

— Ellipse-E

External NMEA GNSS integration

Operating handbook

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SGPGGA,015028.80,3350.6525141,N,11820.2240417,W,2,11,0.6,23.774,M,-  
32.277,M,6.8,0138*45  
SGPRMC,015028.80,A,3350.6525141,N,11820.2240417,W,20.50,269.44,220215,12.2,E,D,S*5F  
SGPHDT,269.08,T*00  
SGPGGA,015028.90,3350.6525123,N,11820.2247347,W,2,11,0.6,23.776,M,-  
32.277,M,6.9,0138*46  
SGPRMC,015028.90,A,3350.6525123,N,11820.2247347,W,20.65,270.56,220215,12.2,E,D,S*52  
SGPHDT,269.08,T*00  
SGPGGA,015029.00,3350.6525109,N,11820.2254293,W,2,11,0.6,23.777,M,-  
32.277,M,7.0,0138*45  
SGPZDA,015029.00,22,02,2015,00,00*6D  
SGPRMC,015029.00,A,3350.6525109,N,11820.2254293,W,20.85,269.73,220215,12.2,E,D,S*59  
SGPHDT,269.08,T*00
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Document
Revision

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

Step 1: GNSS and Ellipse connections

1. Connect GPS Tx signal(s) to one of the following pins on Ellipse connectors: PORT B, C, D Rx pins. Please also connect Ellipse and GPS ground signals to each other.
2. Connect GPS PPS signal to Sync A, B, C or D input.

Step 2: GNSS module configuration

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

- RMC @ 5 Hz
- GGA @ 5Hz
- GST @ 5Hz
- HDT @ 5Hz (if applicable, on dual antenna systems)
- ZDA @ 1Hz

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

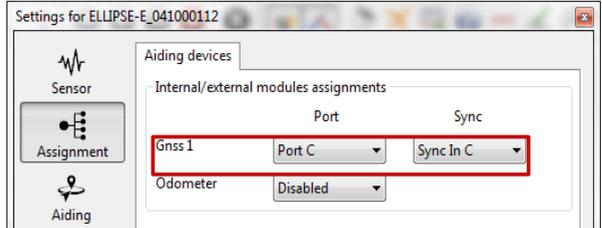
Step 3: Ellipse configuration

In order to configure the Ellipse-E, you need to use the sbgCenter and open the configuration window. Simply follow those instructions:

Set Aiding Assignment

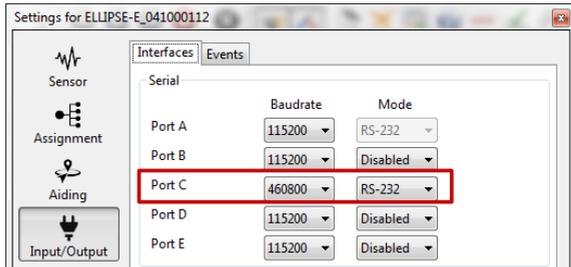
In this window, you just indicate where you connected your GNSS receiver.

Both communication port and Sync In pin must be set.



Set correct baudrate and mode for serial port

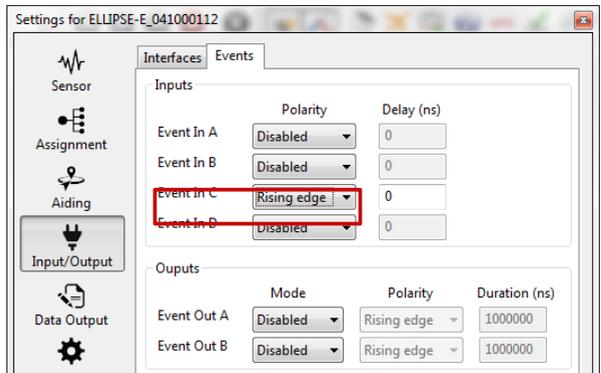
In our example we configured the GPS to be connected on PORT C in RS-232 mode.



