

# 200A battery control sensor

Product reference : 90-60-455



## USER GUIDE and INSTALLATION GUIDE

**nke** – Sailing competition

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# 1 USING

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## 1.1 PRESENTATION

The **Topline battery controller** allows to monitor the state of charge of the battery pack of your boat. This sensor measures in real time the voltage, rate of charge and discharge, and calculates the estimated remaining capacity of the batteries. These parameters are shown on the **Topline Multifunction** displays of your installation.

It is connected to the **TOPLINE bus** of your installation.

### IMPORTANT

- Please read this guide completely before starting the installation.
- Any electrical connection on the **TOPLINE bus** must be carried out with the terminal box 90-60-121. 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 the user guide of your **TOPLINE** display.

## 1.2 LIST OF CHANNELS DISPLAYED

The **battery control sensor**, connected to the **TOPLINE bus** of your installation, creates the following channels. They are accessible from the displays of the **TOPLINE** range.

Channel	Display	Unit
Battery 1 Voltage	Bat1 volt	Volts
Battery 1 Amperage	Bat1 amp	Amperes
Battery 1 Capacity in %	Bat1capa %	Capacity in %
Battery 1 Capacity in Ampere-Hour	Bat1capa	Capacity in Ah

Please note that on the **Multifunction displays**, the channels **Bat1 volt** and **Bat1 amp** are displayed alternately, on the same screen. The same applies to the channels **Bat1capa %** and **Bat1capa**.

### Battery voltage

The battery voltage is directly measured from the terminals of the battery pack controlled, with an accuracy of +/-0.3V.

This voltage is approximately 14 volts when the battery is charging.

### Amperage

This value is the instant amperage measured by the battery controller either during charge or discharge. When the batteries are charging (engine operating or quay side charger) this amperage must be positive, and inversely, it is negative outside charging periods.

## Battery capacity

It is the gauge of the battery, calculated in Ampere-Hour or percentage. It allows to instantly know the state of charge of the battery pack. This energy meter measures and calculates the total capacity of the battery taking into account :

- the discharge : current used by the electrical installation of your boat
- the charge : current supplied by the alternator or the charger of your installation

## 1.3 ALARMS SETTING

Setting an alarm allows you to monitor the state of charge of your battery pack. When the preset threshold is exceeded, a message of alarm is displayed and a sounding alarm is activated. For example, you can set an upper and a lower threshold on the channel **Battery 1 voltage**.

**The upper alarm** is activated when the value displayed is higher than the preset threshold.

**The lower alarm** is activated when the value displayed is lower than the preset threshold.

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

Thus setting an alarm on the channels **Bat1 Volt and Bat1 capa %**, allows to efficiently monitor your battery pack.

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

## 1.4 TECHNICAL SPECIFICATIONS

- Power supply : 10 to 16VDC.
  - Consumption : 0.3mA.
  - Maximun load current battery:.
- 40A** continuous - **100A** for 2 minutes - **200A** for 30 secondes
- Tightness : IP67.
  - Dimensions : length 105mm X width 71mm X height : 60mm.
  - Weight : 540 g.
  - The battery terminals are screwed onto M10 brass nut (terminals not supplied).
  - Operating temperature : -10°C to +50°C.
  - Storage temperature : -20°C to +60°C.
  - 100mA safety fuse.

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

This chapter can help you rapidly resolve minor problems which do not require the intervention of a specialist. Before contacting technical support, please check the troubleshooting table below.

Problem	Possible causes and solutions
The <b>Topline</b> installation does not detect the <b>battery controller</b>	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 channels <b>Bat1 volt</b> , <b>Bat1 amp</b> , <b>Capa Ah</b> and <b>Capa %</b> displayed show incoherent values	Have the calibration and initialisation been performed correctly : see § 2. Check that the value entered in the sub-channel <b>OFFSET</b> corresponds to the total capacity of your batteries in Ah.

