

NAVIPAC

SURVEY DATA SIMULATOR

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1 Simulation

NaviPac includes a simulation feature (also called simdata), where one or more vehicles may be selected for simulation, as well as one or more sensors. Instead of reading physical data on serial ports, NaviPac calculates realistic data allowing operators to practice in realistic environments.

The selection of vehicles and sensors to be simulated is performed in the NaviPac Configuration program, as described in dedicated help file/manual for this application.

If NaviPac Online is started with one or more simulated instruments, a dedicated simulator window is opened.

Note: The simulator window will not be present on next start/restart if no instruments are simulated.

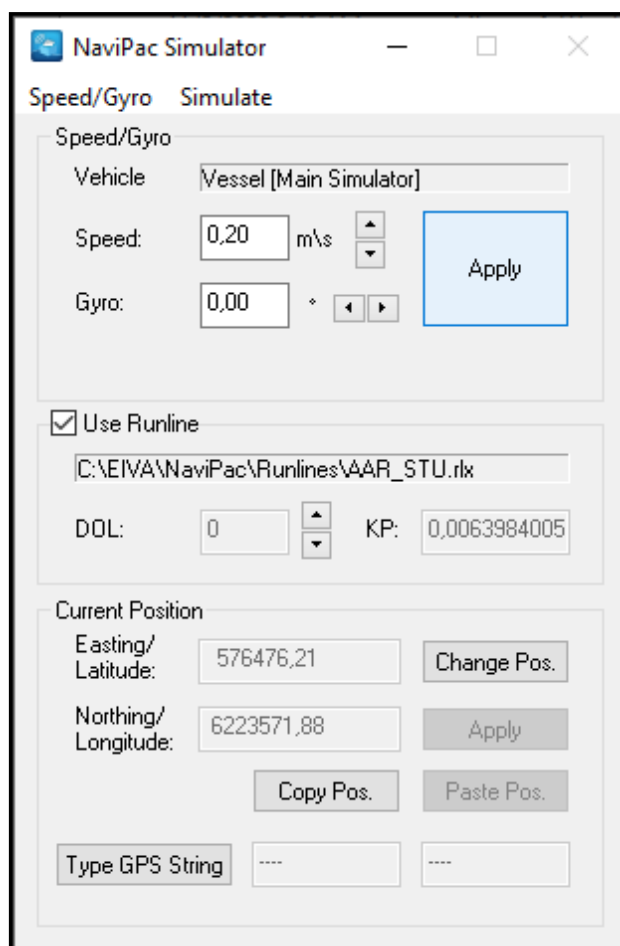


Figure 1 NaviPac Simulator

In the simulator window, the operator may specify the vehicle, current speed, current heading, and current position.

Based on this information, NaviPac generates simulated data from the vehicles and sensors, where the data will include noise to make it as realistic as possible.

Realistic simulations will be performed for the following vehicles and sensors:

- Vehicle default is the vessel.
- Speed based on the entered speed.
- Gyro based on the given course.
- Surface Navigation LOP's based on the given position, the given course, and the given speed.

All other instruments can also be simulated, but the simulation will be more random/static.

1.1 Description of fields and buttons

1.1.1 Vehicle

This field shows the current vehicle that is simulated. The default value is the Vessel [Main Simulator]. The user can also simulate eg a tug boat [Object31]

1.1.2 Speed

This field shows the current speed in meter per second. The operator may change the speed by typing a new value or pressing the spin (interval of 0.1 m/s). Pressing **Apply** will activate the new speed component. Range: 0 to 10 (m/s).

This can also be reached through the menu Speed/Heading.

1.1.3 Gyro

This field shows the current heading in degree, eg the simulated gyro. The operator may change the heading by typing a new value or pressing the spin (interval of 5 degree). Pressing **Apply** will activate the new component. Range: 0 to 359.99 °

This can also be reached through the menu Speed/Heading.

1.1.4 Use Runline

Here you may simulate the vessel movement along a runline

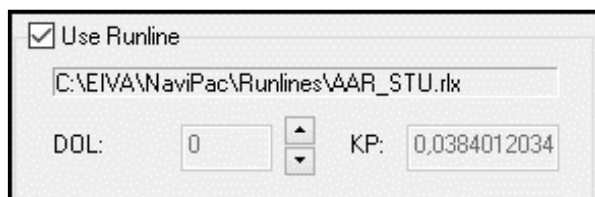


Figure 2 Simulating along a runline

Set the tickmark in the **Use Runline** tick box and select the wanted line in the pop-up dialogue. The simulator will hereafter produce positions along the line as the speed is applied as **speed of kp**.

You may furthermore move the vessel across the line by manipulating the DOL value by the spin control.

The vessel will hereafter follow the line and when it reaches the end jump back to the start.

1.1.5 Current Position (Easting/Latitude)

This field shows that the current estimated position Easting component, eg the base position used by the simulator. The operator may change the Easting component by pressing **Change Pos.** and entering a new Easting value. The value will be active after Apply.

1.1.6 Current Position (Northing/Longitude)

This field shows that the current estimated position Northing component, eg the base position used by the simulator. The operator may change the Northing component by pressing Change Pos. and entering a new value. The value will be active after pressing Apply.

