



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:

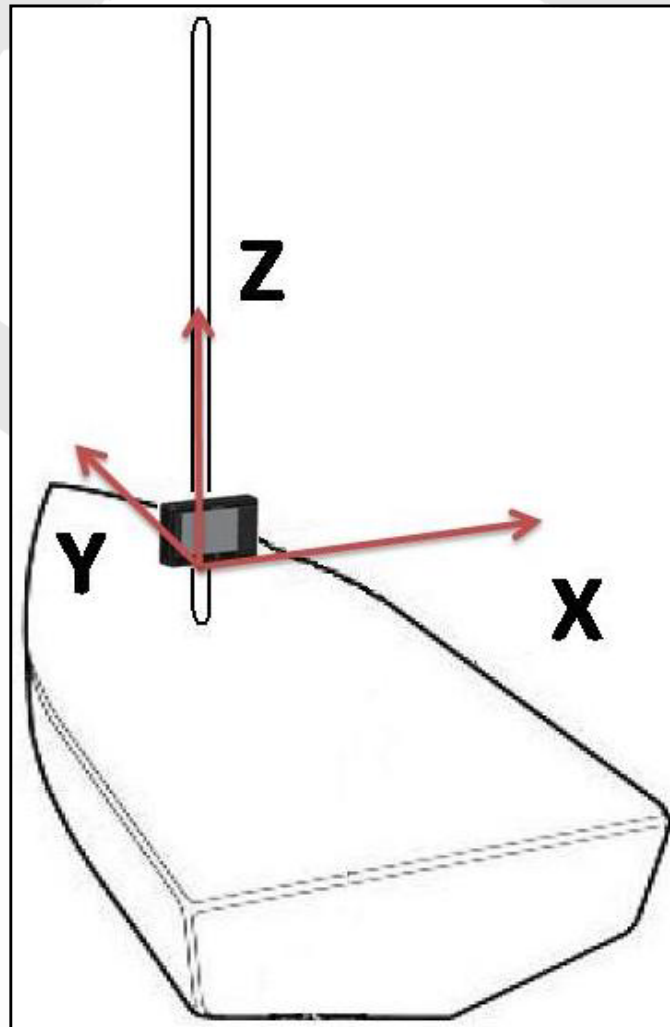
- Record up to 1092 hours of racing (1 point / 30 seconds)
- Wireless connectivity to a PC, Macbook, iPhone, Apple watch, external anemometer
- Replay on Google Earth and other navigational software
- Computer management of 100 waypoints, including their coordinates and descriptions
- Computer management 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.

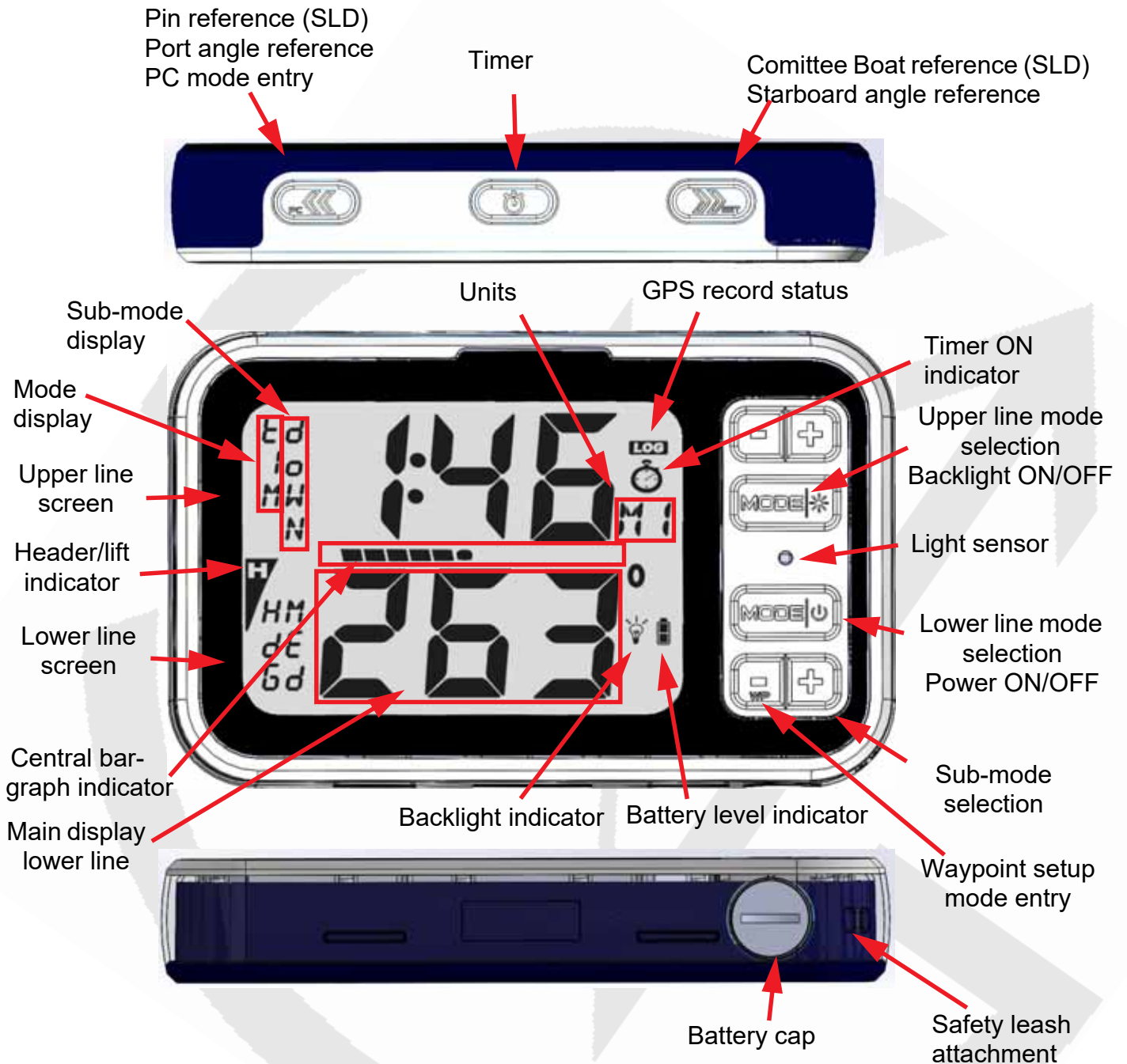
The **NS360.Pro** should be ideally mounted close to the vertical and horizontal planes.



*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

Anemometer - wind information


xWx


- **AWA & AWS:** Apparent wind angle & apparent wind speed
- **TWA & TWS:** True wind angle & true wind speed
- **DWI:** Battery level indicator & temperature of wind sensor

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.

Operations

*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** 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 ENELOOP, 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 25), 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.
- The **NS360.Pro** will record the current latitude, longitude, altitude, roll, pitch, GPS heading (course over ground), magnetic heading, GPS speed, wind speed and wind direction (if an external anemometer is connected, see “Anemometer mode”, page 33)
- 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

Operations

- **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.

- **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

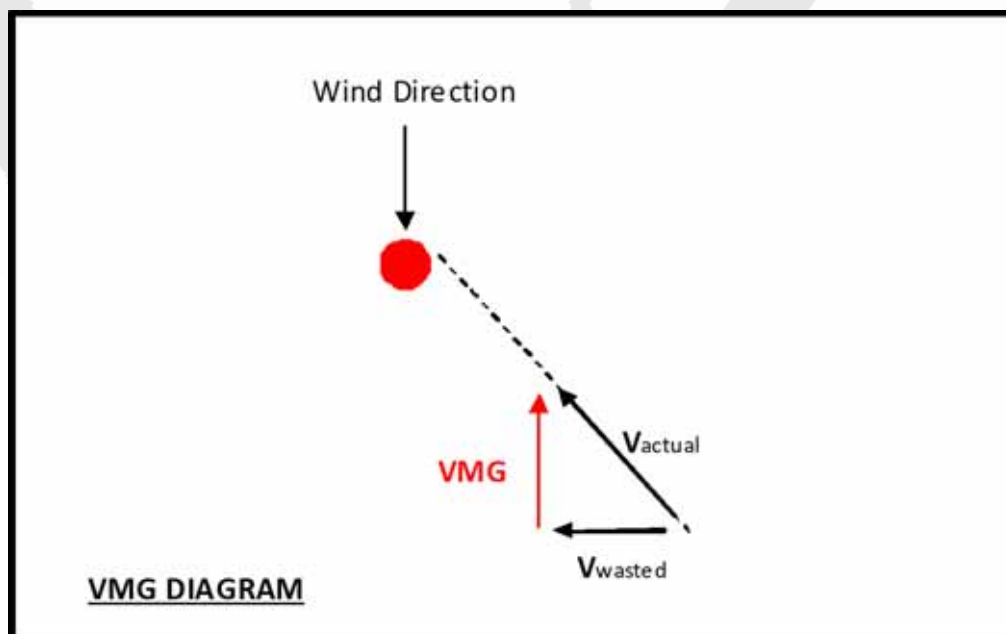
- Press and hold  to capture the port angle direction
- Press and hold  to capture the starboard angle direction
- You may enter or adjust the wind direction value with the  and 

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 wind direction is computed automatically once an external anemometer is connected (see “Anemometer mode”, page 33).

