



NOVASAIL **NS 360.*Pro***

Operating Manual

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Welcome to the **NS360.Pro**

A complete racing system derived from the **NS** legacy, the **NS360.Pro** includes a GPS speedo, gyro-compensated magnetic compass, race timer, distance to the start line and all other essential and advanced race functions.

The new **NS360.Pro** features a Bluetooth communication transceiver offering a wide range of functions and applications:

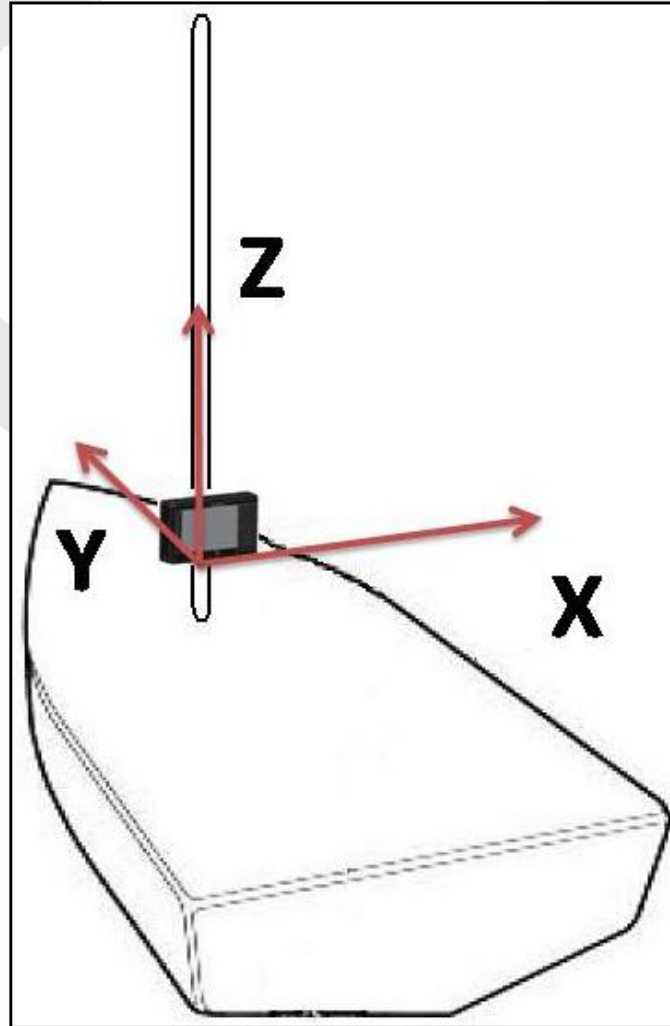
- Record up to 1092 hours of racing (1 point / 30 seconds)
- Replay on Google Earth and other navigational software
- Computer management of 100 waypoints, including their coordinates and descriptions
- Computer management of 20 routes imported from Google Earth and defined by existing waypoints
- Updates with new features

The usage of the **NS360.Pro** is greatly simplified with large and dedicated buttons for starting the timer and defining the start line points, and the port and starboard references at your finger tips.

Installation

The mounting location should be as far as possible from any magnetic objects to avoid any interference with the compass sensor.

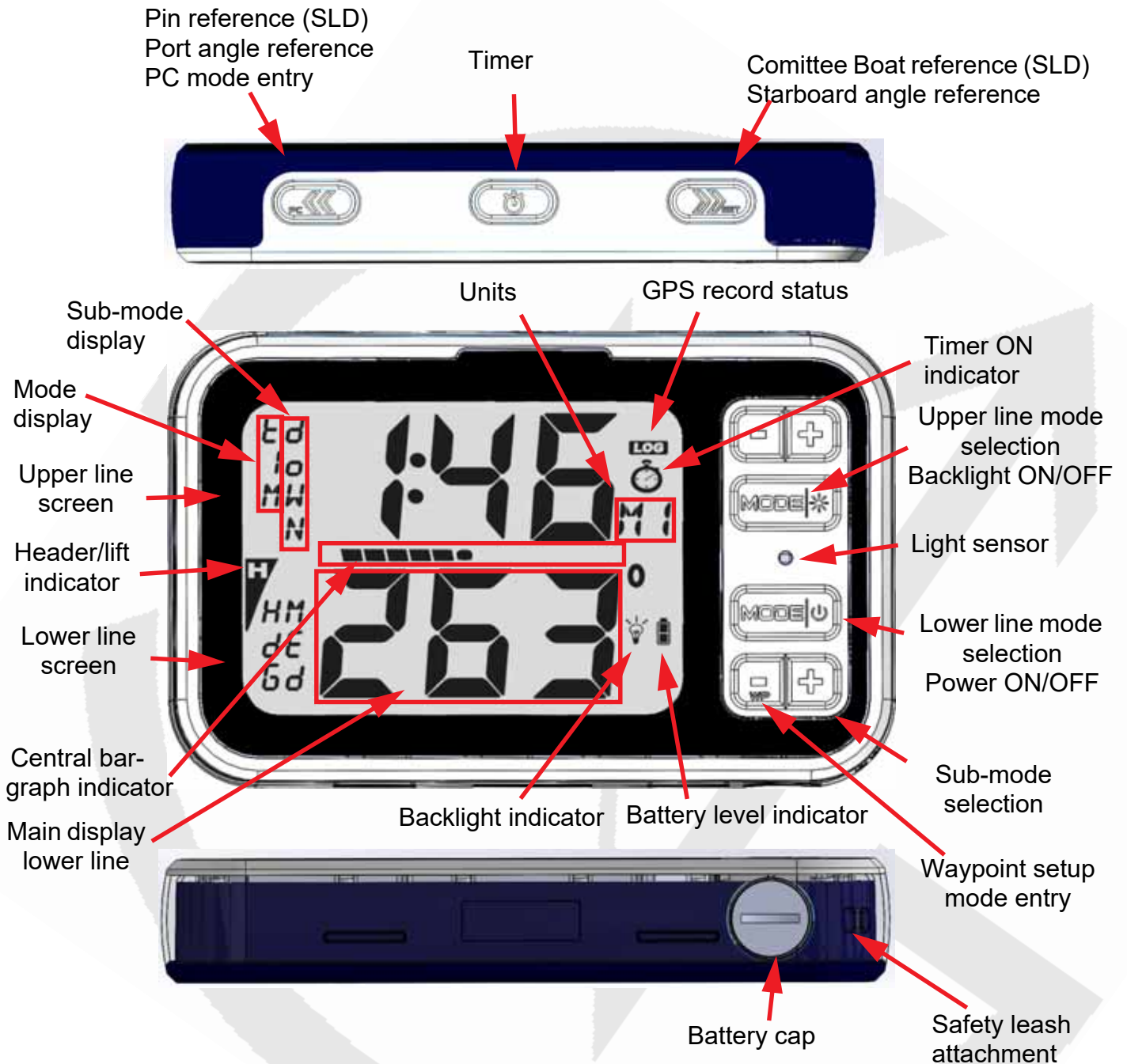
The **NS360.Pro** should be ideally mounted close to the vertical and horizontal planes.



Note: *Wherever you mount the **NS360.Pro**, it shouldn't be flush to any thick surface such as the hull, so that the sensitivity of the embedded GPS receiver is not affected.*

Note: *If your **NS360.Pro** isn't facing the same direction as the boat, you can compensate this difference in the parameter tab of the Novasail Wireless Manager PC software.*

Controls and display description



Modes and sub-modes

Timer:
Speed:

TIM
SPE

- **High:** High sensitivity
- **Med:** Medium sensitivity

Operations

- **Low:** Low sensitivity
- **MAX:** Maximum speed
- **TRiP:** Total distance

Magnetic Heading:

HDG

- **High:** High sensitivity
- **Med:** Medium sensitivity
- **Low:** Low sensitivity
- **GPS:** GPS heading (course over ground)
- **ROLL:** Roll angle indicator (angle of heel)

Start Line Distance:

SLD

Velocity Made Good:

VMG

Waypoints:

Wxx

- **W00 to W99:** Waypoint 0 to 99

Routes:

Rxx

- **R01 to R20:** Route 1 to 20



Current GPS coordinates:

Latitude & Longitude

Switching power on and off

- Make sure the battery is installed with the correct polarity and has enough remaining power (positive pole inserted first).



- Press the lower  to start the device. A beep will be emitted.
- Press and hold the lower  for more than 4 seconds until the screen displays OFF and the sequence “3”, “2”, “1” is finished. A beep will be emitted when the device turns off.

The device will turn off automatically when it remains in the horizontal position for more than 3 minutes. A beep will be emitted 3 seconds before it turns off.

Upon switching on, the remaining memory time for the GPS data logger is displayed for 5 seconds. This 'GPS LOG' time is given in hours as shown below. The embedded firmware version number is displayed on the lower line.