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

## 2 CALIBRATION AND INITIALISATION OF THE BATTERY CONTROLLER

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Every *nke* sensor is adjusted at the factory. However, in order to adapt the *battery controller* to the specificities of the battery pack of your boat, you must :

- Perform a *calibration*, i.e. enter the characteristics of your battery pack into the *controller*.
- Perform an *initialisation*, when you first install your battery, and periodically during the numerous charge and discharge periods, in order to adjust the state of charge of your batteries.

Follow the calibration procedure below, by visualising the settings on a display : please refer to the user guide of the display.

### 2.1 BATTERY CONTROLLER CALIBRATION

In order to calibrate the *battery controller*, you must set the *calibration coefficient* and the *offset* :

You will estimate the *calibration coefficient*, depending on the charge capacity and the efficiency of the battery of your boat. Depending on the technology and the age of your battery, the latter will not store 100% of the energy supplied by the charger and/or Alternator. A new battery is considered to have an efficiency of 80%, which means that for 1 Ampere supplied, the battery stores 0.8 Ampere. By default this *calibration coefficient* is set at 0.8 (80%). In addition, as the battery ages, its efficiency decreases, and the *calibration coefficient* must thus be adjusted.

The *offset* is the total capacity, in Ampere-hour, of the battery pack of your installation. Add the capacity indicated on each battery in order to obtain the total capacity of your pack. By default, the offset is factory set at **70Ah**.

#### 2.1.1 Setting procedure of the calibration coefficient :

1. Select the sub-channel **calib coef** of the channel **Bat1 capa**. By default this coefficient is
2. Enter the new calibration coefficient calculated and validate by pressing **enter**. 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 at **1.00**. If that is not the case, before starting a calibration, enter the value **1.00**.

To perform the calibration, please refer to the user guide of your display.

#### 2.1.2 Setting procedure of the offset (by default the value of the offset is **70**) :

**Example** : The capacity of your battery pack is **110Ah**

1. Select the sub-channel **calib offset** of the channel **Bat1 capa**.
2. Enter an offset of **110Ah** and validate by pressing **enter**. The new setting will be saved to the memory.

## 2.2 BATTERY CONTROLLER INITIALISATION

When the battery pack is fully charged, initialise the **battery controller**. This initialisation determines the maximum capacity **Bat1 capa = 99%**, from which the controller will count the ampere-hours used and the ampere-hours charged.

Since the control of charge of a battery is no accurate science, because many parameters that influence the charge and the storage are not taken into account (temperature of the battery, heat losses...), it is normal that with time the battery controller drifts and no longer indicates the actual state of charge of the battery pack. This controller must be **reinitialised** regularly, by performing an initialisation when the pack is fully charged.

### 2.2.1 INITIALISATION USING A PERFORMANCE MULTIFUNCTION OR A DL18

- Select the channel « **Bat 1 capa** » on the upper display.
- Press the ▼ key until the beep sounds.
- The display adjusts to the capacity of the battery, which you have previously saved in the "OFFSET" sub-channel.







### 2.2.2 INITIALISATION USING AN INTERCOM


- Bring the cursor on the channel "C1: xx %".
- Press and hold the **L1** key.
- Briefly press the **I5J** key.
- The display adjusts to the capacity in amperes saved in the sub-channel "OF".

### 2.2.3 INITIALISATION USING A TL25 OR AN SL5

- Using the ⬆ key select the middle display : the display flickers (only on **TL25**).
- Using the ▲ ▼ keys select the channel "**Bat 1 capa**".
- Press the ▼ key until the capacity in amperes is adjusted and saved in the "OFFSET" sub-channel.

#### 2.2.3.1 INITIALISATION USING A GYROGRAPHIC

- Using the  key, select "**Main menu**"
- Then using the  browser select the "**configuration**" menu, then the sub-menu "**calibration**",
- Select the channel "bat1 voltage", then press the  key
- Using the  browser select "INIT", press the the  key
- Using the  browser select "YES"

Press the  key, the capacity is reset to 99%.

