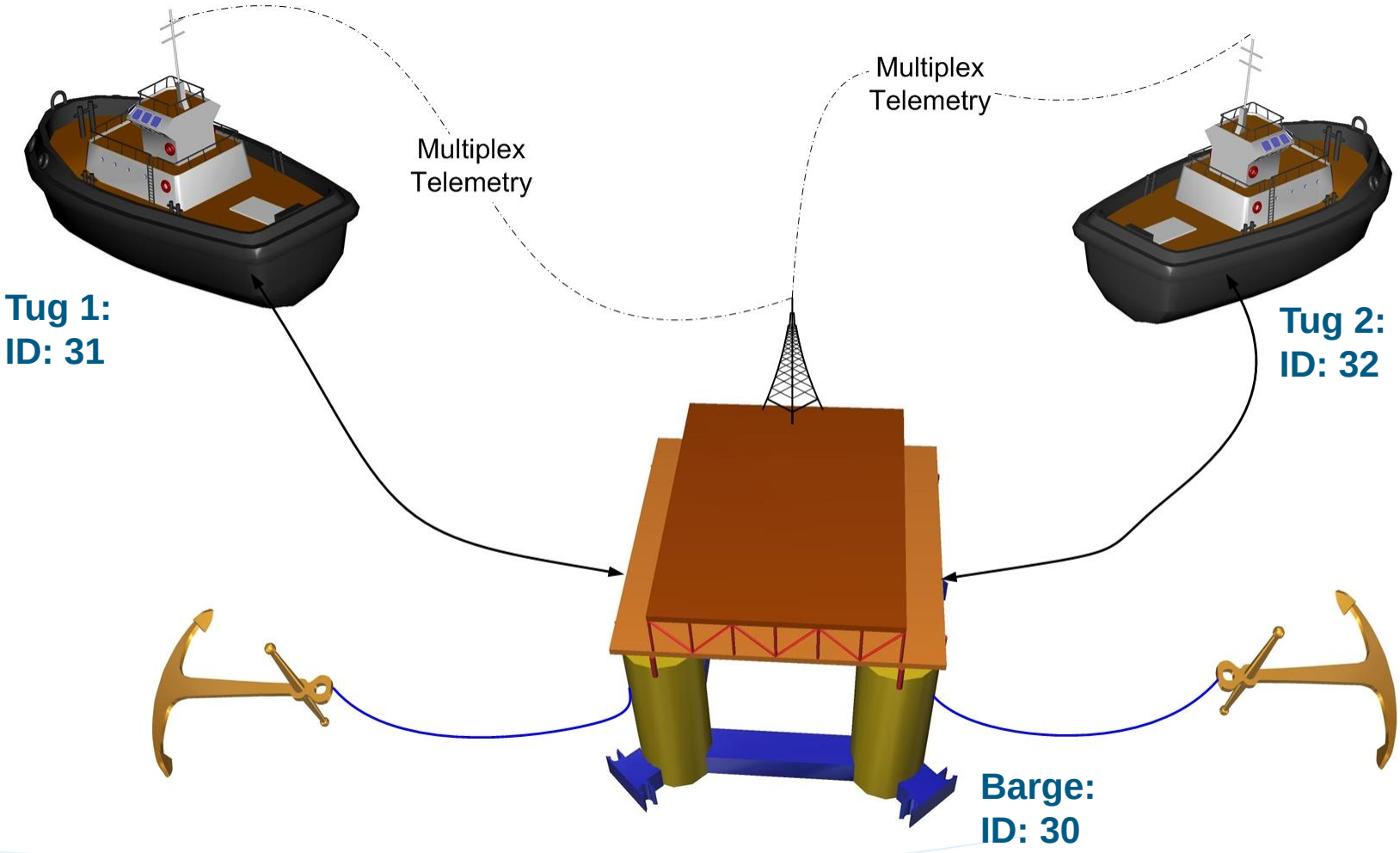
With Telemetry

Tug Management in EIVA NaviSuite

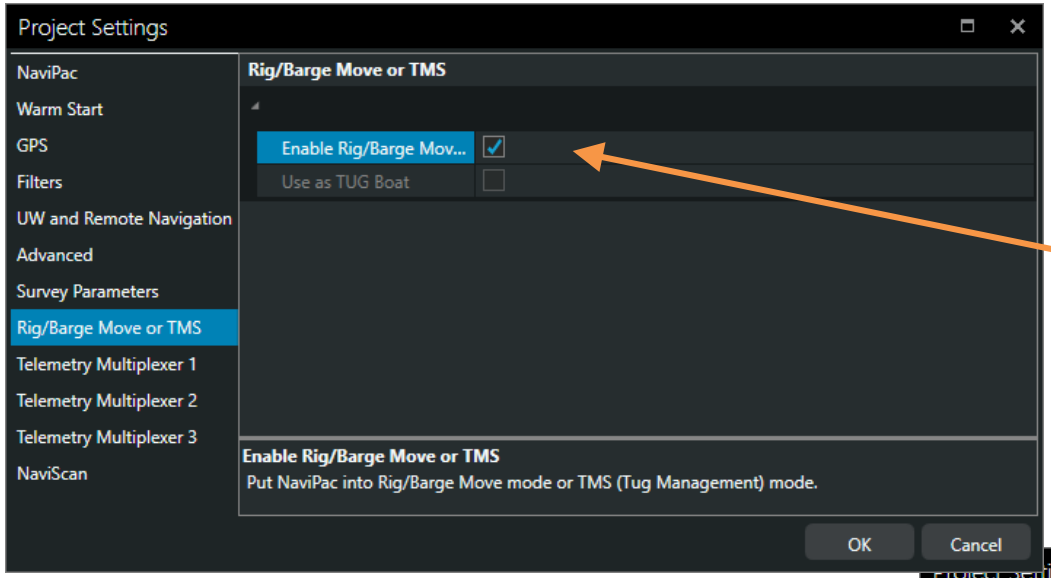


Dataflow Principles, EIVA NaviSuite

The Situation

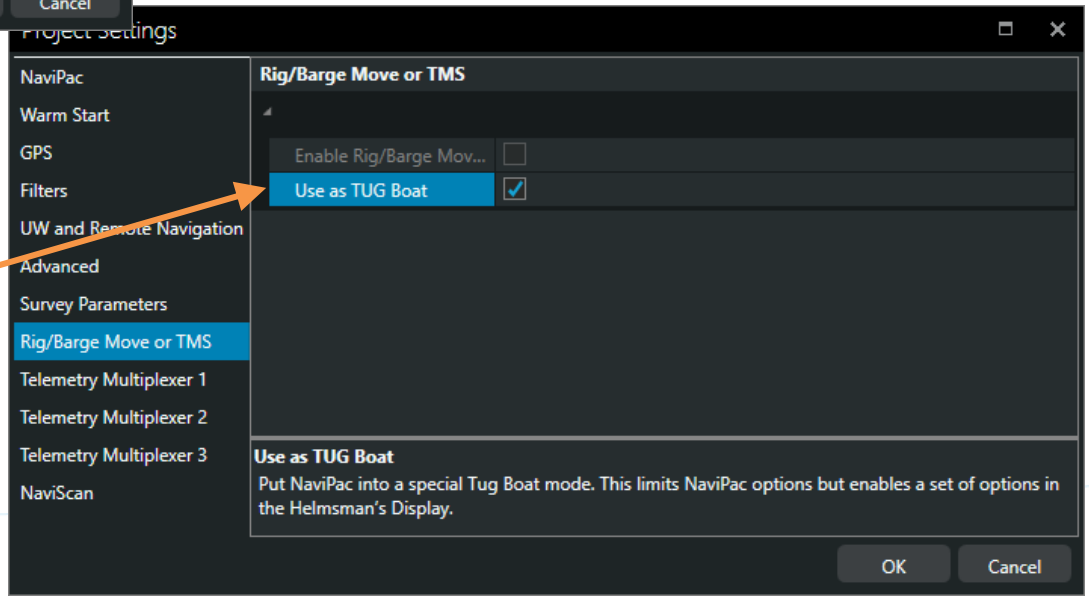


NaviPac – Defining Mode

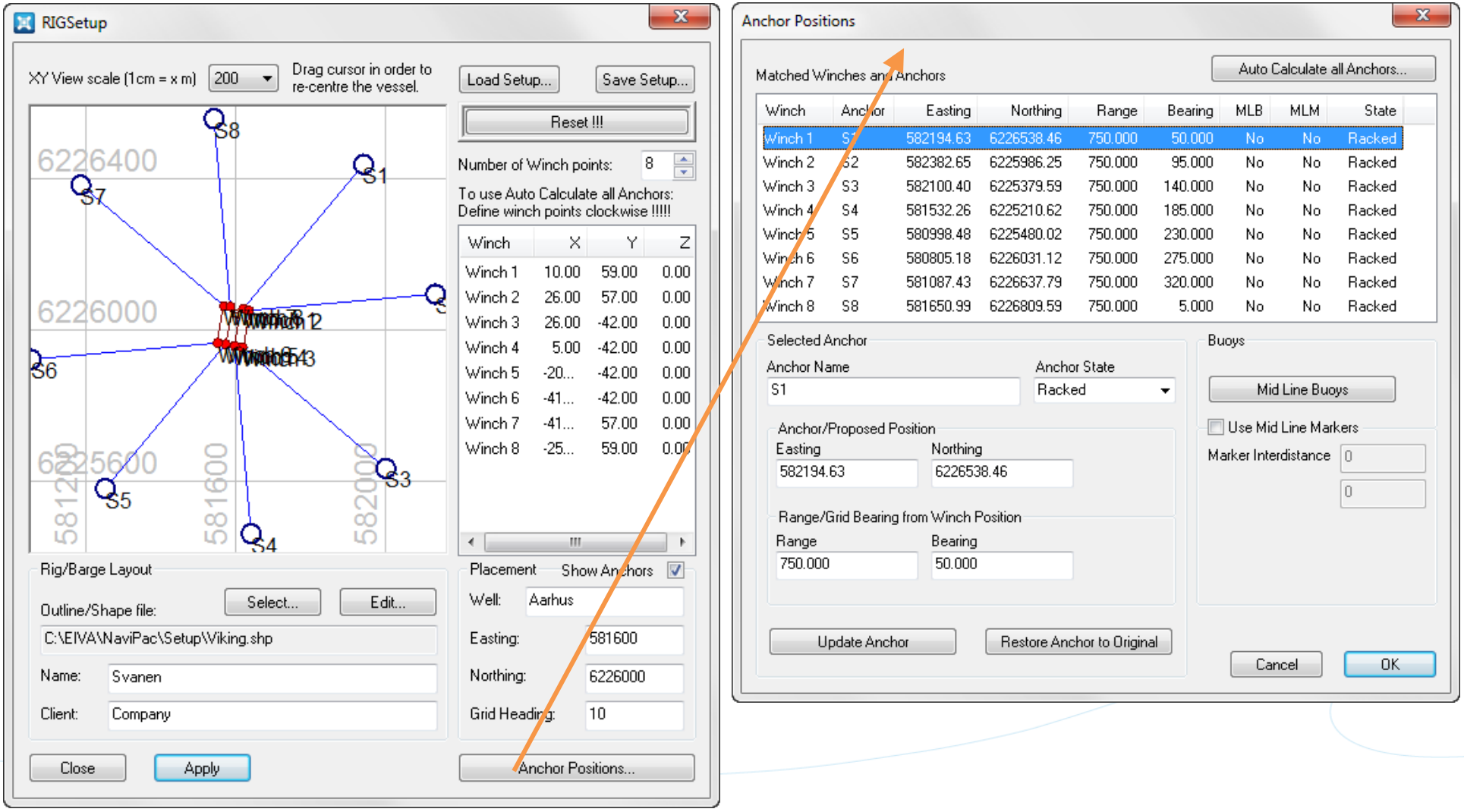


On the Barge, Rig/Barge mode must be enabled.