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.



Operations

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:

- **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.*

- **DIF** : angle **DIF**ference

The **NS360.Pro** displays the angle difference in between the current heading and the VMG reference angle (see VMG mode on page 10). This value can be computed based on the magnetic heading (hi/medium/low sensitivity) or based on the GPS heading and it can be selected on the opposite line set in HDG DIF mode (required only during the time of selection. E.g. the selection of the heading type (magnetic/GPS) used on the lower line in HDG DIF mode is done on the upper line in the same HDG DIF mode).

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

Operations

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.

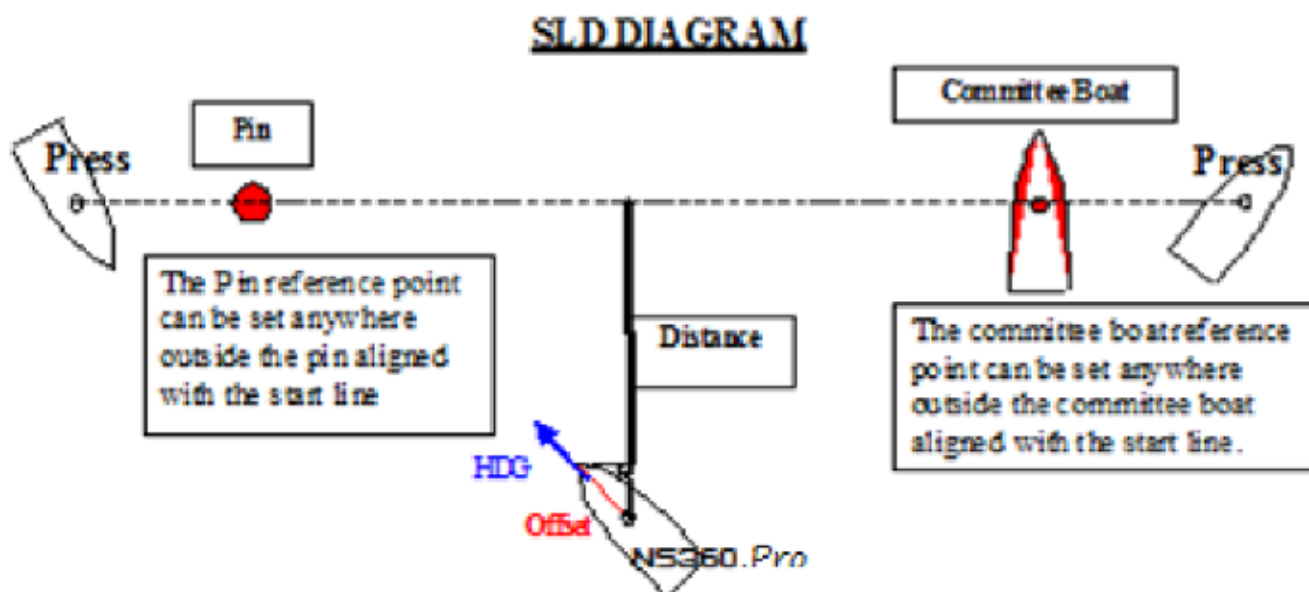
Note: When the down counter reaches 0:00, the timer and the Start Line Distance will switch automatically to the modes selected in the parameter tab of the Novasail Wireless Manager PC software.

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



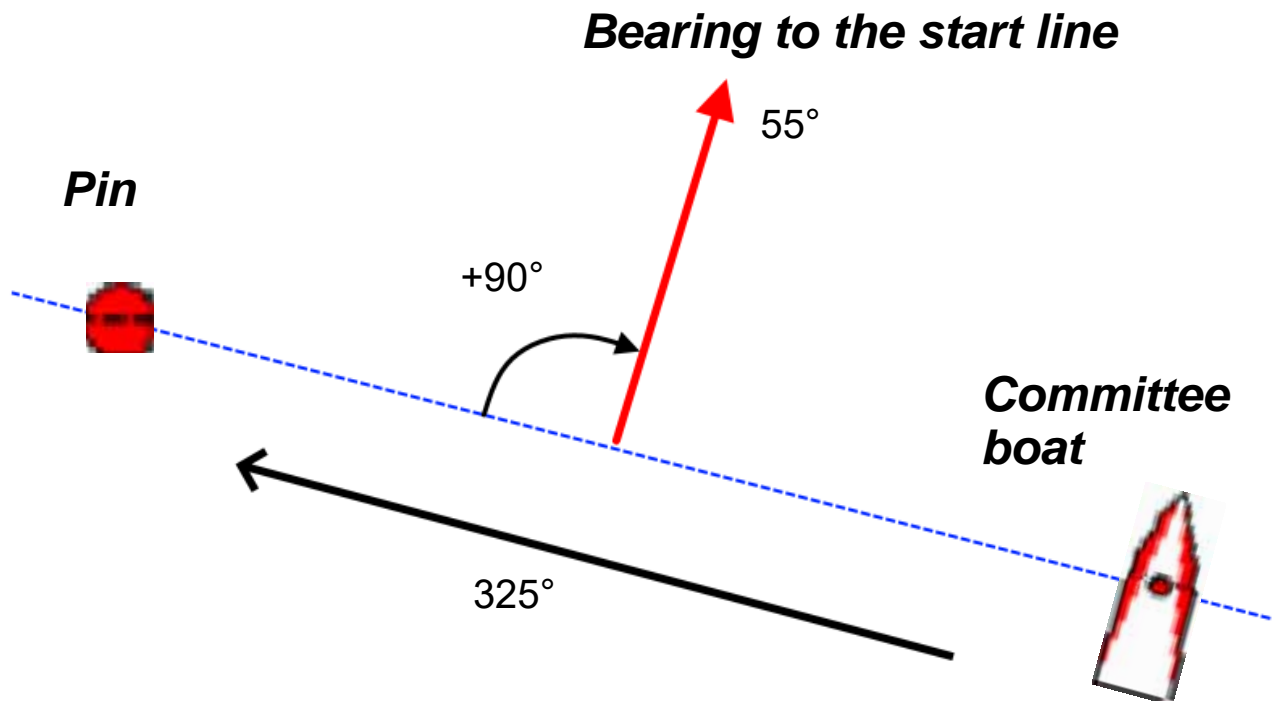
To memorize the start line points

- 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

Optimum bearing to the start line

Once the 2 start line points are recorded, the optimum bearing to the start line is displayed on the left column. It is calculated as the bearing from the committee boat to the pin and adding 90°. The optimum bearing is the direction to follow to achieve the shortest path for crossing the start line.





Operations



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 Difference and Waypoint Distance in the Novasail Wireless 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

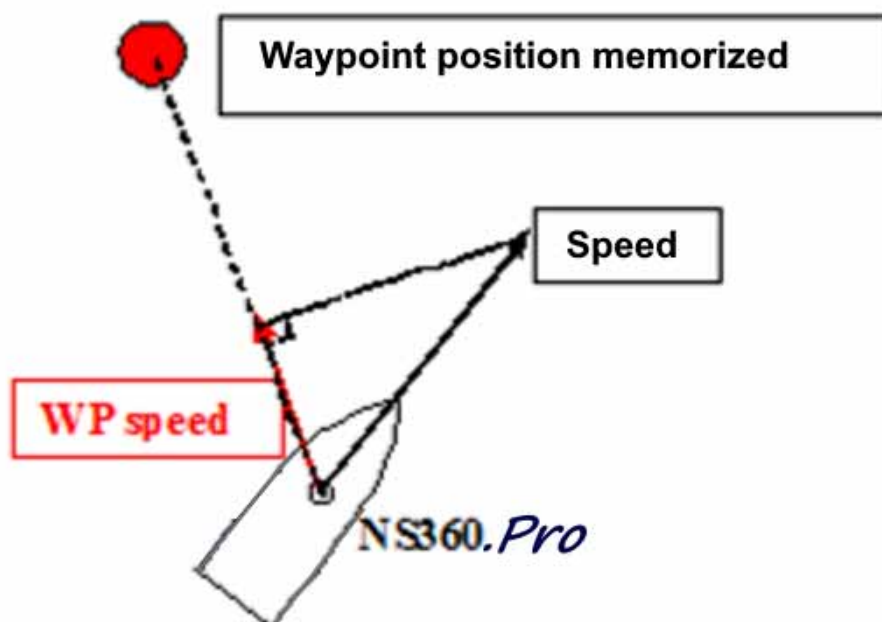
- First select the 'WAY' mode on the **lower line** (the memorization must be done on the lower line screen, it cannot be done on the upper line screen).