## 2.3 HOW TO MAKE SURE THE PACK IS FULLY CHARGED ?

Perform a complete charge cycle of the battery pack and check the battery amperage channel, **Bat1 amp** :

You will notice that the amperage is positive and high at the start of the charge cycle. Then, during the charge cycle, the value progressively decreases. At the end of the charge cycle the current remains stable at a very low value. Note this end of charge amperage and initialise the battery controller at 99%.

### 3 INSTALLATION

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#### 3.1 LIST OF ACCESSORIES

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

#### 3.2 INSTALLATION PRECAUTIONS

Given the significant amperage of the load circuit, 200A, the following constraints must be respected :

- The connection on the **BAT1** and **COM** screw terminals must be performed using a cable with a minimum section of 100mm<sup>2</sup>.
- The circuit terminals must be crimped according to the good engineering practice. They must be clean and properly tightened in order to have a low contact resistance.
- The Common contact stud must be connected to the general 'minus' of the electric board.
- The terminals of the sensor must be held tight between the two nuts of each contact stud. To tighten the terminal, imperatively use two flat spanners of 17, one to hold the counter nut and the other to tighten. If you tighten using only one spanner, you run the risk of damaging the internal contacts.

#### 3.3 INSTALLATION OF THE BATTERY CONTROLLER HOUSING

The battery controller housing is waterproof to water spray. The housing will be fixed in place using four M4 screws (not supplied) in a dry and ventilated location.