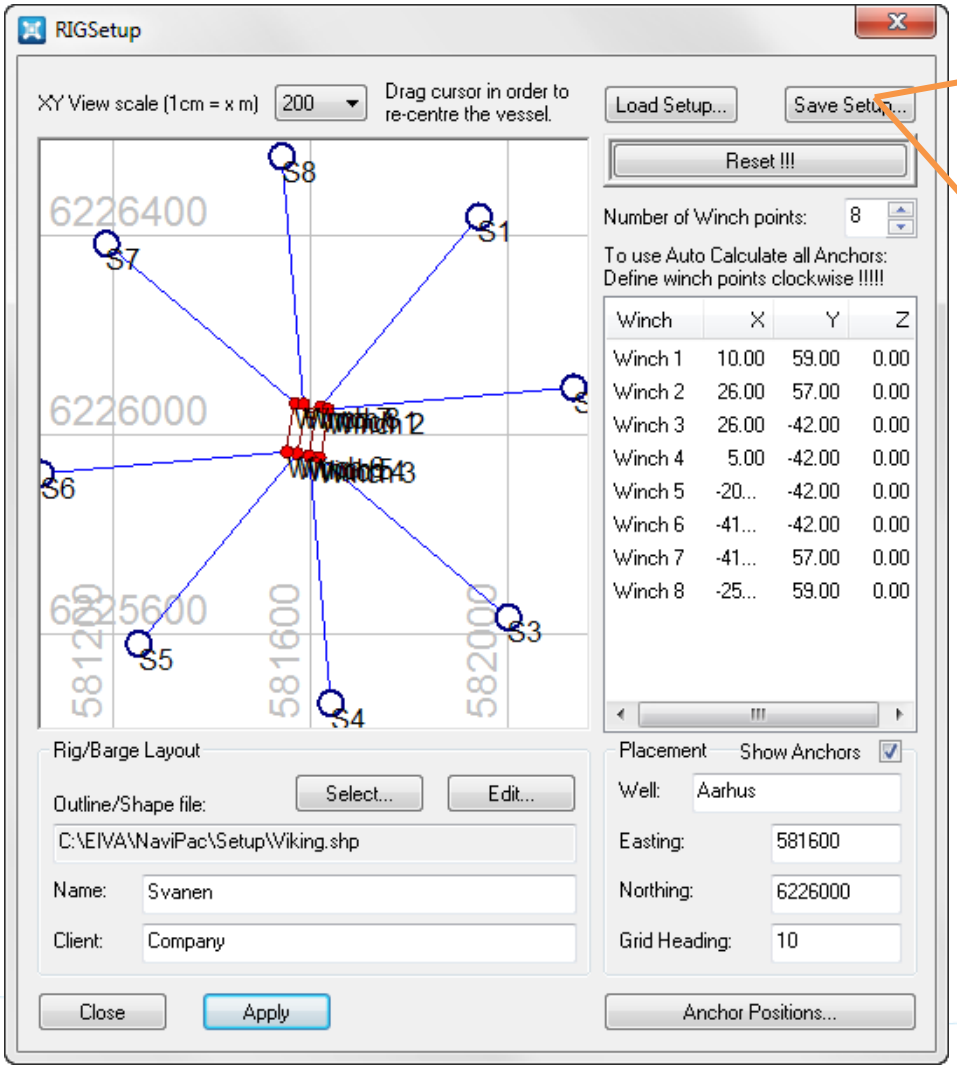
Use as TUG Boat on the Tugs.



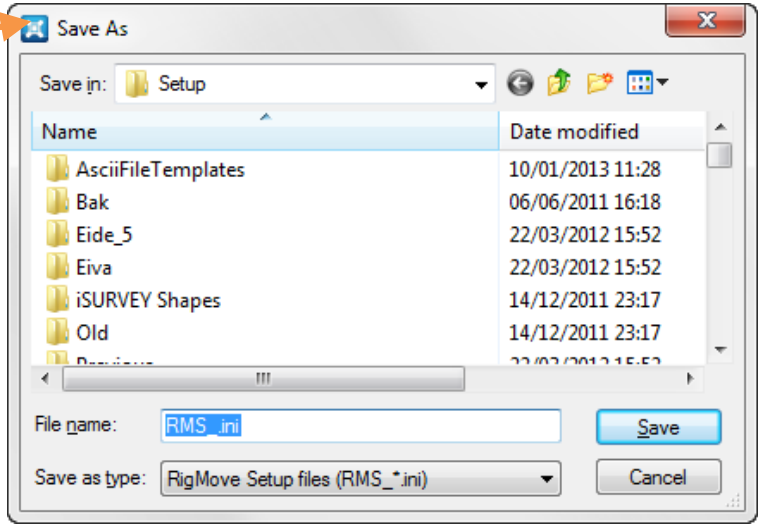
NaviPac – RIGSetup on the Barge I



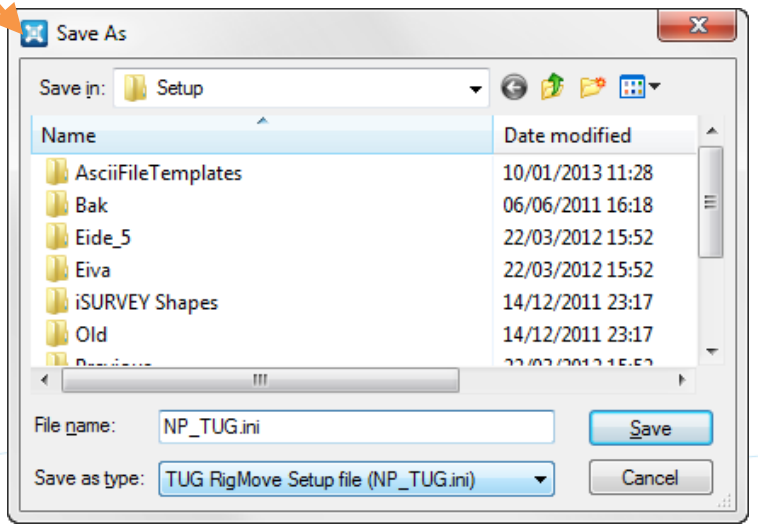
NaviPac – RIGSetup on the Barge II



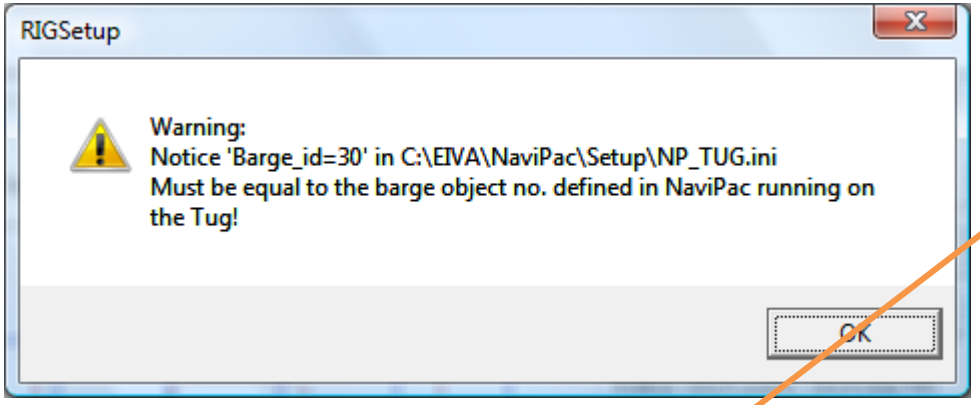
1 - Save as RigMove Setup file.



2 - Save as TUG Rigmove Setup file.



NaviPac – Rigsetup for the Tugs



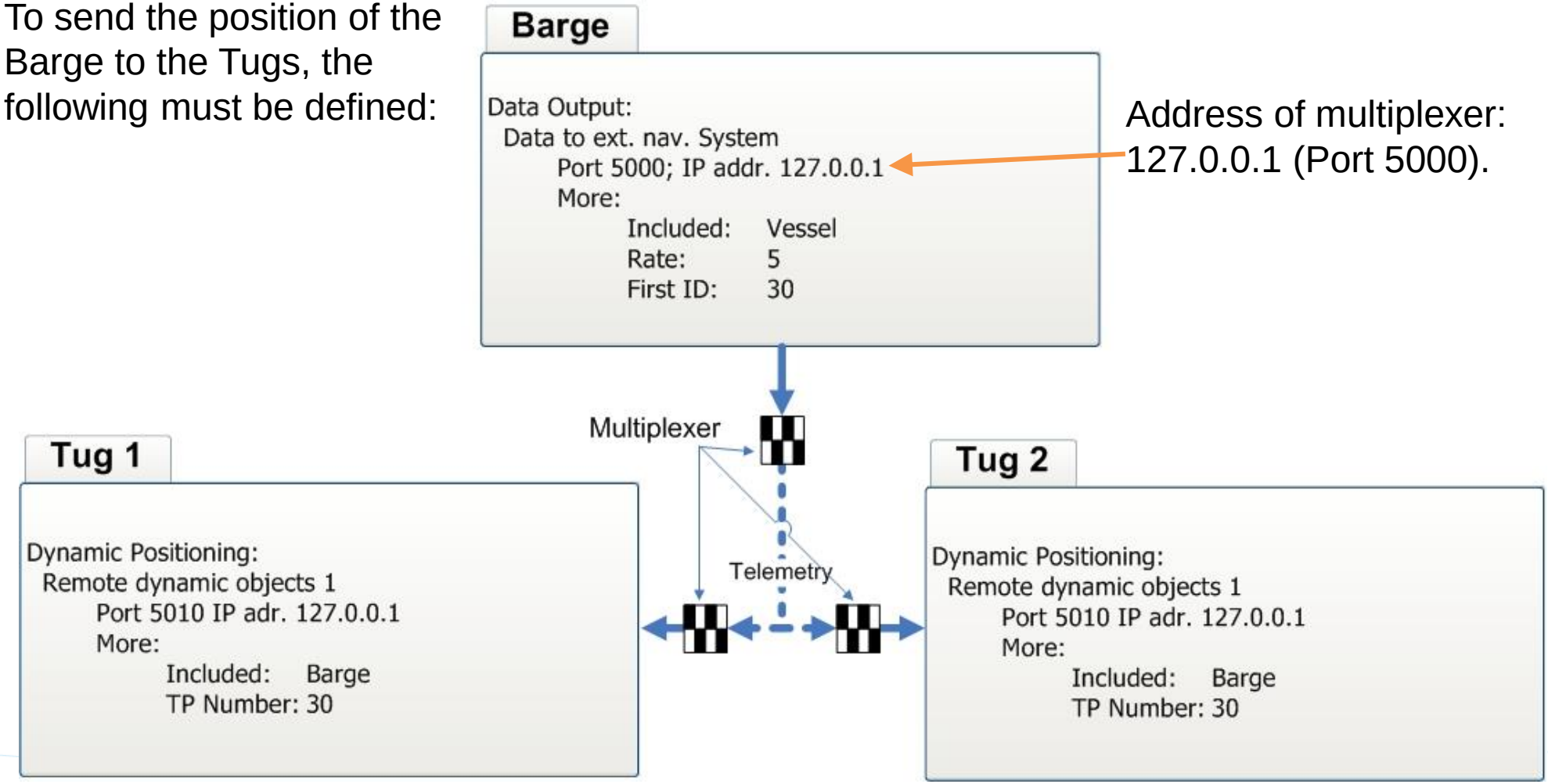
When saving the TUG Rigmove Setup file, the warning above is given.