Operations

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.









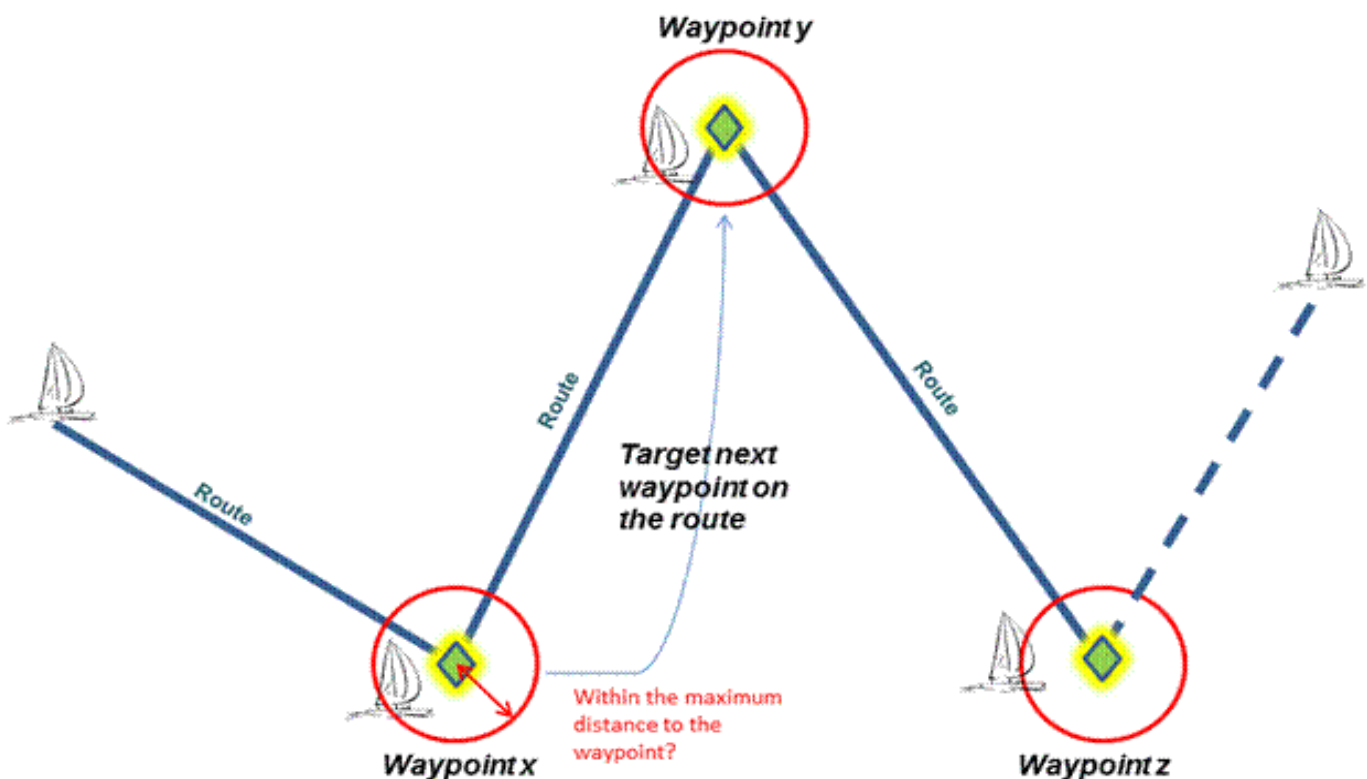
Route mode: Rxx

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.
- 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.





Operations

*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

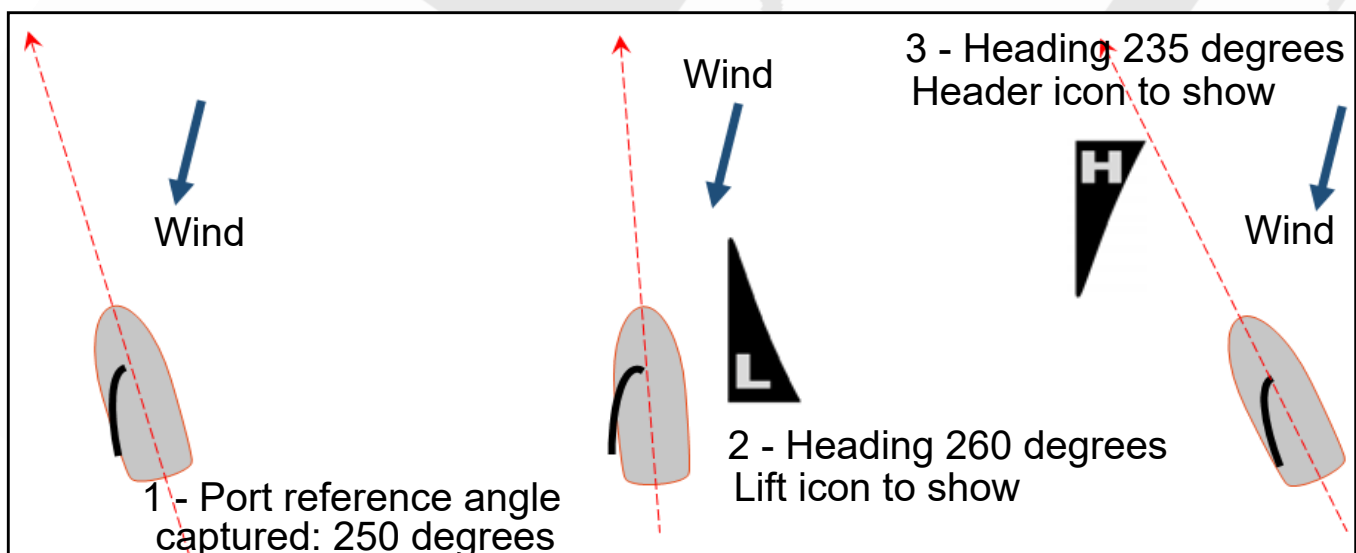
heading is 3 degrees starboard compared to the average reference heading, with a 1 degree value for each segment (the value for each segment can be adjusted in the Novasail Wireless Manager PC software, please refer to the online documentation for more details)

*Note: When an external anemometer is paired with the **NS360.Pro** the central bar graph will operate as described in the chapter “Anemometer mode”, page 33*

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)

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.*

Operations

Anemometer menu and sub menus

Note: in order to display the wind informations a compatible external wind sensor must be installed, see “List of supported wind sensor anemometers”, page 35.

In this mode the **NS360.Pro** will display the wind information : true wind speed “TWS”, true wind angle “TWA”, apparent wind speed “AWS”, apparent wind angle “AWA”, the wind sensor battery level and the wind sensor internal temperature “dWI” (manufacturer dependant, displayed if supported)

On the following picture, the **NS360.Pro** displays:


- a true wind angle of 43 degrees (left column upper line)
- a true wind speed of 10.5 knots (upper line)
- an apparent wind speed of 9.5 knots (left column lower line)
- an apparent wind angle of 29 degrees (lower line)



Five sub-menus for the wind sensor data can be selected with  and .

- **AWS & AWA:** Apparent wind speed or apparent wind angle
This sub-mode provides the apparent wind information as received by the **NS360.Pro**. The apparent wind speed or the apparent wind direction can be displayed on the main line or the left column
- **TWS & TWA:** True wind speed or true wind angle
This sub-mode provides the true wind information as calculated by the **NS360.Pro** thanks to the GPS speed information. The true wind speed or the true wind direction can be displayed on the main line or the left column
- **DWI:** Data wind information
This sub-mode provides the battery level 'bax' x=0 (low battery) to 9 (full) & temperature 'txx°' with xx being the temperature in degrees of the external wind sensor device (whenever available upon manufacturer spec)

Note: In order to connect the **NS360.Pro** to an external anemometer please refer to *the chapter "To pair the external anemometer", page 33*




Note: once the anemometer is connected and the GPS trace is active ( icon is displayed), the **NS360.Pro** will record the wind information in the GPS trace. It can be exported with the PC software 'Novasail Wireless Manager' to a third party software for debriefing analysis.