Note: *If the device does not turn on, you need to check that the battery is fully charged, that the battery compartment is clean, dry and the polarity is correct. **No liquid should get into the battery compartment** otherwise this may cause internal damage. The 2 springs for the +/- battery contacts can be removed/cleaned as well as the bottom of the battery compartment with a small piece of cloth moistened with rubbing alcohol.*

Note: **Rinse with fresh water, do not use corrosive products. Especially any petroleum/mineral based product will damage permanently the plastics and rubber parts (the warranty will be void). For example never use (non exhaustive list): white spirit, acetone, any spray or liquid contact cleaner, grease remover, do never spray any product into the battery compartment.**

Note: *If the battery is almost discharged, the GPS functions are automatically deactivated ('OFF' is displayed) in order to save power. Only the functions linked to the magnetic compass are activated and the battery indicator will blink.*





Note: *Until enough satellites are locked, the **NS360.Pro** is not ready for use. For the modes SPE, SLD, VMG and Wxx, the screen displays '---'. For the MAX speed sub-mode, the maximum value is displayed but blinking until ready.*

Note: *Disposable alkaline batteries are not recommended, but can be used to reach the maximum 40-hour battery life of the **NS360.Pro**. It is **mandatory***

Operations

to remove disposable batteries if the device is not going to be used for a prolonged period of time (a week or more) to avoid **battery leakage**, as this will **irreversibly damage the battery compartment**. Therefore we recommend that rechargeable batteries with a low self discharge rate should be used (normal rechargeable batteries lose their stored energy quickly even when they are not being used), and will last for 30 hours or more. Recommended batteries are SANYO ENLOOP, GP RECYKO+, UNIROSS HYBRIO (2000mA or more typical capacity).



Switching backlight on and off

- After the power of the **NS360.Pro** is turned on, the backlight is automatically switched ON/OFF by the internal light sensor detector.
- The backlight can be manually switched ON or OFF: press and hold the upper  for more than 1 second until the icon  is displayed on the screen.
- To turn off the backlight, press and hold the upper  for more than 1 second until the icon  disappears from the screen.


Note: Once the backlight has been switched ON or OFF manually, the automatic light sensor detector will no longer be used and will resume upon the next power cycle.

Note: In PC mode (see Advanced Operations, page 22), the backlight can be only switched ON or OFF manually.

Switching modes and sub-modes

- Choose the mode and sub-mode required by pushing the 'mode' button and then the  and  for the sub-mode selection.
- You are free to choose any mode on each line **independently**.

GPS record status

- When the icon  is displayed, the GPS trace is recording.
- The Novasail Wireless Manager PC software gives you three options at startup: GPS trace record disabled, GPS trace record always ON and GPS trace record starts at the end of timer countdown.
- For more information please refer to the online manual of the Novasail Wireless Manager PC software for the **NS360.Pro**.

Speed mode: SPE

This mode provides the speed over ground of the boat as measured by the GPS receiver. The sub-modes provide several speed resolutions, the trip distance and the maximum speed. The boat speed is displayed in knots (kts) with a resolution of 0.1 knots. The minimum speed is 0.5 knots.

- Use the  and  to scroll the sub-modes.

Speed sub-modes

- **High:** High sensitivity

The high sensitivity speed allows a very sensitive reading of any speed variation.

- **Med:** Medium sensitivity

This sub-mode provides an average speed of the boat over a short period of time. This is particularly useful when sailing with big waves upwind or downwind.

- **Low:** Low sensitivity

This sub-mode provides an average speed of the boat over a longer period of time. This is particularly useful in rough conditions with lots of speed changes.

Operations

- **Max:** Speed **MAX**imum

The maximum speed that the boat has reached since the last reset.

- **trip:** trip distance

The trip mode displays the total distance made by the vessel since the last reset.

To reset the maximum speed or trip distance:





- Select the maximum speed or the trip distance in the sub-mode
- Tilt the device 90 degrees to the right or left for more than 3 seconds
- The value is reset

Note: *For the 'Max' and 'trip' sub-mode don't forget to reset the value before your next sail begins to ensure the value displayed refers to the new sail.*

Velocity made good mode: VMG

This mode provides the projected speed of the boat on the reference (wind) direction, which is deducted from the port and starboard angle references captured. The VMG is shown in knots (kts) and the memorized wind direction in use will be indicated on the main display.

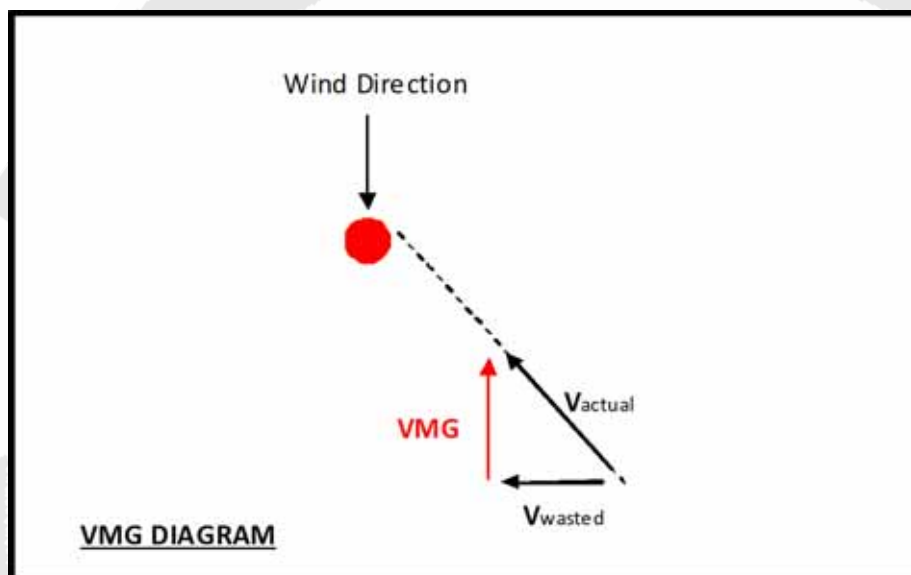
To set and adjust the wind direction in VMG mode

- Press and hold  to capture the port angle direction
- Press and hold  to capture the starboard angle direction
- You may enter or adjust the wind direction value with the  and 

Note: *The VMG speed sensitivity is adjusted (High/Med/Low) by using the sensitivity of the speed in SPE mode on the opposite line (lines are independent, therefore the sensitivity can be different on the upper and lower line).*

Note: The lift  and header  icons will be shown according to the

memorized port and starboard reference directions. They will be displayed only after these 2 angles are memorized.



Magnetic Heading compass mode: HDG

To win races you need to react to the smallest wind shifts. The **NS360.Pro** digital compass delivers precise and reliable heading information to help you to tack and jibe at the most suitable times.

The sensitivity of the compass can easily be adjusted to High, Medium or Low by scrolling through the sub-modes.

- Use the  and  to scroll the sub-modes

Sub-modes of the Magnetic Heading compass:

Operations

- **High:** high sensitivity

When sailing with light winds and flat seas, high sensitivity allows you to appreciate very small wind variation.

- **Med:** medium sensitivity

Medium sensitivity is more suitable for race boats under medium wind and sea conditions. Dinghy racers will appreciate this mode.

- **Low:** Low sensitivity

Under low sensitivity more subtle variations due to big waves and sudden gusts are filtered.

Note: The magnetic variation of your geographical location can be compensated in the parameter tab of the Novasail Wireless Manager PC software.

- **GPS: GPS** based compass

This sub-mode provides the route direction followed by the boat measured by the GPS receiver (course over ground)

- **ROLL: Roll** angle indicator mode (angle of heel)

Used in Roll angle indicator (ROLL) mode, the **NS360.Pro** displays the roll angle of the boat. The angle range can vary from 0 to +/-180 degrees.

*Note: The roll angle displayed is based on the **NS360.Pro** mounting roll angle.*

TIMER mode: TIM

This mode offers a 5-minute countdown timer, which can be synchronized to 5/4/3/2 and 1 minute.



When counting down, a short beep sounds:

- each minute until the last minute
- each ten seconds until the last 10 seconds
- each second until the start time




At the start time:

- a long beep sounds
- the timer starts counting the race duration in minutes and hours

Start and stop the TIMER:

- Press  to start the timer countdown at the last synchronized minute (5/4/3/2 or 1 minute)
- Press and hold  to stop the timer and reset to the last synchronized minute

Synchronize the TIMER:

- In any mode press  will display the timer on the upper line and result in the following action:
 - if the timer is stopped, start and set the timer value to the last synchronized minute
 - if the timer is down-counting and the timer value is lower than 3:45, set the timer value to the lower minute
 - if the timer is down-counting and the timer value is greater than 3:45, set the timer value to 4 minutes
- With the timer mode displayed and the timer stopped, press the upper  to synchronize to the lower minute or press the upper  to synchronize to the upper minute. The upper/lower minute selected will be used as the new synchronized minute value (the timer will re-start from this value)

Note: With the GPS logger synchronized to the upcounting of the timer, the GPS logger stops when the timer is stopped or restarted in order to log the end of the current sail.



