Triton Display
Installation Manual

ENGLISH

bandg.com

Preface

As Navico are continuously improving this product, we retain the right to make changes to the product at any time which may not be reflected in this version of the manual. Please contact your nearest distributor if you require any further assistance.

It is the owner's sole responsibility to install and use the instrument and transducers in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing safe boating practices.

NAVICO HOLDING AS AND ITS SUBSIDIARIES, BRANCHES AND AFFILIATES DISCLAIM ALL LIABILITY FOR ANY USE OF THIS PRODUCT IN A WAY THAT MAY CAUSE ACCIDENTS, DAMAGE OR THAT MAY VIOLATE THE LAW.

Governing Language: This statement, any instruction manuals, user guides and other information relating to the product (Documentation) may be translated to, or has been translated from, another language (Translation). In the event of any conflict between any Translation of the Documentation, the English language version of the Documentation will be the official version of the Documentation.

This manual represents the product as at the time of printing. Navico Holding AS and its subsidiaries, branches and affiliates reserve the right to make changes to specifications without notice.

Warranty

The warranty card is supplied as a separate document. In case of any queries, refer to the brand web site of your display or system: **www.bandg.com**

Important text that requires special attention from the reader is emphasized as follows:

→ ***Note:*** Used to draw the reader's attention to a comment or some important information.

⚠ Warning: Used when it is necessary to warn personnel that they should proceed carefully to prevent risk of injury and/or damage to equipment/personnel.

Declarations and conformance

This equipment is intended for use in international waters as coastal sea area administered by countries of the E.U. and E.E.A.

B&G Triton Display complies with the following regulations:

- CE under EMC directive 2004/108/EC
- level 2 devices of the Radio communications (Electromagnetic Compatibility) standard 2008

B&G Triton Display meets the technical standards in accordance with Part 15.103 of the FCC rules.

About this manual

This manual is a reference guide for installing the B&G Triton system. The manual assumes that the installer has at very least, basic knowledge of DC electrical systems, and of working with power tools with materials such as fiberglass and wood.

An understanding of basic navigation, nautical terminology and practices may be helpful in correct configuration of the product.

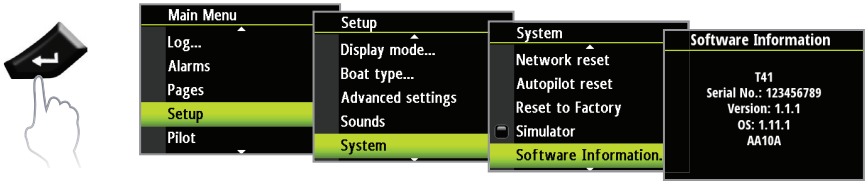
> ⚠ Warning: It is your sole responsibility to install and use the instrument and transducer(s) in a manner that will not cause accidents, personal injury or property damage. Always observe safe boating practices.

→ ***Note:*** The choice, location, and installation of transducers and other components of the system are critical to the performance of the system as intended. If in doubt, consult your B&G dealer.

→ **Note: Global Positioning System:** The Global Positioning System (GPS) is operated by the US Government which is solely responsible for its operation, accuracy and maintenance. The GPS is subject to changes which could affect the accuracy and performance of all GPS equipment anywhere in the world, including this instrument.

The software

This manual is written for B&G Triton Release to Market 1 (RTM1). Please check web site for details on the current release version.



➔ ***Note:*** The menu route shown above is an example only and may not match the software installed on your unit!

➔ ***Note:*** To update the software you will need a compatible multifunction display / chartplotter running on the network. eg. B&G Zeus multi function display (MFD).

If you do not have a suitable device on the network you can arrange to update the software via a B&G dealer.

You can download the latest version of the software from www.bandg.com and upgrade the displays via the B&G MFD, instructions on how to do this can be found on the B&G website. www.bandg.com

➔ ***Note:*** The manual may have been updated to match new software releases. The latest available manual version can be downloaded from www.bandg.com

➔ ***Note:*** Portions of this software are copyright © 2011 The FreeType Project (www.freetype.org). All rights reserved.

Contents

Introduction

The Triton Display utilizes a unique bonded 4.1-inch sunlight viewable LCD display to offer clearly read sailing information, including wind, speed, depth, heading, pilot status, log, timer and much more.

High contrast and a 155˚ viewing angle provide excellent readability, whilst the bonded display ensures there is no chance of condensation occurring regardless of the conditions.

Power consumption is extremely low for this class of product - 155 mA at 13.5 V with backlight driven at full brightness.

Dual Micro-C connectors provide for quick and easy daisy-chain connection - ideal for retrofit or new build. Micro-C is the industry standard cabling used for NMEA 2000 systems.

Overview

The Triton Display and Pilot Controller

1. Display
2. Menu / Enter key

   Used to enter the main menu, select sub menus and confirm selection.

→ ***Note:*** Press and holding the Enter key for 3 seconds takes you directly to the display setup lighting level screen. If the lighting level is set below 5 it will automatically increase to 5. Use the up and down keys to set the desired level and press Enter to confirm.