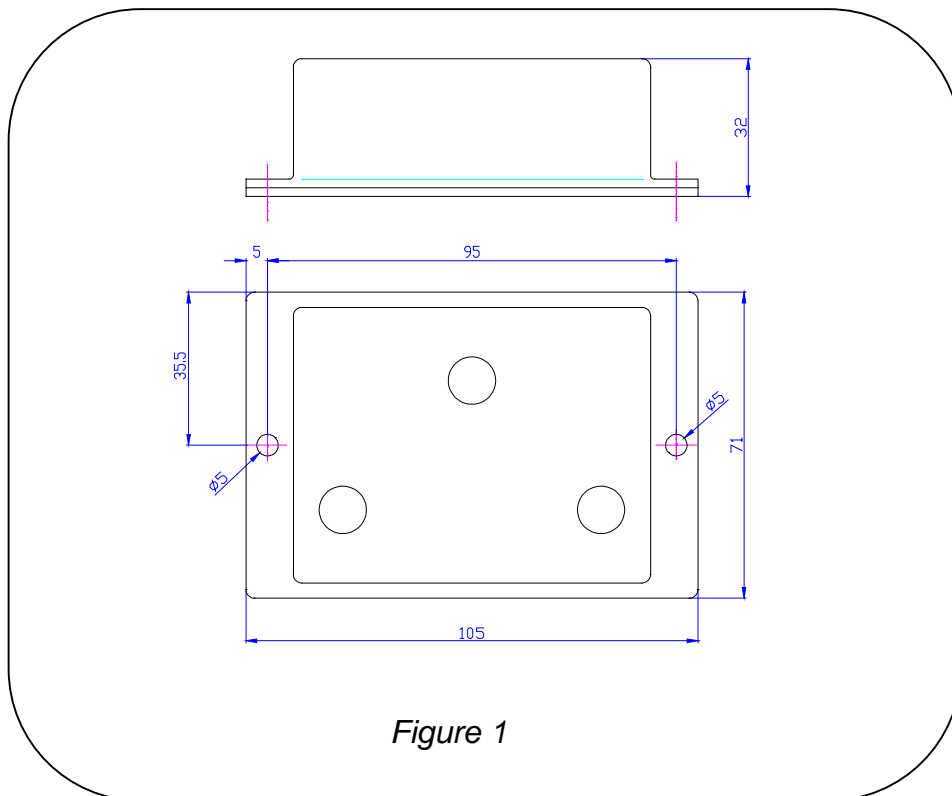
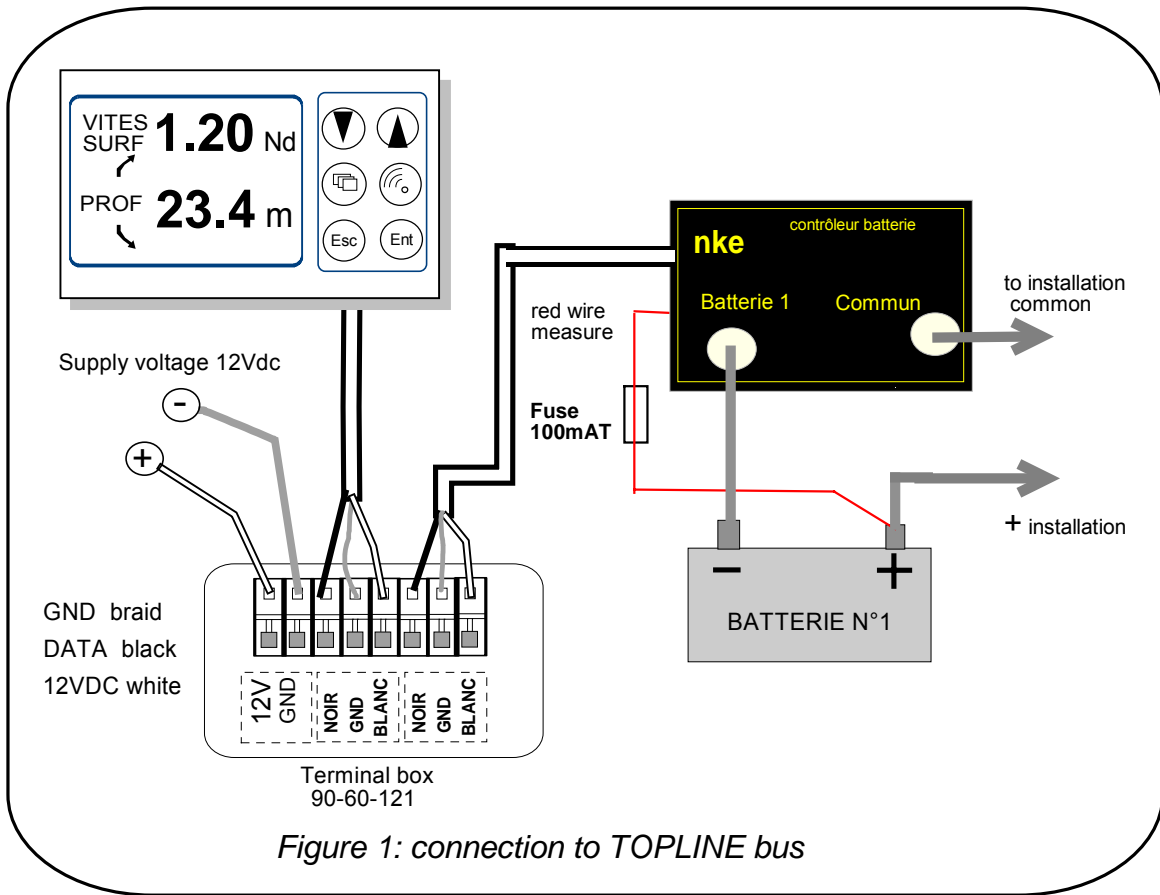


Figure 1

### 3.4 CONNECTION TO THE *TOPLINE BUS* AND TO THE BATTERY PACK

1. Make the bus cable run from the **battery controller** to the **TOPLINE** terminal box of your installation.
2. Connect the bus cable inside the terminal box.
3. The **Bat** contact must be directly connected to the " - " terminal of the battery pack 1.
4. The **Com** contact must be directly connected to the common of the installation.
5. The **red** measurement wire must be connected **directly** to the "plus" of the battery pack 1. It must not run via the general circuit breaker.



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