Operations

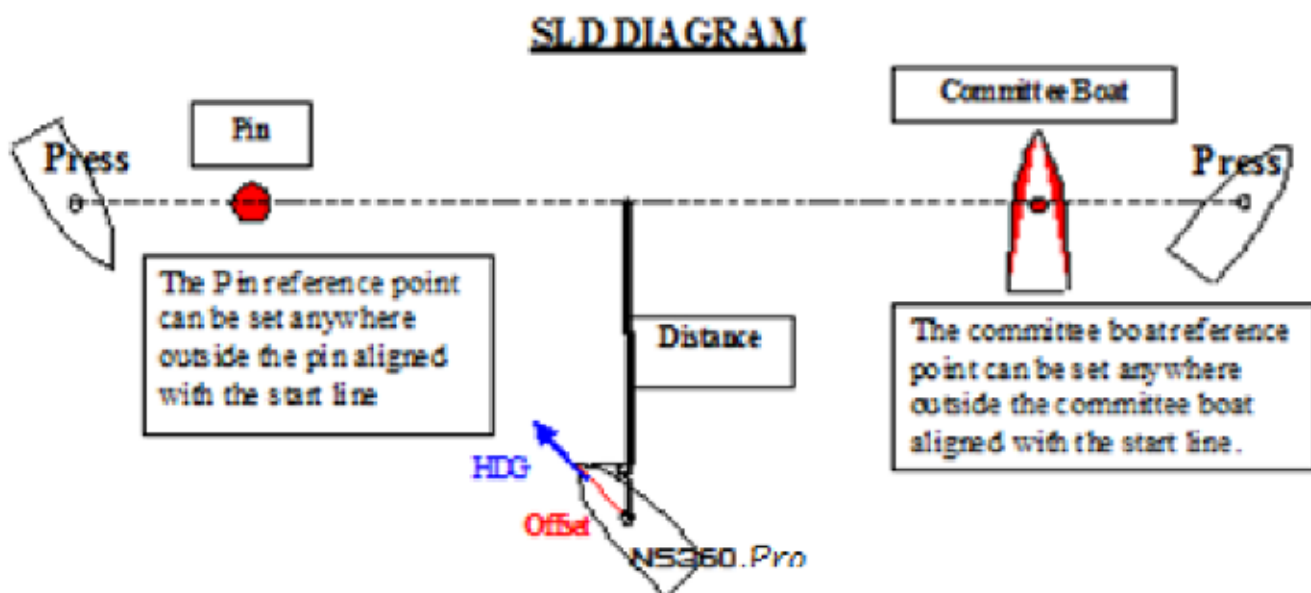
Note: When the down counter reaches 0:00, the timer and the Start Line Distance will switch automatically to the modes selected in the parameter tab of the Novasail Wireless Manager PC software.

Start Line Distance: SLD



Knowing the exact distance in meters to the start line gives a huge advantage in helping you start ahead of the fleet and even win the race. The **NS360.Pro** Start Line Distance function is the most advanced on the market as it combines the latest multi-constellation satellites receiver and a dynamic boat offset compensation, calculated with the real boat magnetic heading to the start line. The maximum distance displayed is 999 meters to the start line.

The start line consists of 2 points that have to be aligned with the start line:

-  : Committee boat
-  : Pin







To memorize the start line points

- Press  when you reach the committee boat reference point
- Press  when you reach the pin reference point
- The distance in meters is now displayed on the data line

Note: If the start line is modified by the committee, you may be required to re-enter one or both reference points.

*Note: The distance from the front of the boat to the **NS360.Pro** can be defined in the parameter tab of the Novasail Wireless Manager PC software.*

Note: When the down counter reaches 0:00, the timer and the Start Line Distance will switch automatically to the modes selected in the parameter tab of the Novasail Wireless Manager PC software.

*Note : if the pin and the boat references are recorded with  and  (instead of  and ) the **NS360.Pro** will show a sign '-' instead of a '+' for the distance to the line (only the sign is changed, the overall distance calculation is not impacted)*

Waypoint mode: Wxx



The waypoint mode has been made for those who are sailing island races and require information such as the direction, angle difference, speed and distance to reach the selected pre-defined waypoint. Up to 100 waypoints can be memorized: W00 to W99. For each waypoint selected on the **NS360.Pro**, the direction, the heading difference between the boat and the direction to the waypoint, speed and distance needed to reach it are displayed sequentially.

Note: The display timings of the directions, angle, speed and distance are defined by the parameters Waypoint Heading, Waypoint Speed, Heading





Operations

Difference and Waypoint Distance in the Novasail Wireles Manager PC software. Please refer to the installed online documentation for more details.

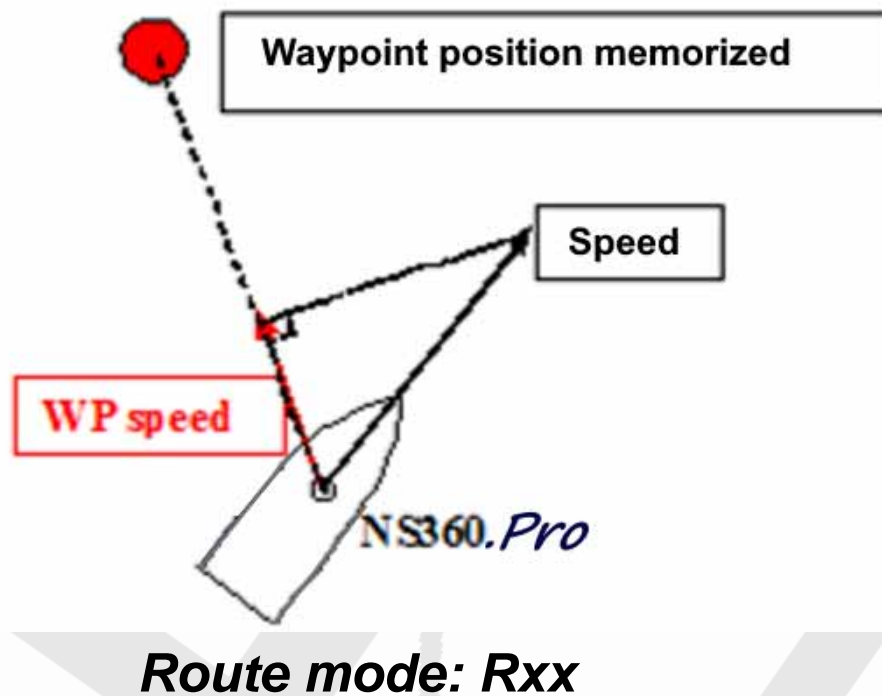
To use a waypoint

- By default, W00 is displayed on the mode line.
- Use the  and  to select the required waypoint, from W00 to W99.
- The direction, speed, distance and heading difference are displayed sequentially.

To Memorize a waypoint while sailing





- First select the 'WAY' mode on the **lower line** (the memorization must be done on the lower line screen, it cannot be done on the upper line screen).
Press the lower  or  to select the waypoint (from W00 to W99) that you want to overwrite.
- Press simultaneously the lower  and  (long push) to memorize the current boat position into the selected waypoint ("MEM" will be displayed, and the waypoint name will be set to the current waypoint number).
- The direction, speed and distance to reach it are displayed sequentially.

Note: The waypoint speed displayed in knots is calculated using the waypoint position, the boat position, the boat speed and the heading.





