

# HR Masthead unit

Product reference : 90-60-369



## USER GUIDE and INSTALLATION GUIDE

Zi de Kerandré – Rue Gutenberg – 56700 – HENNEBONT – FRANCE

[www.nke-marine-electronics.com](http://www.nke-marine-electronics.com)

**nke**

MARINE ELECTRONICS

# TABLE OF CONTENTS

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>USING .....</b>   | <b>3</b>  |
| 1.1      | PRESENTATION .....   | 3         |
| 1.2      | LIST OF CHANNELS DISPLAYED .....                                 | 4         |
| 1.3      | ALARMS SETTING .....   | 4         |
| 1.4      | FILTERING OF THE CHANNELS .....                                  | 4         |
| 1.5      | CHOICE OF THE UNIT .....   | 5         |
| 1.6      | TECHNICAL SPECIFICATIONS .....                                   | 5         |
| 1.7      | DIAGNOSTIC OF 1 <sup>ST</sup> LEVEL TROUBLESHOOTING .....        | 5         |
| <b>2</b> | <b>CALIBRATION .....</b>   | <b>6</b>  |
| 2.1      | CALIBRATION OF THE WIND VANE .....                               | 6         |
| 2.2      | CALIBRATION OF THE ANEMOMETER .....                              | 7         |
| <b>3</b> | <b>INSTALLATION .....</b>  | <b>8</b>  |
| 3.1      | LIST OF ACCESSORIES .....  | 8         |
| 3.2      | INSTALLATION PRECAUTIONS .....                                   | 8         |
| 3.3      | INSTALLATION OF THE MOUNTING PLATE AND OF THE VANE SUPPORT ..... | 9         |
| 3.4      | WINDMILL MONTING PROCEDURE .....                                 | 9         |
| 3.5      | CONNECTION TO THE <i>TOPLINE BUS</i> .....                       | 9         |
| <b>4</b> | <b>MAINTENANCE .....</b>   | <b>10</b> |