The file NP_TUG.ini, which is generated from the RIGSetup tool (previous slide), must be copied onto the Setup folder in EIVAHOME of **each** of the Tugs (C:\EIVA\NaviPac\Setup).

```
[RigMove]
Barge_id=30
No winch points=8
WinchName01=W1
WinchOffset01=10.000, 60.000, 0.000
WinchName02=W2
WinchOffset02=27.000, 57.000, 0.000
WinchName03=W3
WinchOffset03=27.000, -42.000, 0.000
WinchName04=W4
WinchOffset04=5.000, -42.000, 0.000
WinchName05=W5
WinchOffset05=-20.000, -42.000, 0.000
WinchName06=W6
WinchOffset06=-42.000, -42.000, 0.000
WinchName07=W7
WinchOffset07=-42.000, 57.000, 0.000
WinchName08=W8
WinchOffset08=-25.000, 60.000, 0.000
```

NaviPac – Barge – Position Output

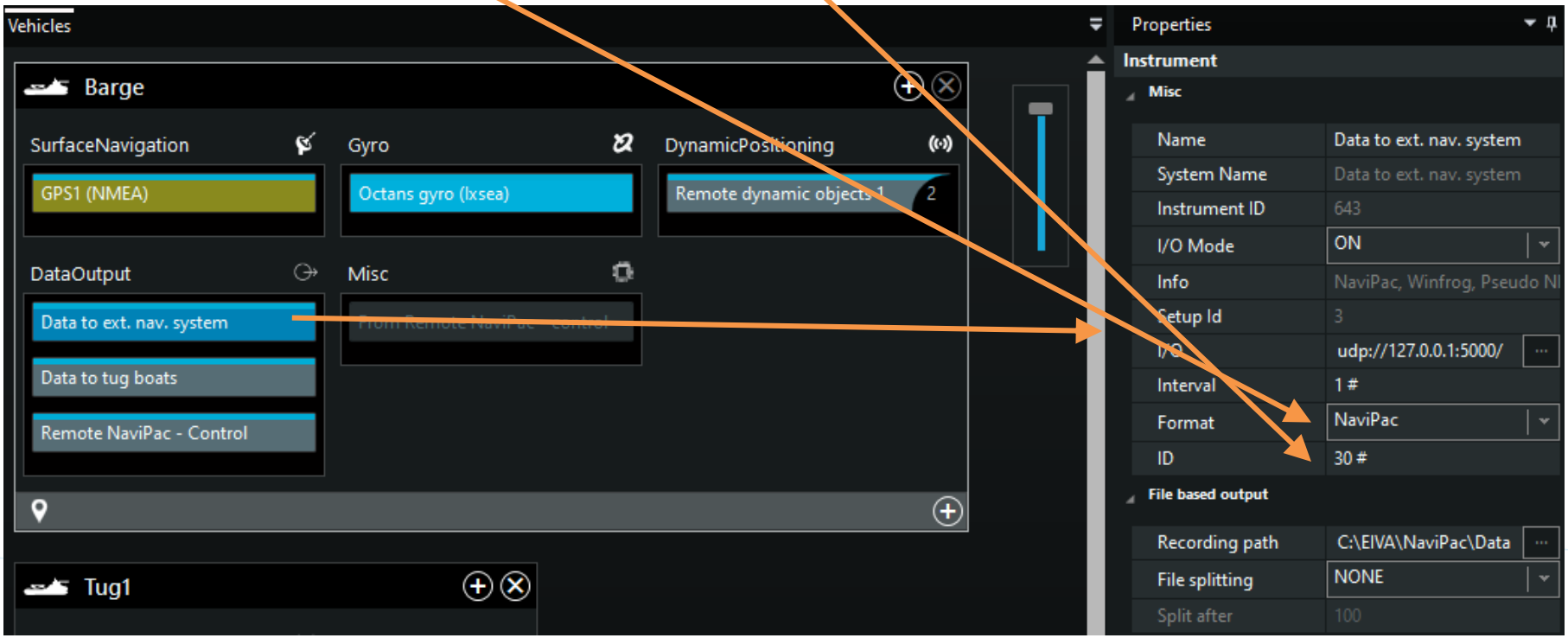
To send the position of the Barge to the Tugs, the following must be defined:



NaviPac – Barge – Position Output

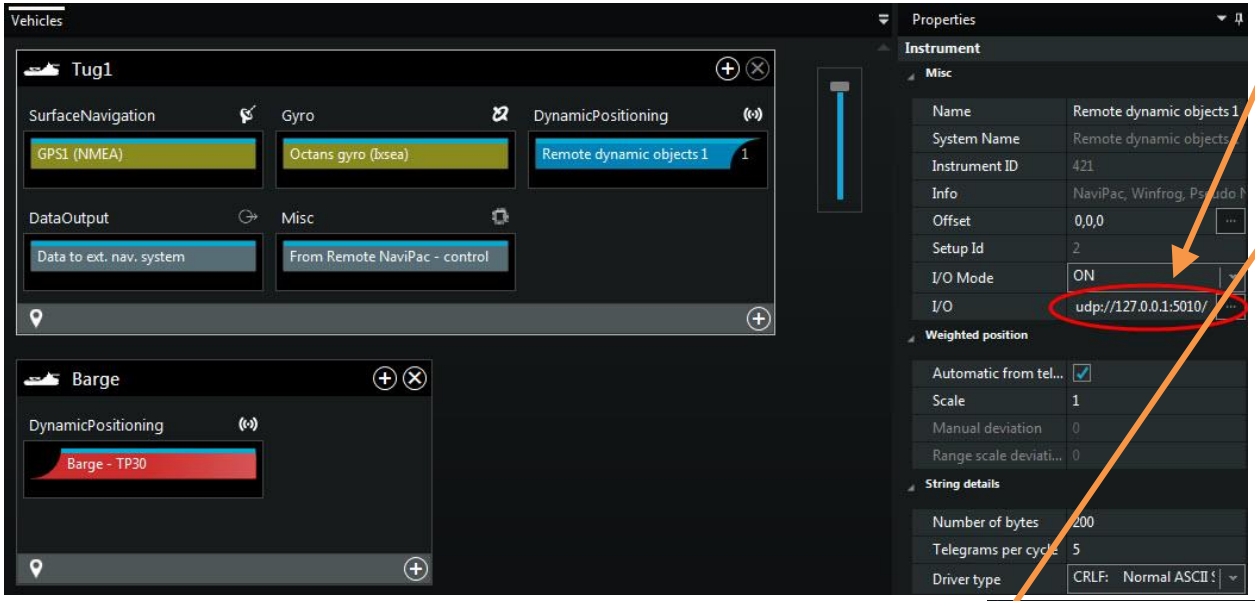
To send the Barge position to the Tugs, the following output must be selected:

- The IP Address should be 127.0.0.1 to send the data to the Multiplexer.
- ID of the barge position must be set to 30.
- Choose format NaviPac.

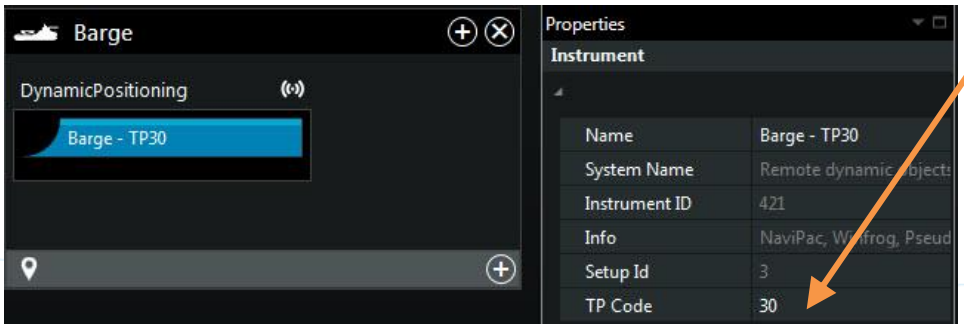


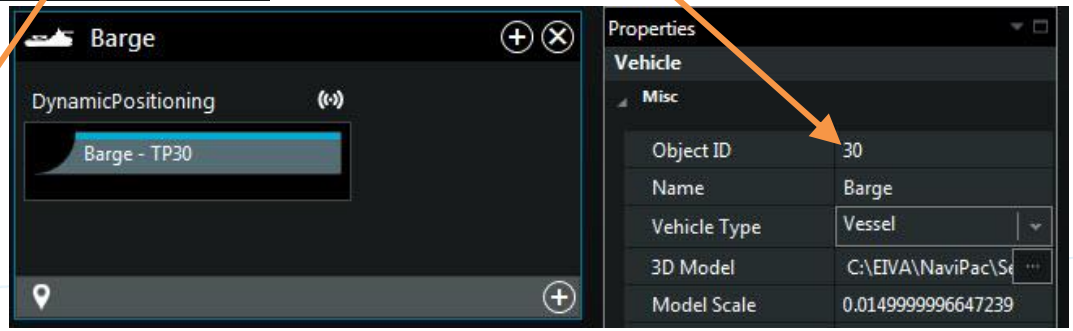
NaviPac – Tug – Receive Barge Position

To receive the barge position on the tugs, the following Dynamic positioning system must be defined:

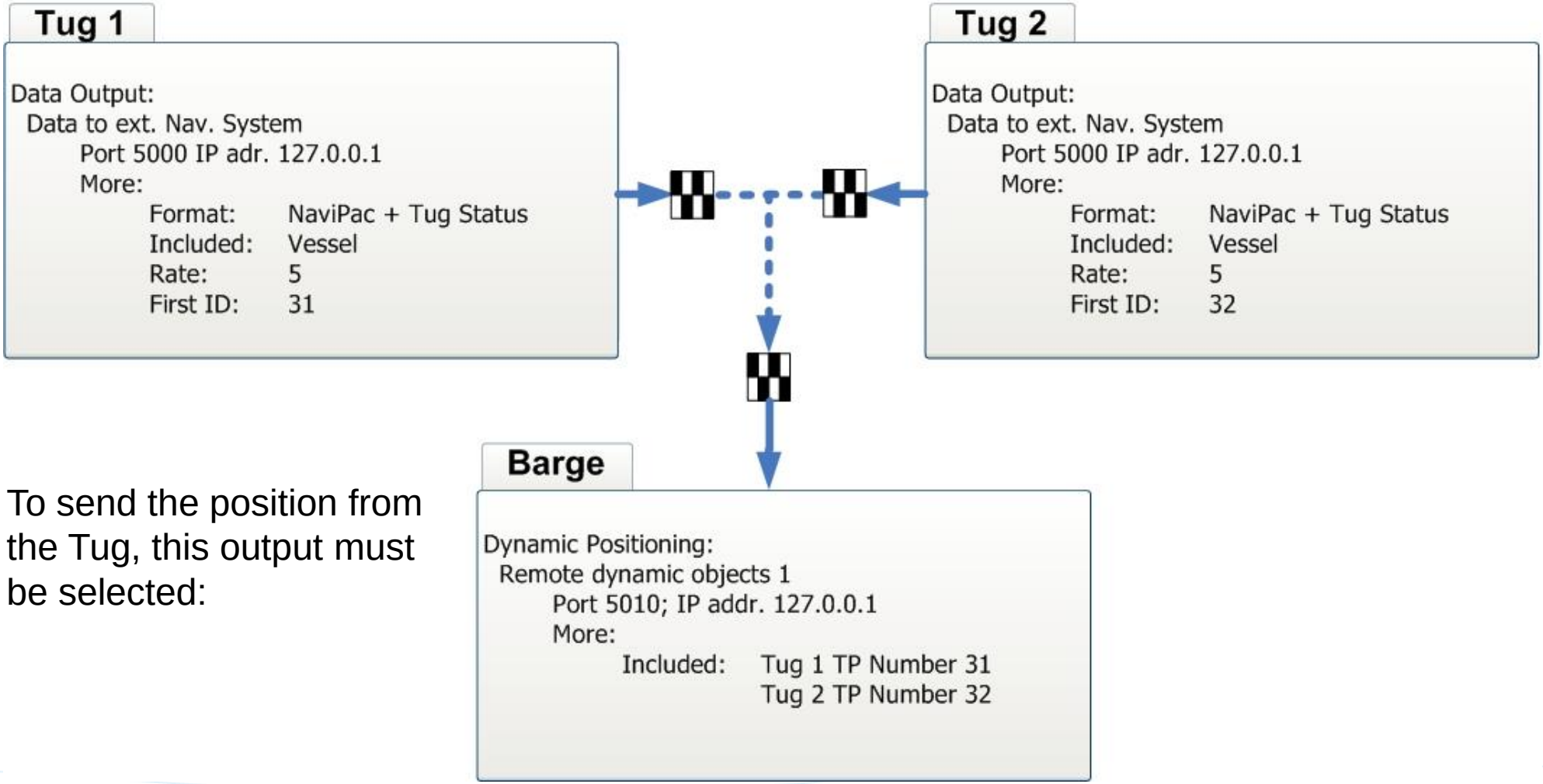


- The IP address: 127.0.0.1 is pointing at the Multiplexer program.
- The TP number of the barge is 30.
- The ID of the Barge vehicle must be 30