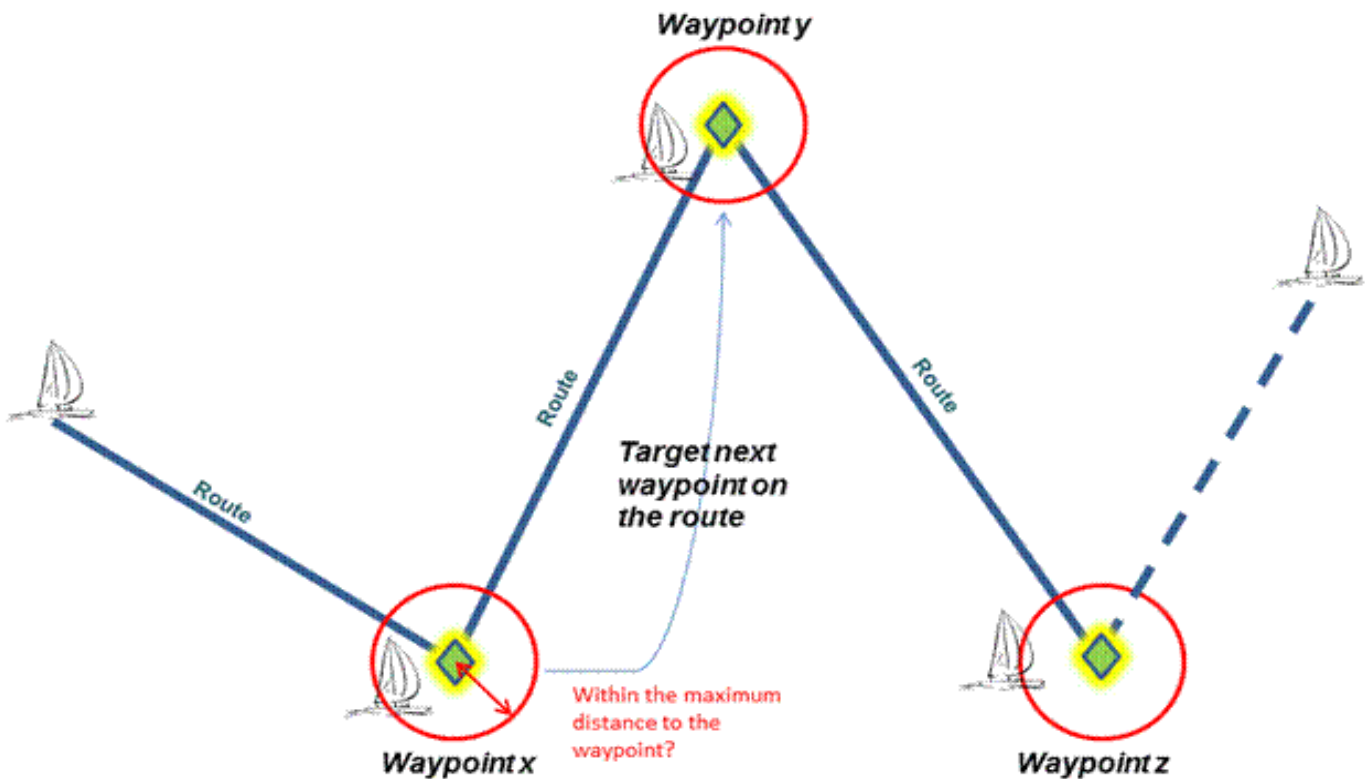
The Route mode has been made for those who are sailing island races and require information such as the direction and distance to reach the series of pre-defined waypoints. Up to 20 routes, made up of up to 500 waypoints, can be memorized: R01 to R20. Each time a route is selected, the direction, speed and distance needed to reach its waypoints are displayed sequentially. When getting within 50 to 500 meters of a waypoint (settable thanks to the Novasail Wireless Manager PC software), the route will switch to the next waypoint automatically.

To use a route

- By default, R01 is displayed.
- A long push on  or  will allow the selection of the route from R01 to R20; then a short push on  or  will decrease/increase the route number.
- The name and the waypoint number are displayed sequentially on the sub-mode column.

Operations

- A push on  or  will select the previous or the next waypoint into the current route.
- The direction, speed and distance to the target waypoint on the chosen route will be displayed sequentially on the main screen.





Note: It is necessary to upload the routes into the **NS360.Pro**

Note: The display timings of the direction, speed, distance and heading difference are defined by the parameters Waypoint Heading, Waypoint Speed, Waypoint Distance and Waypoint diff.heading in the Novasail Wireless Manager PC software. Please refer to the online documentation for more details.

Current GPS coordinates

This mode allows the latitude and longitude of the current position to display (in degrees and decimal minutes). To activate this mode, you need to press the


upper  and  simultaneously. The latitude is displayed on the upper line and the longitude on the lower line.

Press any key to exit this mode.

Central Bar Graph





The central bar graph allows the visualization of the heading variations. After a tack or a jibe, during the average heading calculation, the bar graph displays:



Once calculated, the average heading is used as the reference to display the variations in degrees. For example  means that the current

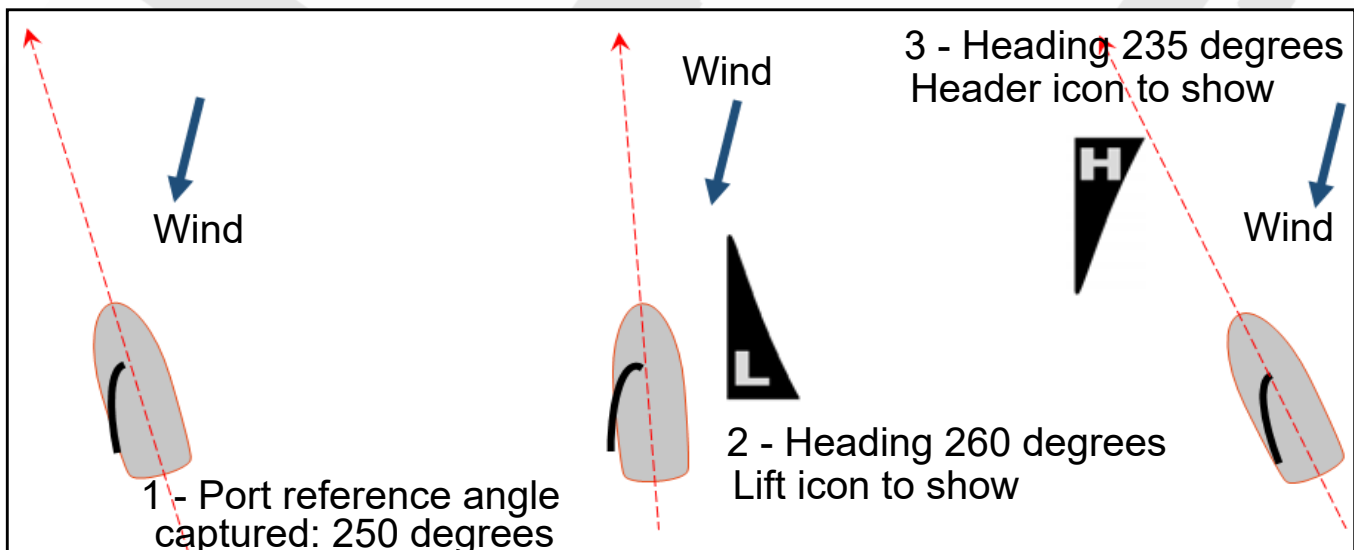
heading is 3 degrees starboard compared to the average reference heading, with a 1 degree value for each segment (the value for each segment can be adjusted in the Novasail Wireless Manager PC software, please refer to the online documentation for more details)

Lift and Header indicators

- The lift  and header  icons will be displayed according to the current heading. The port and starboard reference angles must be memorized first by pressing and holding the  or  buttons for 1 second (a beep will be emitted)

Operations

Example of lift and headers on starboard with a 250 degrees angle reference memorized:






Note: *The lift and header icons won't be displayed until the port and starboard reference angles are memorized. These reference angles will be also used for setting the wind direction in **VMG** mode.*





WAY Setup Mode

The **WAY** setup mode allows waypoints in your **NS360.Pro** to be memorized with a name (4 characters) and the geographical coordinates without the need to use any PC connectivity.

To enter the WAY setup mode:

- With the product switched off, press the lower  then the lower  **simultaneously**. WAY is displayed on the data line of the upper screen.
- The waypoint number and name are displayed on the upper screen line.
- The geographical coordinates are displayed on the lower screen.
- To exit, switch off by pressing and holding the lower .

How to input the name and coordinates of a waypoint

- The **lower**  and  allow the values to be changed from 0 to 9 for numbers and from 'a' to 'z' for letters.
- The **upper**  switches to the next character.
- The **upper**  switches to the previous character.

Memorization of a waypoint




- Select first the number of the waypoint: W00 to W99.
- Enter a name of maximum 4 characters.
- Select 'NOR' (North) if the longitude is in the Northern Hemisphere or 'SOU' (South) if it is in the Southern Hemisphere.
- Select the longitude coordinate, for example 45'36.222.
- Select 'EAS' if the latitude is east or 'WES' if west.
- Select the latitude coordinate, for example: 23'46.345.
- When the latitude coordinate is completed, the selection rolls back to the waypoint number.

Advanced Operations

PC Mode

The **PC** mode is activated to exchange data between the **NS360.Pro** Bluetooth wireless transceiver and the computer. The Novasail Wireless Manager software allows you to check the communication status, upgrade the embedded firmware, store routes and waypoints, setup the device. Please refer to the Novasail Wireless Manager documentation for more details: the online manual can be open in the Novasail Wireless Manager with a right click or in the help menu.

