Ekinox AHRS & INS

External Novatel GNSS integration

Operating handbook

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SBG SYSTEMS

This brief document guides you in the process of connecting an external Novatel GNSS receiver to your Ekinox.

Step 1: GNSS and Ekinox connections

Connect GPS Tx signal(s) to one of the following pins on Ekinox connectors: PORT A, B, C, D, E Rx pins.

You can also use an Ethernet connection if required – not covered by this document.

Connect GPS PPS signal to Sync A, B, C, D or E input.

Note 1: Only the physical PORT A is available for the Ekinox-A. You can still use Eth 1 to Eth 4 virtual serial ports to input GPS data.

Step 2: GNSS module configuration

Configure the following outputs and output rates on your GPS receiver:

- **BESTPOS** @ 10 Hz or 20Hz
- **PSRXYZ** @ 10 Hz or 20Hz
- **HEADING** @ 10 Hz or 20Hz (if applicable, on dual antenna systems)
- **TIME** @ 1Hz

In addition, the GPS **PPS** signal must be sent at 1 Hz for proper operation.

Note: The Novatel Binary protocol must be used as it provides the fastest transfer rate and lowest CPU consumption for data handling.

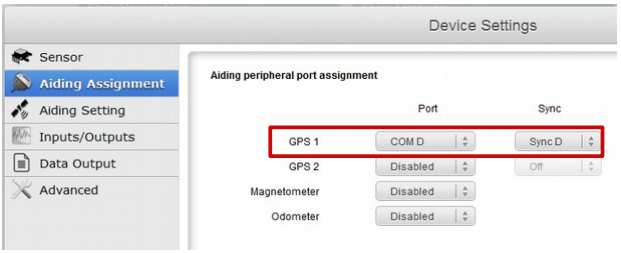
Step 3: Ekinox configuration

In order to configure the Ekinox, you need to connect to the Web interface and open the configuration window. Simply follow those instructions:

Set Aiding Assignment

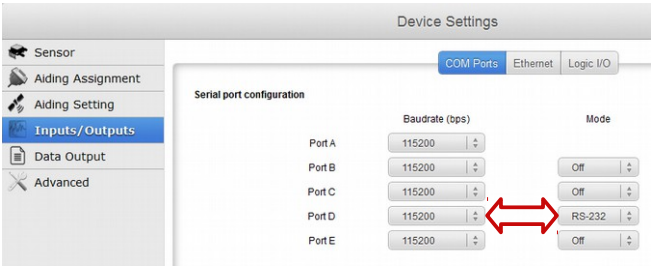
In this window, you just indicate where you connected your GNSS receiver.

Both communication port **and** Sync In pin must be set.



Set correct baudrate and mode for serial port

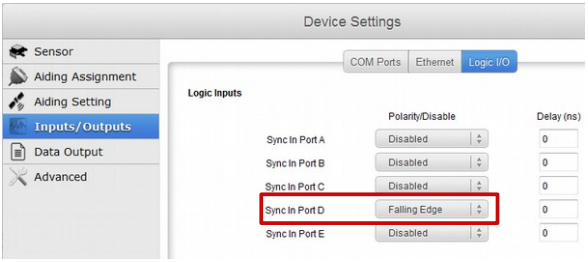
In our example we configured the GPS to be connected on PORT D in RS-232 mode.



Set Logic input configuration for PPS signal

In order to use correctly PPS signal information, you must enable the corresponding logic input. Here we configured PPS on Sync D.

Polarity should be set accordingly with the actual GPS signal.