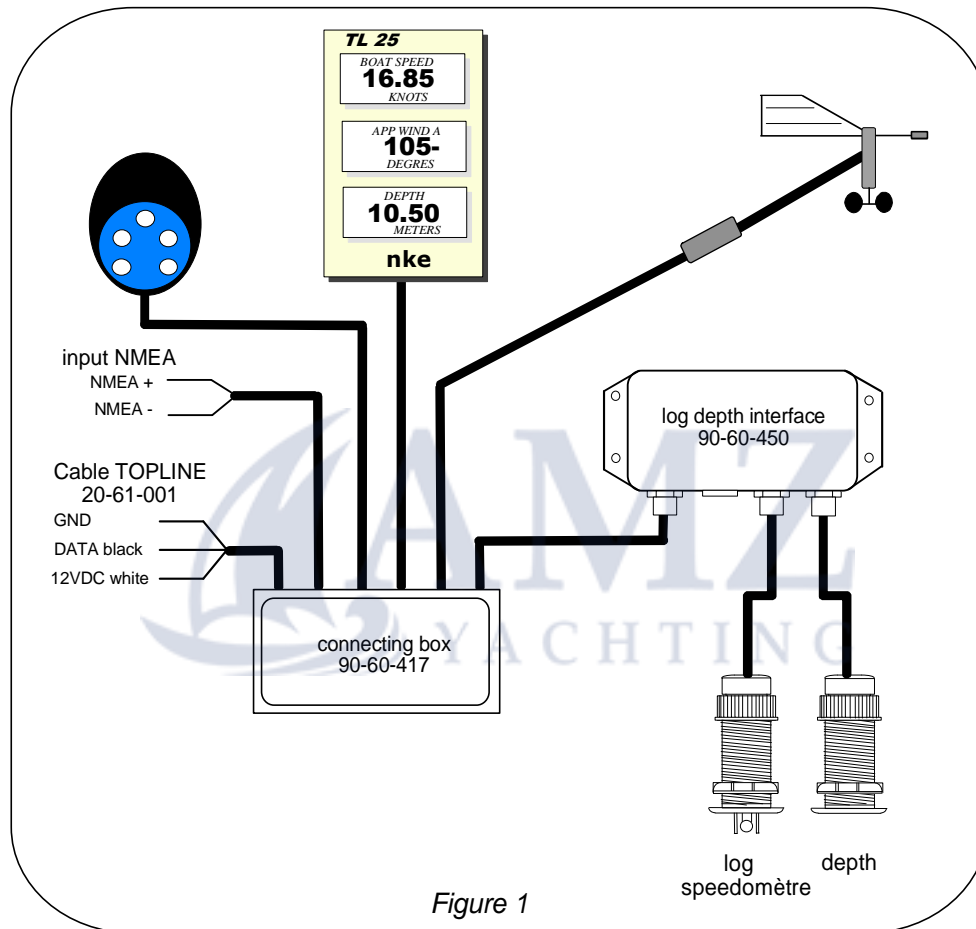
# 1 USING

## 1.1 PRESENTATION

The **HR masthead unit** is a measuring instrument for wind speed and direction. It is connected to the **TOPLINE bus** of your installation. Equipped with high quality ball bearings and mechanical elements of precision, the **HR masthead unit** guaranteed qualities of a reliable, precise and sensitive sensor.

The support equipped with a **TOPLINE bus** cable, is not provided with the masthead unit.

## ARCHITECTURE OF THE INSTALLATION



### IMPORTANT

- Do not dismantle masthead unit parts
- Read this user guide entirely before starting the installation.
- The electrical connection of the **TL25** on the **TOPLINE bus** must be carried out with the terminal box 90-60-121. Only use **TOPLINE bus** cable of the type 20-61-001.
- Any intervention on the **TOPLINE bus** must be carried out with the installation power switched off.

## 1.2 LIST OF CHANNELS DISPLAYED

The **masthead unit**, connected to the **TOPLINE bus** of your installation, creates the channels below. They are then accessible using the displays of the **TOPLINE** range.

| Channel  | Display                   | Unit        |
|--|---------------------------|-------------|
| Apparent wind speed  | WIND SPD / A <b>0.0Kt</b> | m/s or knot |
| Apparent wind angle  | WIND ANG / A <b>0°</b>    | degree      |
| Air temperature  | Air temp <b>15.4°</b>     | °C or °F    |
| <b>If your installation is equipped with a speedometer</b>     |                           |             |
| True wind speed  | WIND SPD / T <b>0.0Kt</b> | m/s or knot |
| True wind angle  | WIND ANG / T <b>45°</b>   | degree      |
| <b>If your installation is equipped with a TOPLINE compass</b> |                           |             |
| True wind direction  | WIND DIR / T <b>300°</b>  | degree      |

The apparent wind angle is displayed in degrees : from **0°** to **-180°** on port tack and from **0°** to **180°** on starboard tack.

## 1.3 ALARMS SETTING

The setting of an alarm enables you to monitor the value of a channel. When the preset threshold is exceeded, a warning message is displayed and an audible alarm is activated.

**The upper alarm** is activated when the display is higher than the programmed threshold.

**The lower alarm** is activated when the display is lower than the programmed threshold.

To cancel the alarm of a channel, enter the value **0** in the upper alarm and the lower alarm.

Thus, the setting of an alarm on the **wind speed, wind angle or air temperature** channels will allow you to supervise your installation effectively as well as the good operation of your boat.

To activate alarms, please refer to the user guide of your display.

## 1.4 FILTERING OF THE CHANNELS

The level of **filtering** of a channel determines the frequency of update of the data displayed.

For example, in rough sea when the boat moves significantly, it is useful to increase the filtering of the speed channel to stabilise the value displayed. Conversely, in calm sea, low filtering will be preferable to obtain a fast response of the display.

**Filtering** is adjustable between **1** and **32**, and the default value is **8**. The lower this value is, the higher the frequency of update is.

Please refer to the user guide of your display to carry out the filter setting.

## 1.5 CHOICE OF THE UNIT

You have the option to choose the following display units :

- Wind speed : in knots or in m/s.
- Air temperature : in degree Fahrenheit or in degree Celsius

Please refer to the user guide of your display to carry out this change of units.

