

# Star



## NAV *Repeater*

### OPERATION MANUAL

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**1 Introduction**

Thank you for choosing the Star NAV Repeater which will display all necessary data from your NMEA navigator.

Power and NMEA data are connected on the reverse side of the instrument. The colour coded 4-pole jack plug makes the installation easy.

**1.1 Part specification**

Star SEA Data is delivered with all mounting material. Make sure all these parts are in the package.

<b>QTY</b>	<b>ITEM</b>	<b>QTY</b>	<b>ITEM</b>
1	Instruction manual for use	1	Drill template
1	Warranty card	4	Mounting screws
1	Instrument SEA Data	4	Rubber plugs
1	Instrument cover	1	Bag with wire protectors and silicon paste
1	Back cover		
1	Screw connector		

### 2 Installation

- **The installation includes 6 major steps:**
  1. Read the installation and operation manual.
  2. Plan where to install the transducer and instrument.
  3. Install the transducer, then the instrument.
  4. Run the cables.
  5. Take a break and admire your installation.
  6. Learn the functions and calibrate your instrument.
- **Before you begin drilling...** think about how you can make the installation as neat and simple as your boat will allow. Plan where to position the instrument. Think about leaving space for additional instruments in the future.
- **A few "do not's" you should consider:**
  - Do not cut cables too short. Allow extra cable length at the instrument so it can be removed for inspection without having to disconnect attached cables.
  - Do not place sealant behind the instrument. The instrument gasket eliminates the need for sealant.
  - Do not run cables close to fluorescent light sources, engine or radio transmitting equipment to avoid electrical disturbances.
  - Do not rush, take your time. A neat installation is easy to do.
- **The following material is needed:**
  - Wire cutters and strippers.
  - Large Philips and small flat head screw driver.
  - Hole saw for the instrument clearance hole, 52 mm (2 <sup>1</sup>/<sub>16</sub>" ).
  - 2.8 mm (<sup>7</sup>/<sub>64</sub> ") drill for the mounting holes in wood.
  - 3.2 mm (<sup>1</sup>/<sub>8</sub> ") drill for the mounting holes in fibre glass.
  - Plastic cable ties.

**If you are doubtful about the installation, obtain the services of an experienced technician.**

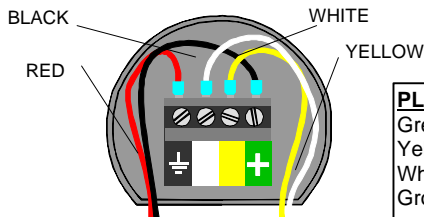
### 2.1 Installing the instrument

- Place the adhesive drill template on the desired location for the instrument. Drill the four screw holes using a 2.8 mm ( $7/64$ " ) drill for wood or 3.2 mm ( $1/8$ " ) for fibre glass. Use a 52 mm ( $2\ 1/16$ " ) hole saw to machine the clearance hole for the instrument connection socket.

**Note! Never drill through the instrument's four mounting holes as the gasket may be damaged and thus cause leakage. The warranty is not valid for damage caused by drilling through the mounting holes.**

### 2.2 Electrical installation

The connector is attached to the four pins on the reversed side of the instrument. The 4-pole jack plug is colour coded



PLUG	FUNCTION	CABLE
Green:	+12 V	Own cable
Yellow:	NMEA RETURN	Own cable
White:	NMEA IN	Own cable
Ground $\perp$ :	Ground (0 V)	Own cable

**Important!** Always connect both NMEA in and NMEA return. Connect NMEA return to ground if the GPS has no NMEA return.

**Connect a 3 Ampere fast fuse between power battery and instrument on the plus lead.**

### 3 Function overview

The display is divided in two function groups: Position and Navigation. To change between them, press **MODE**. To scroll in function list, press **UP** or **DOWN**.