NaviPac – Tug – Position Output

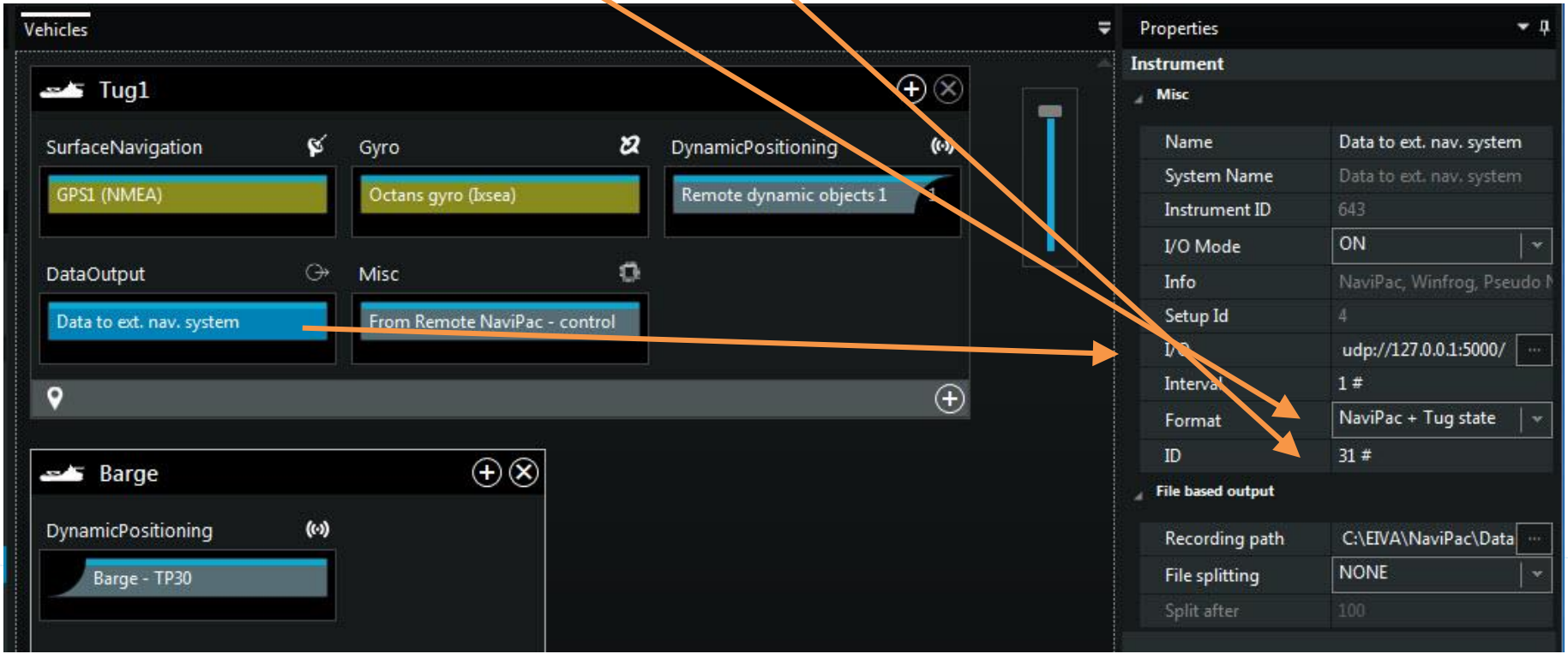


To send the position from the Tug, this output must be selected:

NaviPac – Tug – Position Output

To send the position from the Tug 1, the following output must be defined:

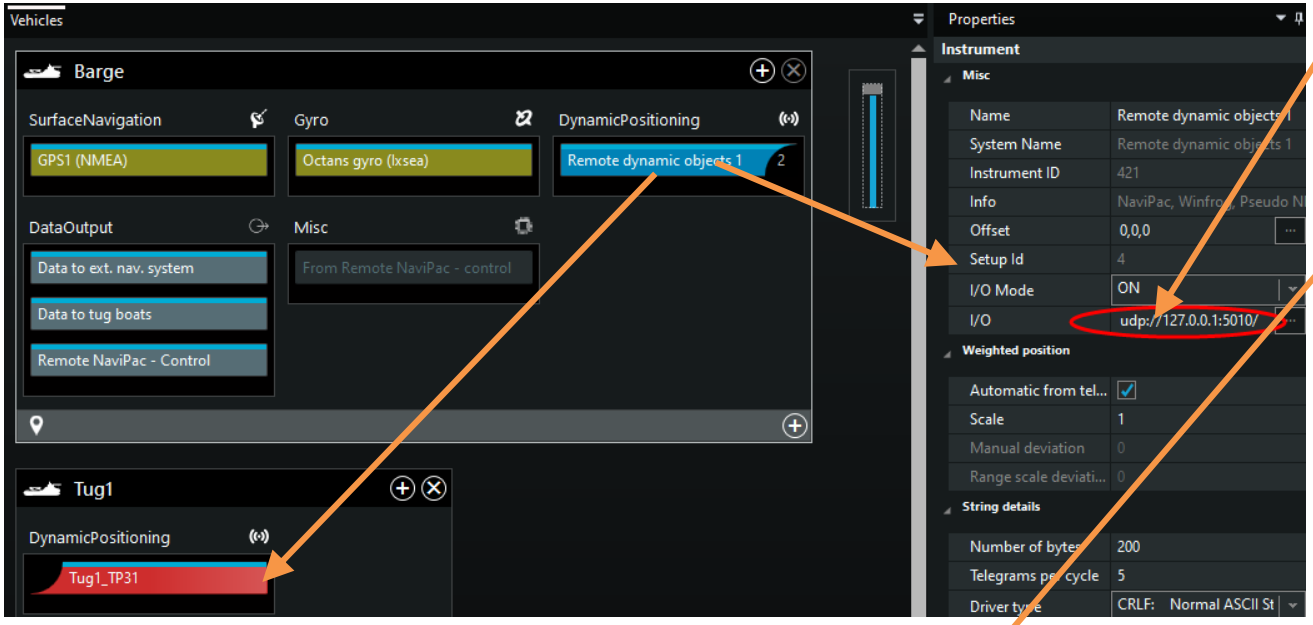
- The reference point (CRP) should be the stern. This is usually the anchor handling point on a tug.
- The ID must be defined as 31 (Tug 1).
- Format is NaviPac + Tug state.

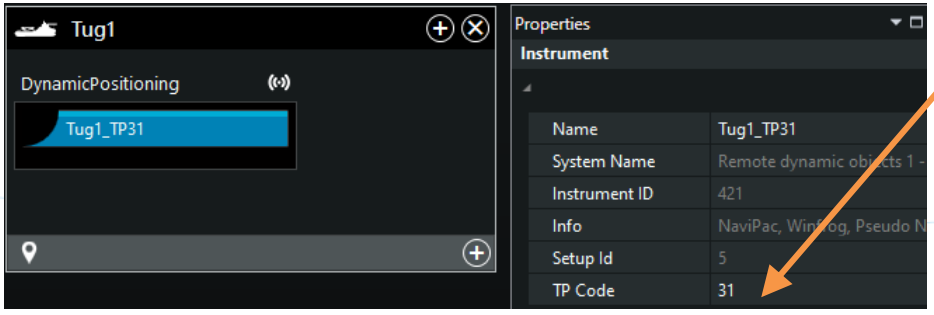


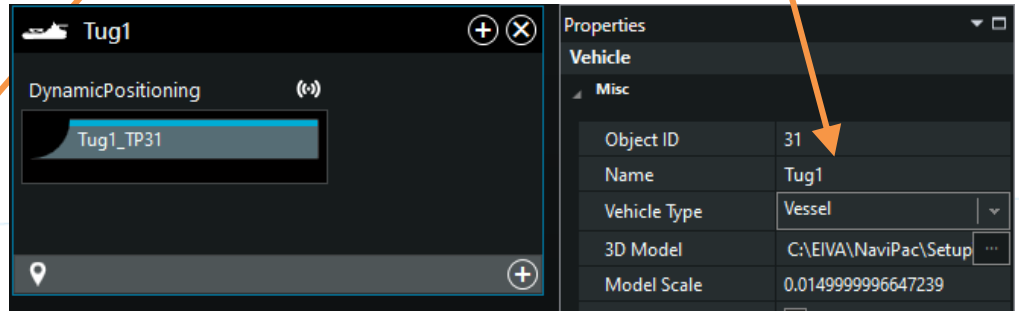
NaviPac – Barge – Receive Tug Position

To receive the tug positions on the barge, the following Dynamic positioning system must be defined:

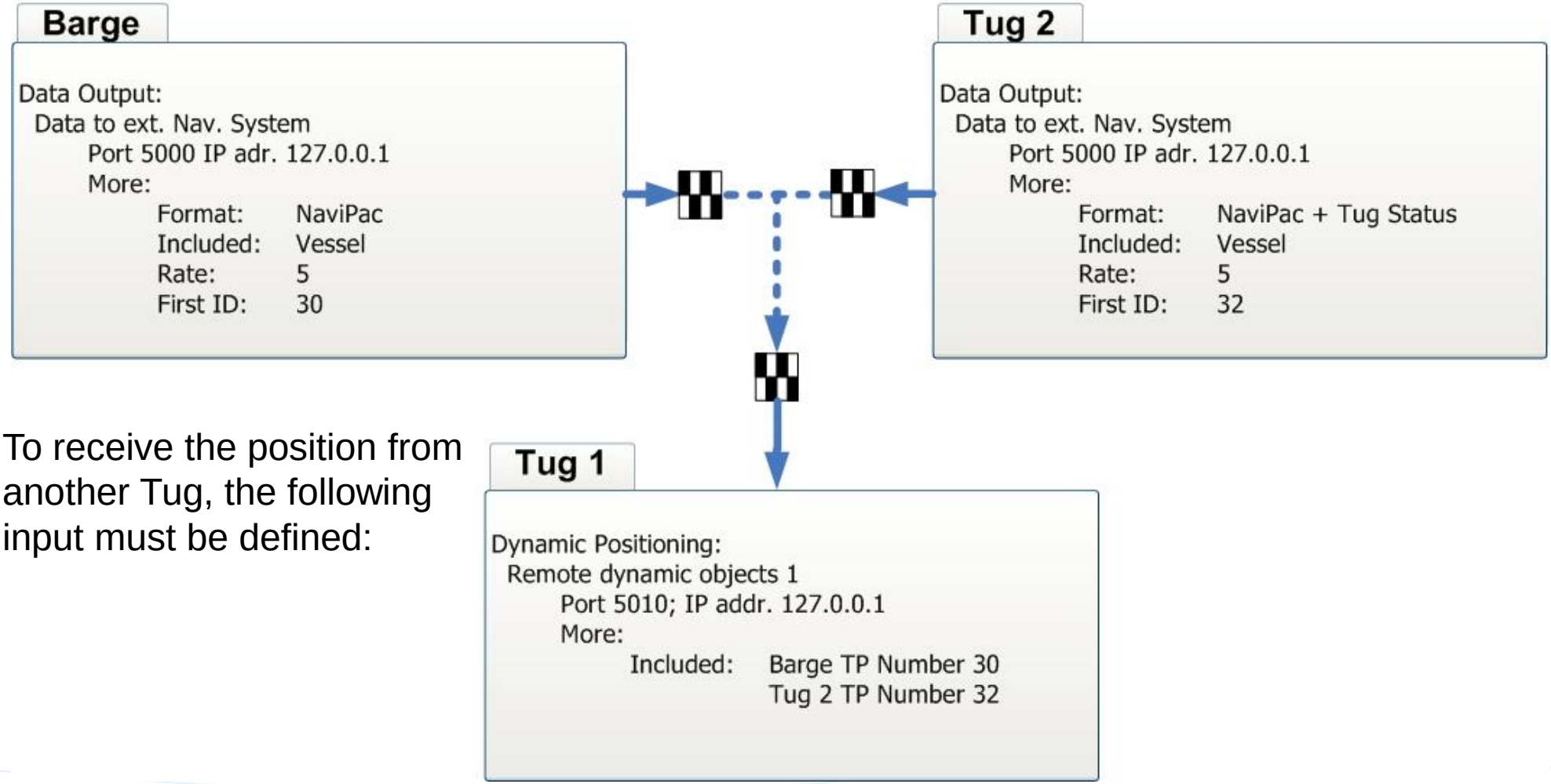
- The IP address: 127.0.0.1 is the address of the Multiplexer.
- The TP number of Tug1 is 31.
- The TP number of Tug2 is consequently 32.
- The ID of the tugs is 31 and 32, respectively