Set Logic input configuration for PPS signal

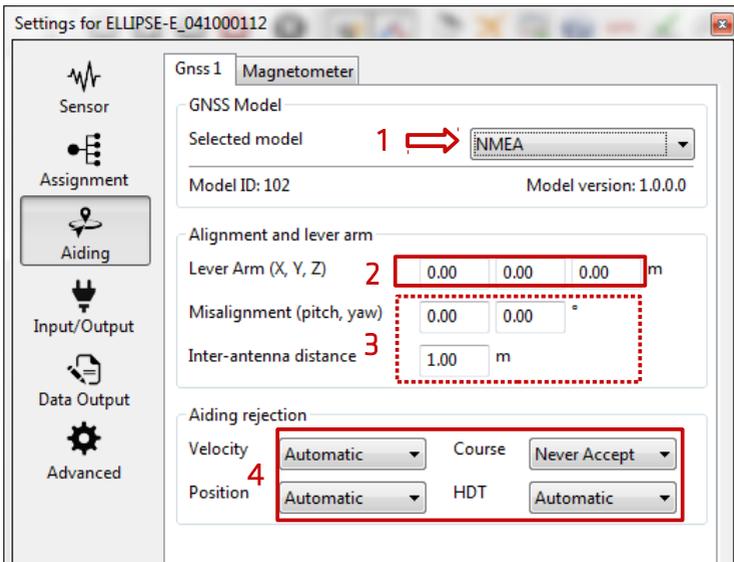
In order to use correctly PPS signal information, you must enable the corresponding logic input. Here we configured PPS on Sync C.

Polarity should be set accordingly with the actual GPS signal.



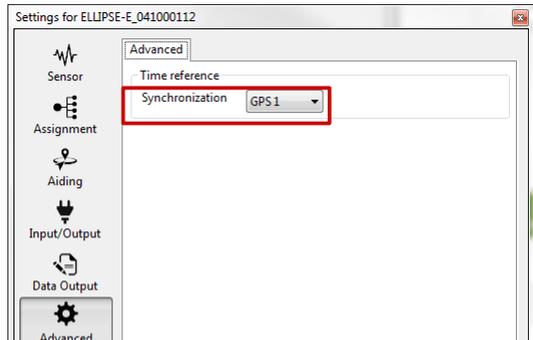
Set correct GPS model and configuration

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



Check Clock alignment

Finally, you check that the time synchronization reference is set to GPS 1 (default configuration).



Step 4: Checking status

The status and GPS windows should be checked carefully before going further. These status indicators will give essential hints in case of troubles to get a correct fix.

1. Corresponding COM port must be OK.
2. GNSS 1 frame in “Aiding Inputs” tab must show active data. Not seeing this would mostly imply baudrate or cabling issue.
3. After that, you can check if the GPS solution has been calculated and is consistent.
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 steering 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.

The screenshots show the following data:

- Device status for ELLIPSE-E_041000112 (Aiding Inputs):**
 - PORT A: Opened (ok), Receive (ok), Transmit (ok)
 - PORT B: Opened (no), Receive (no), Transmit (no)
 - PORT C: Opened (ok), Receive (ok), Transmit (ok) - **1**
- Device status for ELLIPSE-E_041000112 (Aiding Inputs):**
 - GNSS 1: Position (Receiving data), Velocity (Receiving data), True Heading (No data received), UTC time (Receiving data) - **2**
 - Odometer: Velocity (No data received)
- Equipment information for ELLIPSE-E_041000112 (GNSS 1):**
 - Position: Solution status (Solution Computed), Solution type (Single Point)
 - Latitude: 48.86908340° ± 2.540 m
 - Longitude: 2.15024430° ± 2.540 m
 - Altitude (MSL): 47.365 m ± 1.615 m
 - Velocity: Solution status (Solution Computed), Solution type (Doppler)
 - Velocity (2d): 0.0 m/s ± 0.532 m/s
 - Track Course: 10.8° ± 42.0°
 - True heading (HDT): Solution status
 - Heading: -.* ± -.*
 - Pitch: -.* ± -.*
 - GNSS information: GPS (L1, L2, L5), GLONASS (L1, L2), Num Sv Used (9), Base Station Id (0), Differential Age (0.00)
- Device status for ELLIPSE-E_041000112 (Used for Solution):**
 - Vertical Reference (no), Magnetometers (ok)
 - GPS 1 Position (ok), GPS 1 Velocity (ok), GPS 1 Course (no), GPS 1 True Heading (no) - **4**
- Device UTC time and date for ELLIPSE-E_041000...:**
 - Clock Synchronization: Stable Input (ok), Status (Valid)
 - UTC Time and Date: Synchronized Status (ok), Status (Valid) - **5**
 - Date: 2015-04-23
 - Time: 08:03:01



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