3. Page key

   Scrolls through the eight default display pages and navigates back a step in menus.

→ ***Note:*** the eight default display pages including Pilot page can be customized to display the required data.

4. Directional keys

   Scrolls up and down through selected menus / set values.

5. Pilot Controller
6. Mode key

   Changes the Pilot mode.

7. Off key

   Disengages the autopilot.

8. Course control keys

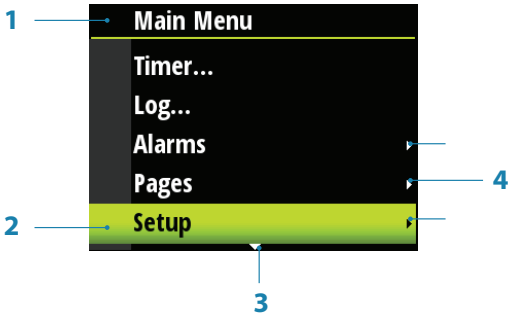
   Changes target course / Activates Non Follow Up (NFU) mode when in Standby mode.

9. Auto key

   Engages the autopilot.

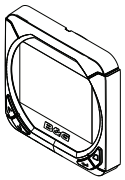
Menus

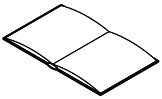
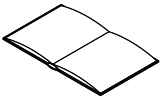
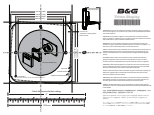
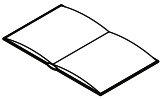
Under normal operation, the unit will power up displaying the most recently used data page. To enter the menu use the Menu/Enter key.



1. Current menu
2. Selection highlight
3. Indication for more content off page
4. Menu expands to further level of detail

Check the contents

Triton Instrument Display	
Mounting Clip	
Sun Cover	
Fixing Screws	
Additional Retention Bracket	
Threaded rods, Washers, and Fasteners for Retention bracket	
0.6m Interconnect Cable (Micro-C) - Straight connectors	

Installation Manual	
Quick Reference Guide	
Operation Manual DVD	
Mounting Template	
Warranty Booklet	

Installation

The Triton display may be mounted via a flush mounting clip or with the retention bracket attached to the rear of the unit.

Choosing a location

Choose the mounting locations carefully before you drill or cut. The display should be mounted so that the operator can easily use the controls and clearly see the display screen. Be sure the chosen location allows access for routing the cables.

Ensure that any holes cut will not weaken the boat's structure. If in doubt, consult a qualified boat builder. Before cutting a hole in a surface, make sure that there are no hidden electrical wires or other parts behind the panel. Leave sufficient clearance space to connect all relevant cables.

If multiple instruments are to be mounted in a row, ensure measurement of space takes in to account the correct spacing between displays.

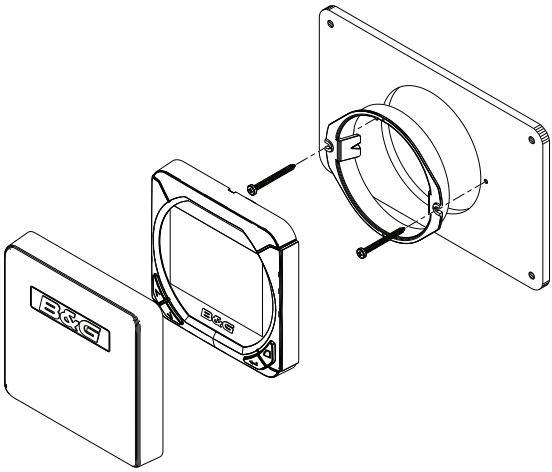
B&G displays are high-contrast, anti-reflective and are easily read in direct sunlight.

For width, height and depth requirements, please see the drawings at the back of this manual.

Viewing angles

The Triton display offers 170 degrees viewing angle, both horizontally and vertically. Avoid installation in locations that require the instrument to have significant rotation of axis relative to the deck. Users wearing polarized sun glasses may have trouble clearly reading a screen that is at a significantly different angle to the lenses.

Fitting with mounting clip



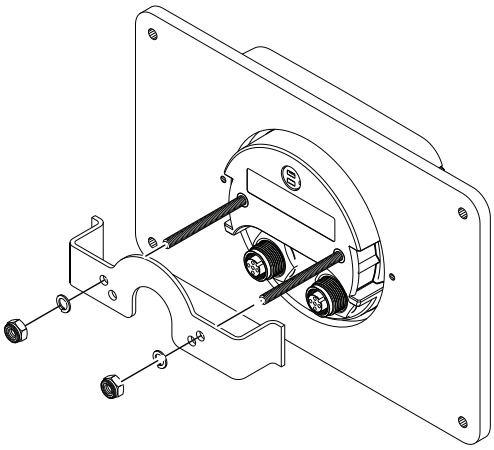
Use the template to cut the required size hole in the chosen location. At the same time mark the holes to be drilled for the fasteners. Take care to be as accurate as possible when cutting out the mounting hole - the mounting clip should be a close, but not tight fit in the hole. If the clip requires pressure to get in to position, there is a high chance it will distort, and not retain the display as well as intended.