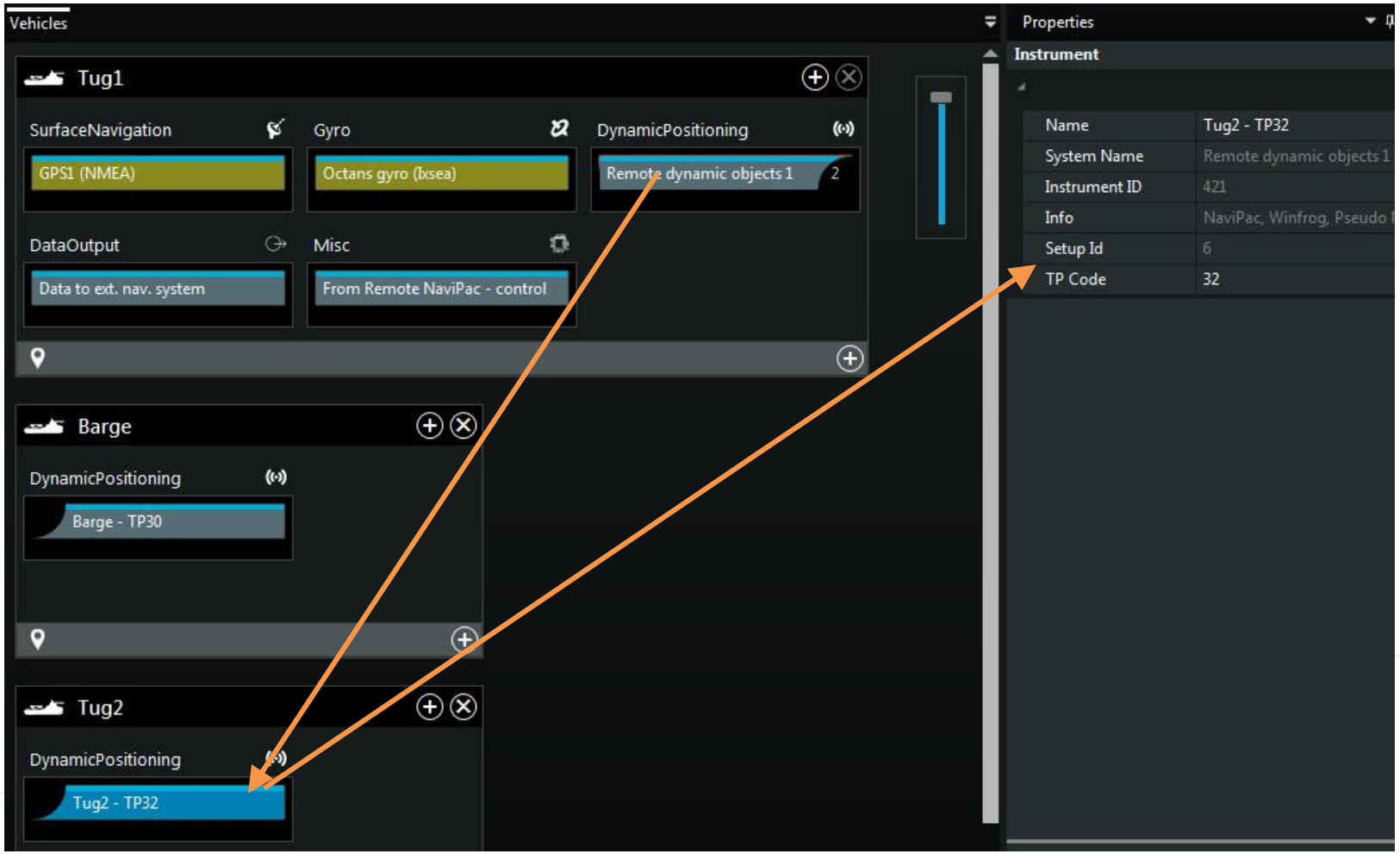
NaviPac – Tug1 – Receive Tug2 Position



To receive the position from another Tug, the following input must be defined:

NaviPac – Tug1 – Receive Tug2 Position

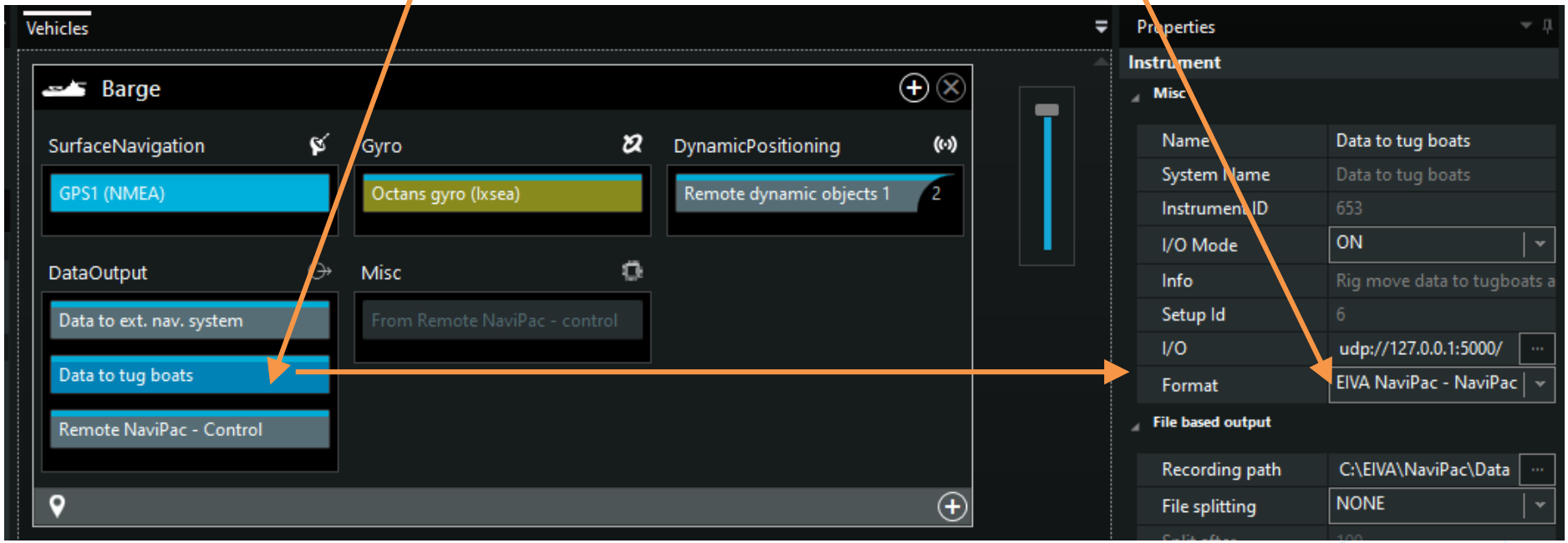
To receive the position from another Tug, the following input must be defined:



NaviPac – Barge – Output Anchor Pattern

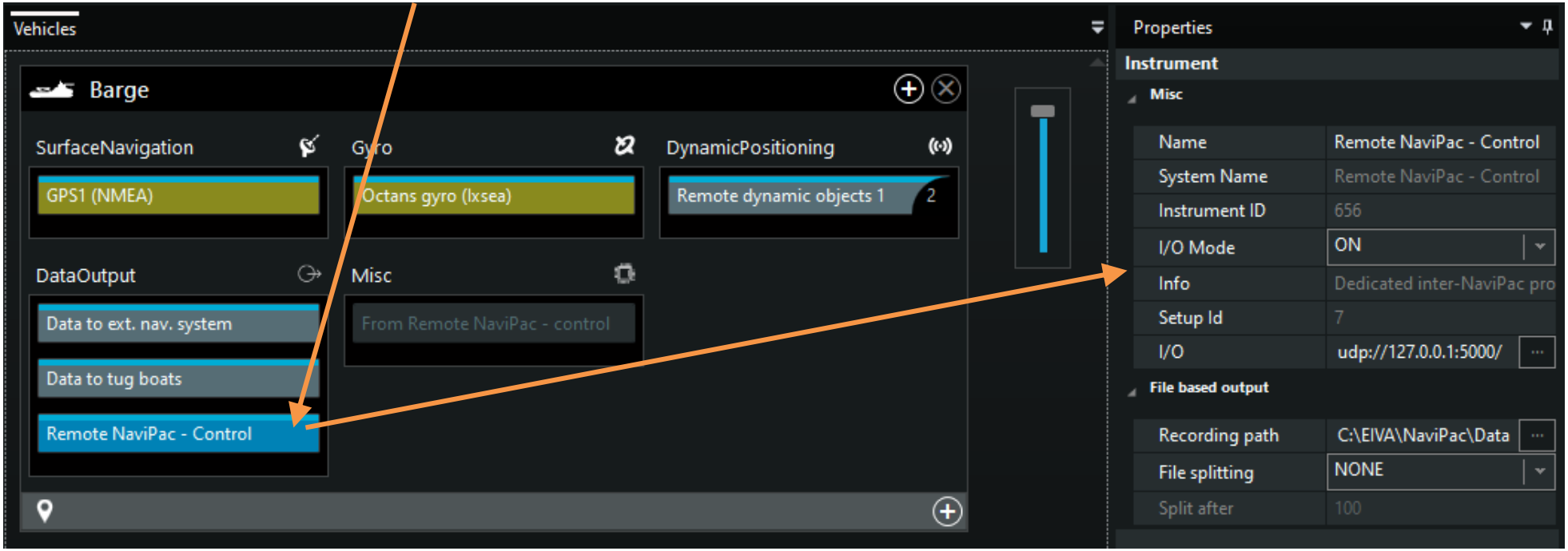
To send the Anchor pattern to the Tugs, a 'Data to tug boats' output must be defined on the Barge:

NaviPac format must be chosen.