Advanced Operations





WAY Setup Mode

The **WAY** setup mode allows waypoints in your **NS360.Pro** to be memorized manually 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.

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 

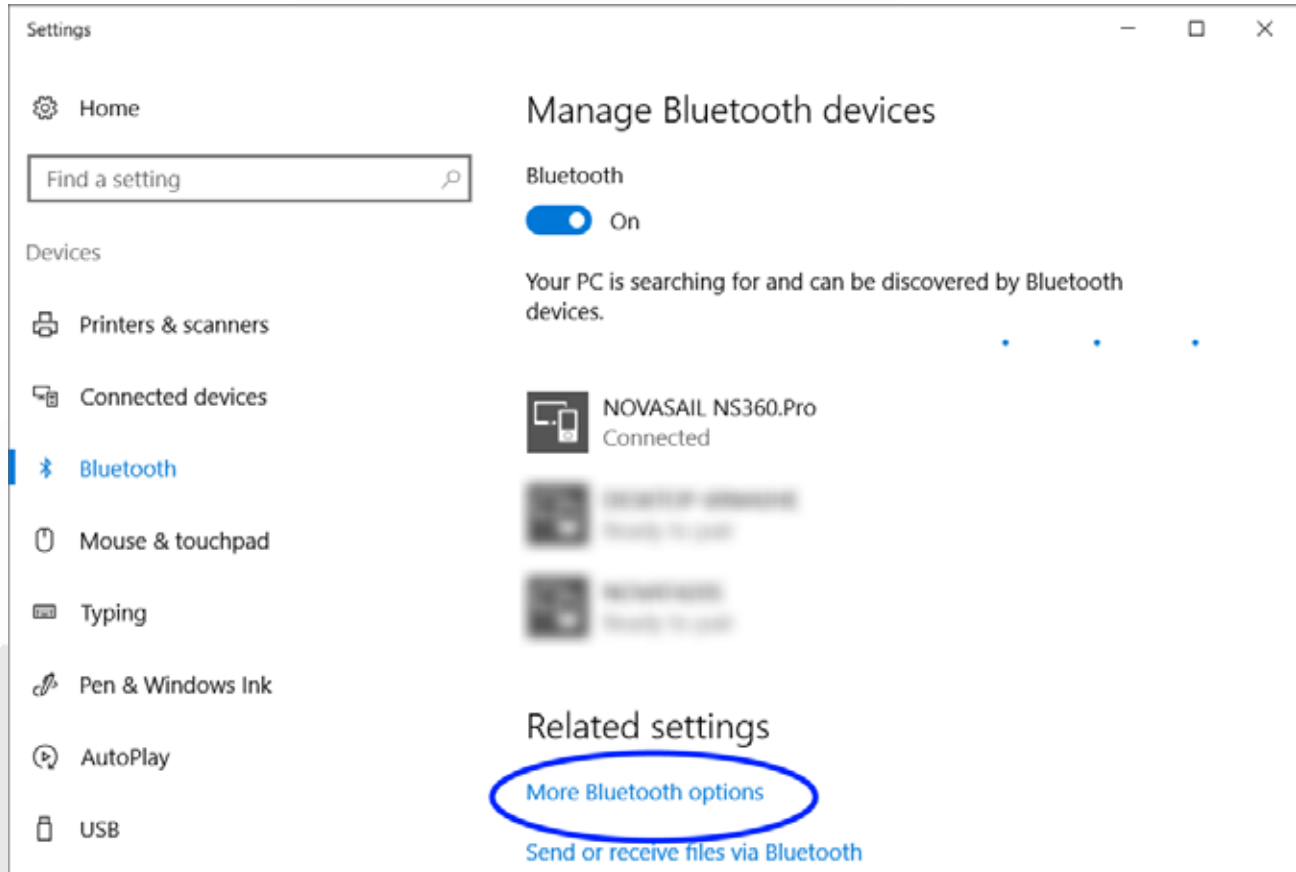
Troubleshooting

- 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)

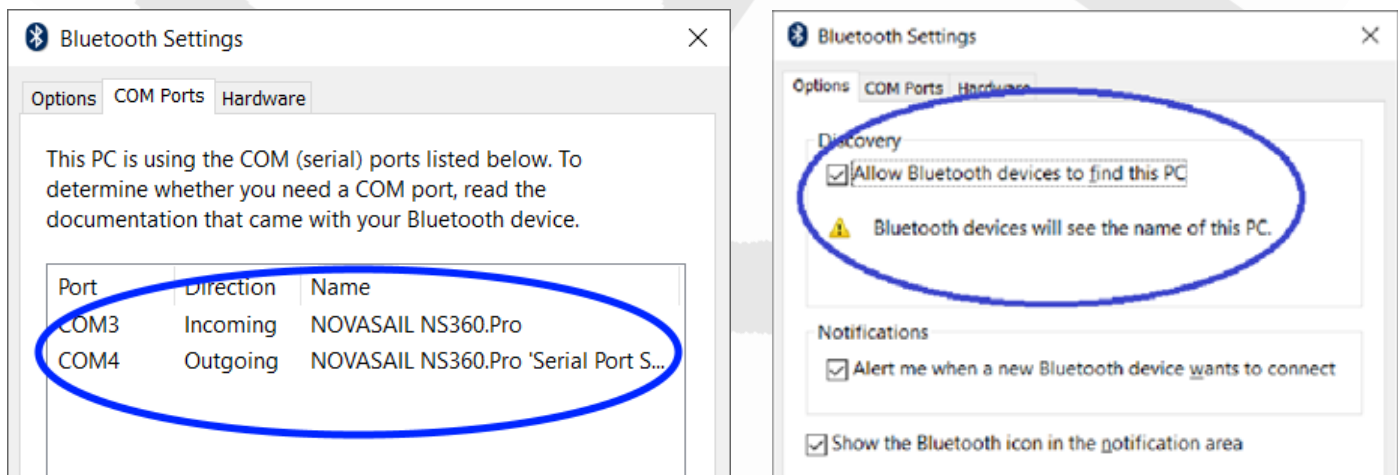
*Note: to save batteries the **NS360.Pro** will shut down automatically if no computer connectivity is detected for 10 minutes.*

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:

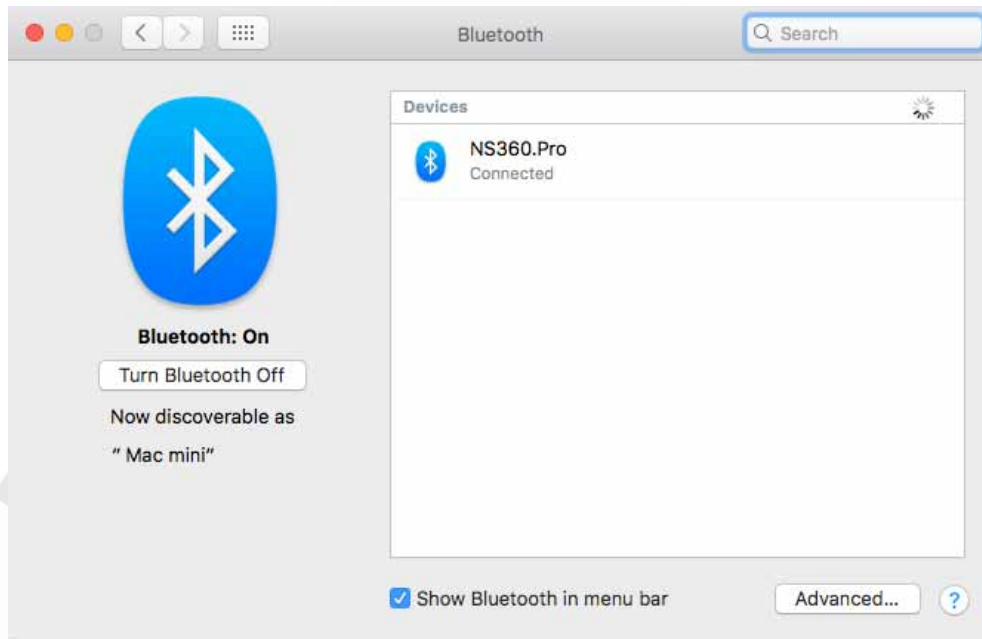


In the Bluetooth options (Windows 10 screen capture), additional information should be displayed as followed (the COM port numbers may be different):