To enter in PC connectivity mode

- With the product switched off, press the buttons  first and the lower  **simultaneously**. PC is displayed on the data line of the lower screen (blinking) with “blu” (bluetooth) shown
- To exit the PC mode, switch off by pressing and holding the lower 

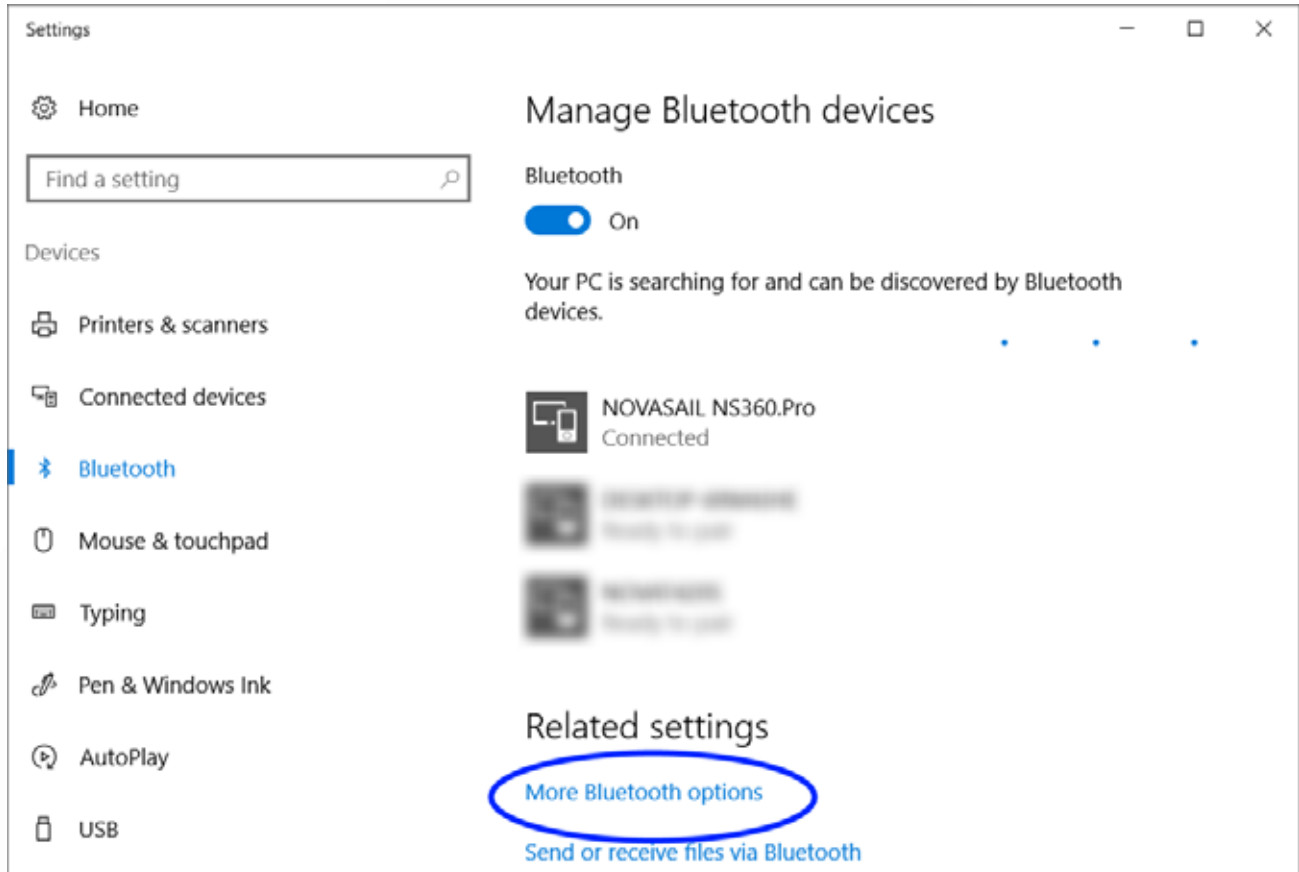
Troubleshooting

- Make sure the Bluetooth connectivity is activated on the PC
- Make sure to allow any Bluetooth device to find the PC in the operating system
- Close/re-open the Novasail Wireless Manager app. Remove the **NS360.Pro** from the previously paired bluetooth devices and launch a new pairing process
- Make sure the PC mode on the **NS360.Pro** is turned on: “PC” **must** be blinking on the main display and “blu” (Bluetooth) must be shown on the lower line
- Confirm the **NS360.Pro** is indicated on the available Bluetooth devices on the computer
- The message 'connected' should appear in green at the bottom of the Novasail Wireless Manager app within a minute (the delay is computer hardware dependant)

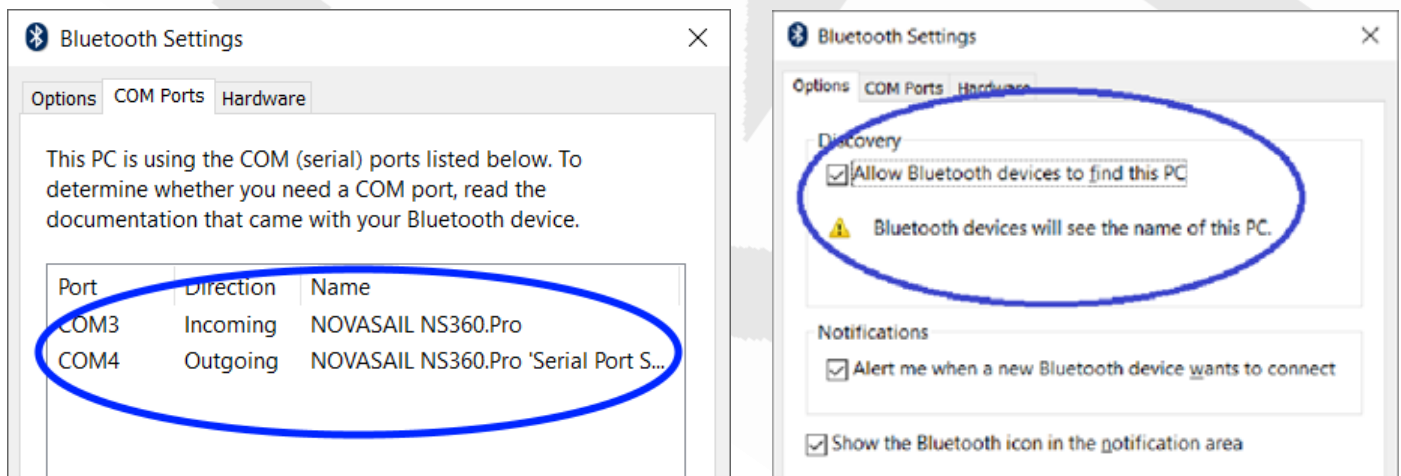
Note: *to save batteries the **NS360.Pro** will shut down automatically if no computer connectivity is detected for 10 minutes.*

Advanced Operations

Screen capture example, Windows 10 Bluetooth settings. Once the **NS360.Pro** is paired and in an active connection the device appears as followed:

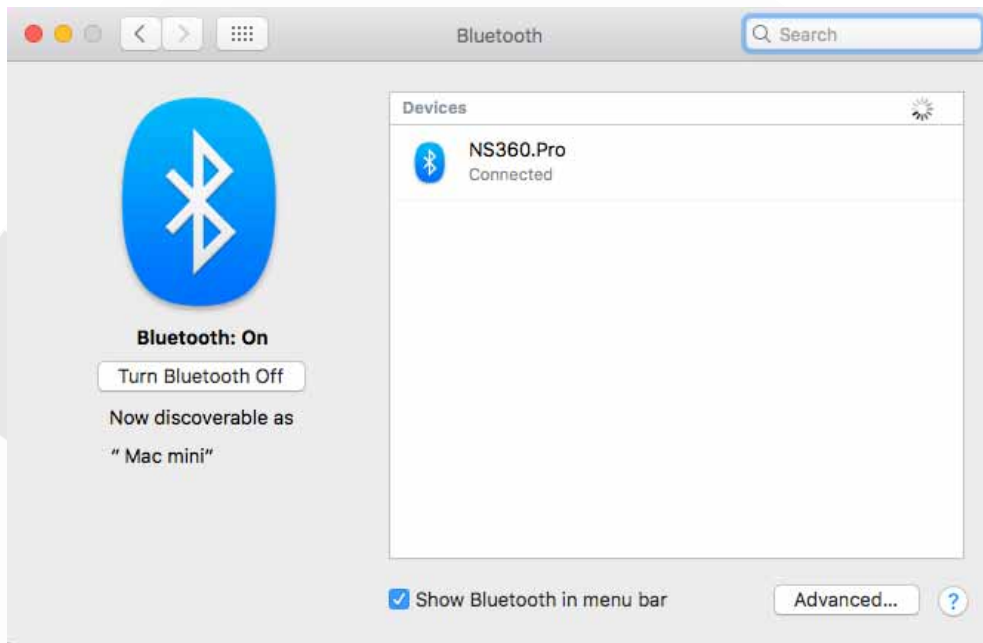


In the Bluetooth options (Windows 10 screen capture), additional information should be displayed as followed (the COM port numbers may be different):