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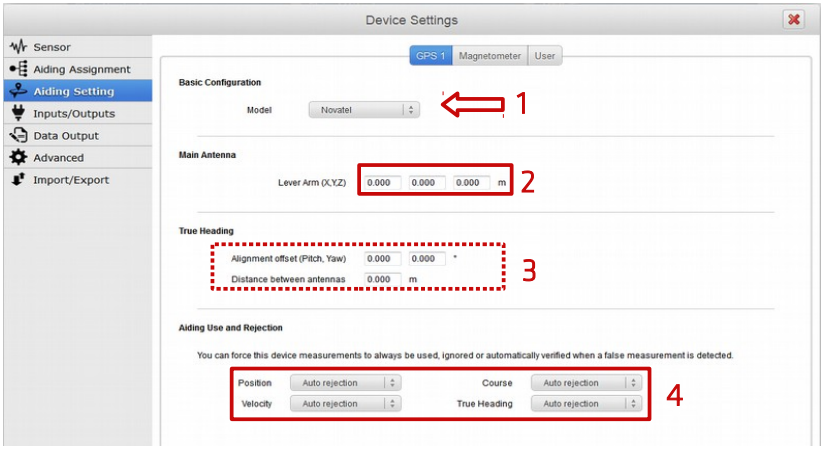
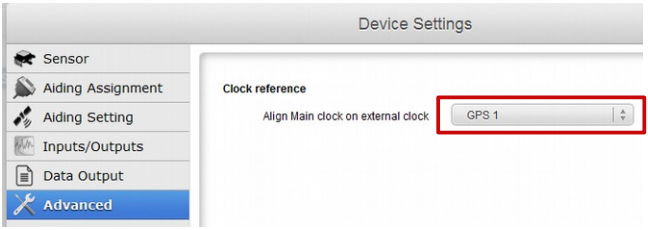
Set correct GPS model and configuration

1. GPS model should be set to Novatel.
2. GPS lever arm is measured within 5mm FROM the Ekinox, TO the antenna.
3. In case of Dual antenna system, the alignment offset must also be entered as well as antenna separation (within 3mm).
4. Finally, each available measurement (position, velocity, course and true heading if available) should be configured to be used or not.



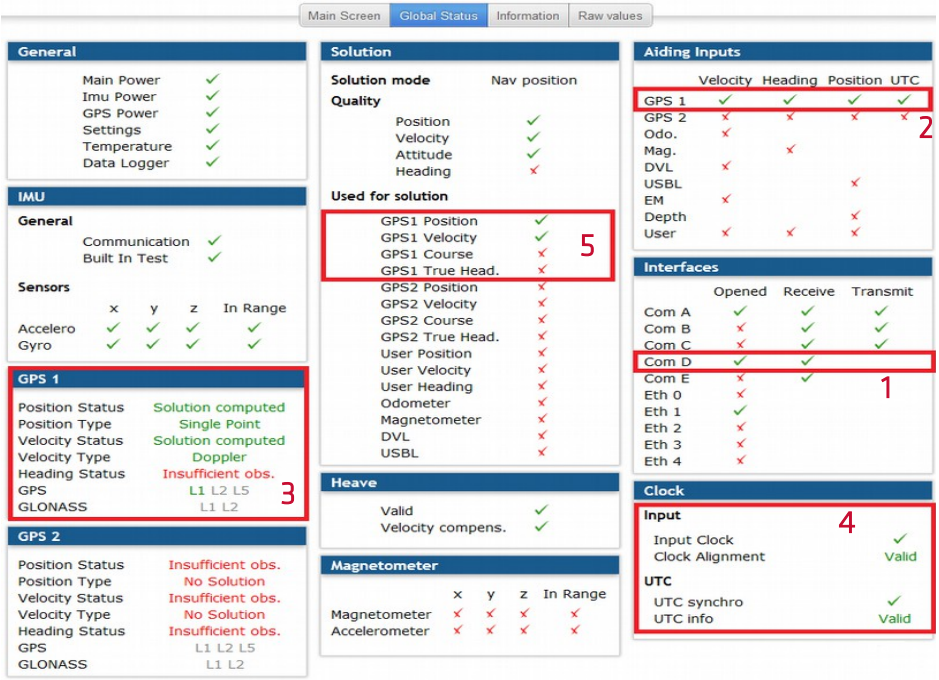
Set Clock alignment

Finally, you should define which GPS should be used to align the internal clock and provide UTC time data. This is done into the advanced settings section:



Note: If you have two connected GPS receivers, the Ekinox doesn't need a PPS signal for the second GPS receiver to accurately time stamp the data.

Step 4: Checking status



Once fully configured, the global status must be checked:

1. Corresponding COM port must be OK.
2. GPS 1 or GPS 2 line in "Aiding Inputs" section must show active data.
3. After that, you can check if the GPS solution has been calculated for the position and velocity.
4. Then you can check at the Clock section. Input clock must be OK and UTC time should be set to valid after a few minutes in alignment mode.
5. Once the GPS acquired a solution, the Kalman filter should pass in Full Navigation mode and show active items in the "Used for Solution" field.

Note: The Kalman filter will run into navigation mode once a correct heading could be estimated (requires magnetometers, true heading or some accelerations).

Support

If you have any trouble or question with the use of the Ekinox, feel free to contact our support team:

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