1.1.7 Change Pos.

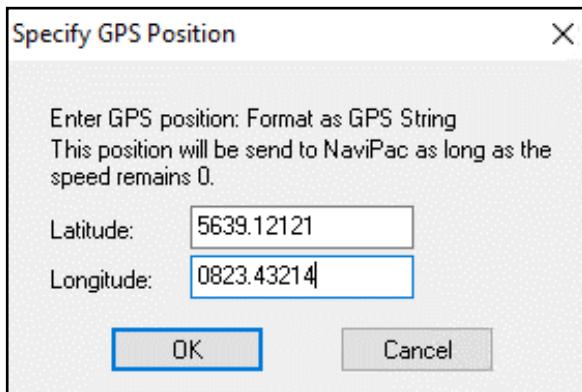
When this button is activated the user can insert a new current position. This enables the current position button Apply, which must be used for accepting changes. Note: The simulator stops during Change Pos.

1.1.8 Apply

The position (in Easting, Northing fields) will be used in the instrument simulation.

1.1.9 Type GPS String

By pressing this button, the simulator changes to a test transformation state. The following dialogue is now opened:



The dialog box titled "Specify GPS Position" contains the following text: "Enter GPS position: Format as GPS String. This position will be send to NaviPac as long as the speed remains 0." Below the text are two input fields: "Latitude:" with the value "5639.12121" and "Longitude:" with the value "0823.43214". At the bottom are "OK" and "Cancel" buttons.

Figure 3 Specify GPS Position

In here the operator may enter exact GPS position information, by giving latitude and longitude string, as eg the NMEA GGA is ddMM.mmmm etc.

By entering the parameters from a known fix-point, you can test the selected datumshift and 3D offsets by comparing the result in NaviPac with a known result.

The simulator will stay in this mode until speed is set to 0.

Only NMEA and Trimble GPS simulators will be affected – the rest will continue to use the original data.

2 Additional Simulation Control

Simulation of UW and remote objects are based on the current position with some pre-defined offsets.

This might be controlled via an INI file SIMULATE.INI located at the \eiva\navipac\setup directory.

You may edit the file via the **Simulate** menu:

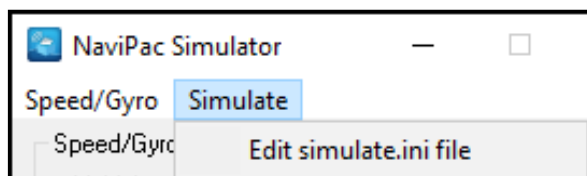


Figure 4 Edit simulate.ini file

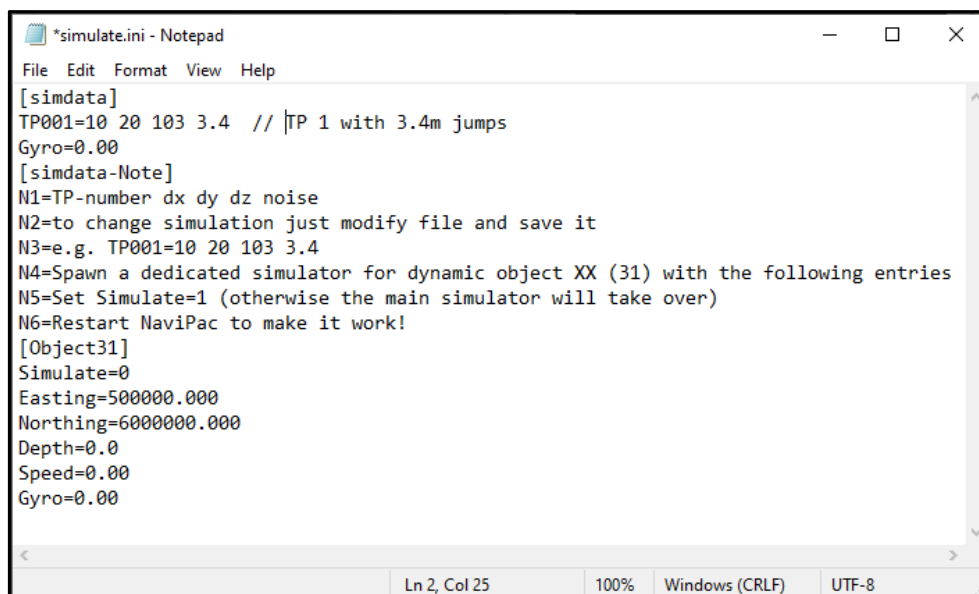


Figure 5 SIMULATE.INI file

The file must be defined manually by the operator. To control a remote object just add a line with the following syntax:

TP<tpcode>=<dx> <dy> <dz> [noise] [comment]

The dx/dy/dz values are normally defined as distance from vessel to dynamic object. For remote **NaviPac's** the dz value is defined as gyro!

3 How to set up a second simulated vehicle

- Open the NaviPac project, eg Test configuration.npp. It has two vessels in it called Vessel (Object ID 0) and Towfish (Object ID 20)
- Set I/O mode for the DynamicPositioning instrument as **Simulated**, eg HiPAP positioning instrument or PhinsOut.
- Start NaviPac

- The simulator starts in default mode (**Vessel [Main Simulator]**)
- Open the **Simulate** option and edit the **simulate.ini** (saved to the ../setup/ folder)
- Add a similar section as:

```
[ObjectXX]
Simulate=1
Easting=500000.0
Northing=6000000.0
Depth=50.0
Speed=0.00
Gyro=0.00
```

eg exchange XX with your object id, here 20

If Simulate=0, the **Vessel[Main simulator]** handles the simulation for that instrument instead.

- Restart NaviPac will start as many simulator instances (simdata) as described in the *.ini
- Eg a scenario with one dedicated simulator for a specific object named PSD:
The main simulator will handle/include all simulated objects, except the PSD object
The PSD simulator instance will handle/include the PSD object only!

