

# Heel angle sensor

Product reference : 90-60-343



## USER GUIDE

Version 1.0

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

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

**nke**

MARINE ELECTRONICS



+33 297 365 685

## TABLE OF CONTENTS

1	INTRODUCTION .....	3
2	LIST OF CHANNELS DISPLAYED.....	4
3	SENSOR CALIBRATION.....	4
	OFFSET SETTING.....	4
4	FILTERING OF THE CHANNELS.....	5
5	NMEA 0183 OUTPUT .....	5
6	SENSOR DEMONSTRATION SOFTWARE.....	6
7	TECHNICAL SPECIFICATIONS .....	7
8	DIAGNOSTIC OF 1 <sup>ST</sup> LEVEL TROUBLESHOOTING.....	8
9	INSTALLATION.....	8
	SENSOR INSTALLATION .....	9
	CONNECTION TO THE <i>TOPLINE BUS</i> .....	9

## 1 INTRODUCTION

---

The **nke Heel Angle** sensor is a measuring instrument that provides the heel angle (rolling) of the boat. It can be connected to the **nke TOPLINE bus** of your installation, or, thanks to its NMEA 0183 output, to any NMEA receiver that processes XDR frames.

The sensor is supplied with a 5 meter long **TOPLINE bus** cable.

### IMPORTANT

- Read this user guide entirely before starting the installation.
- Any electrical connection on the **TOPLINE bus** must be carried out with the terminal box 90-60-417. Only use **TOPLINE bus** cable 20-61-001.
- Any intervention on the **TOPLINE bus** must be carried out with the installation power switched off.
- For channel settings, please refer to your **TOPLINE** display guide.

## 2 LIST OF CHANNELS DISPLAYED

---

The **heel angle sensor**, connected to the **TOPLINE bus** of your installation, creates the following channels:

Channel	Display	Unit
Heel (degrees)	HEEL ➡ 2°	Degrees
R_Heel (degrees)	(no display)	Degrees

The **Heel** channel is accessible from the displays of the **TOPLINE** range. The other channel (**R\_Heel**) corresponds to the fast heel angle of the boat, i.e. to the non filtered value of the heel. (see channel filtering part).

## 3 SENSOR CALIBRATION

---

The **heel angle sensor** is adjusted at the factory. However, offset setting may be required to calibrate your sensor on the boat and obtain an absolute value that is optimal. Follow the calibration procedure below, while visualising the settings on a display : please refer to the user guide of your display.

### OFFSET SETTING

#### 3.1.1 Principle

After the installation, it may be necessary to correct the **OFFSET** of the **heel angle sensor** so that the heel angle displayed is coherent in relation to the heel of the boat.

#### 3.1.2 Setting procedure of the offset (by default the value of the offset is 0) :

This setting will allow to make an angle correction from -180 degrees to +180 degrees.

1. Select the sub-channel **offset calib** of the **Heel** channel.
2. Enter the new **offset** coefficient and confirm. The new setting will be saved to the memory and will apply to the 2 **Topline** channels (Heel & R\_Heel).

## 4 DAMPING OF THE CHANNELS

---

The level of **damping** 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 damping of the heel angle channel to stabilise the value displayed.

**Damping** is adjustable between **1** and **32**, and the default value is 6. The lower this value, the higher the frequency of update.

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

### IMPORTANT

If you access the filtering parameter from a Performance display (V3.4 or lower), the label displayed on the LCD screen is incorrect. Indeed, the Performance display indicates **Offset** even though the numerical value displayed actually corresponds to the filtering parameter.

Brief pressing of the ENTER key allows to access the **damping** sub-channel.

Extended pressing of the ENTER key allows to access the **Offset** sub-channel.

## 5 NMEA 0183 OUTPUT

---

5 times per second, the **heel angle sensor** transmits the heel angle to its NMEA output (yellow wire). The measurements of its sensors (accelerometer and rate gyro) are also sent to its NMEA output, using an nke proprietary frame.

Note that it is possible to independently use the **NMEA 0183** output and the **Topline** bus link. However, the data transmitted over the NMEA link take into account the existing settings in the **Topline** sub-channels (Offset and filtering).

Example of NMEA transmission :

\$IIXDR,A,-1.3,D,Heel Angle\*0F

\$PNKEP,06,-0.988,-0.096,12.0\*5D

*Connection parameter : 4,800 bauds - 8 bits - 1 stop bit - no parity*

## 6 SENSOR DEMONSTRATION SOFTWARE

The demonstration software, downloadable from [www.nke.fr](http://www.nke.fr), allows to check the good operation and to set the sensor's parameters.

The PC must be connected to the Topline bus via the interface TOPLINE PC reference 90-60-466.



After selecting the type of connection (Topline or NMEA) and the associated port, click on the “Connect” button to activate the measurement acquisition.