Check that the clip lines up with the markings for the fastener mounting holes, then drill the holes. Fasten the mounting clip in place with the supplied screws.

The display can then be fitted by pressing into the mounting clip aperture - a positive 'click' should be felt when the display engages with the clip. Check that all four edges of the display make good contact with the mounting surface, and apply adequate compression to the gasket.

Fitting with retention bracket

The Triton display may be mounted using only the mounting clip, or may be secured additionally with the retention bracket. In order to secure the bracket, adequate rear access must be available to fit the fasteners.



Before fitting the display in to the mounting position, firmly wind the threaded rods into the back of the Triton display by hand.

Place the display in to position and fit the retention bracket, followed by washers and fasteners.

Multiple displays

If mounting Triton displays in a row or column, ensure that enough space is left for the sun covers to clip on.

Even where the sun covers are not required, the correct spacing should be used, as the displays require 3.5mm on each side when rotating for removal from the mounting clip.

The absolute minimum space that should be allowed for each display is:

- Width: 123 mm (4.84")
- Height: 120mm (4.72")

Wiring

The B&G Triton Display can be connected to either an NMEA2000 or SimNet network. There is no separate power cable, as the unit is powered from the network.

There are two Micro-C connectors on each display, allowing for daisy chaining, which greatly increases the ease of connecting multiple displays that are in close proximity, and can save in cable weight and loom size. Note this method is approved in SimNet networks, but not in NMEA 2000 networks.

Introduction to NMEA 2000 (SimNet)

NMEA 2000 is a combined electrical and data specification, and is based on CAN (Controller Area Network - SAE J1939) bus technology. NMEA2000 permits exchange of data and commands between the interfaced products. NMEA2000 stipulates the use of Micro-C and Mini-C hardware for the physical aspect of the network.

SimNet is largely based on NMEA2000, but with added proprietary messages, and it's own physical cable and connector system. The data transfer capacity of NMEA 2000 is 50 times higher than that of the NMEA0183 standard at 4800 baud.

Most NMEA2000 devices can be connected directly to a SimNet backbone and SimNet devices can be connected to an NMEA 2000 network by using adapter cables. The physical layout and limitations of the two networks are nearly identical, so the following information is interchangeable.

Essential network information

- NMEA 2000 is a powered network. It must have a separate 12-15 V DC power supply protected by a 5 Amp fuse. Do not connect the NMEA 2000 power cable to the same terminals as the start batteries, Autopilot Computer, Radar, thruster or other high current products
- An NMEA 2000 network consists of a linear "backbone" from which "drop cables" connect to NMEA 2000 devices
- A single drop cable has a maximum length of 6 m (20 ft). The total length of all drop cables combined should not exceed 78m (256 ft)
- An NMEA 2000 network has a maximum cable length of 100 m (328 ft), between any two points

- An NMEA 2000 network needs to have a terminator at each end of the backbone. A terminator can be one of the following:
    - a power cable with built in terminator
    - a terminated blanking plug
    - a wind transducer (terminator is in the mast head unit as opposed to mast cable).
- Certain Simrad products have two Micro-C or SimNet connectors, which can be made to be an in line component of the backbone. Connecting from device to device is known as 'daisy chaining' This network topology is not officially NMEA 2000 compliant.
- NMEA2000 devices can be connected to the SimNet Network providing they:
    - are NMEA2000 certified, or state full compatibility
    - meet the CE, FCC regulations with a SimNet adapter cable
    - do not exceed the SimNet load specification - see Simrad SimNet Installation Manual (20222006)

Planning and installing a network backbone

Plan the backbone carefully.

The NMEA 2000 backbone needs to run between the locations of all products you want to install, typically in a bow to stern layout, and be no further than 6 m from a device to be connected.

Choose from the following components to make up your NMEA 2000 backbone:

- Micro-C cables: Available lengths from 0.4 m (1.3 ft) to 25 m (82.5 ft)
- Micro-C power cables with or without termination
- T-connector. Use at locations where you want to connect a device by drop cable
- Wind transducer. If using a wind sensor, plan to connect this to one end of the backbone as this has a terminator built in
- Micro-C male and Micro-C female to SimNet adaptor cables for connecting to existing SimNet bus, or adding devices fitted with a SimNet connector to a Micro-C network.

Power the network

An NMEA 2000 network requires its own 12 V DC power supply protected by a 5 amp fuse or breaker.

In smaller NMEA 2000 systems, the power connection may be made anywhere in the system,

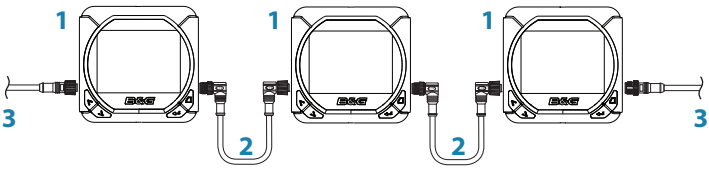
For larger systems introduce power at a central point in the backbone to "balance" the voltage drop of the network. Use a power cable without termination.

