MULTIDISPLAY

Item number: 90-60-543 (White) / 90-60-544 (Carbon)
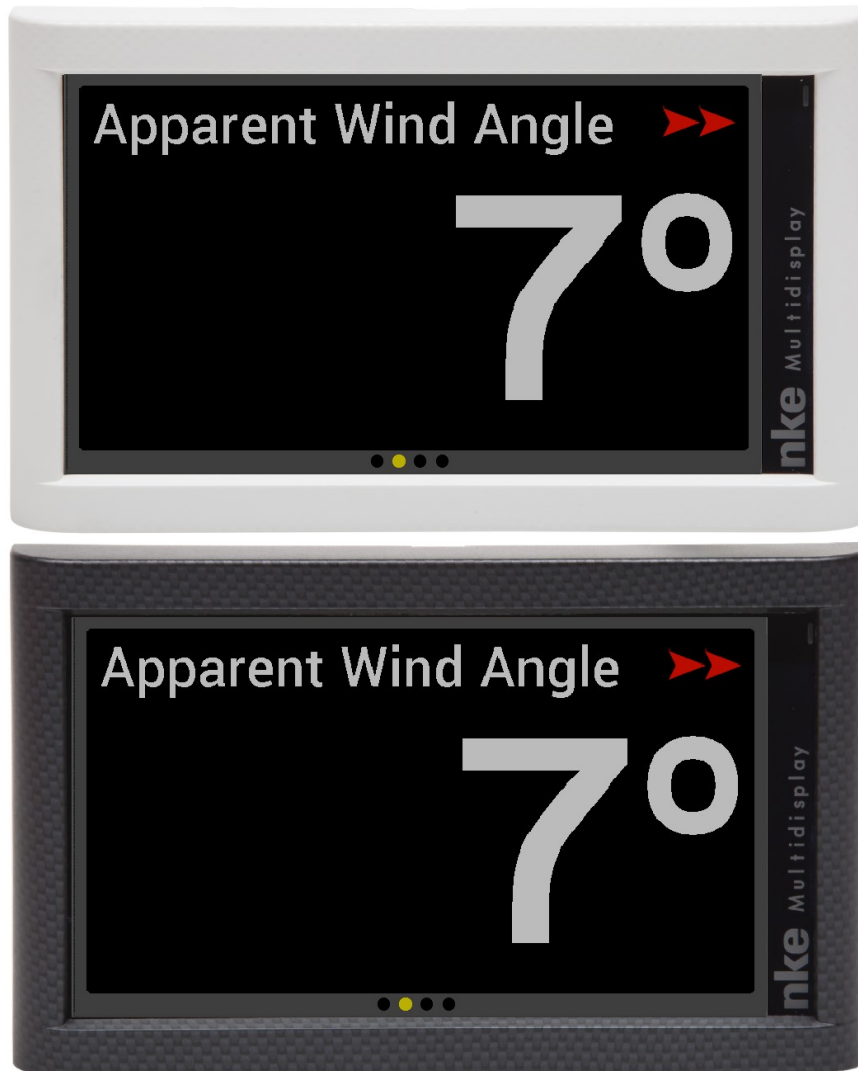
USER MANUAL
&
INSTALLATION SHEET

V1.4

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1 PRESENTATION

Thank you for your trust in the new Nke marine electronics Multidisplay.

The display includes the following functions:

- Show all data collected by the sensors on the nke Topline bus, in a numerical, analogical or graphical format. The display also manages all alarms and calibration of each sensors.

- Compatibility with NMEA 0183 external devices and can create up to 30 custom channels. The input port of the display can receive NMEA data from 4800 to 38400 baud rate (including A.I.S. data). For more information about custom NMEA channels, contact our support center.

- Interface with various navigation software (Adrena, Expedition,…). These software are compatible with nke and can manage the data. For example, data such as the TIMER and LINE BIAS can be handled by the navigation software.

- Autopilot (Gyropilot2 and/or HR Pilot). When either pilots are connected to the nke Topline bus, the display will automatically generates a page dedicated to the autopilot and its settings. The pilot can be control with the remote Pilot Pad.

2 USE

The **Multidisplay** doesn't have a build-in keyboard therefore it is necessary to use a Pad (display or pilot) or a transmitter (display or pilot) in order to control the display.

See Pad (display or pilot) or transmitter (display or pilot) manuals.

- **PAGE**
  Pressing the page button allows to browse through all pages (main menu, pre-configured and pilot pages).

💡 *Press and hold (at least 2 seconds) to open the Menu page.*

- **OK**
  Press the OK button to confirm a selection or open specific features on some pages.

💡 *Press and hold (at least 3 seconds) to open the backlighting settings.*

- **Cursor pad**
  Use for the selection of pages and menu options.

- **A,B,C,D (Pad display)**

Those keys are shortcuts allowing access to different pages already programmed and the standby display.

- **-1, +1, -10, +10 (Pad Pilot)**

  Use to control the autopilot's course in 1° or 10° increments to Port or Starboard.

💡 ***Press and hold the +/-10° to tack.***

- **AUTO**
  Single press to engage the autopilot.

💡 ***Press and hold this key to go directly to the Pilot Mode menu.***

- **STOP**
  Single press to disengage the autopilot.

- **MOB**
  Press and hold to activate the man Over Board function on the ***Topline*** bus.

2.1 MENU PAGE
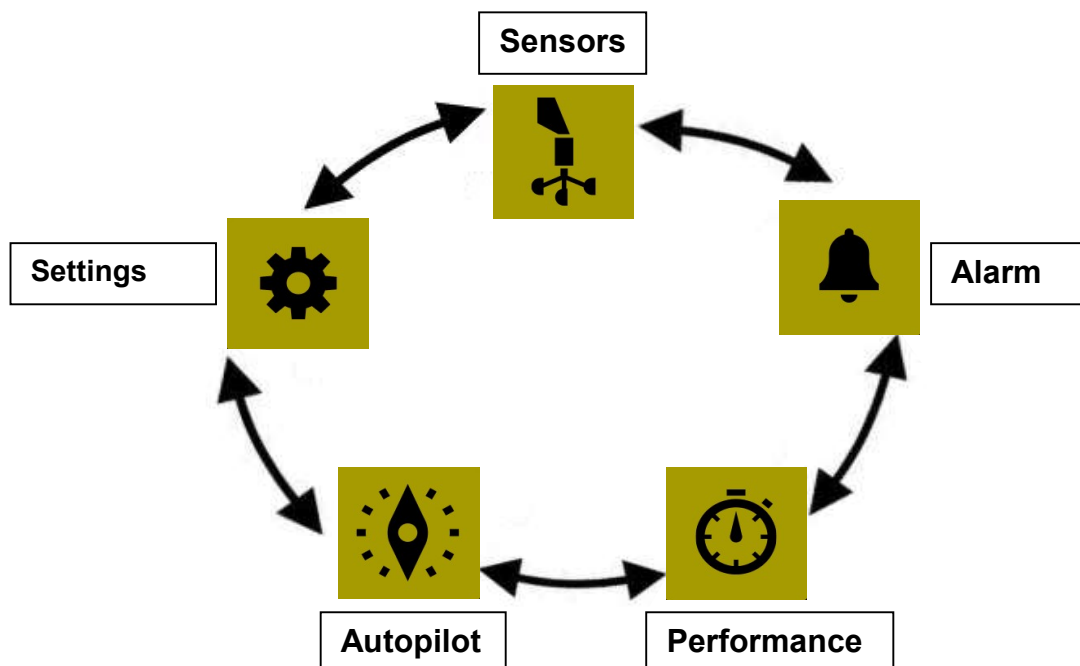
When the **Multidisplay** is used for the first time it displays a screen with a menu providing access to:

- the sensor settings
- the alarm settings
- the pilot settings
- the Performance page setup
- the Configuration settings

Press the cursor pad's arrows « left » and « right » to scroll through the menu icons for selection.

2.2 PAGE BUILDING WIZARD

Using the **Multidisplay**, building user specific pages has never easier. You will be able to create up to 10 pages with different layouts with digital, graphical or analog data.

- To build a page, first select the « Parameters » icon in the menu.

- Select pages and press .

- Select the page you want to build or edit with the up and down arrows . Empty pages are grayed out. Once you have made your selection, confirm with .

 11 pages are available; the first one is for the pilot and the other are numbered from 0 to 9.

2.2.1 Page layout

You can choose between different layouts for the page. Press , a list will appear.

Select the screen layout template with the « up » and « down » arrows on the pad.

, depending on the layout you wish to display on the page.

Screen types available in landscape orientation:

1 line	Displays 1 data
2 lines	Displays 2 data
4 lines	Displays 4 data
6 lines	Displays 6 data
9 lines	Displays 9 data
1+3 lines	Displays one main data on the left and superimposes 3 thumbnail data to the right
4/4 page	Displays 4 data on the same page and alternates every 3 seconds with 4 other data
2/2 page	Displays 2 data on the same page and alternates every 3 seconds with 2 other data
1/1 page	Displays 1 data and alternates with 1 other data every 3 seconds
XTE page	Displays the waypoint difference at Waypoint
Waypoint page	Displays the Waypoint heading from the COG
Tactics page	Displays tactical data
Starting line page	Displays the timer and data of the starting line
AIS page	Displays AIS data

Screen types available in portrait orientation:

1 line	Displays 1 data
2 lines	Displays 2 data
3 lines	Displays 3 data
4 lines	Displays 4 data
8 lines	Displays 8 data
2/2 lines	Displays 2 data on the same page and alternates every 3 seconds with 2 other data
3/3 lines	Displays 3 data on the same page and alternates every 3 seconds with 3 other data
4/4 lines	Displays 4 data on the same page and alternates every 3 seconds with 4 other data

Once you have made a choice, press to confirm.

2.2.2 Edit a page

This setting selects the data that will be displayed on the selected page

- NEXT to accept the current data in that selected part of the screen (only for multiple line pages) and go to the next page partition.

- EDIT to change the information and the colour in which it will be displayed by selecting from a list.

Groupe	Data
Wind	Apparent wind angle
	Apparent Wind Speed
	True Wind angle
	True Wind Speed
	Magnetic True Wind Direction
Navigation	Depth
	Boat Speed
	Ultrasonic Speed Sensor
	Magnetic heading
	True Heading
	Corrected Heading
	Trip Log
	Total Log
	Maximum Speed
	Average Speed
	DR1 distance
	Reckoned bearing
Pilot	Pilot consumption
	Pilot Voltage
	Rudder Angle Sensor
Energy	Bus Voltage
	BAT1 Voltage
	BAT1 Current

	BAT1 Capacity
	BAT1 Level
	BAT1 Energy
	BAT2 Voltage
Performance	Race Timer
	CMG
	Optimum Wind Angle
	Drift Angle
	Direction of measured current
	Speed of measured current
GPS	Speed over ground
	Heading over the ground
	Magnetic COG
	Distance to Waypoint
	Bearing to Waypoint
	Cross-Track Error
	Position
	Time
	Date
	Declination
Weather	Air Pressure
	Sea temperature
	Air temperature
Specific sensors	Heel
	Pitch
	Forestay tension
	Mast Angle Sensor
	HR Mast Angle Sensor
	Engine hours
Customs	Dynamic channels
All	…….

FINISH to confirm the page and save the settings.

Some partitions of the page can display the information in analogue, graphic or digital format. You may not need to have access to all pages at all time. In order to avoid having to "page/browse" through multiple pages that you do not want to use at a particular instant, you can "Hide" one or multiple page(s). For example, you may want to hide the AIS page on a clear day cruising near the coast.

After building the page, the page building wizard will offer to name the page and save it.

Press (OK) to save the page.

Select Name with the pad and press (OK) button to access the virtual keyboard.

Use the pad keys to select letters and press (OK) to confirm your choice. Repeat the action for each entry.
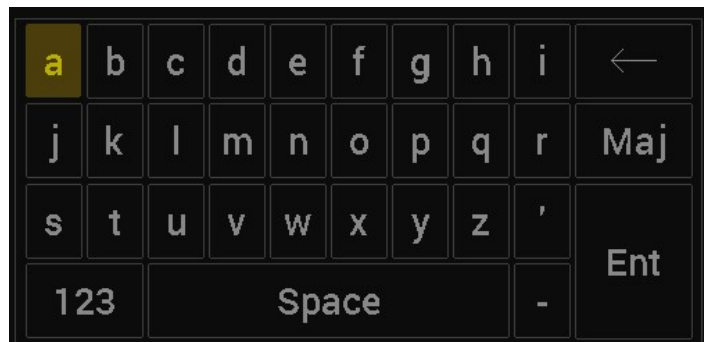
123 Toggle between numbers and letters.

Maj Caps lock.

← Delete last digit

Ent Enter, to confirm the name and save the page.

2.2.3 Visible

 The six first pages are visible by default.

Press (OK) to hide the page.

Unhidden "ON"

Hidden "OFF"

2.2.4 Label the page

Use this menu to label the page you just created.

2.3 DISPLAY PAGES

Use the PAGE button to browse through all the pages you have created. Pressing the PAGES button successively will eventually display the Main Menu carousel and the Autopilot Page.

● ● ● ● ● 🟡 ●

2.3.1 Temporary modification

Temporary modification of a page allows data of your choice to be displayed without saving a new layout.

- Browse through the page with .

- Highlight the data to modify and press .