#### 3.1 How to use the push buttons

##### Mode / Light button

This button is used to change between Position mode and Navigation mode. One short press changes between the two modes. To select light levels, press mode for more than two seconds.



##### Down button

This button is used to move down in the function list or to decrease a value in set mode.



##### Up button

This button is used to move up in the function list or to increase a value in set mode.



##### KEY button

This button is used to lock/unlock a value, to be able to change it.



##### Clear

To clear a value or reset trip distance, press **UP** and **DOWN** together.



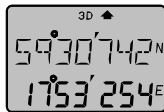
##### Man Over Board

To activate Man Over Board function, press **MODE** and **KEY** together.



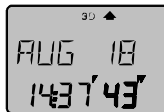
### 3.2 Position

The position is displayed in latitude and longitude to three decimal places. If the NMEA Navigator just sends two decimals, the third will always read zero.



#### 3.2.1 Time and date

To display date and time, press **DOWN**. Date and time is displayed in month, day, hour, minute and second. Some NMEA navigators does not send date. In that case, the text TIME is written instead of the date. To set the local time zone, press **KEY**. The "underline" sign is flashing (underline is the same as plus), change with **UP** or **DOWN**, move to next character with **MODE**, change value with **UP** or **DOWN**. When you have entered the correct time zone, press **KEY**.



#### 3.2.2 Battery voltage

To display battery voltage, press **DOWN**. Battery voltage is measured in the instrument. It can therefore be different to the voltage meter in your boat. That is due to voltage drop in cables.



### 3.3 Navigation functions

To change to combi steer, press **MODE**. The combi steer window provides you with information of five values at a time. The arrow at the top helps you to keep on track. This function is explained in section 3.3.7. The functions displayed are speed over ground, course over ground, distance to Waypoint and course to Waypoint. If no Waypoint is selected to navigate towards in the NMEA navigator, the bottom row will display dashes.



#### 3.3.1 Cross track error (XTE)

To display XTE, press **DOWN**. The XTE window displays the XTE numerical on the top row. Bottom row displays distance to and course to Waypoint. If no Waypoint is selected to navigate towards in the NMEA navigator, the bottom row will display dashes.



#### 3.3.2 Waypoint closure velocity (WCV)

To display WCV, press **DOWN**. The WCV window displays the WCV numerically on the top row. Bottom row displays distance and course to Waypoint. If no Waypoint is selected to navigate towards in the NMEA navigator, the bottom row display dashes. If your boat is moving away from the Waypoint, WCV will display dashes.



#### 3.3.3 Time To Go (TTG)

To display TTG, press **DOWN**. The TTG window displays the time to Waypoint. If no Waypoint is selected to navigate to in the NMEA navigator or if your boat is moving away from the Waypoint, TTG will display dashes.





### 3.3.4 Select Waypoint

In the navigation mode you can at any time set a Waypoint to go to. The NAV Repeater will then compute the distance and bearing to Waypoint and all other functions. The Waypoint is selected by pressing the **KEY** in any navigation mode. When the **KEY** is pressed the NMEA Waypoint number is displayed. To enter your Waypoint, press **UP** or **DOWN**, the text Lat/Lon is displayed. Press **KEY** and the present position is displayed, edit the latitude coordinate for your Waypoint. To increase/decrease a value, press **UP/DOWN**, to move to next character, press **MODE**. When ready with latitude, press **KEY** to lock. Edit the longitude the same way as for the latitude and lock with **KEY**.



### 3.3.5 Man Over Board (MOB)

You can at any time press the MOB buttons, which will store a Waypoint called MOB WP. The display will show course, bearing and distance to MOB WP. To clear the MOB function, press **UP** and **DOWN** together. The MOB WP is stored in memory and can be selected again at any time. It will be erased when a new MOB is pressed or at power off.