Advanced Operations

Screen capture example, MAC OS, Bluetooth preferences. Once the **NS360.Pro** is paired and in an active connection the device appears as followed:



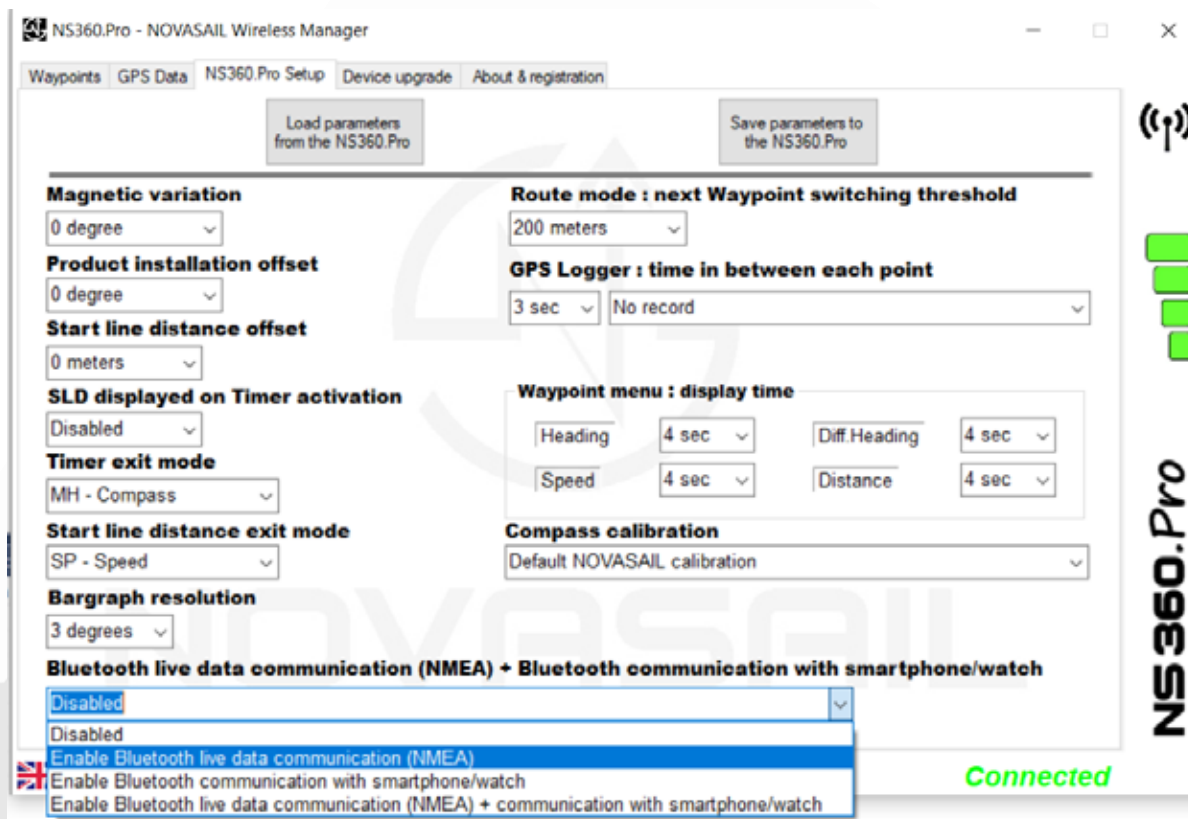
Live NMEA data broadcast

This feature is supported with the embedded firmware version 1.8 or above (update must be done if required).




Advanced Operations

Once enabled in the setup parameters of the NOVASAIL Wireless Manager Windows or MAC software, the device will start transmitting the NMEA0183 data through Bluetooth.



These data can be received by any third party navigation software supporting a serial port communication like 'OPENCMP' (<https://opencpn.org/>).

The icon  (1 bar) will be shown on the lower screen line once the **NS360.Pro** will start transmitting in this mode.

Note: *it is recommended to enable this feature only when required in order to maximize the battery life (+8% typical when disabled).*

The NMEA data broadcasted are:

- the GPS NMEA messages: \$GPGLL, \$GPGSA, \$GPGGA, \$GPGSV, \$GPRMC, \$GPVTG
- the magnetic compass and magnetic deviation message: \$GPHDG
- the pitch & roll messages: \$NOXDR

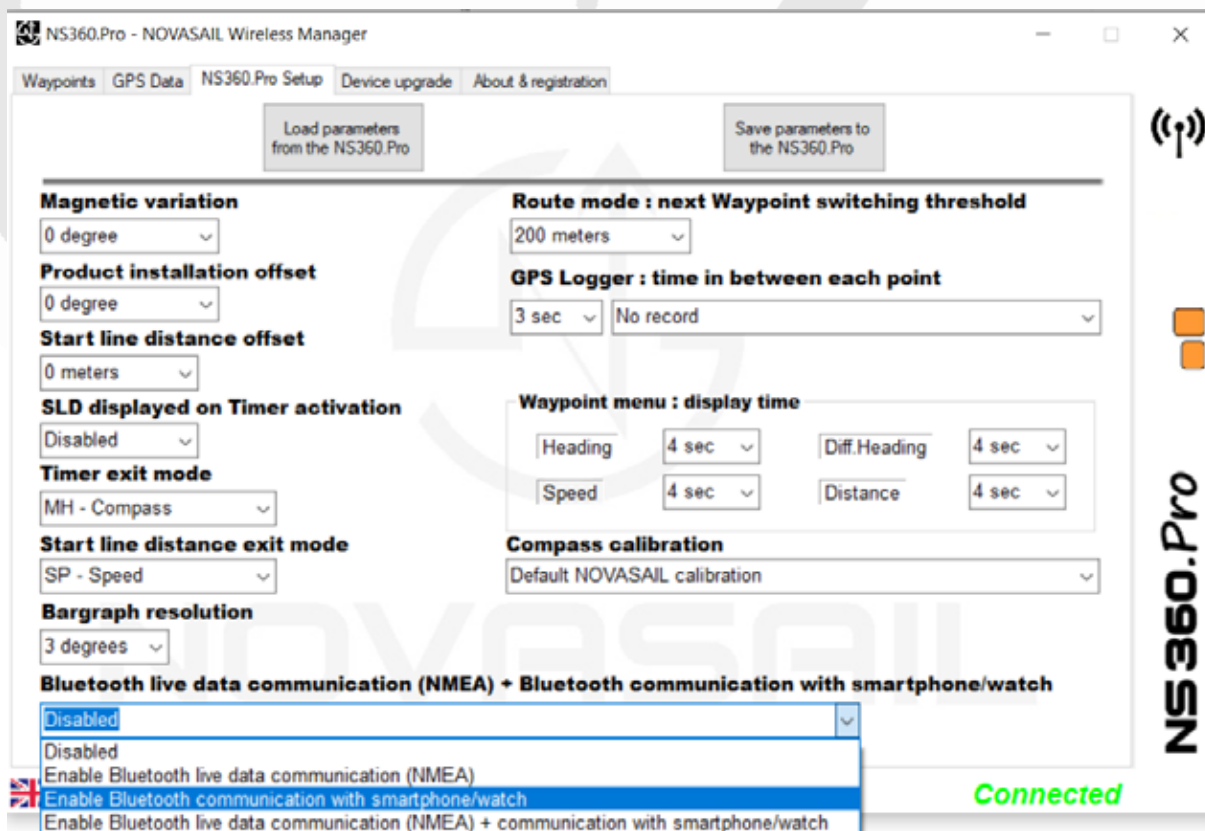
Advanced Operations

Remote control and navigation data broadcast to smart phone/watch through Bluetooth

This feature is supported with the embedded firmware version 1.9 or above (update must be done if required).




Once enabled in the setup parameters of the NOVASAIL Wireless Manager Windows or MAC software, the **NS360.Pro** will be able to send/receive data with a smartphone/watch through Bluetooth (iOS/iWatch).