Advanced Operations

Screen capture example under MAC OS, Bluetooth preferences:



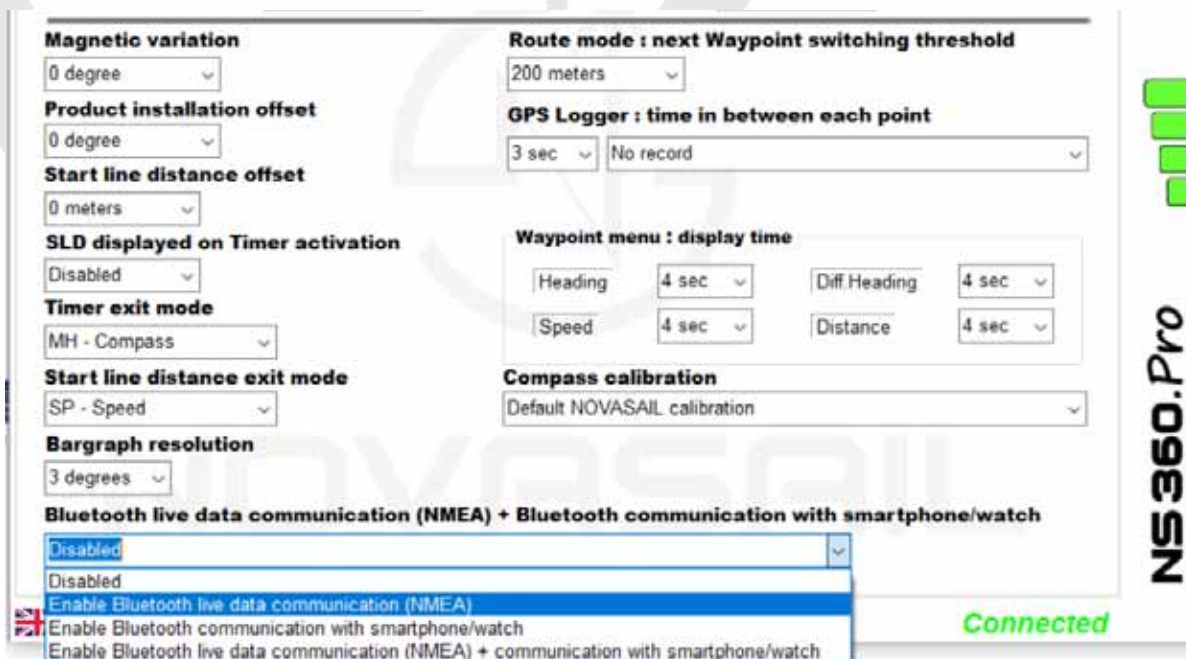
Advanced Operations

Live NMEA data broadcast

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



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.



Advanced Operations

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

The 1st segment of the wireless transmission icon  (1 bar) will be shown on the lower 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).

*Note: the wireless connectivity status icon  is made up of 4 segments : once any wireless connectivity is enabled on the **NS360.Pro** the corresponding segment will be displayed. Therefore any combination of*

(live NMEA data broadcast),  (smart phone/watch data broadcast) or  (anemometer data broadcast) will be displayed according to the features enabled.

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

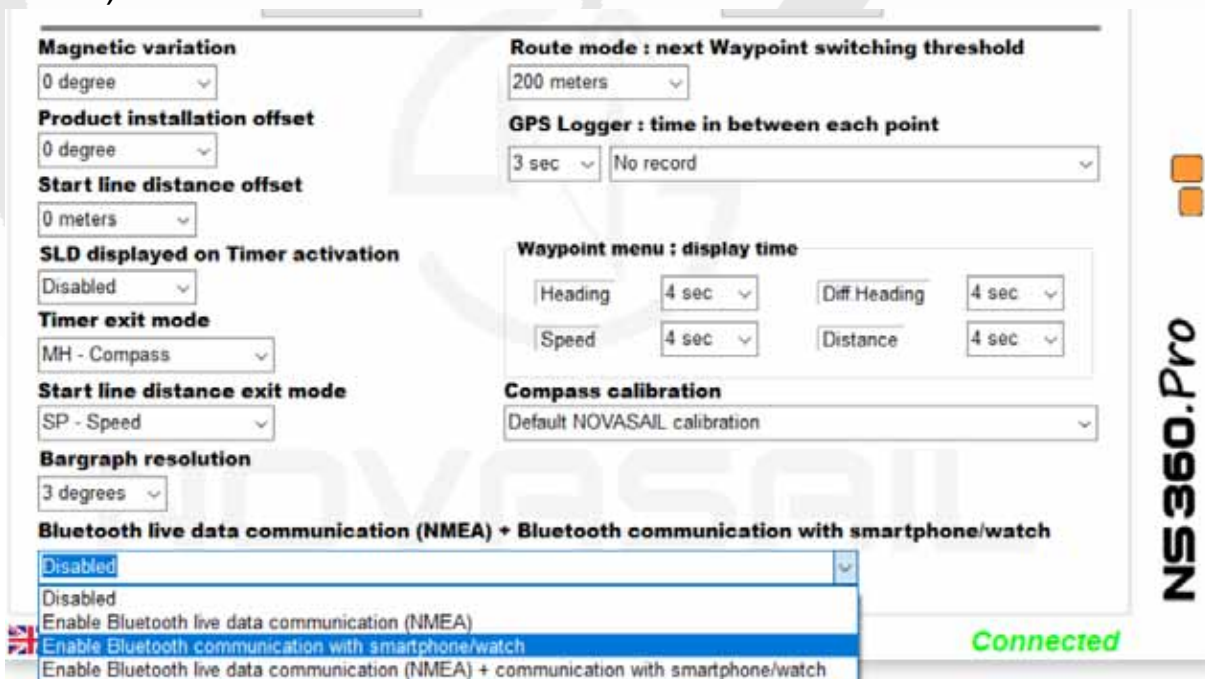
Advanced Operations

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

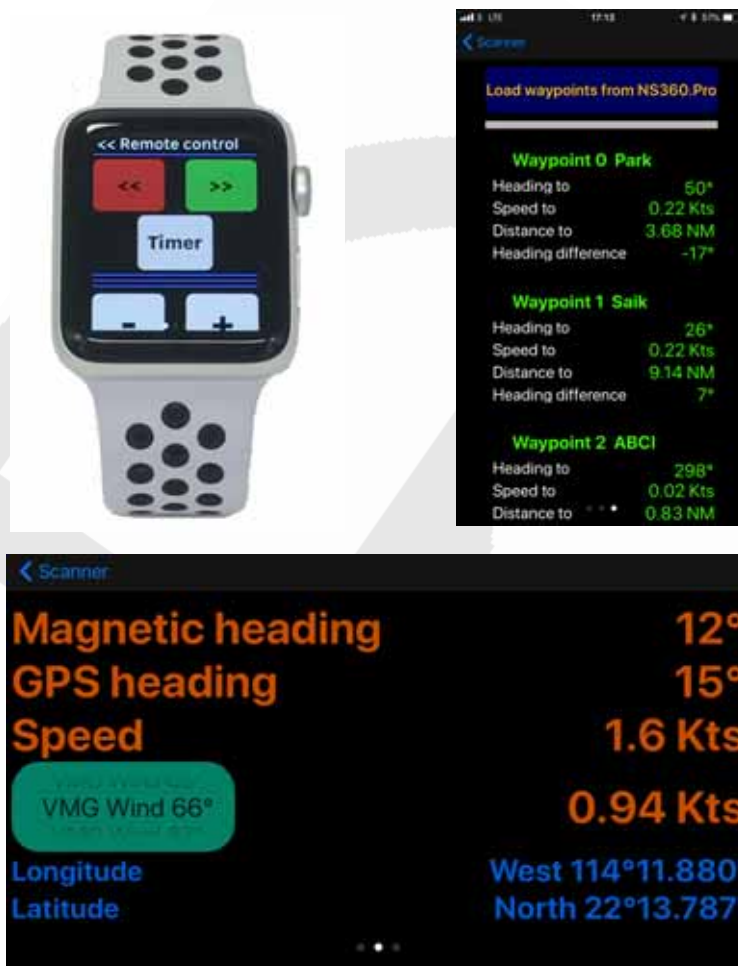
This feature is supported with the embedded firmware version 2.0 or above (update must be done if required). Once enabled in the setup parameters of the




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 2nd segment of the connectivity icon  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).