## 1.6 TECHNICAL SPECIFICATIONS

- Power supply : 10 to 16VDC
- Consumption : 25mA
- Wind speed range : tested in laboratory, 0 up to 60 knots.
- Wind speed sensibility: < 2 knots.
- Angular resolution of the anemometer : 1°
- Air temperature range : -10°C à +50°C
- Tightness :IP67
- Weight : masthead unit : 180g – Mounting plate and support : 160g
- Bus cable : Ø 5.0 ± 0.3 – weight : 34 g/m.
- Operating temperature : -10°C to +50°C
- Storage temperature : -20°C to +60°C

## 1.7 DIAGNOSTIC OF 1<sup>ST</sup> LEVEL TROUBLESHOOTING.

Before contacting technical support, please check the troubleshooting table below.

| Problem  | Possible causes and solutions  |
|--|--|
| The <b>Topline</b> installation does not detect the masthead unit.                                     | The bus cable is not or is badly connected to the terminal box : check the connection inside the terminal box. Check the state of the cables : they must not show any sign of wear or cut. |
| The apparent wind speed indicates <b>0.0</b> , <b>no matter what</b> the wind speed is.                | Check that the calibration coefficient is different from <b>0.0</b> : refer to §3.<br>Check that the winch is not blocked.   |
| The apparent wind speed indicates <b>0.0</b> and the air temperature channel indicates « <b>Pan</b> ». | It is possible that the masthead unit is disconnected or broken. Check the state of the cable and the connection to the box.   |
| The apparent wind angle indicates 35° at close haul on one board and 65° on the other.                 | Check that the stem of the masthead unit follows the axis of the boat<br>Carry out a calibration of the vane: refer to §3.   |

If you do not manage to solve the problem, please contact your distributor.

## 2 CALIBRATION

---

The **masthead unit** is adjusted at the factory. However, a calibration is required to adapt the sensor to the specificities of your boat and to obtain an optimum measurement accuracy. Follow the calibration procedure below, by visualising the settings on a display: please refer to the user guide of the display.

### 2.1 CALIBRATION OF THE WIND VANE

#### 2.1.1 Principle of the calibration

After the masthead unit has been installed, a real test at sea needs to be carried out. You will sail on port tack and on starboard tack in order to raise the wind angle displayed on the channel **APP WIND ANGLE**. Then, you will deduce the offset value which will enable you to adjust the wind vane. Thus, a calibration rectifies all the shifts that result from an installation at the head of mast : assembly position (alignment), torsion and inflection of the mast during navigation.

Note that each wind vane is set with a factory offset. This offset ranges between **0°** and **-180°** or between **0°** and **+180°**. It is the reference of your wind vane in relation to the axis of the support stem. Before the start of a calibration, we recommend that you make a note of this value as it may be useful in case of bad handling.

#### 2.1.2 OFFSET setting procedure

To achieve a successful calibration, sail on a calm sea, with a moderate wind.

1. Display the channel **APP WIND ANGLE**.
2. Sail and follow several close-hauled tacks : note the values of apparent wind angle displayed.
3. Calculate the average of the values displayed on starboard tack and those displayed on port tack.
4. Calculate the offset correction : 
$$\frac{(\text{average starboard angle} - \text{average port angle})}{2}$$
5. Adjust the factory offset with the value of offset calculated

#### **Example 1 :**

Factory OFFSET = 60

Average apparent wind angle starboard tack : 45°

Average apparent wind angle port tack : 35°

Value to be **added** to the factory OFFSET =  $(45^\circ - 35^\circ) / 2 = 5^\circ$

New offset value = 5 + 60 = **65**

#### **Example 2 :**

Factory OFFSET = 60

Average apparent wind angle starboard tack : 39°

Average apparent wind angle port tack : 45°

Value to be **deducted** from the factory OFFSET =  $(39^\circ - 45^\circ) / 2 = -3^\circ$

New offset value = 60 - 3 = **57**

## 2.2 CALIBRATION OF THE ANEMOMETER

### 2.2.1 Principle of the calibration

You will adjust the calibration coefficient of the channel **apparent wind speed**, so that the speed displayed is equal to the true ambient wind speed.

You can carry out this calibration at port.

### 2.2.2 Setting procedure of the calibration coefficient

1. Select the **calib coef** sub-channel of the **apparent wind speed** channel.
2. Enter the new calibration coefficient and validate using the **enter** key. The new setting will be saved to the memory.

- **CAUTION** : The **calib coef** parameter is a multiplier coefficient. This value must never be equal to zero. By default this coefficient is set to **1.00**. If it is not the case, before starting a calibration enter the value **1.00**.



### 3 INSTALLATION

---

The masthead unit is attached to the mast using a plate support. Two versions are available:

- 90-60-509 plate equipped with 25 meters of cable.
- 90-60-562 plate equipped with 35 meters of cable.