- With choose the replacing data and press .

IF you want to save the temporary modification, press the button and confirm in the next window.

IF you do not want to save this temporary modification, no manipulation is necessary. The modification will not be saved and the original layout will be displayed after turning the system off, then back on.

2.4 SETTING PARAMETERS

Press and hold PAGE to display the main menu in which you select for the «Parameters» page.

Use the up and down arrows of the pad to select and to confirm.

2.4.1 Display Settings

The Display Settings menu gives access to:

- The Display Mode
- The Daylight Mode settings
- The Night Mode settings
- ZOOM

2.4.1.1 Selecting Day Mode or Night Mode

The screen offers two settings in order to optimize the display parameters for the conditions of use, the first intended for the display in daylight and the second for the display at night with in particular a low light level.

The lighting level and the displayed theme are independently adjustable in each mode.

It is possible to switch automatically from "day" mode to "night" mode thanks to the light sensor, or to manually choose the desired mode. The setting is specific to each **Multidisplay**.

process for setting day / night mode

- Select "Display configuration" using the browser and press .

- Highlight "Display mode" and press .

- Choose "Auto" or "Day" or "Night" and press .

Auto mode: the screen automatically switches from day mode to night mode depending on the brightness received by the light sensor.

Day mode: the screen is forced with the level and theme defined in day mode.

Night mode: the screen is forced with the level and theme set in night mode.

2.4.1.2 Backlight setting

The lighting level for each mode is adjustable in 20 levels

- Select "Display configuration" using the browser and press .
- Choose "Day setting" or "Night setting" and press .

- Press again and modify the value of "Lighting level" with the browser . Once satisfied press to save the parameter.

> *Whatever page is currently displayed press and hold « OK » for 3 seconds to access directly to the backlight levels settings.*

2.4.1.3 Skin Settings

- In « parameters » choose « Display Setting » and press OK .

- Choose « Day adjustment » or « Night adjustment » and press OK .

- Select « Skins » and press OK

- Select the skin desired with the OK key and press OK to save the parameter.

Five skins are available for day and night modes. The default settings are black and white for Day and black/red for night. It is recommended to try different skins because it will enhanced visibility depending of the viewing angle.
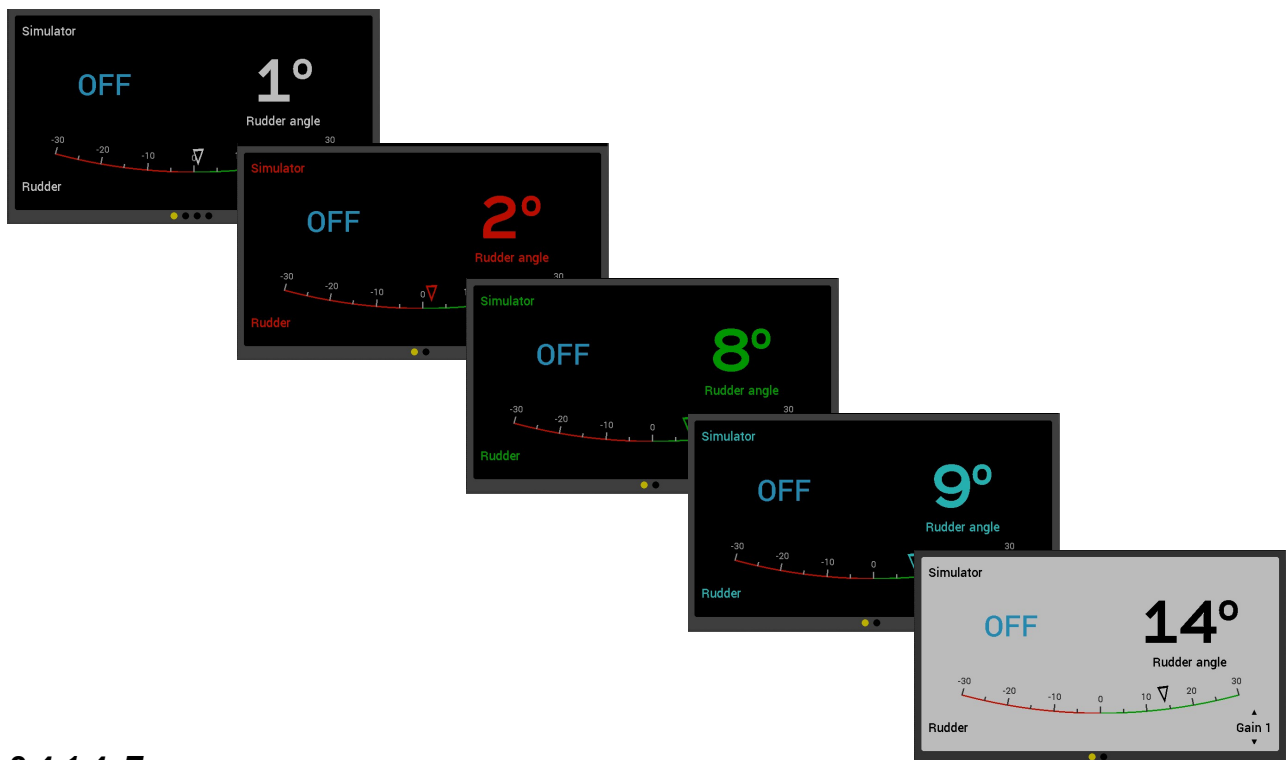
2.4.1.4 Zoom

The Zoom mode offers a better visibility of the menus when the pad is far from the displays.

- Select with OK « display settings » and press OK

- Choose « zoom » and press OK . Then confirm zoom mode by switching to « ON »

> ⚠ Menus in zoom mode are all in English. When the zoom mode is activated, the language menu is not available.

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2.4.2 Data logging : « stripcharts » settings

4 different sets of data can be logged simultaneously over a 48 hour period with a 15 seconds log rate. The logged data can be displayed on stripcharts on the "*Multidisplay*".

"Stripcharts" settings process:

- In « parameters » select « Logger configuration » and press ⓞⓀ .

- Choose the logger to modify among the 4 available and press ⓞⓀ .

- With ✛, modify the data and save with ⓞⓀ .

2.4.3 A,B,C,D and SYNC keys configuration of the multifunction Pad

Keys A, B, C, D and SYNC enable to display the pages programmed on all the displays.
In >> Parameters >> shortcuts configuration: select one of the keys to program and press ⓞⓀ Choose in the list the page desired. By default no key is programmed.
In order to set a *Multidisplay* in sleep mode, a Display Pad is required. Go to >> Parameters >> shortcuts configuration. From there, assign one of the shortcut letters from the pad (A, B, C or D) to the SLEEP mode.
You can also assign the SYNC button to a Timer Page.

2.4.4 Language selection

Your Multigraphic can be set to display menus in various languages.

Language setting process:

In « parameters » choose the language and press ⓞⓀ to save your choice.

2.4.5 Unit selection

The *Multidisplay* can be set to use various units for boat speed, depth, air temperature, sea temperature and wind speed.

Depending on the information selectable units are "knots", "meters per second", kilometres per hour", "degrees Celsius" and "degrees Fahrenheit".

- In parameters go to « Unit Selection » Select the unit and press ⓞⓀ

- Choose the unit and press ⓞⓀ to save.

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2.4.6 Maintenance

2.4.6.1 Multidisplay node address in the Topline system

In this menu you have to give a *Topline* address to the *Multidisplay*. With address n°1 it will be considered as « Master » and manages the whole system. If there is already a Master », the *Multidisplay* will get an address different from 1 and it will behave as « Slave ». This process is carried out automatically: if there is no « Master » in the system, the *Multidisplay* will automatically be selected as « Master ». Systems with an existing « Master » will automatically deliver a « Slave » address to the *Multidisplay*.

Note: the *Multidisplay* comes with a factory default setting as n°0. It has no address and it cannot work with your system. Giving an address to the *Multidisplay* is the very first setting to do once the display is connected to the *Topline* bus and the installation complete.

1) *Multidisplay Address Process:*

- Make sure the nke instruments are TURNED OFF.

- Connect the red wire of the *Multidisplay* with the bare wire (ground slot) or in the INIT slot when using a 90-60-417 junction box.

- Turn the nke instruments ON.

- The *Multidisplay* will indicate the following message: "disconnect the red wire to start initialization".

- WITH the power still ON, disconnect the red wire as prompted.

- The *Multidisplay* will start automatically and will take the first address available on the Topline bus.

- Turn the nke instruments OFF.

- Isolate the red wire with heat shrink or electrical tape.

2) *Multidisplay Reset-addressing Process:*

- Using the Pad (either Pads will work, Pilot or Display), go to "GEAR SYMBOL", then "MAINTENANCE", then "TOPLINE ADDRESS".

- Select "ERASE" and confirm with the OK BUTTON.

- Refer to 1) *Multidisplay* Address Process.

3) *Multidisplay Change of Address Process:*

- Using the Pad (either Pads will work, Pilot or Display), go to , then "MAINTENANCE", then "TOPLINE ADDRESS".

- Select "YES" and confirm with the OK BUTTON.

- The ***Multidisplay*** will automatically take the first available address on the nke Topline bus.

> Once this procedure is complete, the Pad won't have any control on the ***Multidisplay***, you'll have to execute the address taking process to be able to control the display. In case of "master bus lost" it is possible to reconnect the red wire to reset the address to zero and start the address taking process.

2.4.6.2 Auxiliary inputs

The peripheral menu is accessible from the Maintenance menu.

2.4.6.2.1 Console

The ***Multidisplay*** has a NMEA console allowing NMEA input data to be displayed.

2.4.6.2.2 NMEA settings

The ***Multidisplay*** features a NMEA0183 input which allows any compatible instrument (GPS, computer…) to be connected. This port converts any NMEA incoming data to ***Topline*** channels if they do not already exist on the ***Topline*** bus. The data will be used by the ***Topline*** system. Baud rate is automatically detected between 4800 or 38400 Bauds.

NMEA input settings:

- In >> parameters >> maintenance >> external devices >> NMEA init, Select « NMEA init », then press (OK), to initialize press (OK) again.

- A window opens and asks: « Do you want to start a capture? »

- Press (OK). Wait during the capture. Once complete, a certain amount of channels will be available.

- Press « Validate », channels available will be listed.

- On the Topline network it is possible to display or not, the channels available in NMEA. All NMEA channels are activated by default. You can choose to inhibit some channels. This is done by selecting the chosen channel and pressing (OK) .

- Pressing (PAGE) ends the NMEA initialisation by updating all channels available on the Topline bus.

2.4.6.2.3 Topline Instrument system

This system menu displays the properties and software versions of all the sensors and displays connected to the Topline bus.

2.4.6.2.4 Utility for the WIFI box

When the nke "WIFI box" is connected to the Topline bus, the following can be displayed:

- Editable SSID
- WPA key
- editable WIFI channel
- IP for the WIFI box
- WIFI box port

Please refer to the WiFi Box manual.

2.4.6.2.5 GPS statistics

When a HF GPS is connected to the NMEA input of the *Multigraphic* an additional menu appears "GPS Stats" in the external devices menu. This menu displays the visible satellites and their signal levels. It is possible with a NMEA 0183 GPS to obtain this page if it sends the GGA, GSA and GSV frames which activate this page.
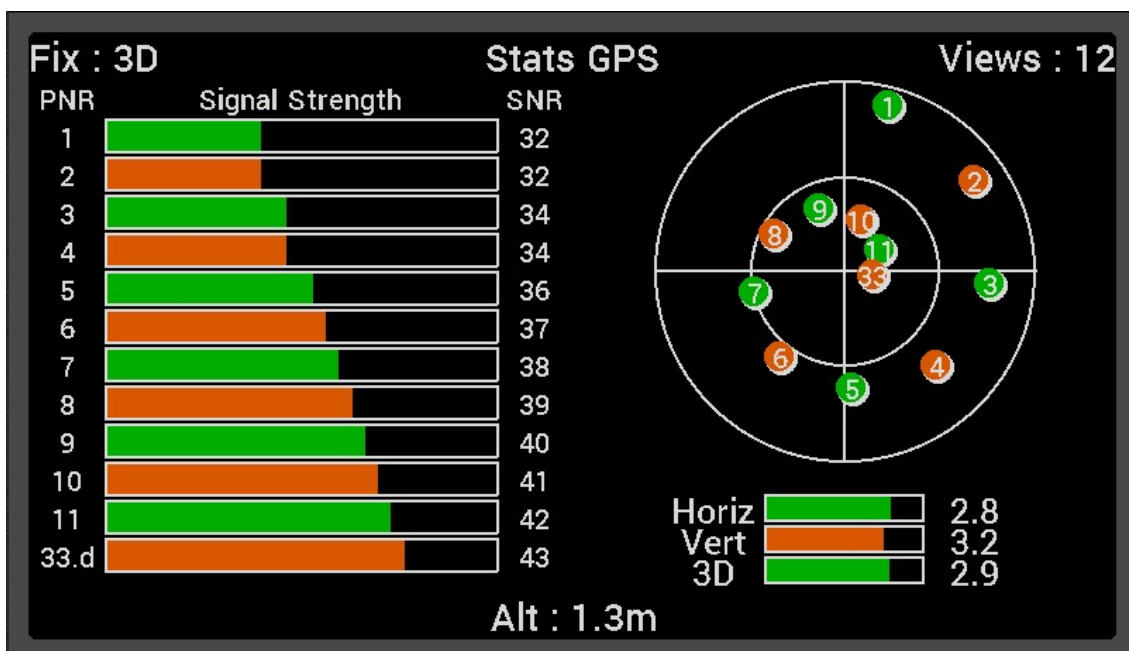
2.4.6.3 Orientation

It is possible to change the layout of your **Multidisplay**. To do so, go in >> parameters >> maintenance >> orientation: select « landscape » or « Portrait » and save with 🆗 .