NaviPac – Barge – Send Runlines

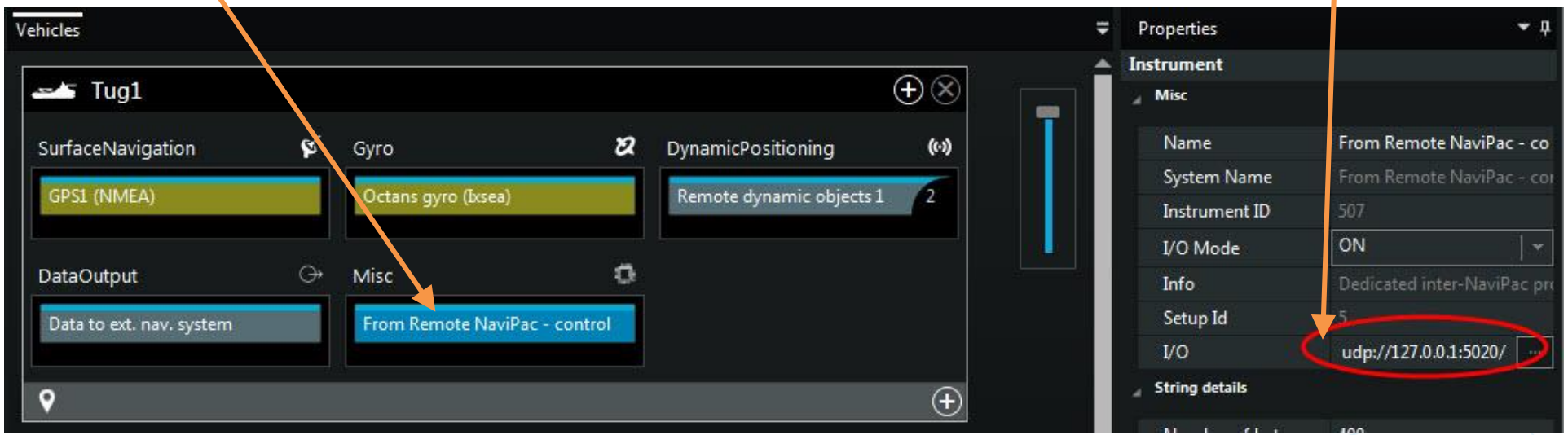
To send Runlines to the Tugs, this output must be selected:



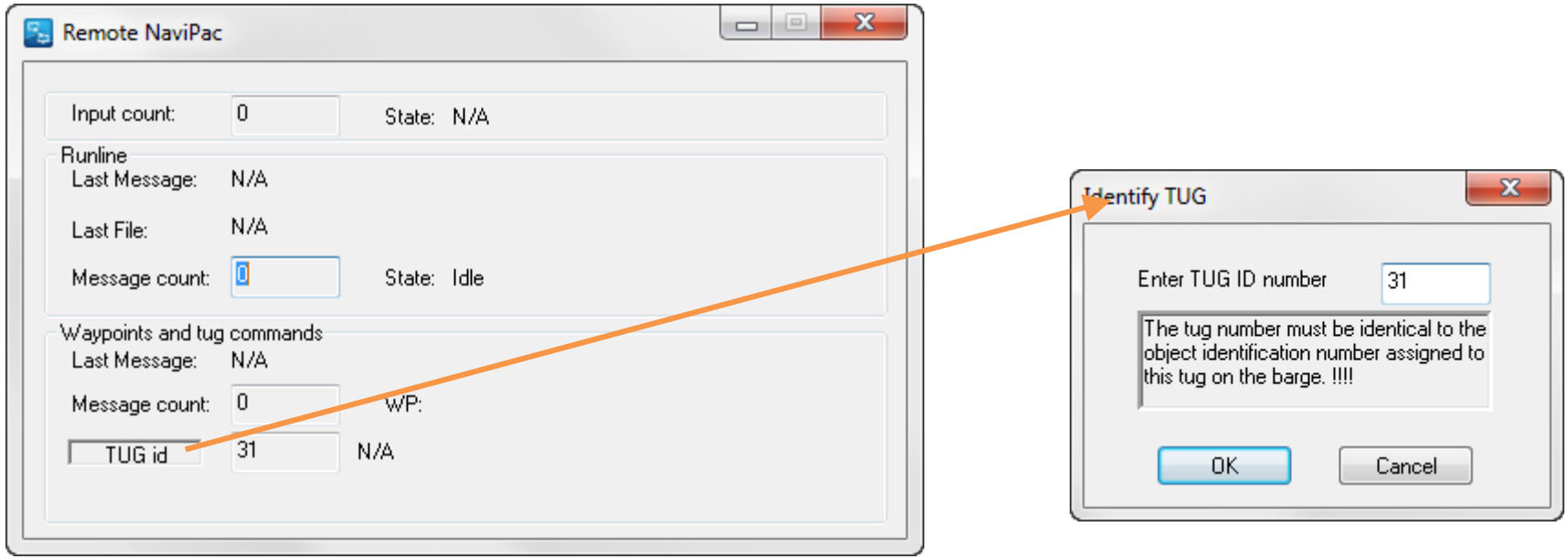
NaviPac – Tug1 – Receive Anchor Pattern I

To receive the anchor pattern on a tug, a 'From Remote NaviPac – Control' Misc input must be defined:

The IP address: 127.0.0.1 is the address of the multiplexer.
Port 5020 is the port, to where the multiplexer is distributing the anchor pattern and the runline data.



NaviPac – Tug – Receive Anchor Pattern II



To receive the anchor pattern on the Tug, the Remote NaviPac window will be opened automatically when entering online mode. Click on the 'TUG id' text-box and the window to the right will open. Now insert the ID (31 for Tug 1 etc). NaviPac will remember this setting.

NaviPac – Messages from Tug to Barge

The operator on the tug can activate some anchor-related commands towards the barge. The activation takes place from the Helmsman's Display of the Tug:

- PICKED UP - The anchor has been picked up from barge (state becomes 'Tracking').
- DROPPED - The anchor has been dropped on the seabed (state becomes 'Laid').
- DE-ASSIGN - The assignment is rejected from the Tug
- FIX - Various events performed on the tug (will be shown on HD of the Barge).

The commands are sent on top of the existing 'Data to external navigation system' output, so no additional setup is required on the tug boat.

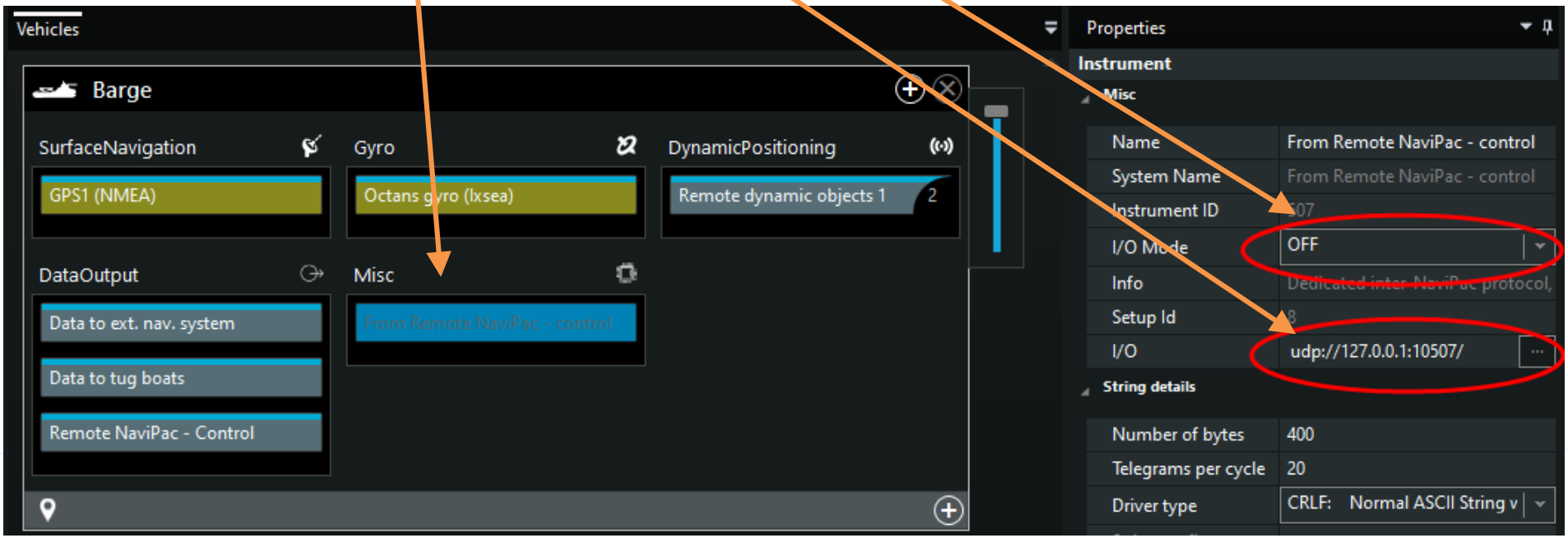
The data output (on the Tugs) must be selected to 'NaviPac + Tug state' or 'Expanded NaviPac'.

NaviPac – Barge - Messages from the Tug I

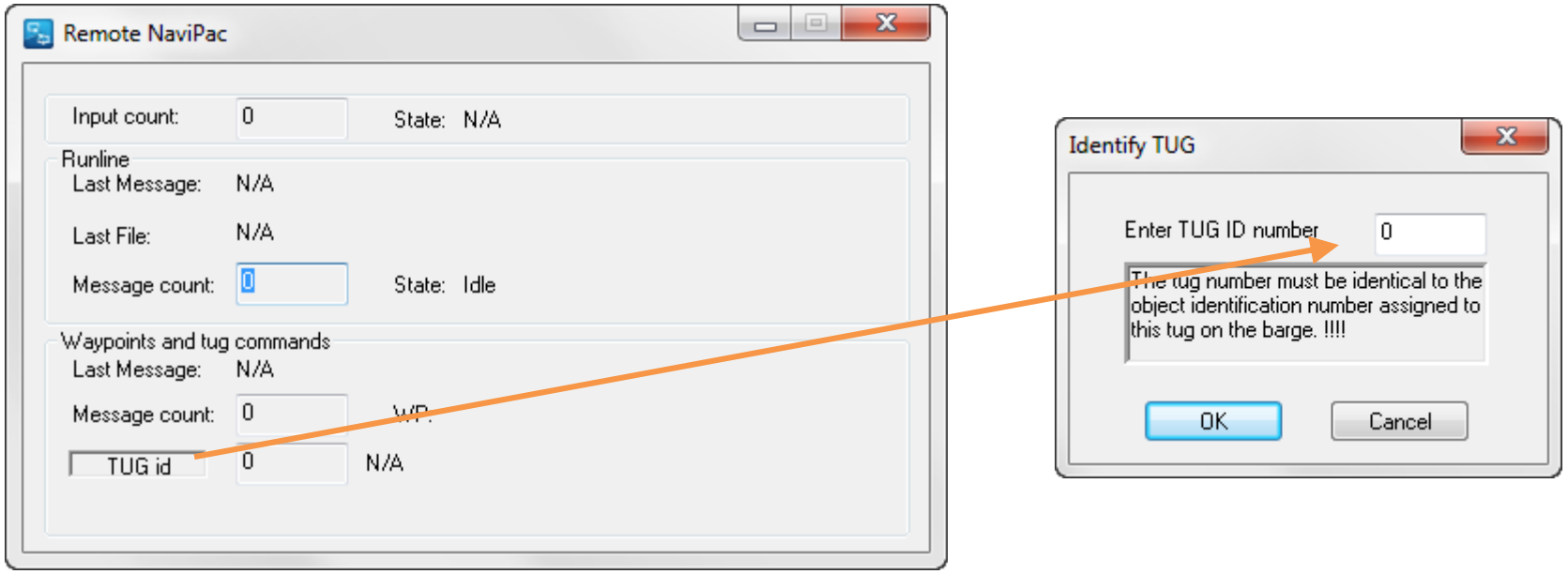
A ‘Misc’ input, ‘From Remote NaviPac – control’, must be defined in order to enable the Barge NaviPac to be capable of using the in-coming tug commands.

As the data most often is overlaid the general navigation data (from the Tug) the driver must be specified to I/O mode ‘Off’.

Note the port number – has to be 10507.



NaviPac – Messages from the Tug II



When in online mode, click on the ’TUG id’ text-box and the window to the right will open. Now insert the ID (0 - telling that this is the barge). NaviPac will remember this setting. The window should never be closed, as it acts as interface between the NaviPac kernel (interpreter) and the TMS kernel (RigMon).

NaviPac – Barge – Using Multiplexer I

Three different telemetry systems possible, each related to a radio/frequency.