You can now adjust:

- the damping coefficient of the heel measurement,
- the measurement offset,
- the sensor orientation in the boat (front or rear)

## 7 TECHNICAL SPECIFICATIONS

---

### General :

- Power supply : 10 to 16VDC
- Power consumption : 25mA
- Tightness : IP54
- Weight : 270 g (with 5 meters of cable)
- Operating temperature : -10°C to +50°C
- Storage temperature: -20°C to +60°C

### Measurement :

- Measurement range: -180° to +180°
- Resolution : 0.1 °
- Accuracy:  $\pm 2^\circ$  @25°C from -180° to +180°

## 8 DIAGNOSTIC OF 1<sup>ST</sup> LEVEL TROUBLESHOOTING

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

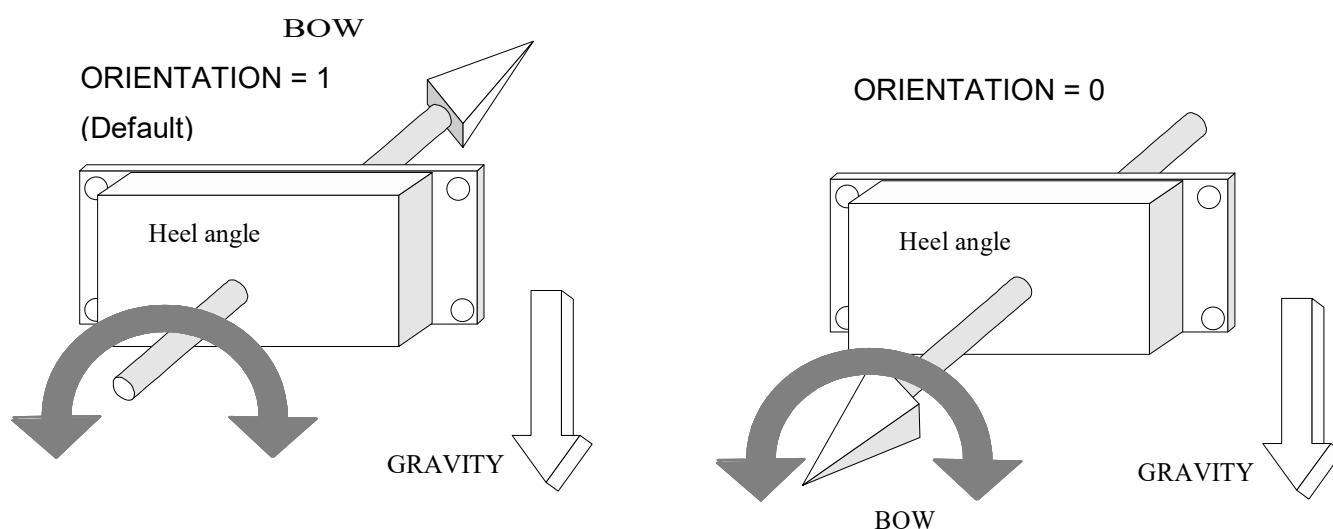
Problem	Possible causes and solutions
The <b>Topline</b> installation does not detect the Heel Angle sensor.	The bus cable is not or is badly connected to the terminal box : check the plugging and the connection inside the terminal box. Check the state of the cables : they must not show any sign of wear or cut.
The <b>Topline</b> <i>HEEL</i> channel shows the message FAULT.	Cut the power supply of the sensor for a few seconds. If the problem persists after switching the power back on, contact technical support.

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

## 9 INSTALLATION

Before starting the installation, take the time to select the most appropriate location for the sensor. It must be installed away from any heat source (solar radiation, cooking plate, etc...).

Moreover, the sensor must be positioned facing the front or the rear of the boat. Depending on this positioning, the direction of the sensor must be set as shown on the diagram below.