> ⚠️ **WARNINGS :**
>
> By default, the Multidisplay is in landscape with the logo nke on the right. In portrait, the logo is at the bottom of the screen.
>
> Some parameters are not available in Portrait such as the type of page.

2.4.6.4 Keypad Beep

The keypad beep is a sound emitted by the **Multidisplay** when a command is sent by the **Display Pad** or **Pilot Pad**. It is possible to activate or inhibit this sound in >> parameters >> maintenance >> Keypad Beep.

2.4.6.5 Firmware

This page displays the **Multidisplay** software version and date of issue.

Display the firmware:

- In parameters >> maintenance >> Software: press 🆗 to see the Firmware and bootloader version.

- Press **PAGE** to quit.

2.4.6.6 Memory

This menu allows the user to reset the **Multidisplay** to factory settings.

Reset the **Multigraphic:**

- In parameters >> maintenance

- Select « Memory » and access to the options by pressing 🆗 .

- Select « Yes » to erase the memory by pressing 🆗

2.4.6.7 Simulator

There is a simulator available in the **Multidisplay**. Once activated, it sends random data to the **Topline** bus (Sensors, pilot and AIS).

- in parameters>> maintenance
- Select « Simulator » and choose « on » or « off », save your choice with ⊙.

2.4.6.8 Autotest

Autotest is useful to check the **Multidisplay.** This procedure verifies the following functions step by step:

- keys
- colour display
- Light sensor (vlight), internal temperature sensor, power supply.
- backlighting
- memory
- **Topline** bus
- NMEA input and output (connect the yellow and red wires together for that operation).
- Data logged in cookies

> ⚠ **WARNING :**
>
> If your display is in portrait orientation, the autotest process is not available.

- Proceed to each step by confirming with ⊙.
- Select « Autotest » and choose the option with ⊙.

Follow the instructions and press ⊙ to go to the next page.

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2.5 SENSOR SETTINGS

Press the [PAGE] button until you reach the main menu carousel. Using the

keyboard, press the RIGHT ARROW and press OK on the SENSORS.

All sensors connected to the *Topline* bus can be calibrated from this menu. Settings are different for each sensor. Refer to the sensor's manual for more information.

Main settings:

- **Filter:** the **filter** takes the data average value to set a data refresh rate. This damping set for apparent wind speed, boat speed and heading (Regatta compass) affects the autopilot's "True Wind" mode.
- **Offset:** applies a correction to data for some sensors.
- **Coefficient:** applies a correction factor for calibration.
- **Reset:** back to default settings of the selected sensor.

Sensor set up process:

- Select the Sensor that needs calibration you want to modify and press [OK].

  (Trip Log, Apparent Wind Angle, Boat speed…)

- Modify it with [arrows] and confirm with [OK].

2.5.1 Calibration wizard

Calibration wizards are available to help you calibrate the apparent wind angle, the boat speed and a fluxgate compass (not available for the REGATTA compass).

2.5.2 Apparent Wind Angle calibration wizard

Sail 4 legs upwind to measure the average wind angle on each tack. A wind vane offset will be calculated and applied to correct the Apparent Wind Angle.

Apparent Wind Angle values must be similar from one tack to another (+-1°) when the calibration is correct. If this is not the case, the wind may have shifted, or the crew cannot sail with the same angle on each tack upwind!
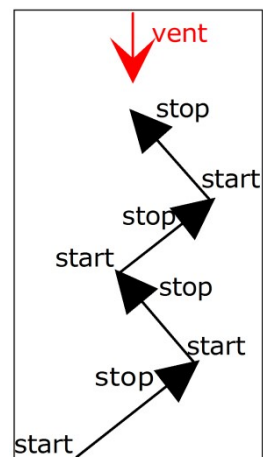
Calibration of the Apparent Wind Angle:

- From the main menu carousel, go to the SENSOR symbol.

- Choose "Apparent Wind Angle" and press ⓞⓚ button.

- Choose "Calibration Wizard" and press ⓞⓚ.

- Select "Start" and press ⓞⓚ.

- Go on starboard tack and press ⓞⓚ.

- Sail the boat until you are on the close-haul, hold your course on a closed-haul (30 seconds or less is fine) then press ⓞⓚ.

- Tack to Port.

- Press ⓞⓚ then bring the boat to a closed-haul. Hold your course on a closed-haul (30 seconds or less is fine) and then press ⓞⓚ.

- Repeat the same procedure once (meaning once more on starboard, once more on port).

- Once finished, the wizard will offer a new angle offset. You can accept it or exist without changing the old offset.

2.5.3 Speed through water calibration wizard

The boat speed is calibrated with the speed over ground as reference. You must sail 0.5 nM on a constant heading and then sail back (180°) the same distance. The new calibration is processed from the current calibration value already saved (there is no need to reset the calibration value to 1).

The COG (Course Over Ground) function <u>must</u> be displayed on the Topline network to achieve the boat speed calibration.

<u>Boat speed calibration:</u>

- Select « Boat speed » and press ⓞⓚ.

- Choose « Calibration Wizard » and press ⓞⓚ.

- Select « Start » and press ⓞⓚ.

- When your course and speed are approximately steady, press ⓞⓚ.

- Go about 0.5 Nm in those conditions and press ⓞⓚ.

- Make a U turn (Your current heading + 180°) and press ⓞⓚ.

- Hold your course at a constant speed during 0.5Nm. Once complete press ⓞⓚ.

- A window will open and ask you to save the new factor. If satisfied, select "yes" and save with ⓞⓚ.

This page displays the current calibration value (old correction), the new calibration value (new correction), the factors calculated from the runs (ratio FW/BW) and the correction factor for boat speed.

2.5.4 Compass Auto-adjustment

Some magnetic deviation errors are unique to each boat, due to the magnetic environment. An auto-adjustment of the compass is required to make the compass learn this environment and achieve acceptable accuracy.

2.5.5 Auto-adjustement principle

To achieve this a swing procedure is required which consists of turning the boat through a complete and perfect 360° turn clockwise at a constant rate of turn and boat speed.
During this procedure the compass builds its own deviation curve table. Corrections will be applied accurately from **0** to **359° i**n the sectors of sluggishness and unsteadiness.

2.5.6 Compass auto-adjustement procedure

Conditions to achieve a successful auto-adjustment manoeuvre:

- Steady waters without current.
- Safe distance from any source of magnetic field such as cargo ships.
- Safe area for free manoeuvre in a 5 boat length radius.
- Motor at constant low speed (2 or 3 knots).
- For the *9X compass* it is not necessary to navigate see its instructions.

WARNING: the auto-adjustment operation needs to be carried with a lot of care. Motor the boat at 2 or 3 knots in a perfect circle. For the *Regatta compass,* the compass swing must be performed in less than 5 minutes. Providing you match these conditions the auto-adjustment will be successful.

- Choose « Autocompensation » and press .

- Select « yes » and press .

- Make a constant circle clockwise

While swinging the *fluxgate*, or *Regatta* compass, you can display the Course Over Ground in a window to show the progress of the manoeuvre. In the case of the *Regatta* compass without COG data on the bus the progression will not be displayed and you will need to follow the procedure from the bowl compass at the helm.

Once the auto-adjustment has been completed a message will be displayed telling you that the operation was successful or not.

2.5.7 Compass deviation table

COURBE DE DEVIATION

Can be used solely for the fluxgate and 9X compass

This method can be used to set up the fluxgate compass when it is not easy to complete the automatic compensation. The deviation curve needs to be set at points every 30°. Each point can be determined using leading lines, or by comparing headings against a calibrated compass with the results being used to fill the correction table with the measured values.

How to fill the correction table:

- Select « Magnetic heading » and press (OK).

- Choose « Correction Table » and press (OK).

- Select « Start » and press (OK).

- Use (key) to set up different offsets depending on the headings and confirm with (OK).
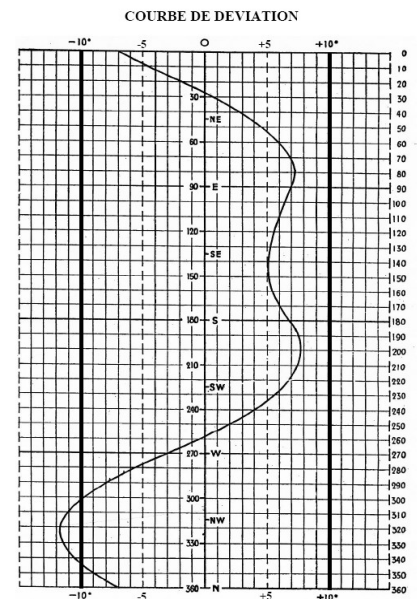
When this table is completed your compass is corrected for the deviation curve.

2.5.8 Compass adjustement wizard

This method can only be used with the fluxgate and 9X compass

It consists of sailing the boat on the nke compass heading (+/-5°), comparing this heading with the magnetic heading over the ground and noting the value every 30° to determine the values for the correction table.

Compass adjustment procedure:

- Select « Magnetic heading » and press (OK).

- Choose « Calibration Wizard » and press (OK).

- Choose « Start » and press (OK). You will have to follow nke compass information as precisely as possible every 30°.

- Choose « start » and confirm with OK. Follow nke compass' instructions as precisely as possible every 30°.

- Once nke compass is ready choose "validate" and press ⓞ. Repeat this procedure every required angle and then validate to save the correction.

Press ⓞ to save the new correction. You can highlight "Abort" and press ⓞ if you want to cancel a correction. Repeat this operation every 30° to fill the whole correction table. The compass will have its deviation curve implemented once this table is completed.

2.5.9 Drift angle

Drift angle is measured between the boat's heading and its course.
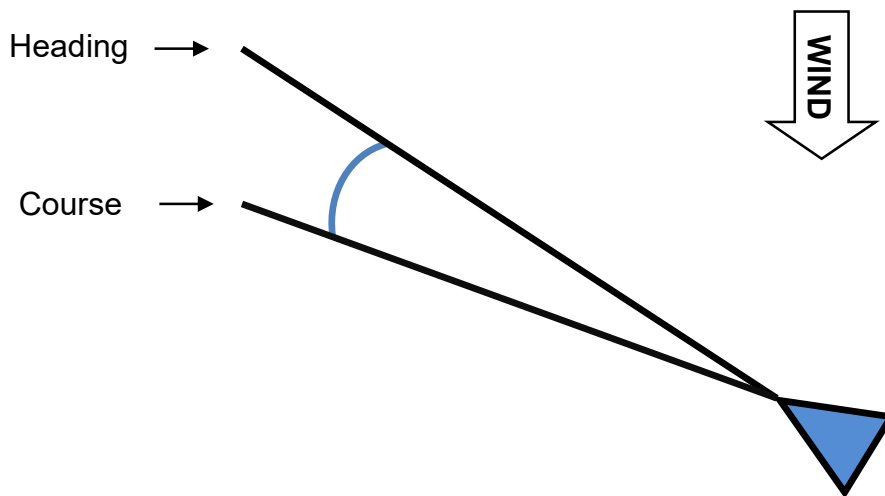
This value is used for true **wind, VMG, corrected heading** and **current** calculation. Therefore it **must** be calculated optimally.

We use the following formula:

$$Drift = \frac{Drift\ adjustment\ \times Heel\ angle}{Boat\ speed^2}$$

The correction factor is linked to the hull shape and the boat's performance. Lower values indicate higher performance. The drift value is always applied whatever the navigation conditions. Therefore, it has to be an average value, valid for all weather conditions or alternatively, you can alter that value upon the wind strength.

The drift angle for each boat speed and heel angle is shown with the polar tables supplied by your architect. Calculate the drift factors with the formula below, and determine the average value.

$$Drift\ adjustment = \frac{Drift\ \times Boat\ speed^2}{Heel\ angle}$$

Use a 10.0 factor if you cannot find the relevant data.

i.e. the drift with 17° heel angle and 7 knots boat speed is:

$$10 \times 17° / 7^2_{nds} + 0° = 3.46° \text{ drift angle}$$

As an alternative to this formula, an offset value can be set to force the drift angle by setting the factor to 0 and entering the desired value of the drift angle as an offset.

A maximum value can be set for the drift angle, i.e. with a 5° limit; the final result will never exceed 5° even though the data is still processed in the same way.

Drift angle data processing procedure:

- Select « Leeway Angle » and press ⊙.

- Choose « Calibration coefficient » and press ⊙.

- With ⊙, adjust the value selected and save with ⊙.

The procedure is the same for setting the maximum drift angle and the offset for drift angle.

2.5.10 Sensor access code

The sensors access code is meant to protect all calibrations for the sensors connected to the Topline bus. Once activated, the access to the calibration menu is locked.