Advanced Operations



*Note: the wireless connectivity status icon  is made up of 4 segments : once any wireless connectivity is enabled on the **.NS360.Pro** the corresponding segment will be displayed. Therefore any combination of (live NMEA data broadcast),  (smart phone/watch data broadcast) or  (anemometer data broadcast) will be displayed according to the features enabled.*


Anemometer mode

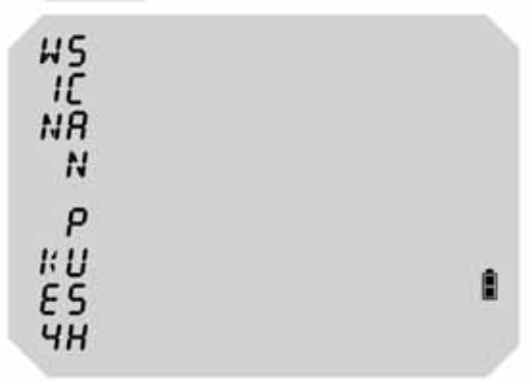
This feature is supported with the embedded firmware version 2.7 or above (update must be done if required).




To pair the external anemometer

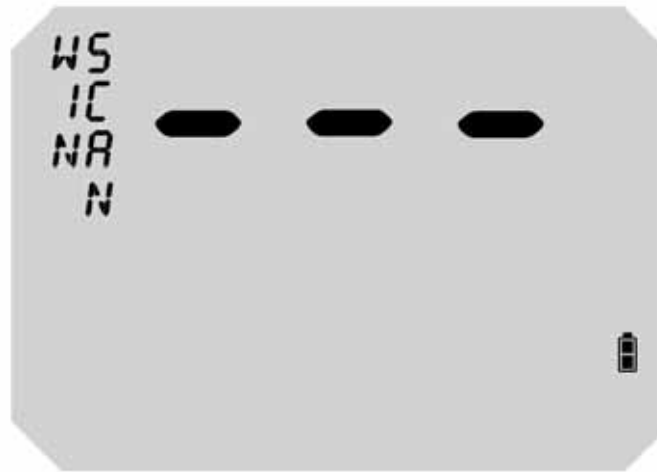
With the **NS360.Pro** switched off, press  then the lower  to enter the anemometer pairing mode

- a short press on  will select one of the 2 sub menus : reset (unpairing) or scan mode (search for anemometer)



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- a long press on  will validate the current sub menu and start the scanning (search for anemometer) or the reset (unpairing) process



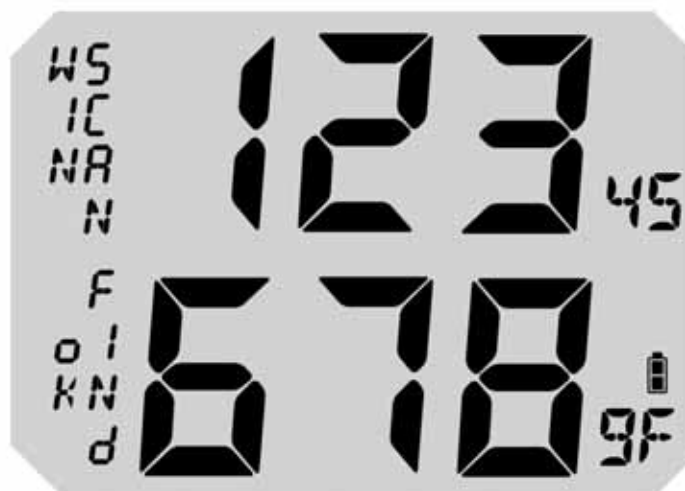
Note: the scanning will look for any compatible wind anemometer in the range (see “List of supported wind sensor anemometers”, page 35) and will store the connection information upon the end of this process. It allows the

NS360.Pro to identify and connect to your unique external anemometer.

Once successful the **NS360.Pro** will display the MAC address of the external anemometer found (“123456789F” in the following example); pushing any key will exit this mode and shutdown the device.

If several external anemometers are found in the range, the one with the strongest signal will be paired.

If no external anemometer is found “Fail” will be displayed.



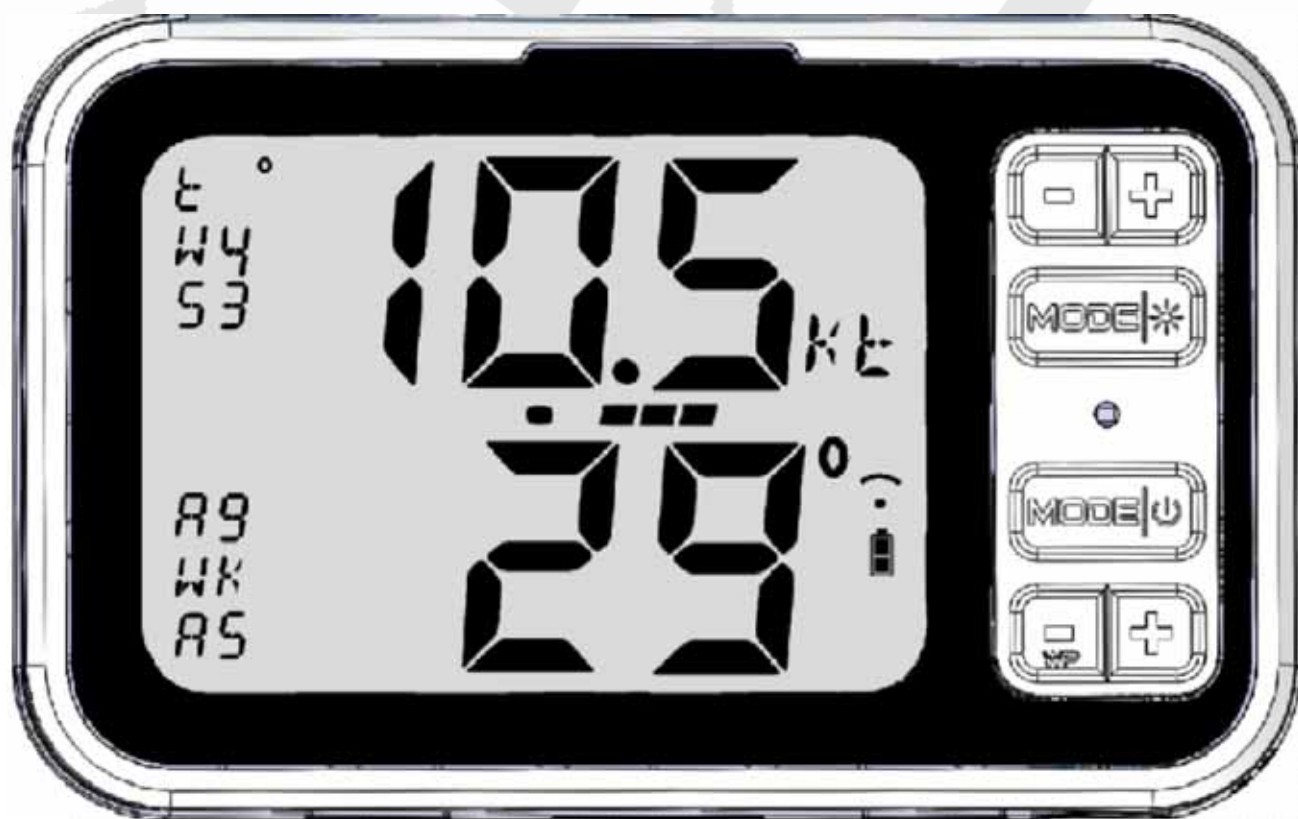
Advanced Operations

List of supported wind sensor anemometers

- <https://www.openwind.de/> wireless solar powered wind instrument
- <https://calypsoinstruments.com/> ultrasonic wireless solar powered wind instrument

Note: the unpairing process can be used to discard any previous anemometer connection information and it allows to disable the anemometer function. At any time the scanning process can be re-launched to re-pair any previous or new anemometer devices.


After pairing an external anemometer, the **NS360.Pro** will be able to receive the wind information and display the corresponding data : true wind speed “TWS”, true wind angle “TWA”, apparent wind speed “AWS”, apparent wind angle “AWS”, the wind sensor battery level and the wind sensor internal temperature “dWI” (manufacturer dependant, displayed if supported)





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In true or apparent wind speed menu (“TWS” or “AWS”), the **NS360.Pro** will display the speed information on the main line and the angle information on the left column (see upper line on the above screen capture).

In true or apparent wind angle menu (“TWA” or “AWA”), the **NS360.Pro** will display the angle information on the main line and the speed information on the left column (see lower line on the above screen capture).

Note: After power on, the **NS360.Pro** will search for the external anemometer associated (see “To pair the external anemometer”, page 33) during 3 minutes. If no detection is made after 3 minutes the **NS360.Pro** will stop searching and the 3rd segment of the icon  won't be showing anymore.