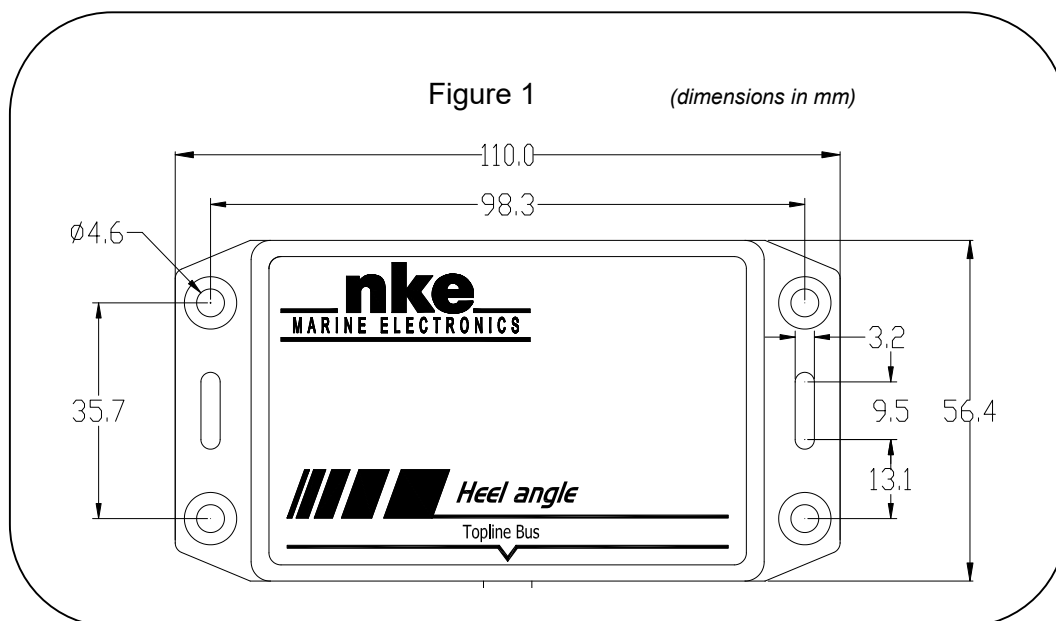


This parameter can be set using the demonstration software of the sensor.



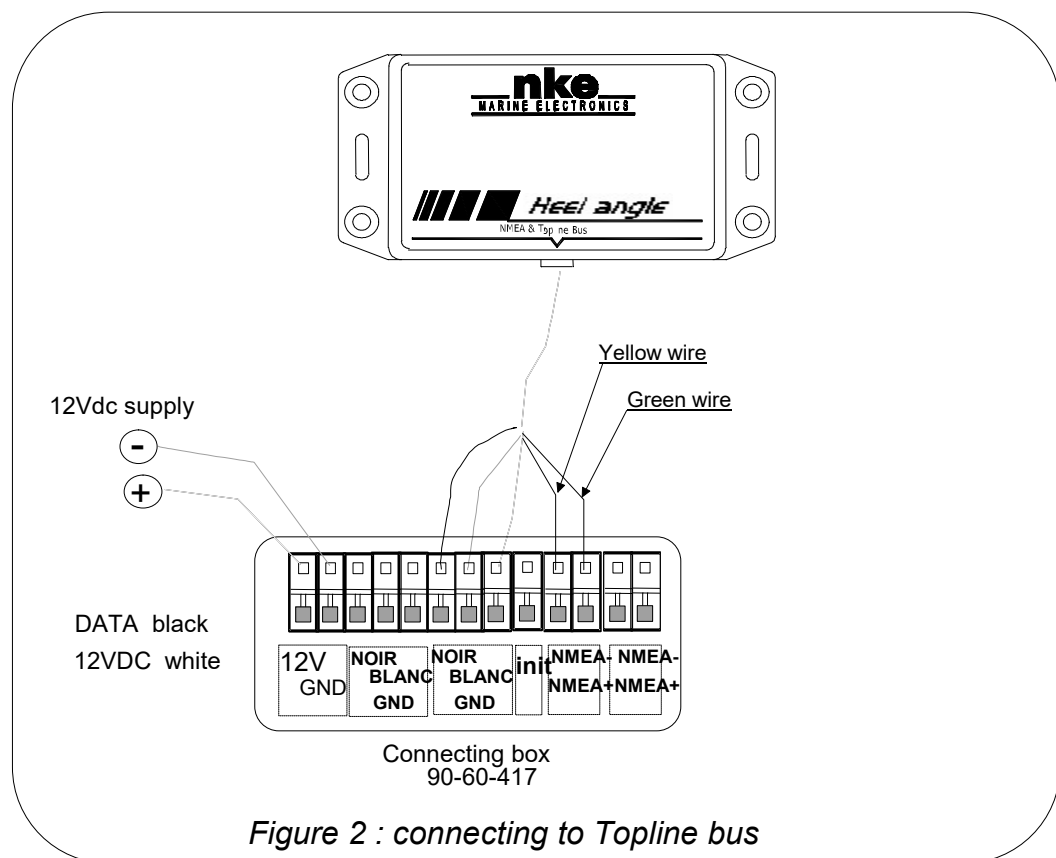
## SENSOR INSTALLATION

- Fix the housing using Ø4 screws



## CONNECTION TO THE TOPLINE BUS

Connect the bus cable of the **sensor** inside the terminal box according to the drawing below:



If you reduce the length of the bus cable, strip and galvanise the wires before connecting them inside the terminal box.

## List of accessories

- TOPLINE Terminal box : 90-60-121
- TOPLINE bus cable : 20-61-001

## NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.