Procedure for sensor access code setting:

- Select « Access code » and press ⊙.
- Choose a code and enter it with the keypad appearing on the screen.
- Valid with **Ent**

Procedure to unlock the sensor menu:

- Enter into « Sensors »
- Enter the code configurated previously.
- Valid with **Ent**
- The « Sensor » menu is available again.

2.6 ALARMS SETTINGS

Press and hold ⬭PAGE to display the main menu from which you select 🔔 to display the « Alarm » page.

Setting alarms allow keeping watch on the value of set channels. Once the set value is reached a message is displayed and an audible signal is emitted.

For example, low and high values can be set for the *Boat Speed* channel.

High alarm will be activated when the data reaches the set value and above.

Low alarm will be activated when the data reaches the set value and below.

Note that for channels with angle data such as magnetic heading or wind angle the alarms sub-channels are based on a value +/- x from a reference angle called "*base alarm*".

Setting alarms is an efficient way to monitor the *TOPLINE* system and the way your boat is sailing.

2.6.1 Alarm setting procedure

In order to use alarms you must first select the data you want to monitor and then determine the low and high values or the base and ranges for angles. Once set up, the 🔔 icon indicates the validation of the relevant channel.

Here is an example of alarm setting for low value of the apparent wind speed:

- Select « Apparent Wind Speed » and press🔘.

- Press 🔘 again to « Set on alarm ».

- Set up a low alarm and high alarm. Confirm with🔘, your alarm will trigger beyond those limit configurated.

2.6.2 Activation of an alarm

When an alarm is activated a window will appear showing which data is activating the alarm and an audible signal is emitted. The data for this channel is displayed in red on the relevant page of the *Multidisplay*. Press 🔘 to pause for 10 minutes. If after 10 minutes the conditions are still met for the alarm to activate, the window will resume.

If you want the rest of your instruments to ring when an alarm triggers on the *Multidisplay*, you need to activate the Topline alarm, first line in the alarm menu.

2.7 RACE TIMER

The race timer works as a countdown before the start of a race. Two different race procedures can be set up as *« T1 »* and *« T2 »*. The default settings are 5 minutes for *« T1 »* and 4 minutes for *« T2 »*. At the end of the countdown, a short audible signal is emitted at the 10 last seconds signal and the start time triggers a long audible signal. These audible signals are repeated by every display.

Once the countdown reaches « 0 », the timer starts for the race time in hours and minutes.

The timer data is available on the *Topline* for any display to repeat it.

2.7.1 Setting the race timer

The default settings are 5 minutes for *« T1 »* and 4 minutes for *« T2 »*. Here is the procedure to set the timers to your own values:

- Select « sensors » in the menu and press .

- Choose « Timer » and press .

- With , Set the timer T1 or T2 at the value desired and confirm with .

2.7.2 Using the race timer with T1 and T2

On a page displaying the race timer, it is possible to control the timer using times T1 and T2 with a *Pilot Pad or Display Pad*.

- Once on your timer page, press a window will appear to « Start timer T1 », press .
- A single press on enables to start the timer. If you want to synchronize Time T2, press again and start the second timer.
- A single press on a window will appear to « Stop timer », press .

2.7.3 Using the race timer with buttons Timer/Sync

It is also possible to control the race timer directly with a *Display Pad* using :

- Press the button (Start, Pause the timer)
- Press the button (Synchronization to the nearest minute)
- Long press on button (Charging at 5 minutes, Initialization)

2.8 PERFORMANCE FUNCTIONS

The performance function is available in the menu and represented by this icon

2.8.1 Calculation of the current

The *Multidisplay* will automatically calculate the current when it is set as a master.

The following channels are created:

Speed of measured current (in knots).

Direction of measured current (in degrees True).

The data can be displayed on the *Multidisplay*.

Contrary to wind direction, which is measured as the bearing the wind is blowing from, the current's direction is measured in the direction it is travelling towards. This value is a True Heading (geographic).

The calculation of the current requires the following channels to be active:

- Magnetic Heading
- Magnetic Variation
- Heading Over Ground
- Boat speed
- Drift angle

The primary sensors must be correctly calibrated to ensure reliable and accurate information.

2.8.2 True wind tables

The data measured by the wind sensor placed on top of the mast, even when on a long carbon arm, is affected by the sails.

The wind flow is disturbed around the sails and rig. This is called the "upwash".

This "Upwash" affects the measured raw data measured for the calculation of the true wind direction. Therefore, the true wind direction may be different from one tack to another and the wind speed varies from upwind to downwind.

The errors due to upwash can be repeated with sail configurations and wind speed combinations making it possible to apply corrections. A correction table can be filled for true wind speed and angle.

2.8.3 True wind angle table

The true wind angle table allows correction of the true wind angle value without researching the causes of angle's errors. It corrects all repeatable errors (twist, flow over-speed downwind, sensor).

The true wind data is calibrated by logging the true wind direction differences from one tack to another repeatedly. It is recommended that these calibration sessions are run from 5 to 50 knots in winds that are stable in direction.
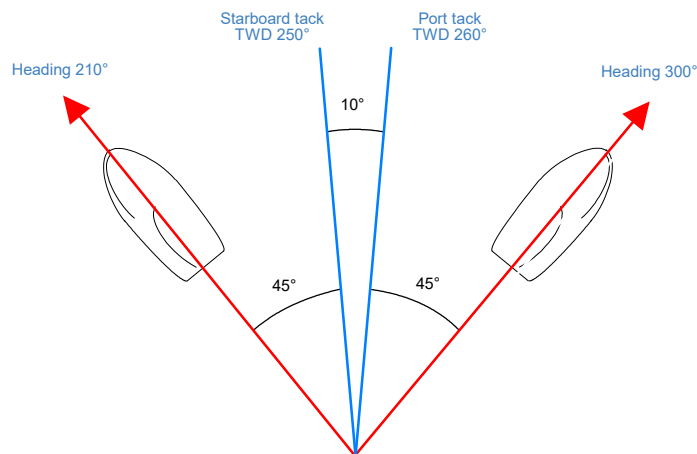
TWD port tack > TWD starboard tack:

Add half of the difference between the two True Wind Directions.

- Select « Performance » and press (OK).

- Choose « Wind Table » and press (OK).

- Choose « True Wind Angle Table » and press (OK).

- Select the value you need to modify and save with (OK).

(←◆→) Select the value to be corrected.   (↑◆↓) Modify the value

The column on the left indicates the true wind speed in knots, the "V1" column is the correction to apply in degrees and the "A1" column indicates on which angle the correction will apply. The same pattern applies for "V2" and "A2" for sidewind and "V3" "A3" for downwind.

2.8.4 True wind speed table

Even when placed one meter above the mast head on top of a carbon arm the wind sensor will measure a flow altered by the effects of the mainsail. When sailing downwind the mainsail causes an acceleration of the air flow at the mast head and when the boat is heeling the measurement of the wind will be altered. A calibration of the wind speed is required for all these reasons.

Procedure for measurement:

- Hold the boat upwind at no boat speed and measure the average wind speed shown by the display.

- Then, while sailing at all wind angles log the wind speed shown on the displays. The average values can be used in the correction table. Always think about logging these values whenever you sail between 5 and 30 knots.

Same procedure as for the true wind angle for setting.

The column on the left indicates the true wind speed in knots, the "V1" column is the correction to apply in degrees and the "A1" column indicates on which angle the correction will apply. The same pattern applies for "V2" and "A2" for sidewind and "V3" "A3" for downwind.

2.8.5 Statistics for the last hour

True Wind Direction: average of the true wind direction during the past hour.

Wind shift: calculation of the true wind direction standard deviation for the past hour.

Average wind speed: average of the true wind speed data for the past hour.

Gusts: calculation of the of true wind speed standard deviation for the past hour.

Maximum Speed: maximum speed averaged on 12 seconds laps time.

It is necessary to set up "stripchart configuration" to have access to the last hour statistics.

2.8.6 Boat's Parameters

Enter the relevant data for increased accuracy in the Regatta page.

Tack Angle: enter the boat's tack angle so the boat speed recovering after a tack can be displayed.

Boat's size: this data is used to calculate the distance to the starting line in boat's lengths.

GPS antenna's distance to bow: this data is required to calculate the distance to the starting line in meters and the time to the starting line.

2.8.7 Start Line in portrait mode

In portrait mode the start line page is not displayable, only the distance, time, orientation, and line advantage channels are available. From the performance menu it is possible to create the start line as well as to lock the TWD. Once the line is entered you can also display the line information. To place the starting line refer to paragraph placing the starting line.

2.8.8 Tactical page
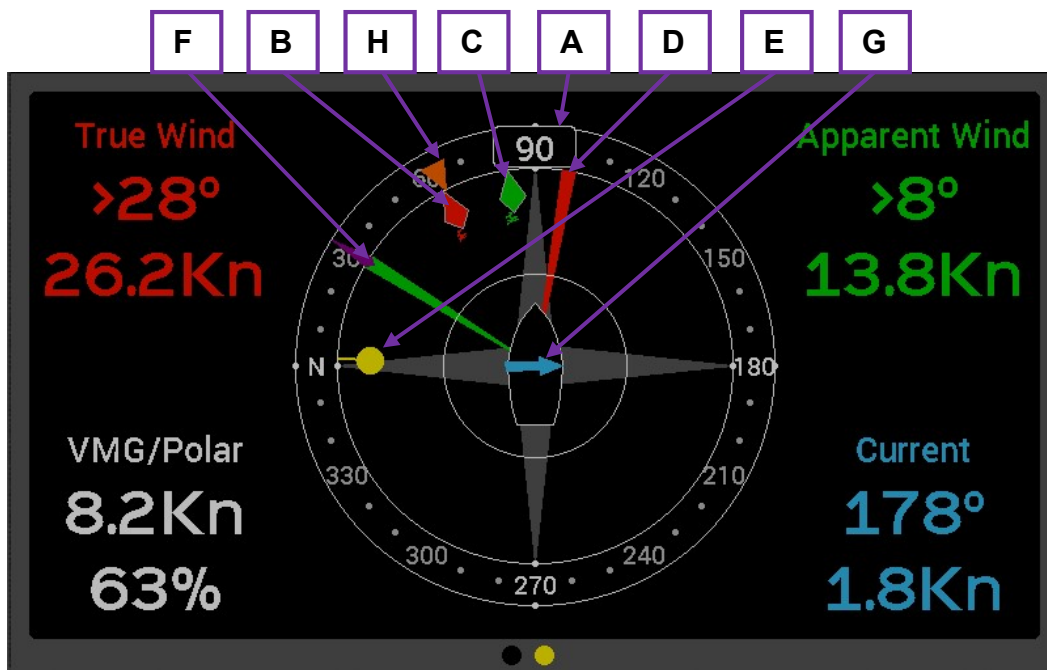
A. **Magnetic heading**

B. **TWA, Instant True Wind Angle and historical**

C. **AWA, Instant Apparent Wind Angle and historical**

D. **COG, Course Over Ground**

E. **Heading towards waypoint**

F. **Layline, heading at next leg**

G. **Current Direction and Speed of the (related to the boat)**

H. **TWA Target**

2.8.8.1 Selection of the reference

The selection of the magnetic or true reference is available on the regatta page.

It allows you to choose the reference for the directions (heading, course over ground, heading to waypoint, current).

Press ⬤(OK) for select the Mag or True reference.

2.8.9 Starting line page
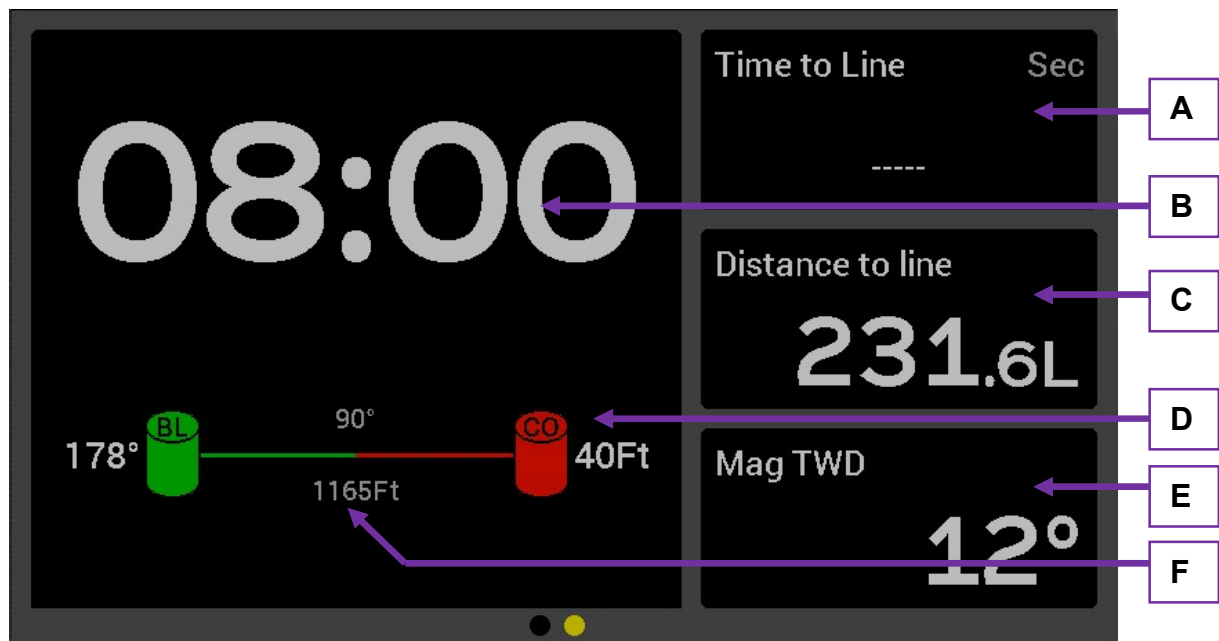
A. Time to the starting line

Time to the starting line is calculated according to the Speed Over Ground. This information takes into account the effect of the current (direction and speed). When the information can be calculated, the time is given in seconds. It corresponds to the time required for the boat to reach the starting line, given the current boat speed and heading.