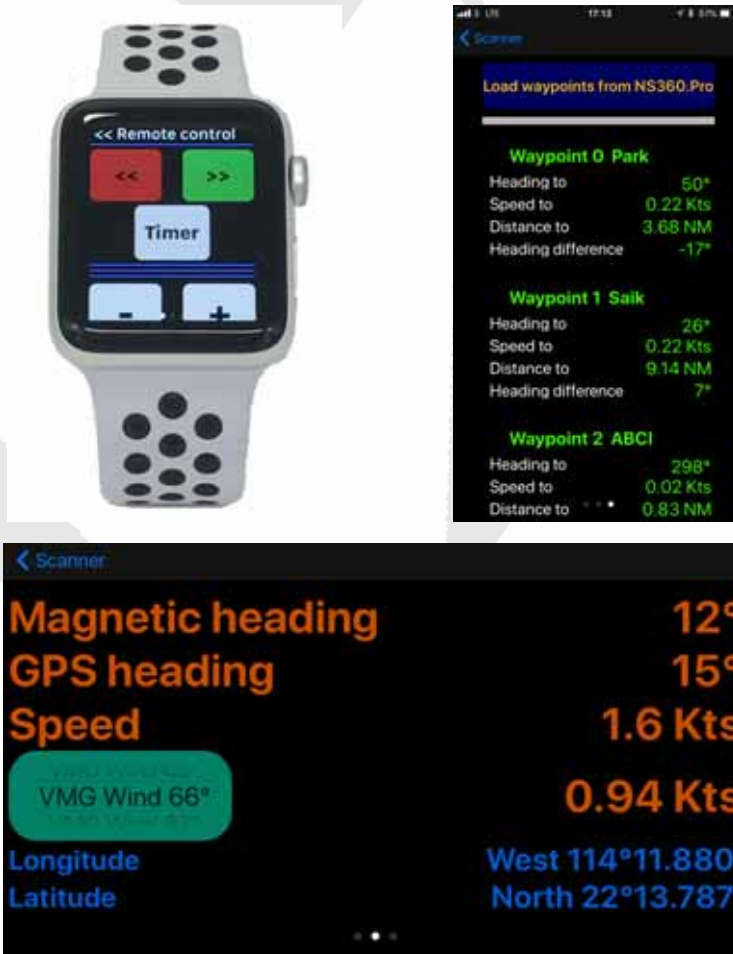
Advanced Operations

The smart phone/watch can be used as a remote control and can receive navigation data to update in real time various informations such as the speed/VMG/track/Waypoints/etc.

The icon  (2 bars) will be shown on the lower screen line once the **NS360.Pro** will start broadcasting in this mode.

Note: *it is recommended to enable this feature only when required in order to maximize the battery life (+8% typical when disabled).*

Note: The icon  (3 bars) will be shown on the lower screen if the live NMEA and the smartphone/watch broadcast are both enabled



Advanced Operations

User Calibration of the magnetic compass: CAL

When enabled in the parameter tab of the Novasail Wireless Manager PC software, the **NS360.Pro** enters automatically a set of sub-menus to allow a self calibration of the magnetic compass/accelerometers/gyroscopes at power ON. There are 10 sub-menus that have to be followed in the sequence described below.

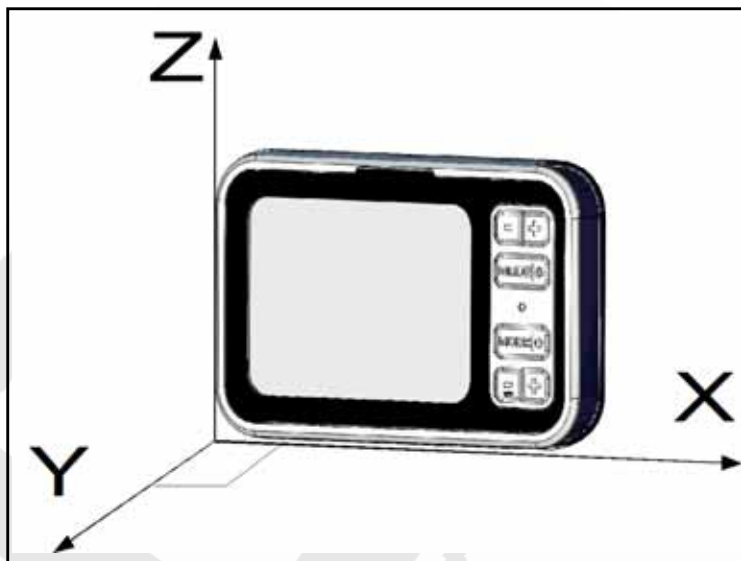
To allow the maximum accuracy of the calibration procedure, it is recommended to perform this outdoors to avoid any magnetic disturbing fields. A wooden surface is recommended and it is necessary to ensure that there are no ferrous materials nearby (wrist watches should be removed). The unit must be still during each calibration phase, any vibration will lower the calibration accuracy.


To start with, draw 2 perpendicular lines (X and Y axis) on a perfectly horizontal plan. On the lower screen of the display, the calibration sub-menu number is displayed. There are 10 steps to follow in order to complete the calibration of your **NS360.Pro**. Upon completion of the sequence, the **NS360.Pro** will memorize the new values and shut down automatically. If the **NS360.Pro** is shut down during the calibration, nothing will be memorized.

Note: Whenever necessary, the factory calibration values can be restored at any time in the compass calibration menu of the Novasail Wireless Manager.

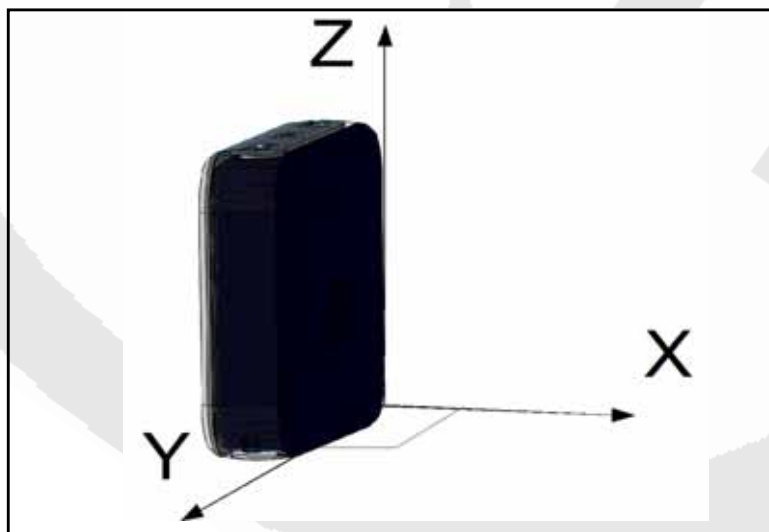
Advanced Operations


- Step 1: '1' is displayed on the lower screen. The **NS360.Pro** must be oriented as follows:



Push the lower  key when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 1.

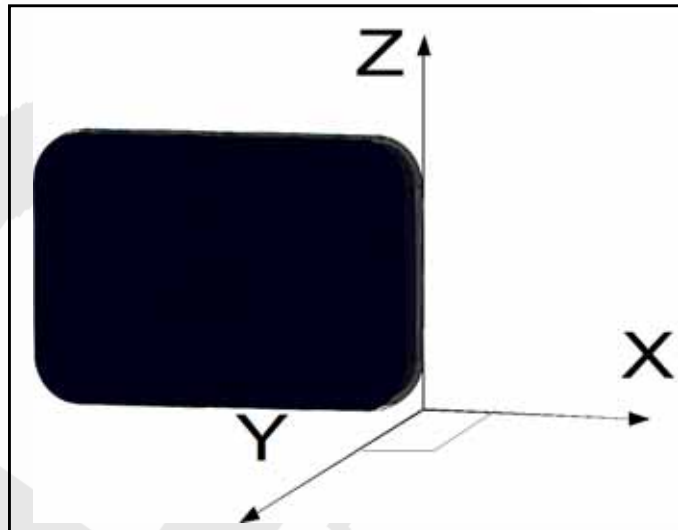
- Step 2: '2' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows:




Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 2.

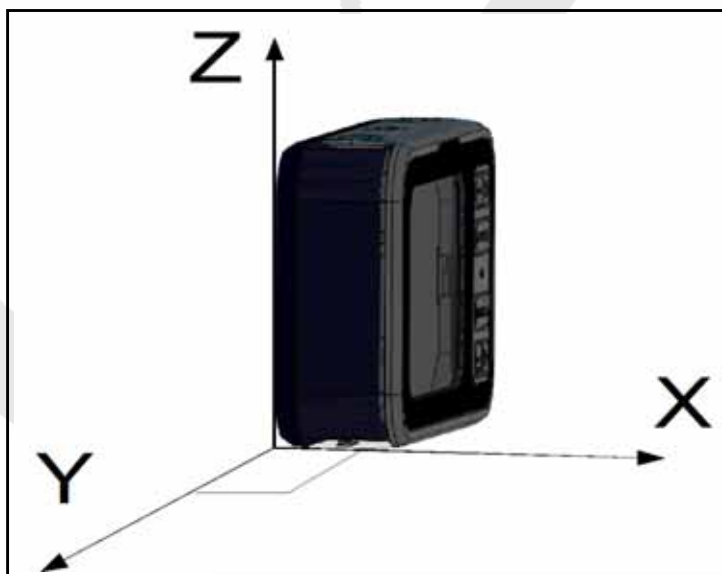
Advanced Operations


- Step 3: '3' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows:



Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 3.