→ ***Note:*** When joining an NMEA 2000 network to a SimNet network, it is not necessary to introduce power to both.

→ ***Note:*** Do not connect the power cable to the same terminals as the autopilot computer, pulse radar, bow thruster or other high current devices - the network may be affected by voltage drop when these devices are operated. Avoid connection to the engine starting batteries where possible.

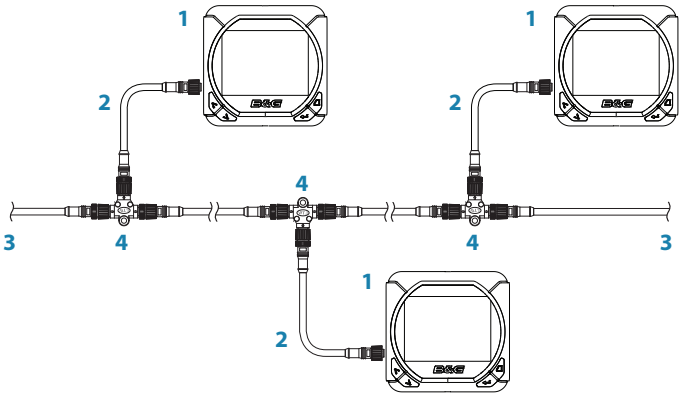
Daisy chaining the Triton display

Where displays are located close together, the supplied right angle Micro-C cable may be used to link the displays in series. The daisy chain should form part of the back bone. It is not advisable to daisy chain devices off a drop cable.



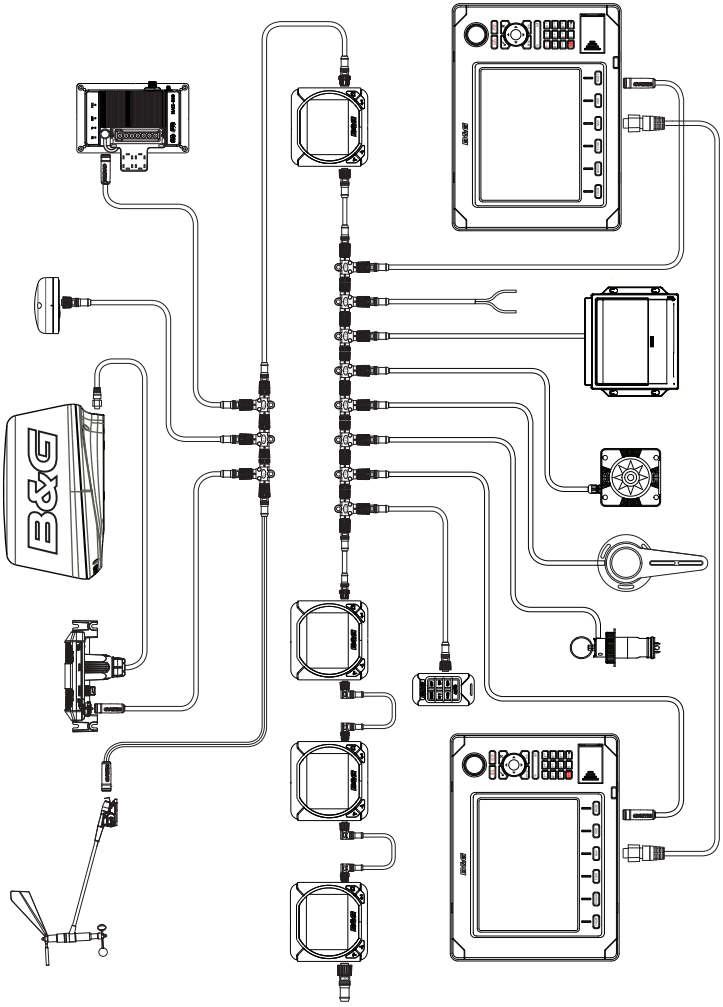
1. Triton Display
2. Right angle Micro-C plug connector cable 0.4m (supplied)
3. NMEA2000 / SimNet backbone

Drop cable connection of the Triton display



1. Triton Display
2. Drop cable
3. NMEA2000 / SimNet backbone
4. Micro-C T-connectors

Typical network example



Display

This section focuses on initial setup of settings that should require infrequent adjustment. For regularly used features, refer to the Operation or Quick Guide.

Setup wizard

The first time a new Triton display is turned on, the Setup Wizard will guide you through essential configuration items.

- Language
- Boat Type
- Set Date and Time Format
- Unit Selection
- Display Mode

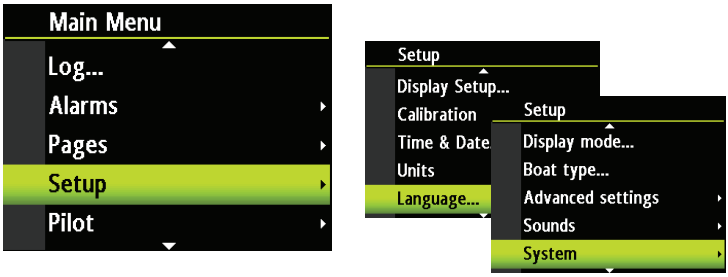
The available settings and descriptions are given in the following section on the Setup Menu.