Should boat speed or heading change, the time to the line is updated.

B. Race timer

The race timer can be set thanks from the regatta page.

C. Distance to the starting line

The distance to the starting line is displayed in meters or feet and boat lengths.

The value displayed is the distance between the line and the boats bow (not the GPS antenna's location). For accurate information, the boat's size and the distance between the GPS antenna and the bow must be entered in the system via the menu *Performance → Boat's parameters*.

D. Starting line
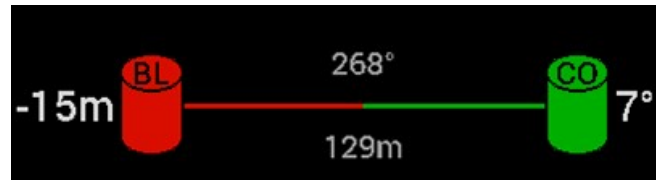
The race committee (RC) boat is symbolized by the buoy on the right, the pin, by the left one.

The favored end is represented in green. In this example, it is the committee.

16° shows the favourable angle value. In this example the wind angle to the right side of the perpendicular to the line is 16°.

By knowing the start line length, the *Multidisplay* can calculate the gain to windward difference between both ends of the line.

In this example, the 16° favourable side on the committee side of the line gives a 228 meters gain to windward for a 796 meters start line. This interesting information shows that the gain to windward grows considerably with the line length and favourable angle value.

E. Magnetic true wind direction

Display magnetic true wind direction data. To lock the TWD value during the starting sequence, head into the wind, and select "FORCE TWD" in the START menu.

F. Length and orientation of the starting line

Represent the distance between the committee and the pin in meters.

This is the bearing of the pin from the committee boat side given in True degrees. For magnetic information you must add the magnetic declination.

2.8.10 Set the starting line

The starting line's ends can be entered using the GPS position (antenna) or bearing and distance.

Entering the GPS position:

Sail as close as possible to the mark at low speed and validate the position when the GPS antenna matches the marks position as much as possible.

Enter a line end with GPS position or by bearings:

- Press (OK), select « set a mark », choose the mark by pressing (OK) and choose the bearing method.

- Repeat the same procedure for the two other marks.

2.9 THE WAYPOINT PAGE AND THE XTE PAGE

The waypoint and XTE page is displayed only when a waypoint or a route is active on the Bus Topline. In the screen menu, configure the Waypoint page and the XTE page. These two pages allow you to view several data on the active waypoint as on a GPS in GOTO mode. No data is editable on these two pages.

- *Waypoint page*
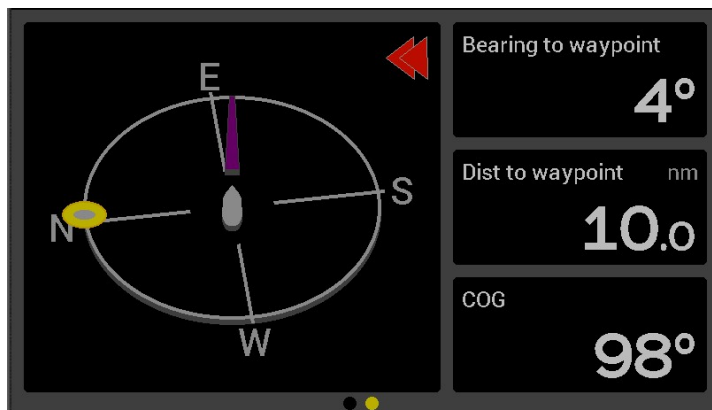
- *XTE page*
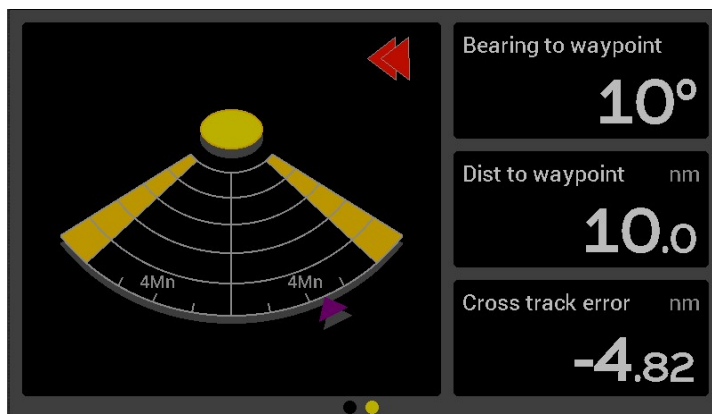
2.9.1 Turn to Waypoint angle

When a waypoint is activated (for example, using a GO TO WAYPOINT of a chart plotter connected to the nke TOPLINE via NMEA), the master display calculates the TURN TO WAYPOINT which is the difference between the COG and the BTW (Bearing to Waypoint). It is possible to create a page to display the TURN TO WAYPOINT.

2.10 A.I.S. PAGE

A.I.S. (**A**utomatic **I**dentification **S**ystem) is a worldwide system for exchanging information between ships and stations ashore. A.I.S uses dedicated VHF frequencies to automatically broadcast information such as ship's identification, status, position and route. This information is available to any ship or traffic control station within the signal reception area.

The NMEA input of the *Multidisplay* can be connected to any A.I.S. receiver or transponder to display A.I.S. targets and to calculate collision risks.

Glossary:

CPA (Closest Point of Approach) is the shortest distance to the meeting point of two vessels in approach. This is used to measure the collision risk.

TCPA (Time Closest Point of Approach) is the time remaining until CPA (hours, minutes and seconds)

AIS	4 Targets	Number of target detected
		Target select
MMSI	278565121	MMSI or name of the target
Bearing	35°T	Target Bearing
Distance	2.0Nm	Target Distance
SOG	2.0Kn	Target SOG
COG	210°	Target COG
CPA	1.0Nm	Target CPA
CPA BRG	1°	Target Bearing CPA
TCPA	1H0min	Target TCPA
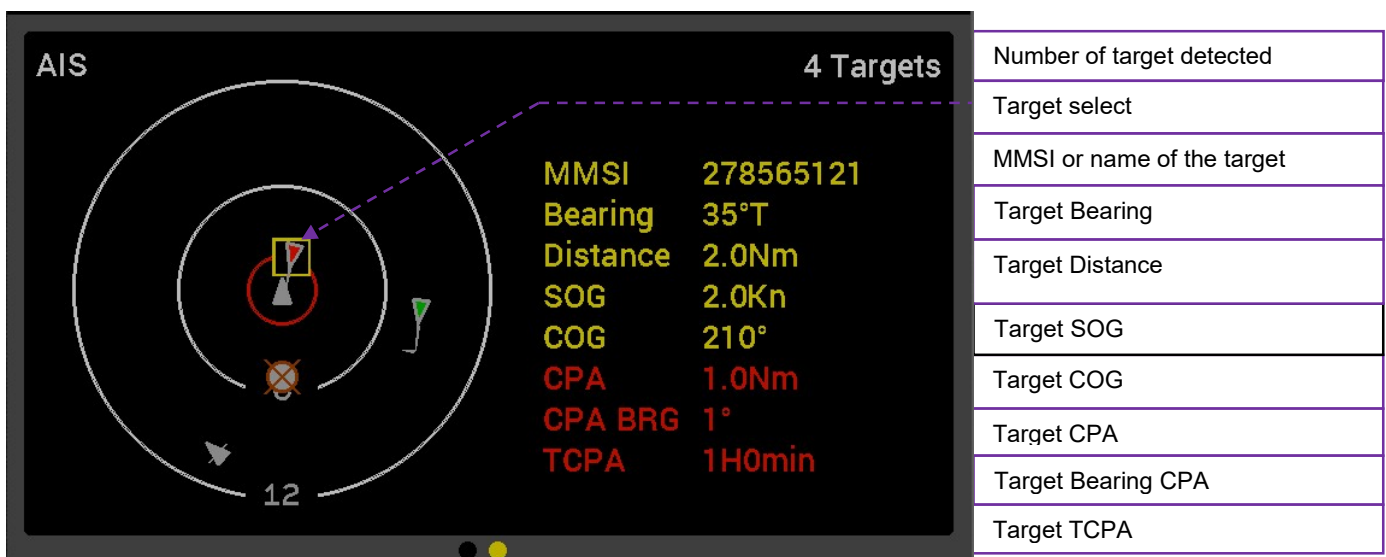
2.10.1 AIS targets symbol
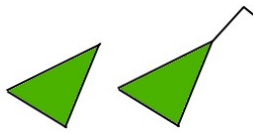
 The green targets are non-hazardous vessels and they are not inside the alert limits you have defined. The front arrow represents the vessels movement.

 Warning:

If you have not set any alert limits, all the targets will appear with a green symbol, even those on a collision course.
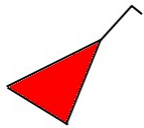
 The red targets are hazardous vessels that are inside the CPA and TCPA limits you have set. The front arrow represents the vessels movement.
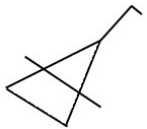
 The white and striped targets are vessels from which no AIS message has been received for the last 60 seconds. These will no longer been displayed after 120 seconds.
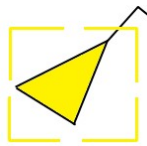
 Selected target is highlighted by a frame.

 AIS Man Overboard

 Target AtoN. These are fixed navigation aid transponders. Buoys, Semaphores, Lighthouses etc.…

2.10.2 Setting the radar-like scale

A display scale can be set-up for targets in accordance to navigation zones. 6 scales are available: 1M, 2M, 4M, 6M, 12M and 24M. The default setting of the *Multidisplay* is 12M.

Press . Select setting of the radar scale then validate the selected radar scale with .

2.10.3 Setting A.I.S. alarms

The *Multidisplay* features an alarm processor which, once connected to an A.I.S. receiver or transponder, calculates bearing and distance of a target vessel, the *CPA* (Closest Point of Approach), the *CPA* bearing and the *TCPA* (Time to Closest Point of Approach).

It generates alarms according to the level activated:

- Alarm if *CPA* < 6 nautical miles and *TCPA* < 30 minutes
- Alarm if *CPA* < 4 nautical miles and *TCPA* < 20 minutes
- Alarm if *CPA* < 2 nautical miles and *TCPA* < 15 minutes
- Alarm if *CPA* < 1 nautical miles and *TCPA* < 5 minutes
- Alarm off

Press (OK). Select AIS alarm setting then confirm the selected alarm with (OK). The alarm circle is marked in red.

2.10.4 Collision avoidance calculation

The *Multidisplay* constantly scans messages received via the A.I.S. receiver/transponder. The unit will generate an alarm if a target is detected and its *CPA* and *TCPA* are both below the level defined. The relevant target will appear red.

Alarm principle

Niveau d'alarme, CPA<4mn et TCPA <20 minutes
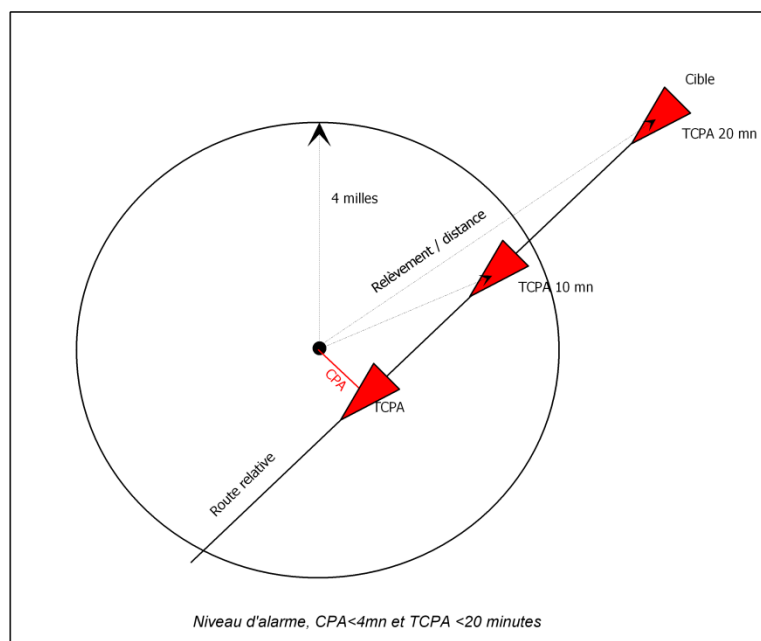
The alarm has been set for « **CPA < 4 Mn and TCPA < 20 minutes** ». As a result, *CPA* being below 4 miles **and** the *TCPA* calculated value being below 20 minutes, the *Multidisplay* triggers an alert. it is possible to relay AIS Alarms on the V3.1 radio receiver. To do this, an alarm must be validated on the AIS page and the Alarm status is valid. As soon as a target is in alarm, the radio receiver will emit three short beeps continuously until the alarm is cleared.