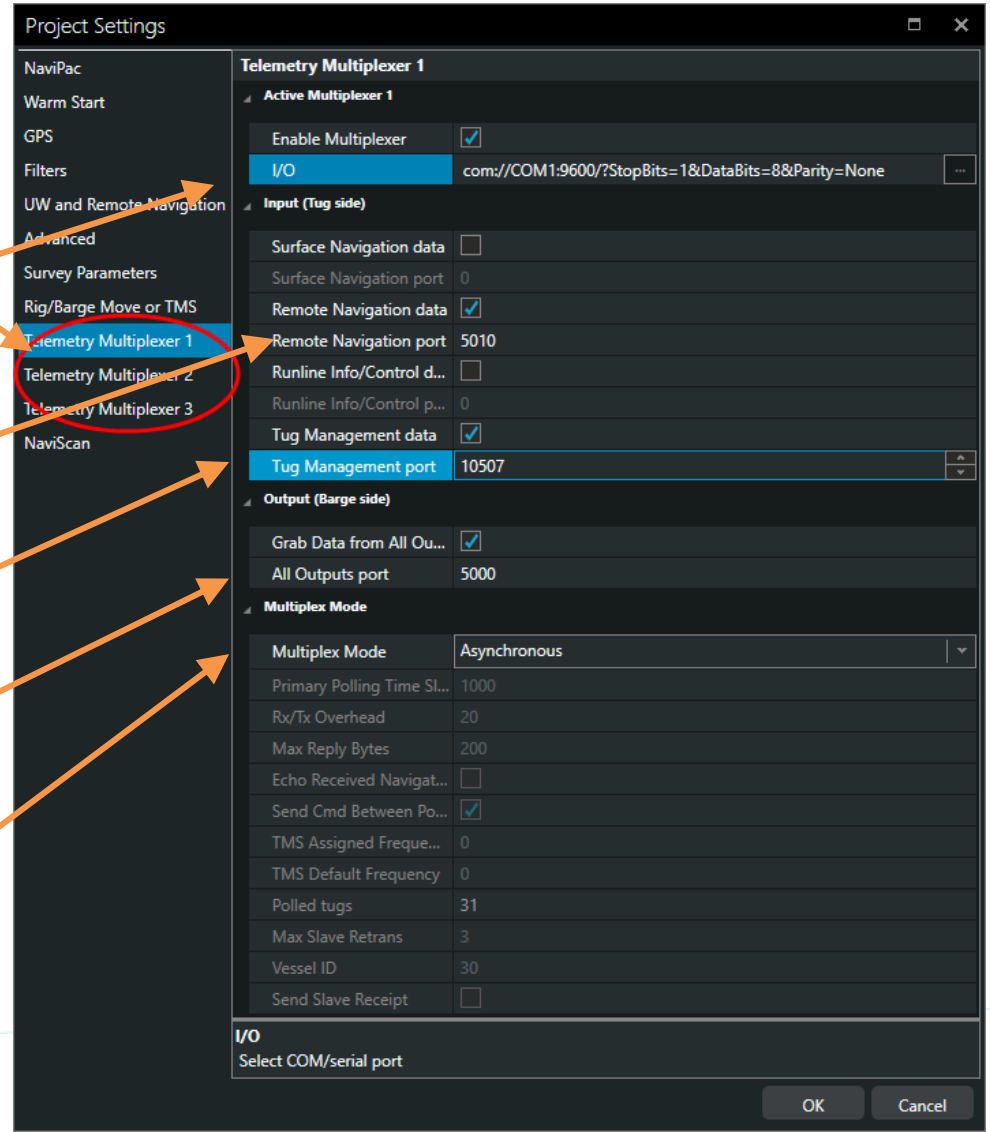
Definition of com-port and I/O settings for the radio interface from where data is read from/routed to.

Remote navigation data distributed to port 5010.

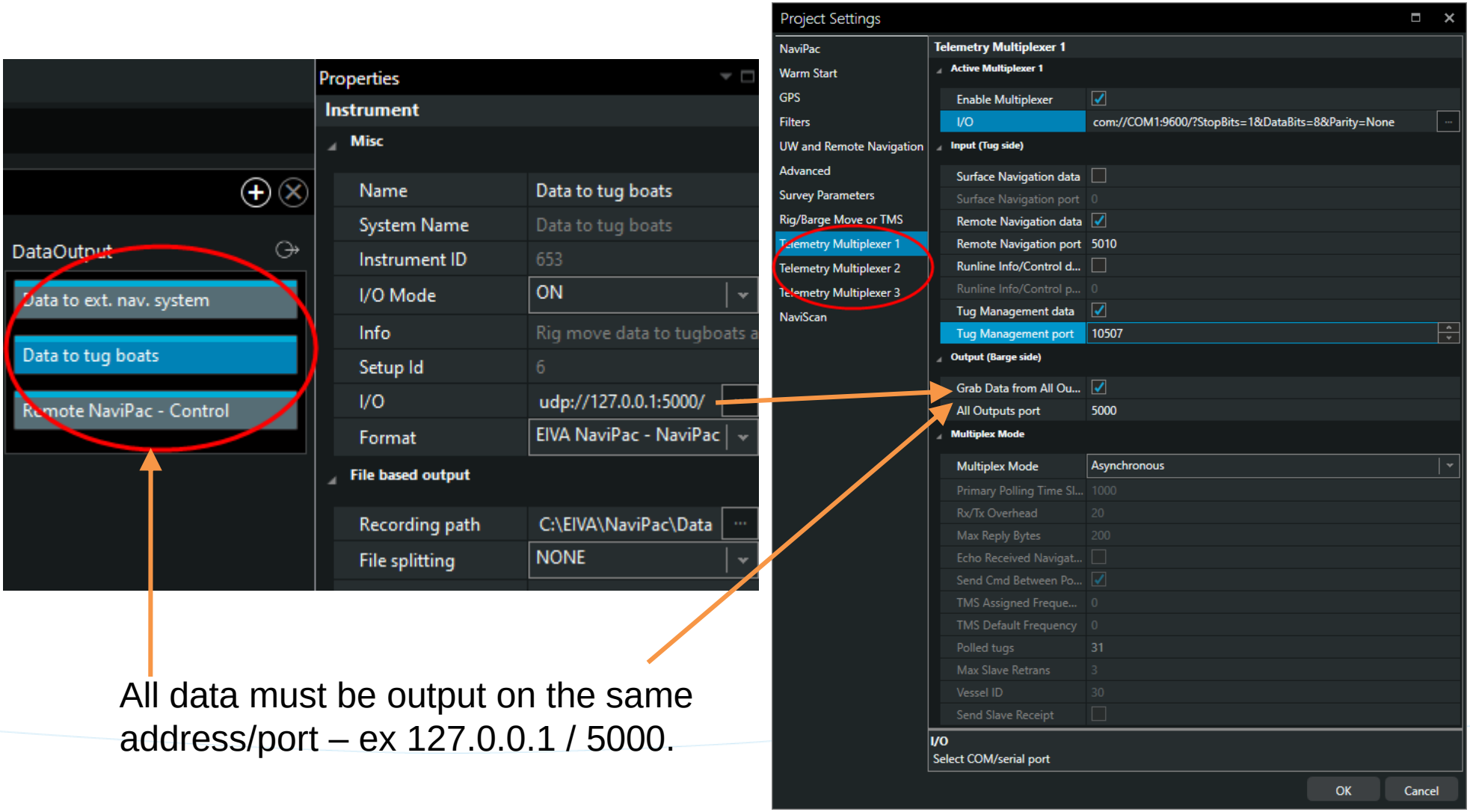
Tug Management data distributed to port 10507 (always).

Output port: all outputs to port 5000 (see next slide)

Asyncronous mode selected – otherwise Polling master on the Barge and Polling Slave on the Tugs.

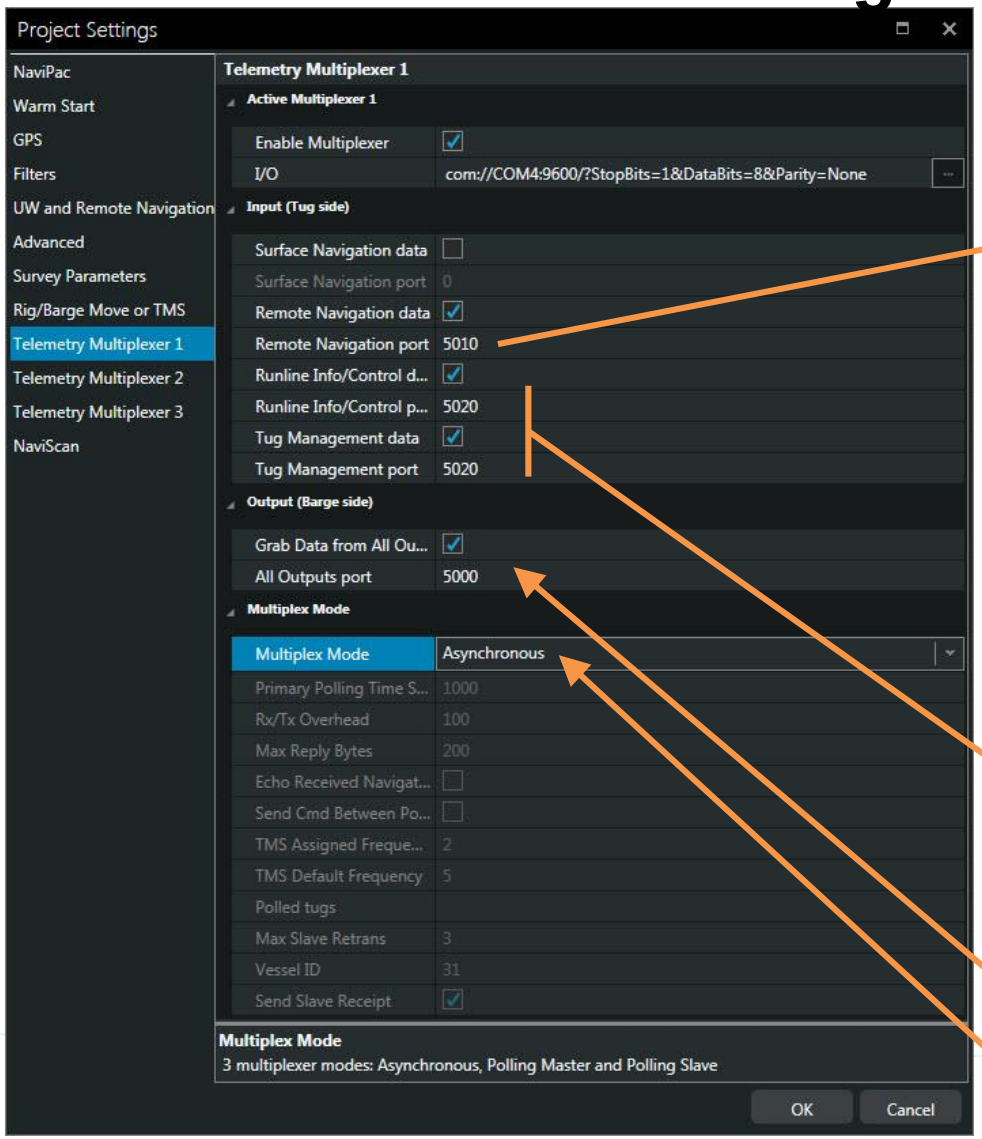


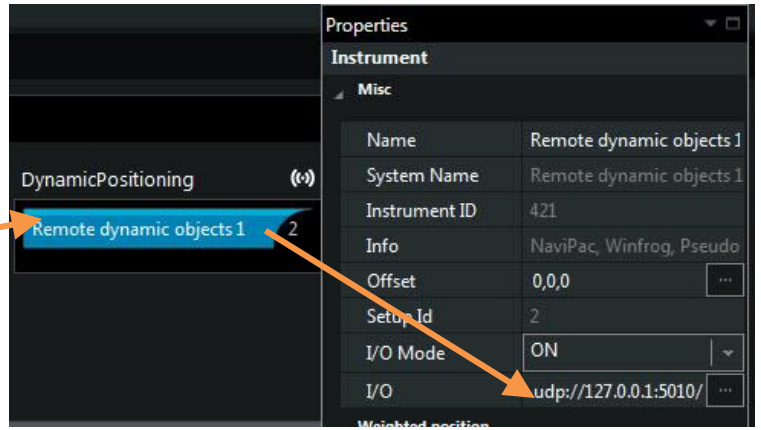
NaviPac – Barge – Using Multiplexer II

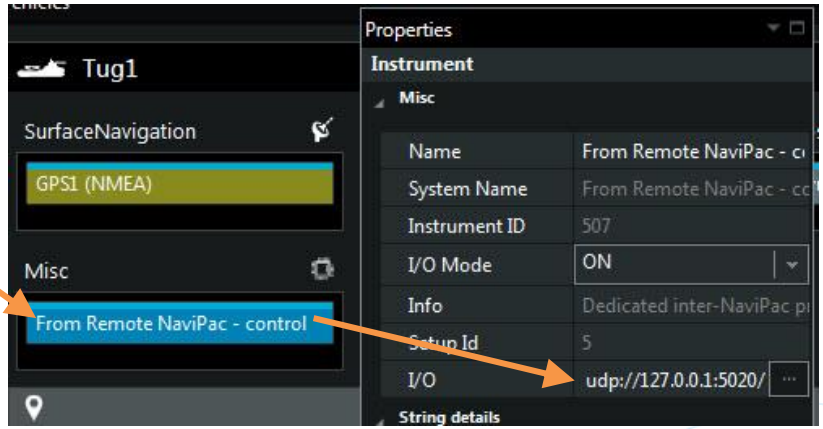


All data must be output on the same address/port – ex 127.0.0.1 / 5000.