Note: During the searching process, the 3rd segment of the wireless icon  will blink. Once detected it will be permanently displayed.

Note: In case the connection to the anemometer is lost, the **NS360.Pro** will try to re-connect one time and the 3rd segment of the wireless icon  will blink again.

Five sub-menus for the wind sensor data can be selected with  and .

- **AWS & AWA:** Apparent wind speed or apparent wind angle
This sub-mode provides the apparent wind information as received by the **NS360.Pro**. The apparent wind speed or the apparent wind direction can be displayed on the main line or the left column

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- **TWS & TWA**: True wind speed or true wind angle

This sub-mode provides the true wind information as calculated by the **NS360.Pro** thanks to the GPS speed information. The true wind speed or the true wind direction can be displayed on the main line or the left column

- **DWI** : Data wind information

This sub-mode provides the battery level & temperature of the external wind sensor device (whenever available upon manufacturer spec)

Note: the wireless connectivity status icon  is made up of 4 segments :

*once any wireless connectivity is enabled on the **NS360.Pro** the*


corresponding segment will be displayed. Therefore any combination of

(live NMEA data broadcast),  (smart phone/watch data broadcast) or 

(anemometer data broadcast) will be displayed according to the features enabled.

Once the **NS360.Pro** receives the anemometer apparent wind data and the GPS speed information:

- the true wind angle (relative to the head of the vessel) is computed
- the direction of the wind blowing across the water is computed. In that case the wind direction reference used for the VMG mode (see “Velocity made good mode: VMG”, page 10) will be updated automatically.

*Note: once the anemometer is connected and the GPS trace is active ( icon is displayed), the **NS360.Pro** will record the wind information in the GPS trace. It can be exported with the PC software ‘Novasail Wireless Manager’ to a third party software for debriefing analysis.*


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Central bargraph display in anemometer mode


The central bargraph will override its standard operation as described in the chapter “Central Bar Graph”, page 20. It will indicate the true wind angle on port and starboard.


Optimum true wind angle values in upwind on port and starboard are represented in the red and green areas on the following diagram.




The first segment  indicates a true wind angle value within 0 and 20 degrees. The subsequent segments will indicate a true wind angle increased by 10 degrees per segment showing.

For example:

-  means that the current true wind angle is 60-70 degrees on starboard

-  means that the current true wind angle is 30-40 degrees on starboard



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-  means that the current true wind angle is 40-50 degrees on port

Note: whenever the true wind angle is out of the 20-70 degrees range, the first segment will blink for angles below 20 degrees and all the segments will blink for angles greater than 70 degrees.

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User Calibration of the magnetic compass: CAL

This mode is enabled in the parameter tab of the "NS360.Pro Wireless Manager" PC software or when the upper  button (first) and the lower  buttons are pushed **simultaneously** to power on the device. The **NS360.Pro** enters automatically a set of sub-menus to allow a self calibration of the magnetic compass/accelerometers/gyroscopes. There are 7 sub-menus that have to be followed in the sequence described below.

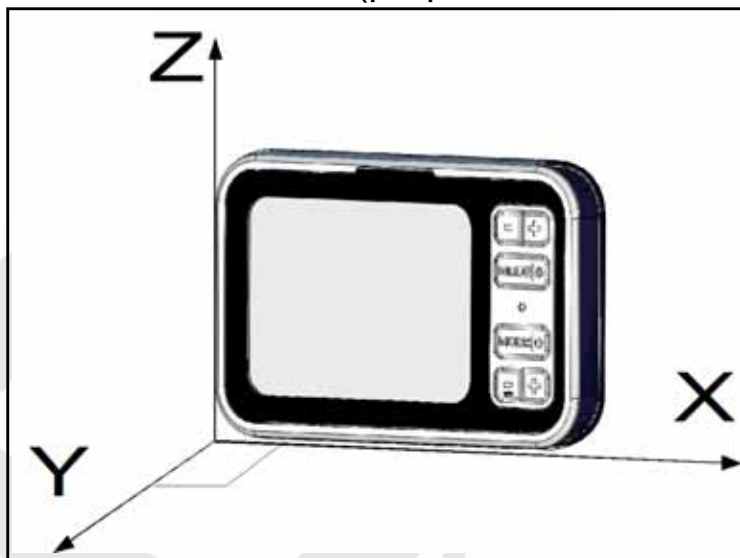
To allow the maximum accuracy of the calibration procedure, it is recommended to perform this outdoors to avoid any magnetic disturbing fields. A wooden surface is recommended and it is necessary to ensure that there are no ferrous materials nearby (wrist watches should be removed).


There are 7 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. 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.

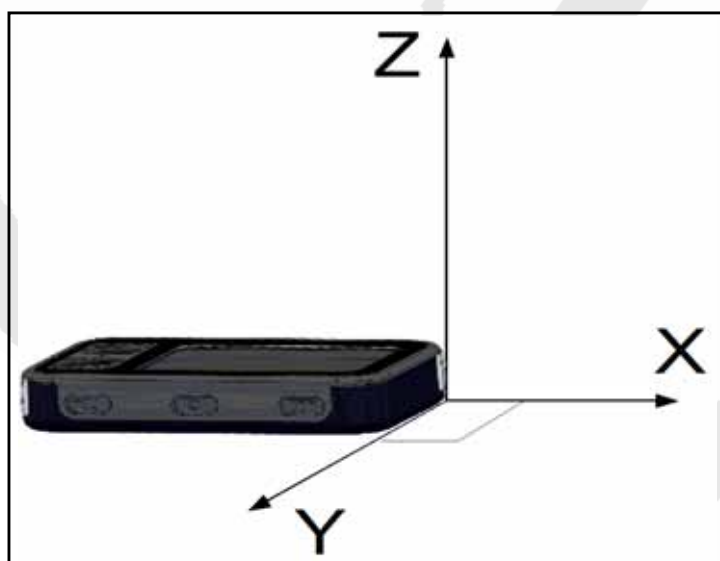
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- Step 1: '1' is displayed on the lower screen. The **NS360.Pro** must be oriented as follows and stand still (perpendicular to the horizontal XY plan):




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.

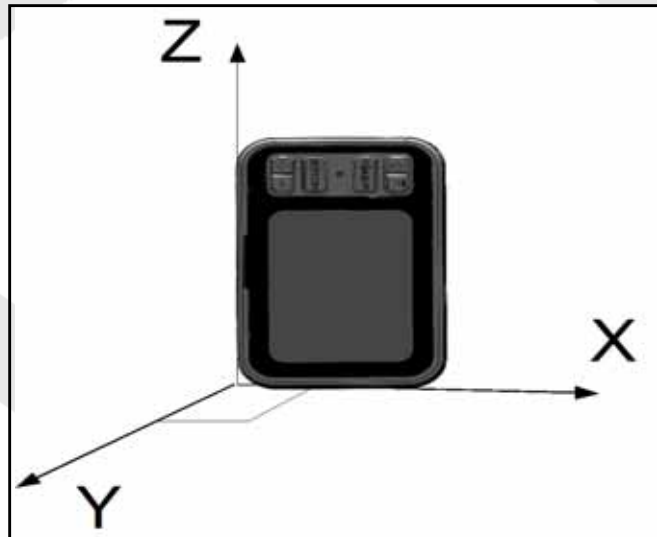
- Step 2: '2' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows and stand still (perpendicular to the horizontal XY plan):




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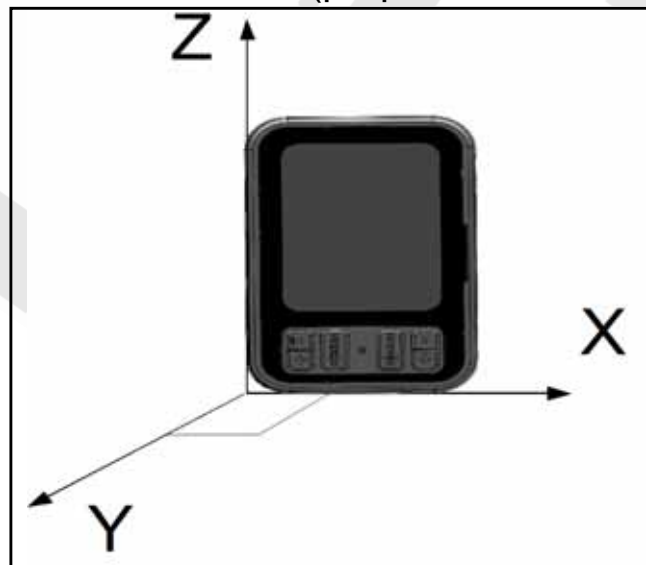
Push the lower  when ready. The **NS360.Pro** will enter the calibration along the axis. After a few seconds, 3 beeps will be emitted to notify the end of step 2.