Setup

Setup Menu

Under normal operation, the unit will power up displaying the most recently used data page. To enter the menu use the selection key.

Select Setup for further options detailed in this section.



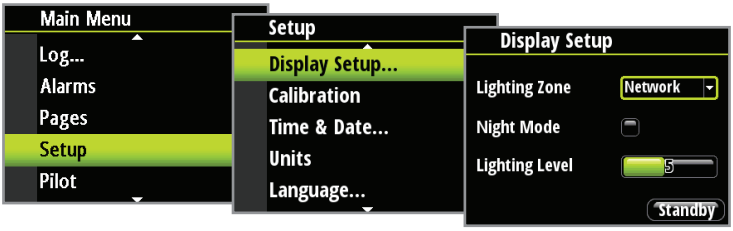
System setup

In display setup you can set the lighting zone, enter night mode and change the lighting level.

➔ ***Note:*** Press and hold the 'Enter' key for 3 seconds will take you directly to the display setup lighting level screen. If the lighting level is set below 5 it will automatically increase to 5. Use the up and down keys to set the desired level and press 'Enter' to confirm.

Lighting zone

All units in the selected lighting zone will mirror each other's light settings. Default setting is Network.



Night mode

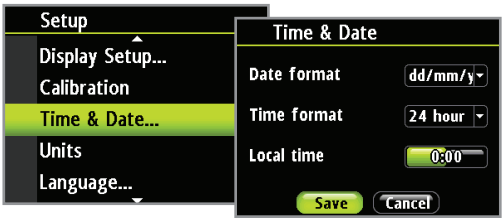
Change the display to night mode colour pallet. All displays in the selected lighting zone will also change to night mode.

Lighting level

Adjust the back light level from 1 - 10.

Time & Date

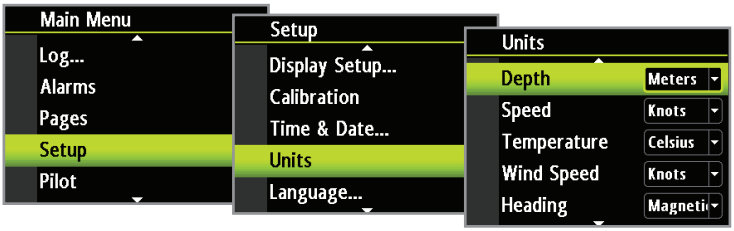
From the time and date menu you can set your preferred time / date format and local time offset. Once complete select Save to save your settings and exit.



➔ ***Note:*** Local time is calculated based on UTC provided via a GPS unit connected to the network.

Units

Set the preferred unit of measurement you want data to be displayed in.

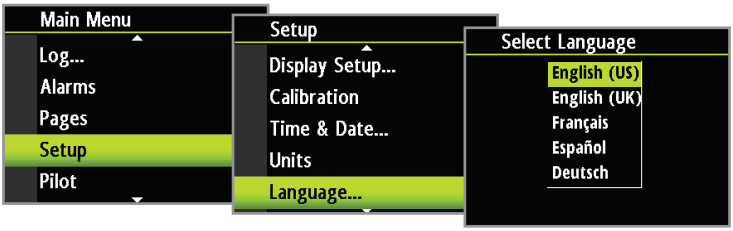


Parameter	Options	Default value
Boat speed	kn Knots	kn
	kph Kilometers per hour	
	mph Miles per hour	
Wind speed	kn Knots	kn
	m/s Meters per second	
	mph Miles per hour	
Distance	nm Nautical miles	nm
	mi Miles	
	km Kilometers	
Depth	ft Feet	m
	m Meters	
	fa Fathoms	
Heading	°M Magnetic	°M
	°T True	
Temperature	°F Fahrenheit	°C
	°C Centigrade	
Pressure	Hg Inches of Mercury	mb
	mb Millibars	
	hPa Hectopascal	

→ ***Note:*** If magnetic variation is not available via a GPS an offset can be entered manually. See Magnetic variation for more information.
The same applies if the user wants to read magnetic heading, but only receives true heading from the compass.

Language

The display can be set to different languages to suit your preference.



Display mode

There are 3 display functionality modes. Highlight the desired mode and press 'Enter' to select.

Instrument display only

Displays instrument data only. No Pilot data page is viewable.

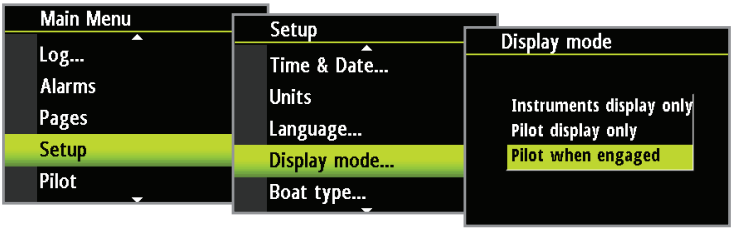
Pilot display only

Displays Pilot data only. No instrument data pages are viewable.