NaviPac – Tug – Using Multiplexer







All outputs to port 5000

Asynchronous mode

NaviPac – Barge – Polling Master

In polling mode, the Barge acts as a master in the communication. Tugs can only transmit within certain time-slots, when requested. Tugs are divided into polling groups with different polling frequencies.

Main polling frequency. A polling sequence starts with this interval. In TMS scenario only tracking vessels are polled with this interval. In normal scenarios all vessels are polled with this frequency.

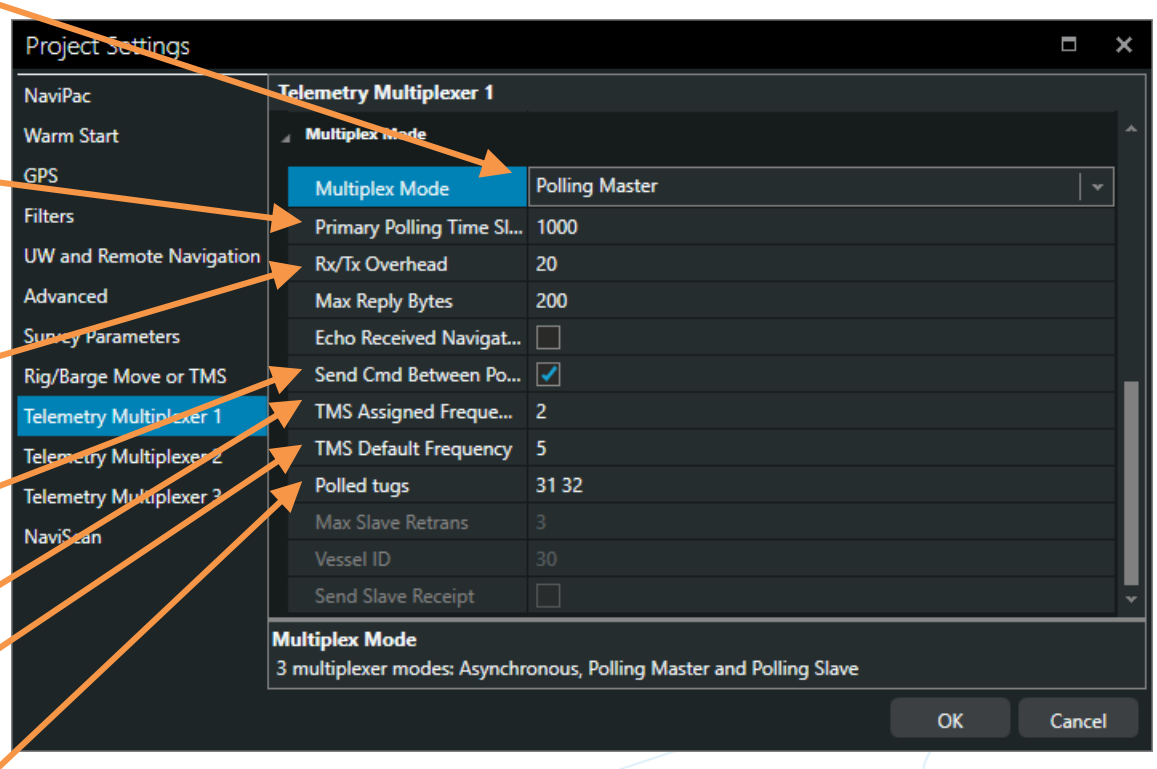
Defines the time given the modems to switch mode (Rx/Tx).

Enable ‘Send Cmd..’ if TMSMaster/ TMSSlave is used

Polling frequency for assigned vessels.

Polling frequency for all other vessels.

List of tugs to be polled. The list must be a space separated list of object IDs.

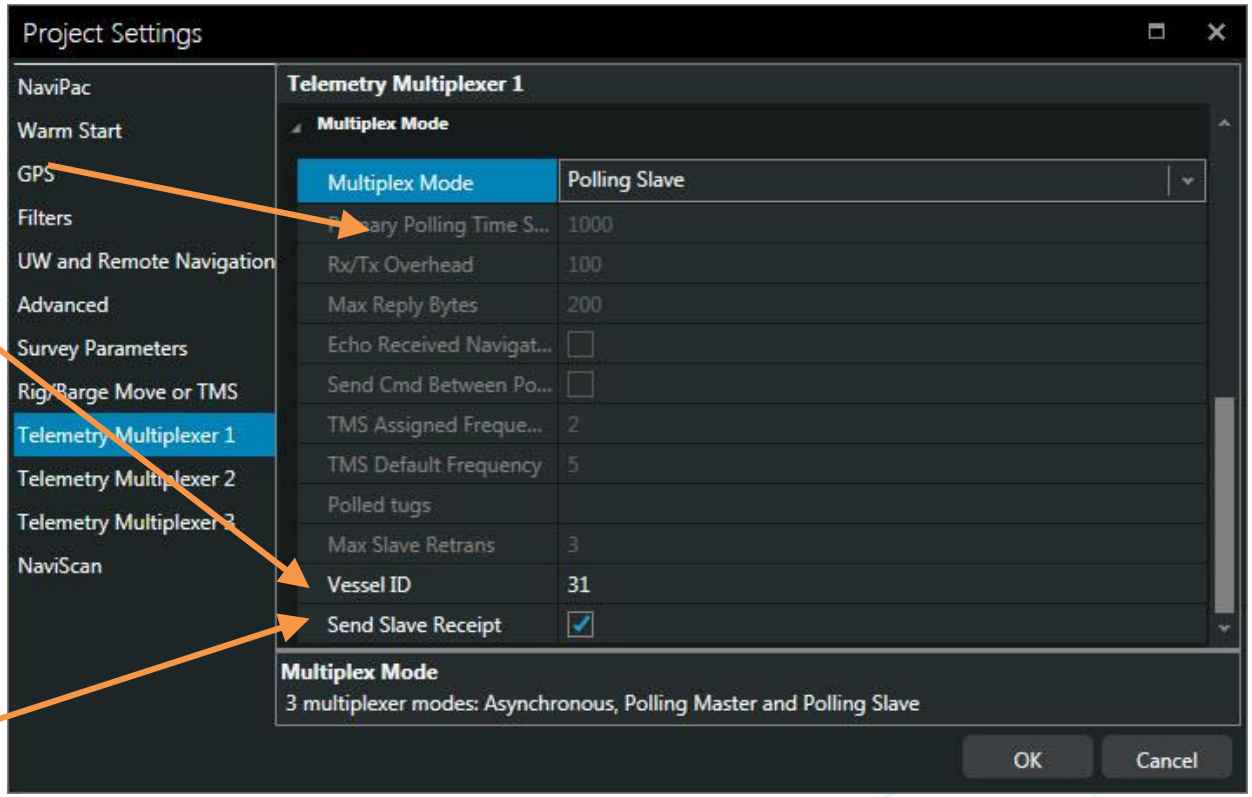


NaviPac – Tugs – Polling Slave

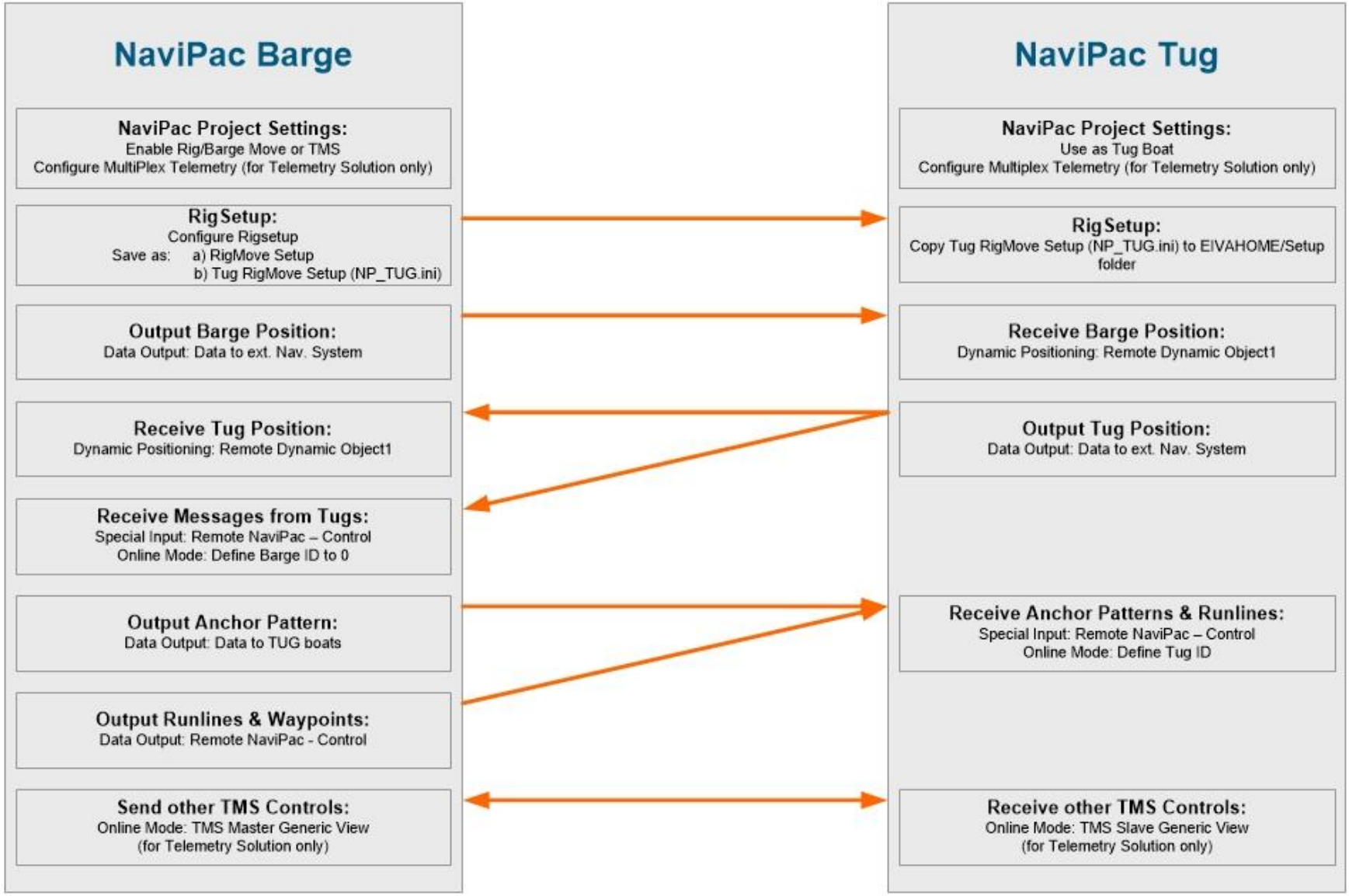
If the Barge is set to Polling Master mode, all slaves must be set to Polling Slave mode. They are only allowed to output data to the multiplexer when requested. Slot allocation for this is handled purely by the master.

The tug ID (31 here) must be defined when in slave mode.

The slave can be configured to send an end message (acknowledge) when all buffered messages have been sent. This allows the master to close the timeslot before timeout and thereby to optimize the use of the bandwidth. This can be an alternative to defining the ‘Maximum Reply Characters’ on the polling master. The optimal solution would be obtained by setting this value too high and let the slave send acknowledgements.



NaviPac 4 TMS - Schematic Overview



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