2.10.5 Dangerous targets list

The list of targets representing a threat shows all targets that are in the alarm zone. They are sorted by threat level. For each of them the MMSI number, the bearing, the distance, the CPA and the TCPA are displayed.

Press (OK). Select List of dangerous targets then validate with (OK). A target present in the list of dangerous targets can be quickly viewed on the A.I.S page, by pressing the (OK), after having selected it.

2.10.6 Monitoring the fleet

A fleet list shows all A.I.S. targets sorted by distance from the closest. The targets that represent a threat are displayed in red.

Press (OK). Select Fleet monitoring list then validate with (OK).

A target present in the fleet monitoring list can be quickly viewed on the A.I.S page, by pressing the (OK), after having selected it.

68_Multidisplay_um_EN_14

2.11 INSTRUMENTS CALIBRATION

2.11.1 Introduction

Accurate and realistic data requires good calibration of the sensors. Without calibration you will not get accurate data for true wind direction, true wind speed, measured drift,...

Poor calibration will produce mistakes that will affect your tactical decisions.

It is recommended to proceed to calibration in moderate wind conditions and steady water. Better results can be achieved when there is no current in the sailing area chosen for calibration.

2.11.2 Calibrations order

Check and calibrate the primary sensors before filling the true wind correction tables:

- Compass
- Speed sensor
- Heel angle sensor

Here is the order in which the primary sensors need calibration:

```
┌─────────────────────────────┐
│     Compass calibration     │
└─────────────────────────────┘
               ⇩
┌─────────────────────────────┐
│   Heel sensor calibration   │
└─────────────────────────────┘
               ⇩
┌─────────────────────────────┐
│   Speed sensor calibration  │
└─────────────────────────────┘
               ⇩
┌─────────────────────────────┐
│    Drift angle calibration  │
└─────────────────────────────┘
               ⇩
┌─────────────────────────────┐
│  Apparent wind calibration  │
└─────────────────────────────┘
               ⇩
┌─────────────────────────────┐
│ True wind correction tables │
└─────────────────────────────┘
```
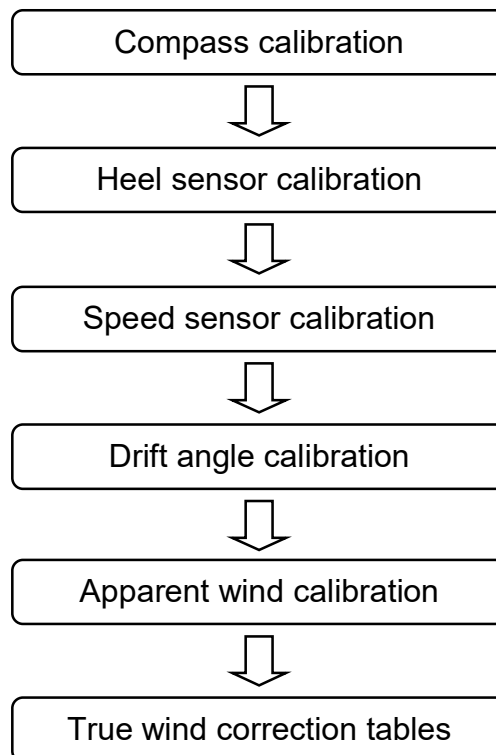
For sensor calibration, see the "Sensors setting" section.

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2.12 MULTIDISPLAY OPERATION WITH THE GYROPILOT 2 PROCESSOR

Gyropilot is an automatic pilot designed to steer the boat. It is intended to assist the helmsman and should never be used without state of the art navigation equipment handled by a qualified navigator.

Once the pilot has been engaged by the helmsman the *Gyropilot 2 processor* will save the current value of the relevant channel: ie. magnetic heading, wind angle or GPS course. This value becomes the reference for course to steer.

From that point the processor uses the data coming from the sensors to control the rudder using the following criteria:

- The error to the course to steer, from data coming in from the compass (compass mode) or the wind unit (wind mode).

- The boat motion delivered by the gyrometer. This sensor measures boat rotation due to the action of the rudder, the wind or the waves.

The correction value is linked to:

- The error from the course to steer,

- The gain value,

- The boat speed (the correction factor is opposite to the boat speed. i.e. with a very low boat speed the correction factor is high, and with no boat speed the *Gyropilot* will not perform).
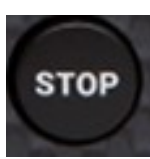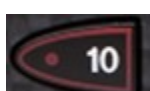
⚠️ **Warning**:

- Never leave the helm unattended. The helmsman has responsibility for keeping an efficient watch and to be ready to act in case of any event affecting the route of the boat. He must be ready to disengage the pilot and control the helm at any time.

---

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2.12.1 Keys to control the Gyropilot

In order to control the pilot you need to use a *Pilot Pad*.

	Press once to engage the pilot on the current course relevant to the pilot mode selected. In compass mode it will be the compass heading at the time you press the button and in wind mode it will be the wind angle at the time you press the button. Press and hold this key (>3s) to go directly to the Pilot Mode menu.
	Press once to disengage the pilot and take the helm back under manual control.
	Press once to change the course to steer by +1°
	Press once to change the course to steer by -1°
	Press once to change the course to steer by +10° Press and hold for automatic tack from starboard tack or gybe from port tack.
	Press once to change the course to steer by -10° Press and hold for automatic tack from port tack or gybe from starboard tack.
	Press the up and down arrows to adjust the gain from 1 to 9 and press OK to confirm.
	Press this button for access to the pilot's mode and settings.

2.12.2 Pilot page selection

The pilot page is available if the Gyropilot computer is detected.

It is possible to choose in the page builder either the display of the standard page or of a customizable page.

2.12.2.1   Standard page

Course to steer

Pilot mode reference

Pilot mode

Rudder angle indicator

Gain value

2.12.2.2   Custom Page

Standard Page

User's selected data, set up according to the user's preference

Pilot clutch indicator
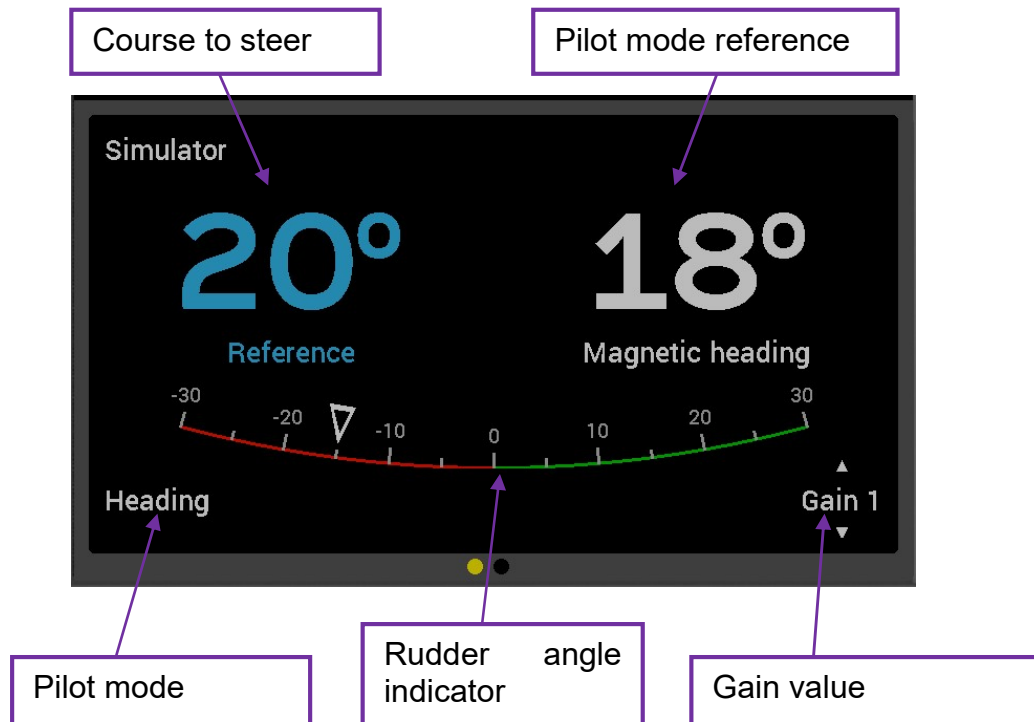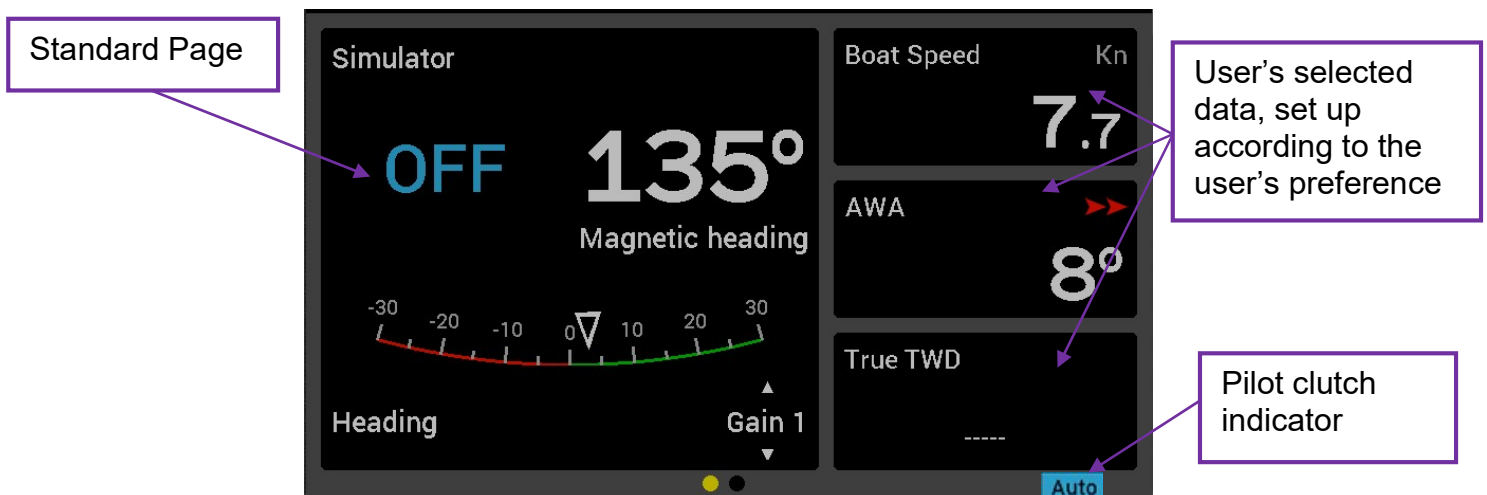
Press to access the pilot mode and settings. Press to cancel the last action.

The gain adjustable is accessible by the up and down arrows .

2.12.3 Pilot Modes

Select the pilot mode as follow:

- On the page Pilot, Press .

- A window will open, « Mode select » is highlighted, press .

- Select the mode desired and confirm with .*

 Press and hold *(>3s) to go directly to the Pilot Mode menu. This shortcut is available from any page*

2.12.3.1 True Wind Mode

This mode requires a speed sensor, a compass sensor, a wind sensor and the software add-on « true wind ». Once this mode has been selected the pilot steers the boat to a set true wind angle as calculated by the Gyropilot computer.

The true wind mode is particularly well adapted to downwind conditions in waves. These are the conditions where the nke pilot demonstrates its true capability. If apparent wind was used you would get the following issues:

- The boat sails down the wave and apparent wind speed increases, the apparent wind angle decreases: it is a header, the pilot bears away to maintain the wind angle it is set to steer to.

- The boat sails up the wave and apparent wind speed decreases, the apparent wind angle increases: it is a lift, the pilot luffs up to maintain the wind angle it is set to steer to.

As a result, in waves the apparent wind mode is not efficient, and it is better to select the compass mode to keep a straight course.

With true wind mode the pilot steers the boat on a straight course keeping the optimum wind angle in the waves. The wind angle to steer is not affected by boat speed variations. While sailing solo it is very efficient to leave the pilot to steer the boat and focus on sails trim (just watch power consumption).

<u>True Wind software add-on</u>

A code is required to activate the *true wind mode* function. Please contact your **nke** dealer to get this code. The code number is linked to each **Gyropilot 2 processor**, your dealer will need your processor's serial number to issue the code for the software add-on. This serial number can be found on a label on the processor itself or in the *true wind menu* of the **Multidisplay**.

<u>Activation of the true wind add-on:</u>

The hexadecimal code is entered with the virtual keyboard. Once the function is activated the little padlock symbol will turn open and green.

2.12.3.2   Apparent Wind mode

This mode requires a speed sensor, a compass sensor and a wind sensor.

With the apparent wind mode the pilot uses data from the mast head unit through the **Topline** bus to steer the boat on a set apparent wind angle. This mode is mainly used while sailing upwind.

2.12.3.3   Compass mode

This mode requires a speed sensor and a compass sensor.

With the compass mode the pilot uses the compass heading data from the **Topline** bus to steer the boat on a set heading*.*

2.12.3.4   Rudder mode

The rudder mode allows the rudder to be set at a fixed angle. The value can be between – 35° and + 35° to the mid-ship position.