Pilot when engaged

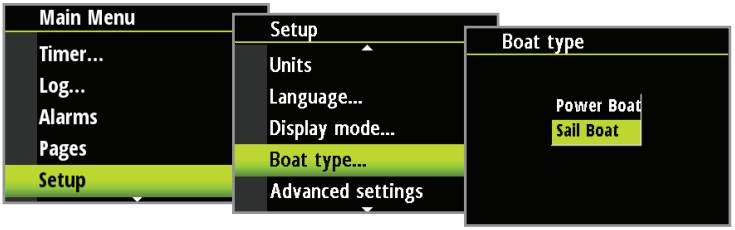
Possible to view instrument data pages at all times and Pilot data when a Pilot system is installed and connected to the network.

→ ***Note:*** The Pilot page is automatically displayed when the Pilot is engaged.



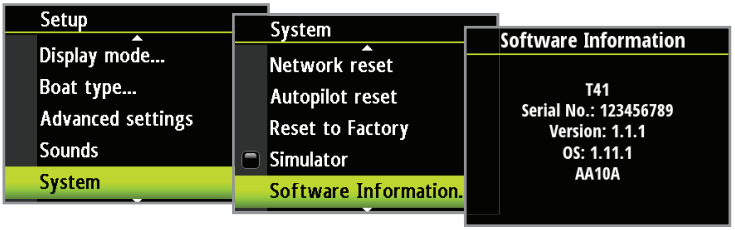
Boat type

Allows selection between Power Boat or Sail Boat. Boat type changes the icon on the depth plot page, as well as determining available features and operational modes for the autopilot.



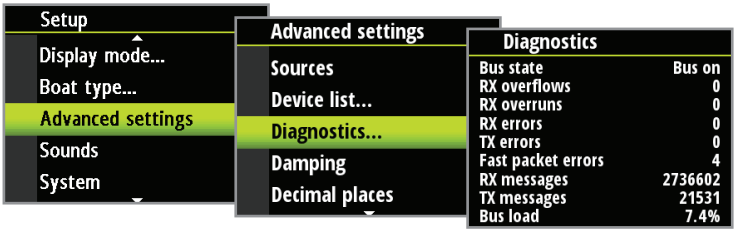
Software information

Shows the software version currently installed on the display. Press 'Enter' or the 'Page' key to navigate back to the menu.



Diagnostics

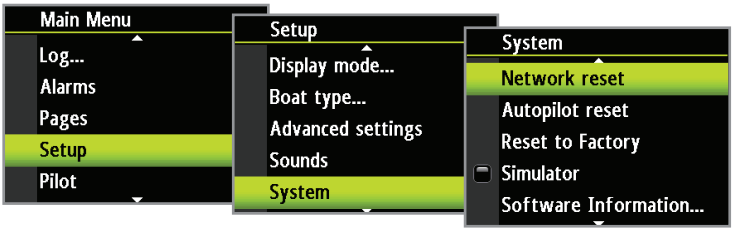
Shows an overview of the data being transmitted on the network, The list shows the network bus status, bus load as a percentage as well as quantity and type of data messages.



→ ***Note:*** We recommend that you use this diagnostic tool as a basic overview of the network status. For more detailed information it is suggested that you check the individual source information via the device list.

System

From the system menu there are several options to reset the system, place the display into simulator and get the current software information.



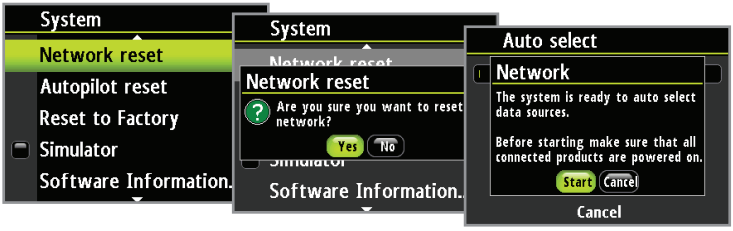
Reset options

There are a variety of reset options available from the system menu.

➔ ***Note:*** Whenever a reset option is selected there will be a dialog box asking you to confirm that you wish to reset before any further action is taken. If you wish to cancel the reset, selecting No will return you to the system menu.

Network reset

Resets the source selection on all displays connected to the network.



Autopilot reset

Resets the Pilot and returns all settings to factory defaults.

⚠ Warning: The Pilot will need to be commissioned before it is fit for purpose. Do not engage the autopilot until it has been commissioned and a sea trial has been completed.

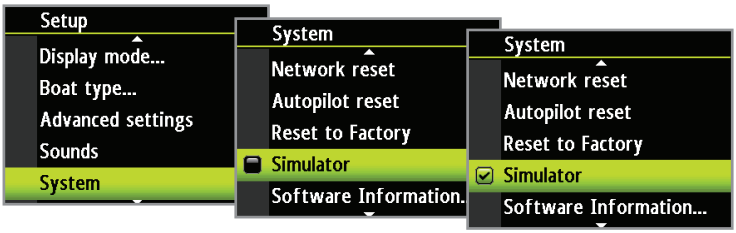
Reset to Factory

Resets the current display to the default settings. When the unit is restarted you will see the original startup wizard asking you to set the display.