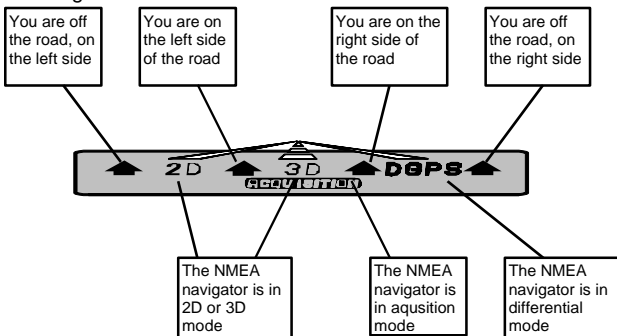
### 3.3.6 View the MOB position

You can display the MOB position in latitude/longitude by pressing **KEY** in navigation mode, press **UP/DOWN** until MOB WP is displayed and press **KEY** again. The latitude and longitude cannot be changed for safety reasons.



### 3.3.7 Top arrows

At the top of the display there are four arrows and four text signs. The arrows tell you if you are on the "road" or not and the text displays the status of your NMEA navigator .



The width of the road can be adjusted, see calibration section 5.9. If you select the road to be 0.050 Nm wide, the arrow will jump to the rightmost position when the cross track error is greater than 0.050, Nm to the right. If the XTE is less than 0.050 the arrow will jump to the second position from the right. If XTE is zero, the two centre arrows will be displayed.

## 4 NMEA input

The NMEA is connected as explained in section 2.1. It is important to know that the Star NAV Repeater only can repeat what is sent from the NMEA navigator it is attached to. Some NMEA navigators do not send all necessary data. It is also important to know that some information is present only after selecting a Waypoint in the NMEA navigator.

The following NMEA sentences are red for displaying different data. The sentences are in priority order (i.e. if the NMEA navigator is sending more than one sentence, the information in the first sentence is displayed.)

<b>Position:</b>	1. GGA, 2. RMC, 3. RMA, 4. GLL
<b>Date and time:</b>	1. ZDA, 2. RMC, 3. GGA, 4. GLL, 5. BWC, 6. BWR
<b>Speed Over Ground:</b>	1. RMC, 2. RMA, 3. VTG
<b>Course Over Ground:</b>	1. RMC, 2. RMA, 3. VTG
<b>Bearing To Waypoint:</b>	1. BWC, 2. RMB, 3. BWR
<b>Distance To Waypoint:</b>	1. BWC, 2. RMB, 3. BWR
<b>Time To Go:</b>	1. Internally computed.

## 5 Calibration

To enter the calibration mode, press **KEY** for more than two seconds. To scroll in the calibration list, press **UP** or **DOWN**. To change a value or setting in the calibration, unlock with **KEY**, change with **UP/DOWN** and lock the value with **KEY** again.

### 5.1 Damping

The damping controls averaging time for computing speed and course over ground. d0 is minimum damping and d9 is maximum damping. **Note!** The minimum damping cannot be faster than the NMEA navigators transmission.



### 5.2 Unit for distance

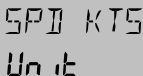
The unit for distance can be selected as nautical miles (NM), kilometres (KM) or miles (MI).



DIST NM  
Unit

### 5.3 Unit for speed

The unit for speed can be selected as knots (KTS), kilometres/hour (KMH) or miles/hour (MPH).



SPD KTS  
Unit

### 5.4 Seconds ON/OFF

Select the position to be displayed in seconds or hundredths of minutes. If seconds is set to OFF, hundredths of minutes is displayed.



SECONDS  
OFF

### 5.5 Magnetic bearing ON/OFF

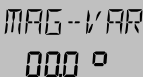
Select the bearing to display magnetic or true bearing. If magnetic bearing is set to ON, all bearings will be computed to magnetic using the magnetic variation set in 5.6.



MAG-BRG  
OFF

### 5.6 Magnetic variation

Enter the local magnetic variation. The variation will be noted in the sea chart. This function will have no effect if magnetic bearings is set to OFF.