2.12.3.5   Autopilot in GPS mode

To active the GPS mode, your chart plotter (or navigation software installed on your boat's PC) must be connected to the nke **Topline**. The connection can be done via the nke Wifi Box (NMEA multiplexer) and by simply using the NMEA In wires (yellow and green wires) of any displays on your nke **Topline Bus**. Once connected, use the navigation device and go a "GO TO WAYOINT". Once the navigation is launched, the GPS autopilot mode will be activated and visible in the modes menu of the Pilot Page.

2.12.4 Pilot settings

Select the pilot's settings page:

Select the parameter that needs to be modified, press (OK) to modify it.

Press right and left arrow to change the value. Once you have the right value, press

to save your choice.

2.12.4.1   Rudder coefficient

Principle: the **Gyropilot** processor automatically adjusts the value of the rudder angle to apply which is proportionally opposite to the boat speed. The faster the boat sails the lower the rudder angle.

This can be tuned to achieve best results by modifying the rudder coefficient between the 1 and 53 value range. The higher the value is, the greater the rudder angle proportionally to boat speed. The default setting is 6, which is valid for a 30 footer. Examples: a Figaro 2 or similar boat will require this factor to be 15, for a 60 footer it can be 20 and a multihull will be better with 30.

Note: if there is no boat speed data on the **Topline** bus, the **Gyropilot** uses SOG (Speed Over Ground) if available.

> A good way to learn the effect of this value setting is to enter an extreme value, i.e. 50, and note the different behaviour of the boat before and after the setting change.

2.12.4.2   Counter rudder / gain

When you are steering you will often apply "counter rudder" by moving the rudder to the opposite direction allowing the heading to be maintained without overshoot. The pilot can be set up to control the boat in a similar way and the importance of this feature will depend on the type of boat and sea conditions. The boat rotation speed measured by the gyrometer embedded in the **Gyropilot processor** is used to provide this feature.

The factory default setting is **AUTO**. This adjusts automatically with the gain. The setting value ranges from 1 to 9. The counter rudder angle is the lowest at 1.

Note that when the counter rudder setting is on AUTO, the counter rudder action is dependent on the gain setting. For a rudder gain between 1 and 3, the gyrometer is not active and there is no counter rudder. For a gain value between 4 and 9, the gyrometer is active and the counter rudder value is automatically adjusted.

2.12.4.3   Wind damping

The wind damping value adjusts the treatment of the raw data coming from the sensor and how it is used by the pilot while steering in wind mode. For example, in rough seas it is useful to increase the damping value because the mast head unit is subjected to a lot of extreme movements and the wind measurements resulting from this need to be treated differently to maintain appropriate pilot performance and sea keeping. In light wind and quiet sea conditions a low damping value will allow a finer

response to changes measured optimising the performance of the pilot for the conditions. The damping value ranges from 1 to 9. The default setting is 1.

The value set to 0 means automatic wind damping. In that case the damping is linked to the wind vane oscillations with 0.5 seconds for each degree of oscillation.

Example: if the wind vane oscillation is +/-10°, the damping is **10** seconds.

Damping value	effect
L = 0	automatic
L = 1	1s
L = 2	2 s
L = 3	4s
L = 4	8 s
L = 5	16 s
L = 6	32 s
L = 7	64 s
L = 8	128 s
L = 9	256 s

2.12.4.4   Tacking angle

Set the tacking angle value for automatic tack performed by the *Gyropilot*.

For the compass mode the tacking angle can be set between 70° and 115° (by 5° steps). The default setting is **100°**.

In wind mode, the autopilot will tack to a reference within the same wind angle than the previous tack.

2.12.4.5   Tack speed

The speed at which tacks are performed by the *Gyropilot* can be set from 1° per second to 32° per second. The default setting is 9° per second.

2.12.4.6   Man Over Board

The Man-Over-Board function can be activated from any MOB button on a *Topline* display or a wireless remote control (Gyropilot, Multifunction or Crew) if the MOB function has been set.

This function works with two selectable modes: *Crew* and *Solo.*

nke
MARINE ELECTRONICS

- ***Crew mode***

This mode is preferred when sailing with double handed or more. It was designed to help the crew during a Man-Over-Board manoeuvre. When triggering the MOB alarm, the following will occur:

- An audible alarm will be sound.

- The autopilot will stay on stand-by or will not have any action on the helm.

- The displays will indicate the bearing and distance to the MOB (not taken into account the effect of the current).

- ***Solo mode (Singlehanded Mode)***

- From Stand-by (aka "autopilot off position"), the Gyropilot Computer will engage and turn the helm + or - 40° from the position of the rudder at the time the MOB was activated.

- If the Gyropilot Computer is activated, and if the system includes a wind sensor, the Gyropilot computer will automatically switches to WIND mode and will steer the the boat into the wind (with a 0° wind angle to steer).

- If the Gyropilot Computer is activated, and if the system does not include a wind sensor, the Gyropilot Computer will automatically engage and turn the helm + or - 40° from the position of the rudder at the time the MOB was activated.

2.12.4.7   Speed reference
If the **true wind mode** is activated the *Gyropilot* will use the speed over ground (if available on the *Topline* bus) or the boat speed through the water, at your choice.

2.12.4.8   Time out setting
This set the time the Gyropilot can steer the boat with the gyrometer data in case of Topline bus data dropout. The setting can range from 0 to 60 seconds. During this time you no longer have access to the pilot.

2.12.4.9   Rudder offset
This calibration sets the rudder to mid-ship position. The default setting is **0°**. It can be adjusted from –3° to +3.

2.12.4.10   Blind spot
Allows a blind spot from 0 to 3° on the rudder angle.
The value of the blind spot removes any play in the steering system. In general this value is between 0.7 and 1.7 degrees. You should not set this value to zero because your cylinder would be permanently controlled and the pilot would swing back (port / starboard).

2.12.5 Gyropilot operation

This section of the manual describes the use and operation of the *Multidisplay* once installed and calibrated. For installation and calibration, refer to the installation section.

The default factory settings of the *Gyropilot* will perform well on most boats.

To power your system on use the general switch panel where two separate 12 V power supplies are installed for:

- The power drive and the processor (refer to the installation guide of the *Gyropilot2*)

- The *Topline* bus where all sensors and displays are connected.

> ⚠️ **Warning :**
>
> Turn the power to the drive unit and Gyropilot Computer BEFORE your nke instruments. Your autopilot will not be detected by not doing so.

2.12.5.1   Operation with compass mode

The compass mode requires a compass sensor and a boat speed sensor.

Steer the boat onto a suitable heading, allow time for the boat to settle on this course with the rudder on mid-ship position and press *Auto* to engage the *Gyropilot*.

The pilot will steer to the current heading which is automatically set as course to steer.

Return to manual steering by pressing *stop* once when you are ready at the helm.

2.12.5.2   Operation with Apparent wind mode

The apparent wind mode requires a compass sensor, a boat speed sensor and a wind sensor.

The apparent wind mode uses data from the mast head unit made available on the *Topline* bus to steer the boat on a set **A**pparent **W**ind **A**ngle. This mode is mainly used while sailing upwind.

2.12.5.3   Operation with true wind mode

This mode requires a speed sensor, a compass sensor, a wind sensor and the software add-on « true wind ». Once this mode has been selected the pilot steers the boat to a set true wind angle calculated by the Gyropilot processor.

2.12.5.4   Operation in rudder mode

The rudder mode allows the rudder to be set at a fixed angle. The value can be between – 35° and + 35° to the mid-ship position.

This mode can be used to check the drive unit or just to lock the rudder in a given position.

2.12.5.5   Using the GPS mode

In **GPS** mode the **Gyropilot** steers the boat to a route provided by the GPS or the navigation software connected to the NMEA input of your **Topline** system.
To achieve this, the GPS or the navigation software must feed the system with the following NMEA sentences:

- **$xxXTE** : cross-track error and
- **$xxBWC** : bearing and distance to waypoint (DTW and BTW) or
- **$xxRMB** : XTE, latitude, longitude and bearing and distance to waypoint (DTW and BTW as minimum data).

⚠️ **WARNING:**

The GPS mode uses the "Cross-track error" provided by your GPS compared to the course chosen.

The pilot uses this value to steer the boat and respect strictly the course over ground.

If you engage the pilot far from the route it will choose the shortest way to join it and might steer hard. To avoid it, put your boat on the route before engaging your pilot or engage the route on your map and engage the pilot.

It is therefore very important to be the closest from the route before engaging your GPS mode because if the cross-track error is > to 0.4 Mn, the gyropilot will steer the boat on the route with a 45° angle.

When arriving to the waypoint, if the next waypoint activation isn't automatic, the pilot rings, follows the compass heading and leave GPS mode. The skipper must therefore verify that his route is free and that the direction of the next waypoint is correct. Press AUTO again will engage the GPS mode, steering the boat toward the next waypoint. The procedure must be repeated at each new Waypoint.

Your GPS or navigation software which is connected to the pilot may be able to activate the next waypoint automatically. In that case the pilot will follow the route's legs accordingly.

2.12.6 Pilot setup saving and recall

Up to 10 pilot setups can be saved and used at any time. For example, you can save a setup for upwind conditions and another one for downwind.

Saving a pilot setup:

On the pilot page:

- Press Ⓞ, a window will appear.

- Select «Save config » and press Ⓞ.

- With the up and down arrows ⊕, select the desired setup N° and press Ⓞ. Then confirm with « Yes ».

- Give a name to your configuration and press « Ent » to confirm.

Recall a pilot setup:

On the pilot page:

- Press Ⓞ, a window will open.

- Select « Restore config » and press Ⓞ.

- Select the desired back-up and press Ⓞ.

2.12.7 Pilot alarm

You can set two different alarms. One is for wind direction variation and another one for low voltage.

- The first alarm is called "Wind/Head' in the system. It measures variations in wind direction when the pilot is in compass mode or heading in wind mode.

Value can be set to trigger the alarm. The default value is 15°.

In Compass Mode: the alarm will go off when the wind angle variation is greater than the set value for more than 30 seconds.

In Wind Mode: the alarm will go off when the heading variation is greater than the set value for more than 30 seconds.

In either case, the *Multidisplay* will display a warning and audible beeps.

The second alarm is called "Power Battery" in the system. It measures variations in the charge level of the battery powering the pilot's drive unit. The default value is 8 V DC

The alarm is triggered when the voltage is lower than the set value. The *Multidisplay* will display a message and sound beeps.

Alarm setup procedure for the pilot:

On the pilot page:

- Press ⓄⓀ, a window will open.

- Select « Pilot alarms » and press ⓄⓀ.

- Select « Wind/head ON/OFF » and press ⓄⓀ.

- With your keypad it is possible to modify Wind/head settings but also the battery level.

2.12.8 Pilot page on remote display

The Pilot page can be temporarily displayed on a remote display, according to the Pilot actions generated on the bus (Gyropilot, Gyrographic, Multigraphic and Pilot Pad). With this option enabled, the Pilot page will display during 5 seconds as soon as an action is made on the "Auto", "± 10°", "± 1°" or "tack" on a remote control or a Gyropilot control display.

3   INSTALLATION

This section describes the installation and configuration of the *Multidisplay* as well as setting the parameters for an installation with a *Gyropilot 2 processor*. Refer to the *Gyropilot 2* manual for the full pilot installation (drive unit, processor, rudder feed-back…).

⚠️ **Warning**:

- Please take time to read this manual carefully before you start installation

- Any connection to the *TOPLINE bus* must be performed through the specific interface box #90-60-417 (featuring an NMEA port)

- Use only with the *TOPLINE bus* cable # 20-61-001.

- All *Topline* bus connections must be performed while the system is powered off.

3.1 PACKING LIST

- A *Multidisplay* with 6m cable, featuring *TOPLINE bus* and an NMEA port.
- A sun cover
- Fixamo M14
- A blocking knurled nut M14

3.2 BEFORE INSTALLING CHECK

The best location for the unit must be:

- Easy for the helmsman to read and operate,

- Safe location with low risk of shocks,

- More than 40 cm (15 ¾") from a compass,

- Not horizontal.

3.3 BULKHEAD INSTALLATION

Check that the surface is clean, flat and straight. There must be enough space on the other side to run the cable.

- Drill a 18mm hole.

- Clean the surface with alcohol.

- Remove the protection film from the back of the display.

- Run the cable through the hole.

- If the thickness of the support is less than 3mm, the display can use the plastic nut provided.

- If the thickness of the support is more than 3mm (and less than 40mm), use the extension (FIXAMO) provided prior to running the cable into the hole.

- Install the display and hand-tight the nut.

Warning:

- With default factory setting, your *Multidisplay* is in landscape orientation with the nke logo on the right. If you want to change the orientation see: **parameters** >> **Maintenance**.

- It is recommended to set up the orientation before installing the *Multidisplay*.

- When you fix the display, gently tighten the bolt by hand. Over tightening may damage the housing and cause a leak.

- Do not use a sealant to fix the display.

Guide size

3.4 INSTALLATION AND RECOMMENDATION FOR THE MAST MOUNT BRACKET

Mechanical resistance for the double vertical mount bracket:

In accordance with the dimensions and the aging test report, NKE recommends:

- A maximum 15kg load in the transverse axis of the boat to preserve the quality of the mount bracket.
- It is strongly recommended, not to use the mount bracket as a step or support for any maneuver onboard.