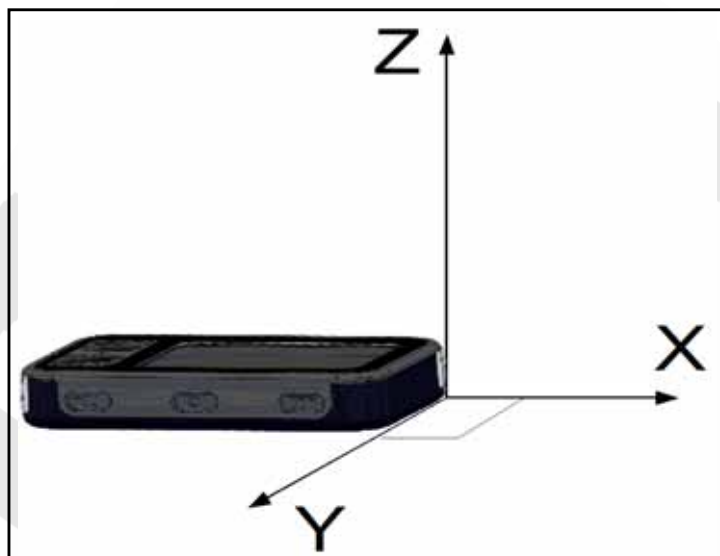
- Step 4: '4' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows:



Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 4.

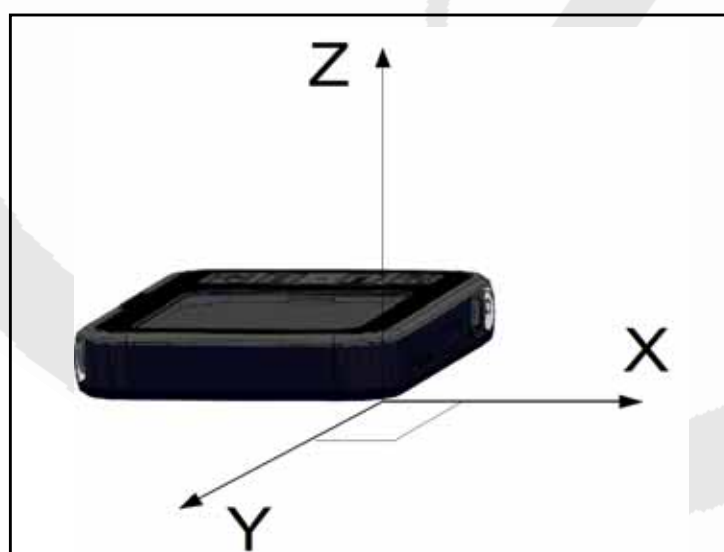
Advanced Operations


- Step 5: '5' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows:



Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 5.

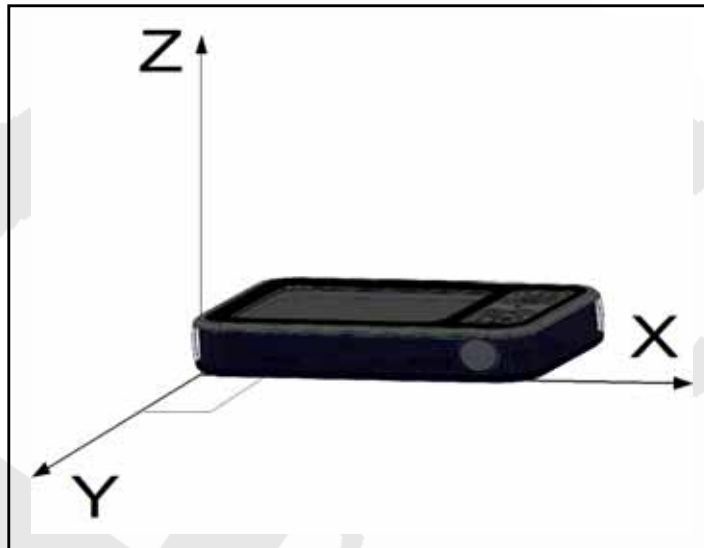
- Step 6: '6' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows:




Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 6.

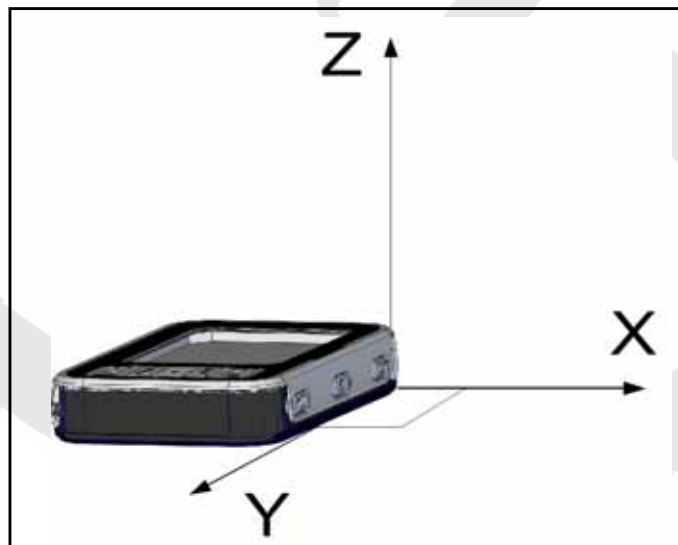
Advanced Operations


- Step 7: '7' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows:



Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 7.

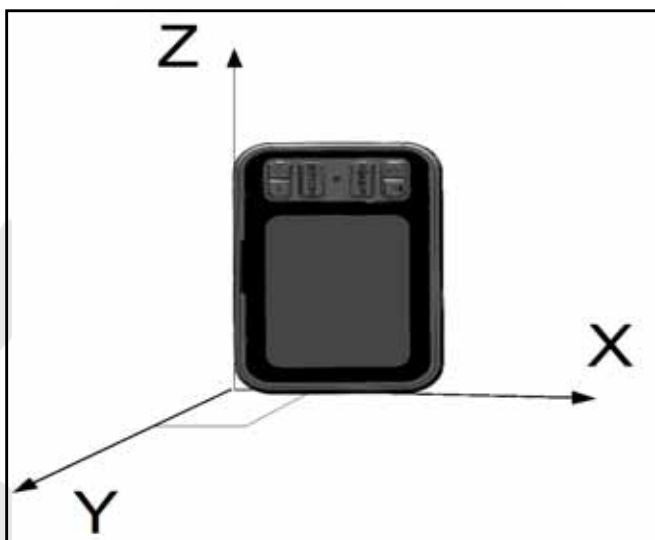
- Step 8: '8' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows:



Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 8.

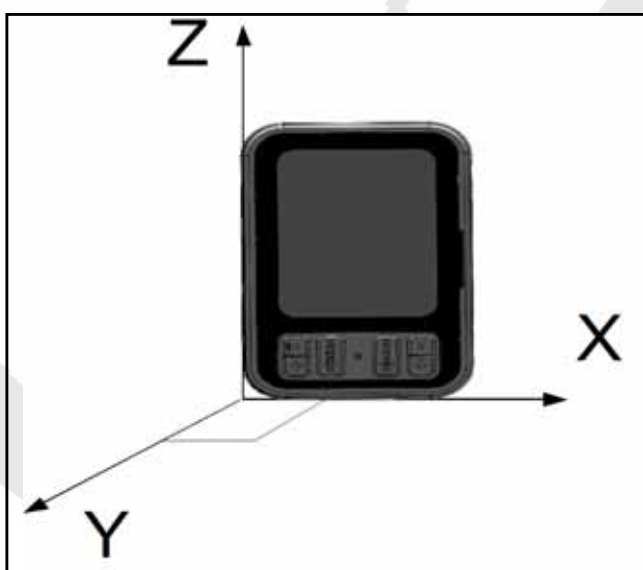
Advanced Operations


- Step 9: '9' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows:



Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 9.

- Step 10: '10' is displayed on the lower screen. The **NS360.Pro** must be oriented as follows:



Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 10.

Advanced Operations

The **NS360.Pro** will store the new values and switch off automatically.

Document history

Version 1.0: First version

Version 1.1: Added chapter for NMEA data broadcast

Version 1.2: Added chapter for Bluetooth connectivity for smartphone/watch

Version 1.3:

Updated SLD mode for +/- sign

Updated route mode chapter

Version 1.4: Modified 'Switching power ON/OFF' chapter: corrosive products

Please visit www.nova-sail.com for the latest user manuals and updates.

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