MAG-VAR  
000 °

### 5.7 Circle alarm

The Star NAV Repeater has a built in arrival alarm. When the boat is closer to the Waypoint than the setting in this calibration mode, the alarm is activated. You can select the radius of the circle. To turn off the alarm, set the value to zero.

**Note!** Circle alarm limit is always in nautical miles.



### 5.8 Cross track error alarm

The Star NAV Repeater has a built in cross track error (XTE) alarm. When the boats XTE is more than the setting in this calibration mode, the alarm is activated. You can select the XTE limit. To turn off the alarm, set the value to zero.

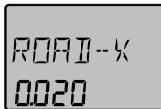
**Note!** XTE limit is always in nautical miles.



### 5.9 Road width

In this calibration mode you select the width of the road. This is the setting for the arrows at the top.

**Note!** The road width is always in nautical miles



## 6 Fault finding

The instrument has three fault messages. No INPUT, NO DATA and UNKNOWN dATA.

Screen	Cause	Action
Blank	No power supply	1. Check fuse. 2. Check connections.
No input	No signals are registered by the NAV Repeater	1. Check connections 2. Check if your NMEA navigator is sending data.
No data	Signals are received but non recognisable by the NAV Repeater.	1. Check connections 2. Change polarity of NMEA out A and B 3. Check baudrate
Unknown data	Wrong type of NMEA are received	1. Check the manual for NMEA output settings.

## WARRANTY

### GENERAL

All our products are designed and built to comply to the highest class industry standards. If the products are correctly installed, maintained and operated, as described in the installation and operation manual, they will provide long and reliable service. Our international network of distributors can provide you with the information and assistance you may require virtually anywhere in the world.

**Please read through and fill in this warranty card and send it to your national distributor for product registration.**

**LIMITED WARRANTY**

The warranty covers repair of defective parts, due to faulty manufacture and includes labour when repaired in the country of purchase. The warranty period is two years, and commences from the date of purchase. The above warranty is the Manufacturers only warranty and no other terms, expressed or implied, will apply. The Manufacturer specifically excludes the implied warranty of merchantability and fitness for a particular purpose.

**CONDITIONS**

- The supplied warranty card and receipt with proof of purchase date, must be shown to validate any warranty claim. Claims are to be made in accordance with the claims procedure outlined below.
- The warranty is non-transferrable and extends only to the original purchaser. The warranty does not apply to Products from which serial numbers have been removed, faulty installation or incorrect fusing, to conditions resulting from improper use, external causes, including service or modifications not performed by the manufacturer or by its national distributors, or operation outside the environmental parameters specified for the Product.
- The Manufacturer will not compensate for consequential damage caused directly or indirectly by the malfunction of its equipment. The Manufacturer is not liable for any personal damage caused as a consequence of using its equipment.
- The manufacturer, its national distributors or dealers are not liable for charges arising from sea trials, installation surveys or visits to the boat to attend to the equipment, whether under warranty or not. The right is reserved to charge for such services at an appropriate rate.
- The manufacturer reserves the right to replace any products returned for repair, within the warranty period, with the nearest equivalent, if repair within a reasonable time period should not be possible.
- The terms and conditions of the warranty as described do not affect your statutory rights.

**CLAIMS PROCEDURE**

Equipment should be returned to the national distributor, or one of its appointed dealers, in the country where it was originally purchased. Valid claims will then be serviced and returned to the sender free of charge.

Alternatively, if the equipment is being used away from the country of purchase, it may be returned to the national distributor, or one of its appointed dealers, in the country where it is being used. In this case valid claims will cover parts only. Labour and return postage will be invoiced to the sender at an appropriate rate.

**DISCLAIMER**

Common sense must be used at all times when navigating and the manufacturer's navigation equipment should only be considered as aids to navigation. The manufacturers policy of continuous improvement may result in changes to product specification without prior notice.

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