> ⚠ Warning: All settings for instrument and Pilot will be restored to factory default. The Pilot will need to be commissioned before use.

Simulator

Simulator mode sends simulated data to the display.



> ⚠ Warning: It is not advisable to enter simulator mode when using your instrument system as a navigation aid.

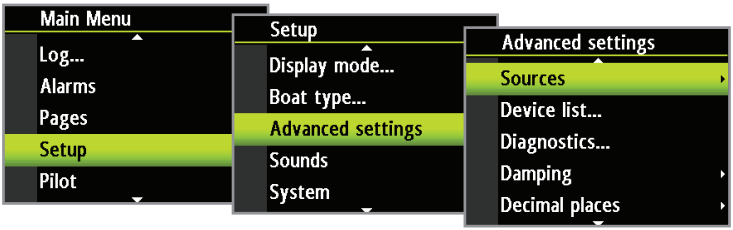
Sources

A data source can be a sensor or a device connected to the NMEA2000 network, providing information and commands to other networked devices. The data sources are normally configured at first time turn on.

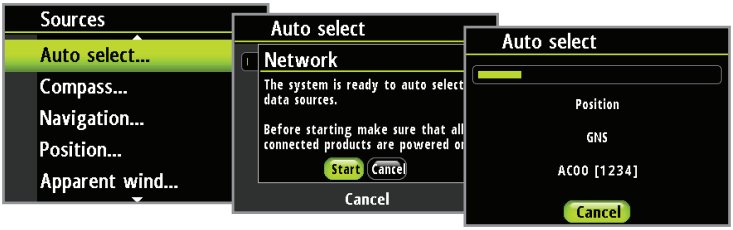
It should only be necessary to update this data if a new source is added, source is missing (sensor failure), source has been enabled/ disabled, sensor replaced or a network reset.

Auto select

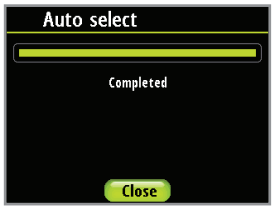
The Auto select option will look for all sources connected to the instrument system. If more than one source is available for each item, the display will automatically select from the internal device priority list.



1. Verify that all interfaced units are powered on
2. Press the 'Enter' key to start the auto select procedure



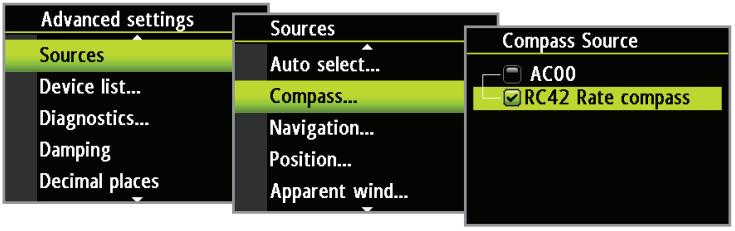
The operator will be noted when the auto select process is completed.



➔ ***Note:*** If more than one source is available on the network you can chose your preferred source from the sources menu. See "Manual source selection" for more information.

Manual source selection

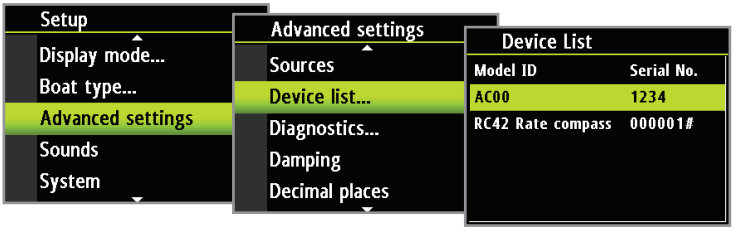
If more than one source is available for an item, the preferred source may be selected manually. As an example, the following illustrations show how the compass source is changed.



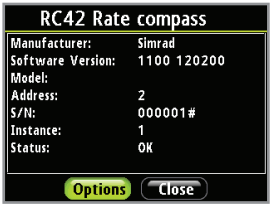
Select the preferred data source. The selected source will be indicated by a tick in the check box.

Device list

Shows a list of devices connected to the Network.



Selecting a device from the list will show you an information pane with details of that device.



Some devices such as an RC42 compass store their configuration, calibration and offset data in their own memory and not in the display memory. For devices of this type you can check the data information, configure and calibrate the device by selecting Options.

Data

The data list shows the data type that the device is transmitting.

Configure

Instance

Enter a number to differentiate between instances of the same device.

Offset

Certain devices will let you enter an offset value to compensate for the position of the sensor or variation of sensor data.

→ ***Note:*** Some devices can be configured further. If a device transmits other data it may be shown on this page also.