Measure the length of cable necessary to connect the sensor, attached at the head of mast, to the **TOPLINE bus** terminal box inside your boat. Choose the appropriate plate.

#### 3.1 LIST OF ACCESSORIES

- 25 meter masthead unit cable, with plate and support : 90-60-509
- 35 meter masthead unit cable, with plate and support : 90-60-562
- TOPLINE terminal box : 90-60-121
- Windmill : 90-60-503
- Vane : 31-02-050

#### 3.2 INSTALLATION PRECAUTIONS

The choice for the location of the masthead unit is crucial to achieve optimal performances.

The location of the sensor must be:

- as high and distant as possible from any equipment blocking or disturbing the air flow.
- horizontal. If the mounting surface is not horizontal, for example the mast head is at an angle, manufacture a taper gib (figure 2).

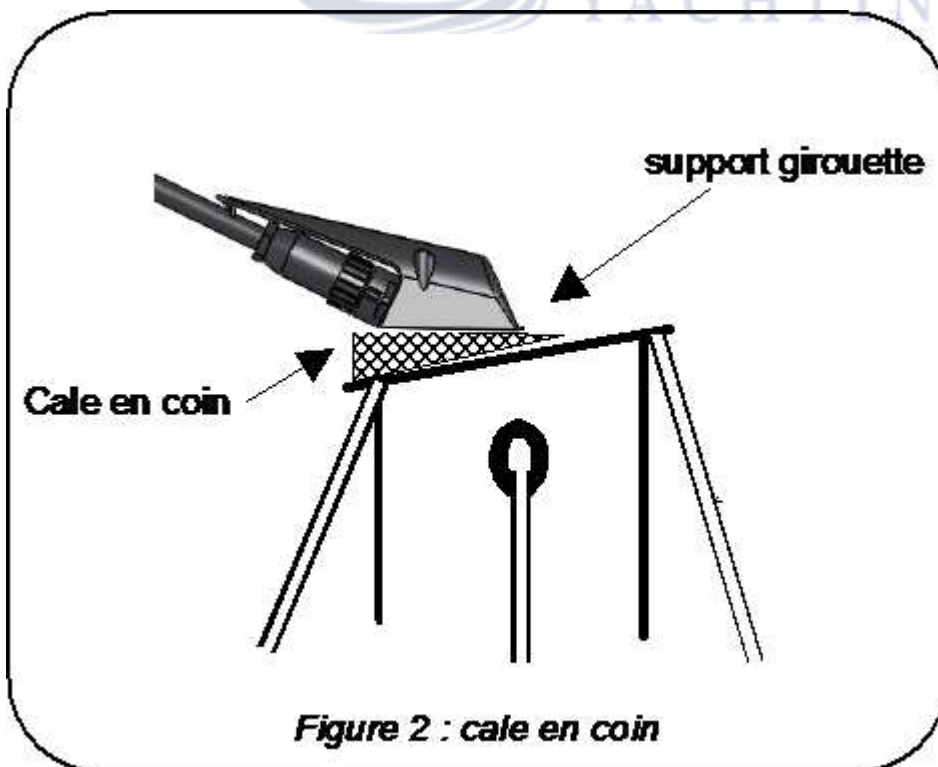
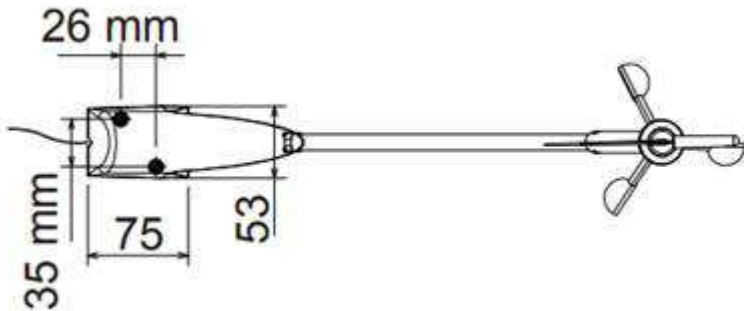


Figure 2 : cale en coin



### 3.3 INSTALLATION OF THE MOUNTING PLATE AND OF THE VANE SUPPORT

The attachment system of the wind vane comprises a vane support. You will start by attaching the support at the head of the mast, then you will mount the wind vane onto the support.