Installation on the mast:

It is strongly recommended not to open the rim of your mount bracket beyond 15mm compared to their initial position. Improper handling could damage the piece and annul warranty.

It is recommended to use 6mm diameter screws with wide head and add a plastic or stainless-steel washer to protect the piece while tightening.

Before fixing the display, make sure your mount bracket is well fixed. Fixings must be strongly tightened on the flat surface of the mast. Strongly tightened means to the right extent and by avoiding crushing the mount bracket. The mount bracket must be immobile on the mast. An abusive tightening might cause deformation and damaging of the piece.

It is highly recommended to drill the mast to make the flat surface of the rim coincide perfectly with the flat surface of the mast.

For a better rigidity, rims of the mount bracket must fully rest on the flat surface of the mast.

Maintenance and cleaning of the piece:

- It is possible to sand the mount bracket with 600, 800 and 1000 grit sandpaper to correct small scratches.
- To get back the shiny appearance, it is recommended to complete the sand with a polishing.
- The mount bracket can be cleaned with white or alcohol vinegar.
- Do not use acetone, it would degrade the surface.
- In case of PMMA rupture or mount bracket peeling due to a severe impact, it is recommended to use bi-component glue such as ARALDITE 2031 to repair it.

Installation of the *Multidisplay*:

- Clean the fixing surface with alcohol
- Put the cable through the ⌀18 drill
- Remove the protection layer at the back of the *Multidisplay*
- Place the display and fasten M3 screws with a lock washer and a wide flat washer.
- Tighten firmly
- To tighten the display, you can use the Fixamo and the blocking knurled nut. Warning: do not tighten excessively.

- Make sure the display can't move by hand once tightened.

3.5 CONNECTION TO THE TOPLINE BUS AND NMEA

1. Run the bus cable from the *Multidisplay* to the *TOPLINE* junction of your system.

2. Connect the cable in the junction box.

Should you want to cut the bus cable to length, uncover and tin the wires before connecting them.

Raccordement au bus TOPLINE

Cable colour code

White cable / 5 wires	functions	
white	+12V	**TOPLINE Bus**
black	Data *Topline*	
braid	common	
red	INIT address	**Isolate after taken address**
yellow	NMEA +	NMEA input
green	NMEA –	

3.6 POWER CONSUMPTION

The ***Multidisplay*** uses 200mA max, 12Vdc. We recommend using a 12v/12v convertor in any installation to protect the bus from power surge. It is required when using an autopilot connected to the same house battery, or in an installation with multiple displays and devices.

While sailing, you can use the "SLEEP" mode of a display that you are not using, saving about 100mA per display. The sleep mode can bet set using the shortcuts button (A, B, C and D) on the ***Display Pad***.

3.7 NODE ADRESS FOR THE M*ULTIDISPLAY*

At the first power on, you must give a node address to the ***Multidisplay*** to enable it to work on the system's bus.

The default address is **0**.

During the address taking, connect the red wire on the INIT terminal and start the installation. A message is displayed and indicates to unplug the red wire and then to plug it again. The ***Multidisplay*** will automatically take a place into the TOPLINE bus instruments' list of your installation:

- Either as "Master" with node 1 if this address is available on the bus,
- Either as "slave" with node 2 to 20 if node 1 is already taken by an existing "master".

To follow the address taking procedure of your ***Multidisplay***, see Chapter 2.5

To follow the address resetting procedure of your ***Multidisplay***, see Chapter 2.5

3.8 CONNECTING TO A NMEA SOURCE AND CONFIGURATION

The *Multidisplay* features an interface which converts *NMEA* sentences to the *Topline* protocol. This allows the system to display the data coming from a NMEA source on the *nke* displays.

Connect the *NMEA* device to the NMEA- and NMEA+ terminals of the 90-60-417 junction box. Be careful to respect the polarity (refer to the connection drawing). The configuration is described in the section 2.5.10.2.2 of this manual.

3.9 INSTALLATION AND CONFIGURATION OF THE GYROPILOT

Once the *Gyropilot* is installed, you need to configure the system. This consists of teaching rudder's positions to the pilot: place the rudder in the midship position, then at the starboard lock and then the port lock. These three rudder positions are essential for the processor to run the drive unit.

Procedure:

- Press PAGE until you have access to the menu

- Select « pilot » and press OK .

- Select « Pilot setting » and follow the instructions displayed.

- Start by putting the rudder at mid-ship and press OK

- Push the rudder all the way to come to starboard and press OK , push the rudder all the way to come to port and press OK

- Lastly, place the rudder at mid-ship and press OK . The Gyropilot initialisation is complete.


⚠ **Warning**

The Gyropilot can only perform the automatic tack if the rudder ends are perfectly symmetrical. While setting the rudder ends, check that this is the case. Port lock to mid-ship and starboard lock to mid-ship must be the same.

---

4 MULTIDISPLAY SPECIFICATIONS

Feature	Value
Dimensions	With sun cover: 196 x 122 x 28mm (length x height x depth) Without sun cover: 192 x 118 x 23mm ((length x height x depth)
Weight	850g with 6m de cable (32g/m) and sun cover
Power supply	DC (continue) 8V – 32V
Consumption at 12 Volts	Day backlight: Level 1 =100 mA Level 10 = 150mA Level 20 = 200mA Night backlight : Level 1 = 91 mA Level 10 = 95 mA Level 20 = 100 mA Sleep mode : 90 mA screen off
NMEA input	NMEA 183, baud rate configurable automatically from 4800 or 38400 bauds.
Environment	Protection IP 68 (waterproof at permanent immersion and to high pressure water flow) Operation temperature -20°C - +50°C Storage temperature -20°C - +60°C
Power supply cable	Ø 5.5 mm, 4 wires + braid, length 6m.
Display	7'' colour graphic screen, translective, embedded LED backlight.

5   EVENTS MESSAGES
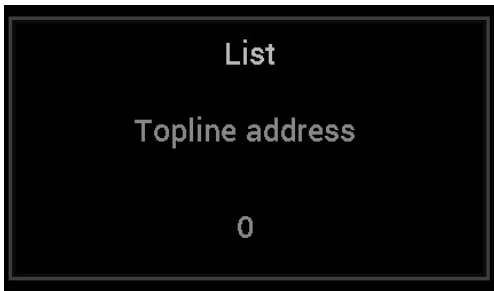
Message at system start up, indicating the ***Multidisplay*** address.
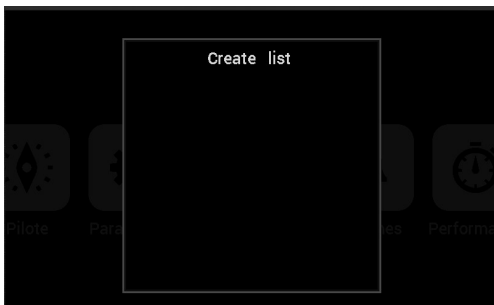
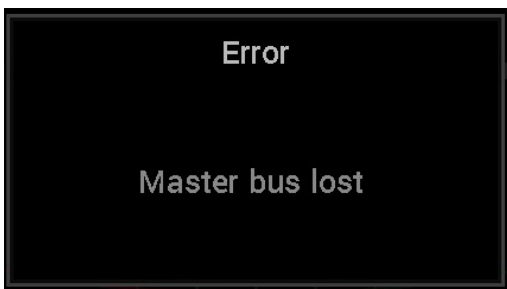***Multidisplay*** being set as "Master", when the system creates the list (search all sensors and displays in the bus), it displays addresses for slave displays.

The "master" display is unplugged or out of order. This can be solved by replacing the "master" display by another one. (Refer to "Topline addresses" section).
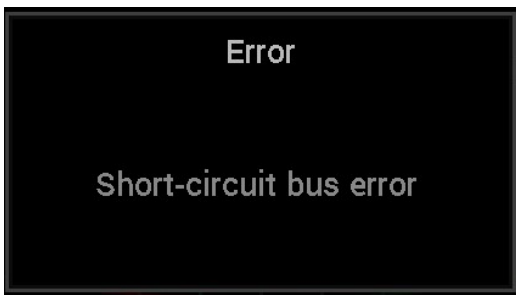
The black wire of the Topline bus cable, carrying the data is in short-circuit with one of the 2 other wires. This can happen in a junction box, the cable itself or one of the units connected to the bus.

2 similar sensors are connected to the bus and transmit the same data, or an NMEA input has been set for the same data as a sensor present in the bus. Check the connected sensors and reset the NMEA inputs.
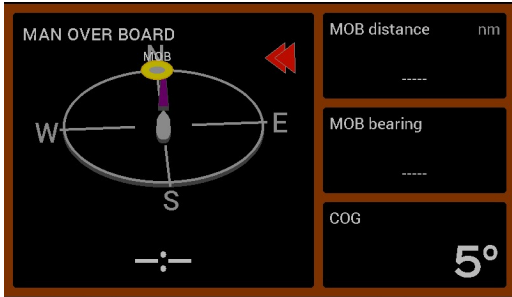
This page is shown when the Man Over Board function has been triggered. The **dead reckoned** distance and bearing to the man over board are displayed together with the boat's course over ground. The timer is triggered to give the time from event.

This message displays when the power supply to the Topline bus is below 9 Volts. Data is saved and the system switches off. Check the battery level and eventually charge it.
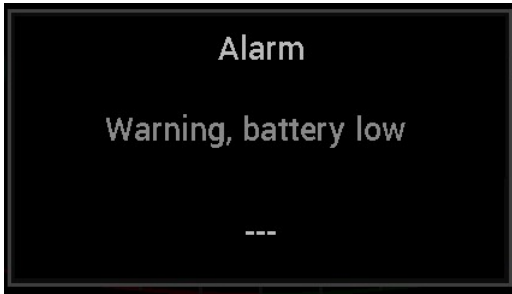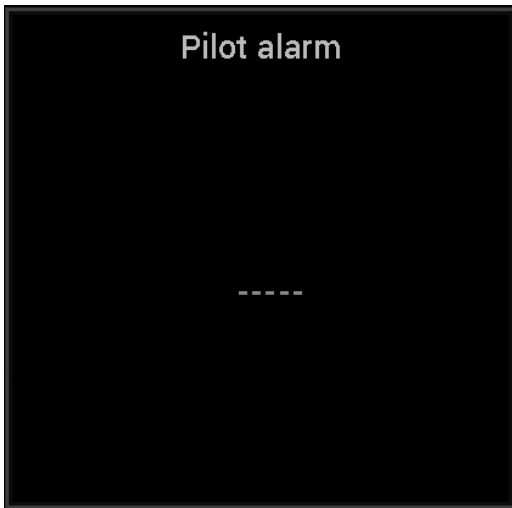

With the pilot in wind mode when an alarm has been set and the apparent wind angle is over the defined range. Press any key to inhibit the alarm for 10 minutes.

When the pilot in compass mode and an alarm has been set this will be displayed when the compass heading is over the defined range. Press any key to inhibit the alarm for 10 minutes.

The battery powering the pilot's drive unit has reached a lower voltage than defined in the setup. Press any key to inhibit the alarm for 10 minutes.

WARNING: THIS ALARM IS ALWAYS ACTIVATED.

Charge the battery.

6 MULTIDISPLAY SOFTWARE EVOLUTION

REV	Date	Information
V1.0	29/03/2018	- Original version
V1.1	06/11/2018	- Calibration procedure of the 9x compass - Apparent Wind Monitor calibration - Timer shortcut - Standby mode shortcut - Topline node address at start up.
V1.2	14/03/2019	- Starting line page - Tactical page - x9 page in landscape mode - Save a page after temporary modification - Zoom mode - Suppression of decimal for true heading, true wind direction and magnetic course over ground. - Marks management via software (Adrena) and V2.2 box - Custom dataset
V1.3		- Correction of unit of measure when *Multidisplay* was set up as master display. - New white background skin. - New of 8 data and alternative 2/2, 3/3 and 4/4 in portrait mode. - Correction of conflict between *Multidisplay* and *Multigraphic* when setting NMEA initiation. - Additional page to manage ultrasonic loch in the Topline devices menu. - Additional page to manage Wifi multiplexer in the Topline devices menu. - Additional page to manage Analog Monitor x 4 in the Topline devices menu. - Add compass deviation table for the 9X Compass Version 1.4. - Display mast height in meters or feet. - Remove decimal for BTW Mag. - New Channel TURN TO WAYPOINT (difference between BTW and COG). - Tactic Page - white background.

		- Heading corrected on tactic page when the heading is in alarm.
		- Update configuration menu in the tactic page.
		- Tactic page: Heading, COG and BTW available in Magnetic or True.
		- Start Line: length and distance to the line available in meters or feet.
		- In Performance Menu: additional Start Line menu to manage start page in portrait mode.
		- Forced TWD in start page.
		- Calculation of favoured end of the line.
		- New design on page XTE with white background.
		- New design on page WAYPOINT with white background.
		- Page Pilot XTE: white background (standard mode) and enhanced in portrait mode. Custom mode: BTW is shown as well as COG as reference. XTE is shown under the rudder widget.
		- Pilot HR: tacking angle settings.
V1.4		- AIS Page
		- Compatible with HR Processor HR Version 4.2
		- Compatible with new modes of the HR Pilot.

YOU CAN HELP PROTECT THE ENVIRONMENT!
Please remember to respect the local regulations:
Hand in the non-working electrical equipment
to an appropriate waste disposal center.