- Step 3: '3' is now displayed on the lower screen. The **NS360.Pro** must be oriented as follows and stand still (perpendicular to the horizontal XY plan):




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.

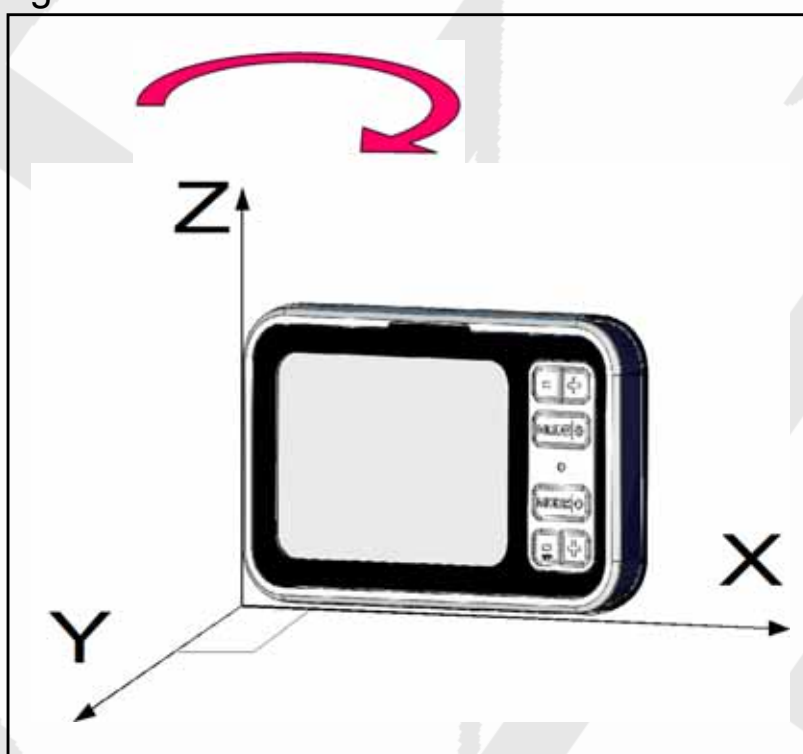
- Step 4: '4' is displayed on the lower screen. The **NS360.Pro** must be oriented as follows and stand still (perpendicular to the horizontal XY plan):



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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.

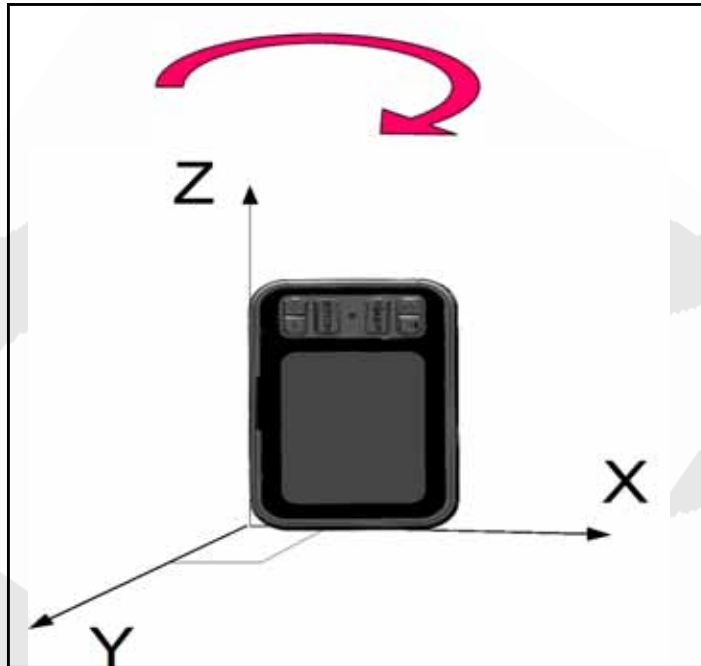
- Step 5 : '5' is displayed. The **NS360.Pro** must be rotated at least 1.5 to 2 turns while being maintained roughly perpendicular to an horizontal XY plan. The rotation (clockwise or anti clockwise) shall be done at an approximate rate of 30 seconds per turn while keeping the rotation axis centered along the Z axis.



Push the lower  key when ready. The **NS360.Pro** will enter the calibration along the axis. The **NS360.Pro** will record the new calibration values once the end of the rotation is detected (2 turns or more might be necessary).

- Step 6 : '6' is displayed. The **NS360.Pro** must be rotated at least 1.5 to 2 turns while being maintained roughly perpendicular to an horizontal XY plan. The rotation (clockwise or anti clockwise) shall be done at an approximate rate of 30 seconds per turn while keeping the rotation axis centered along the Z axis.

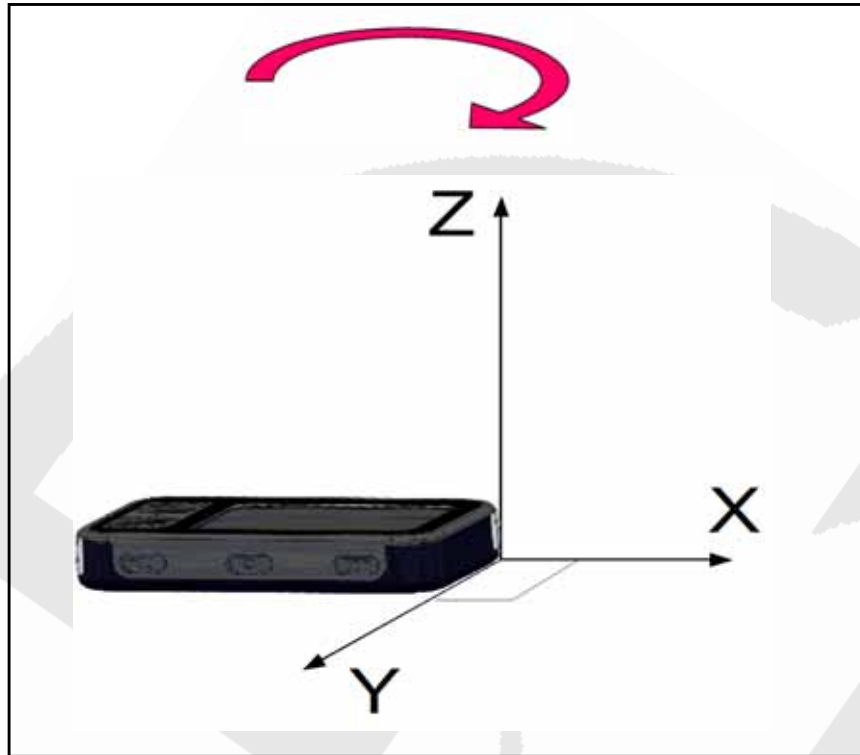
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Push the lower **mode** key when ready. The **NS360.Pro** will enter the calibration along the axis. The **NS360.Pro** will record the new calibration values once the end of the rotation is detected (2 turns or more might be necessary).

- Step 7 : '7' is displayed. The **NS360.Pro** must be rotated at least 1.5 to 2 turns while being maintained roughly perpendicular to an horizontal XY plan. The rotation (clockwise or anti clockwise) shall be done at an approximate rate of 30 seconds per turn while keeping the rotation axis centered along the Z axis.:

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Push the lower  key when ready. The **NS360.Pro** will enter the calibration along the axis. The **NS360.Pro** will record the new calibration values once the end of the rotation is detected (2 turns or more might be necessary).

“END” will be displayed on the lower line, push the lower  key to switch off the device.

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

Version 1.5: Modified 'Remote control and navigation data broadcast to smart phone' chapter

Version 1.6: Modified 'Calibration' chapter (new user calibration process)

Version 1.7 & 1.8: Added anemometer support chapter, modified NMEA & smart phone/watch chapter, modified bargraph chapter, modified VMG mode chapter, modified GPS record status chapter, removed SLD GPS start line distance sub-menu, added bearing to start line in SLD mode

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

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- The product has to be registered using the online service available on the Novasail web site: www.nova-sail.com
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- The actual cost of repair may be charged to the customer or the performance of warranty service may be rendered impossible, even within the warranty period, under the following circumstances:
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 - Disassembly or modification for purposes other than it was originally intended for
 - Failure caused by a fire, earthquake or flood
 - Damage/failure caused by an impact
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