The support is assembled using two screws. The support must be installed on a horizontal, clean, smooth and flat plane. You will attach the support using two **M5X35mm** screws (not provided) so that the stem of the wind vane is in line with the axis of the boat. The sensor will then be screwed to its socket and blocked by a nylon collar (supplied).

#### Mounting procedure

1. On the horizontal plane of the mast head, drill or tap two  $\varnothing 5\text{mm}$  holes for the attachment of the support.
2. Coat the interior face of the plate with sealing putty
3. Attach the support using two screws M5X35mm (not provided).
4. Run the cable inside the mast, preferably in a sleeve. The entry and exit of the mast must be protected using a grommet.
5. Remove the protective cap of the connector.
6. Introduce the wind vane into the socket of the support and screw the vane connector manually. Put on the nylon collar.

### 3.4 WINDMILL MONTING PROCEDURE

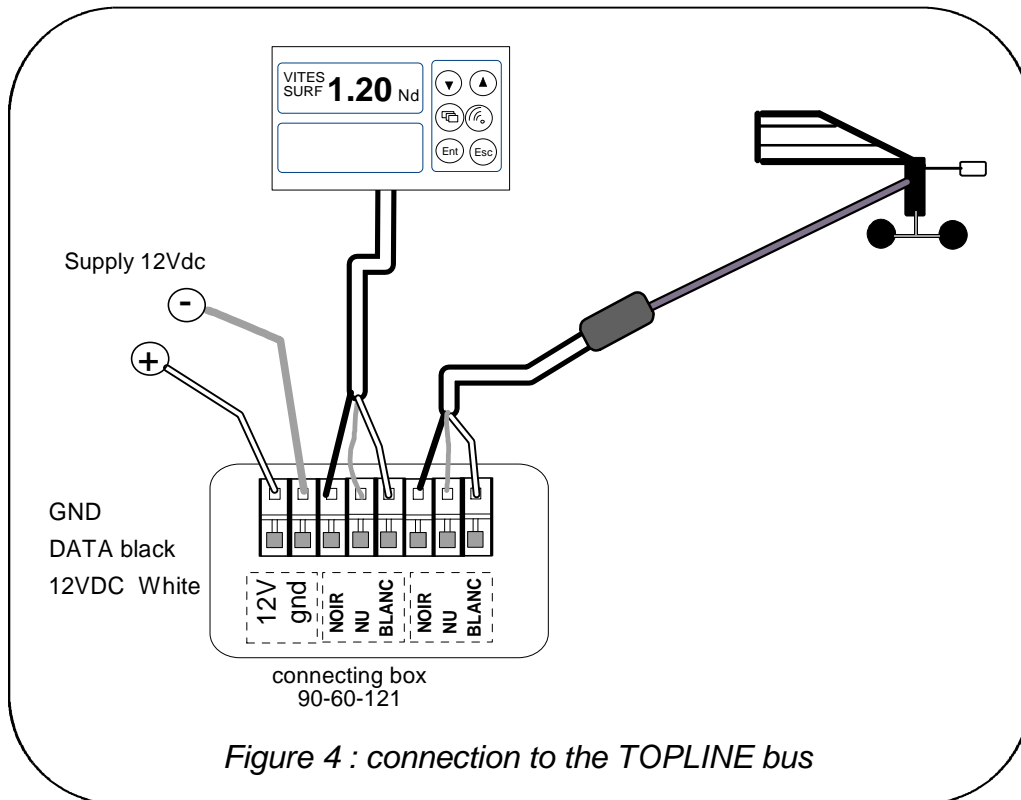
1. Make correspond the flat surface of the windmill with the flat surface of the axis.
2. Insert the windmill on the axis
3. Insert and tight the nut.



### 3.5 CONNECTION TO THE *TOPLINE BUS*

If the cable runs inside the mast, make the cable pass through an opening equipped with a grommet. If the cable runs across the deck, make the cable pass through a tight stern tube gland.

1. Make the masthead unit cable run towards the ***TOPLINE*** terminal box of your installation.
2. Connect the bus cable inside the terminal box :



If you cut the bus cable, you will need to galvanise the wires after stripping them.

#### 4 MAINTENANCE

The axes of the wind vane and of the anemometer are mounted on ball bearings and rotate permanently. If the opportunity presents itself, we advise you to dismount the masthead unit from its support, during wintering periods, in order to increase the lifespan of the bearings.

If you set down the wind vane, because of dismasting or wintering for example, screw the stopper onto the connector of the wind vane support.