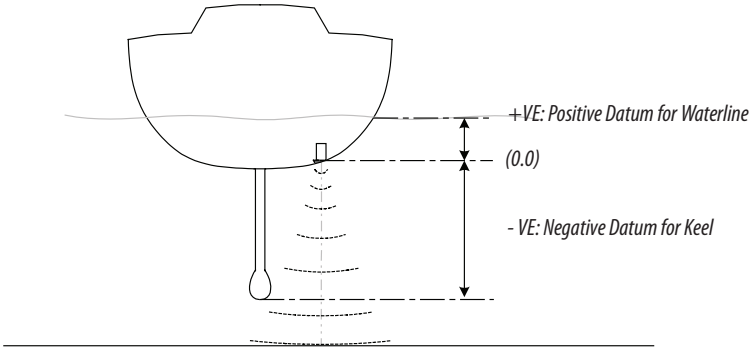
Calibrate

For compass sensors only, once installed you will need to calibrate the device. Select Calibrate and follow the instructions on the display. See calibration section of the manual for more information.

Calibration

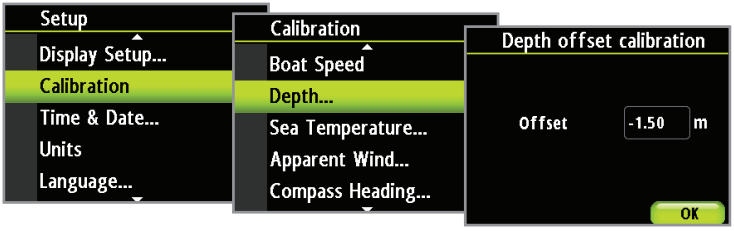
Depth

A typical transducer installation is through the hull in front of the keel. A datum (offset value) can be set, such that the depth display refers to either the water line or the base of the keel.



Setting the depth offset displays depth readings from directly below the keel or propellers of the boat, or from the waterline to the seabed. This makes it easier to see the available depth, taking into account the draught of the boat.

The offset value to be entered should represent the distance between the face of the depth transducer, and the lowest part of the boat below the waterline, or the distance between the face of the depth transducer and the water surface.



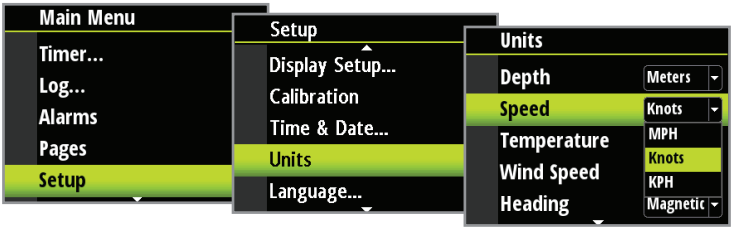
Sea temperature

If a suitable temperature sensor is fitted, the system will monitor the sea temperature.

The offset value to be entered should adjust the temperature reading from the sensor to match a calibrated thermometer when submersed in the water

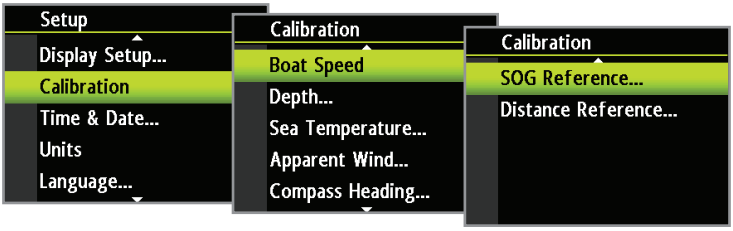
Boat speed

Speed calibration is necessary to compensate for hull shape and paddlewheel location on your boat. For accurate speed and log readings, it is essential that the paddlewheel is calibrated. Boat speed values can be shown in knots, kph or mph. Your preferred unit of measurement can be set in the units page of the setup menu.



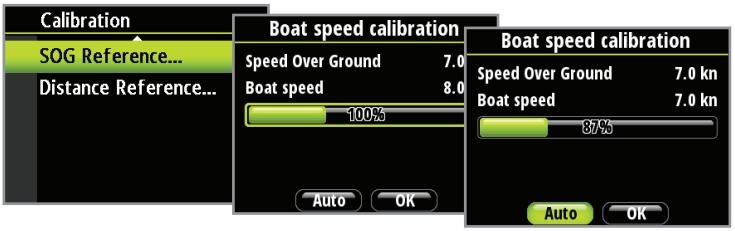
Auto - Calibration via reference to GPS SOG value

This is an AutoCal facility that uses speed over ground (SOG) from your GPS and compares the average of SOG against the average boat speed from the speed sensor for the duration of the calibration run.



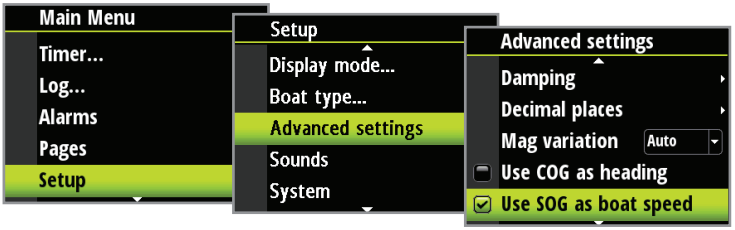
➔ ***Note:*** This calibration should be made in calm sea with no effect from wind or tidal current.

1. Bring the boat up to cruising speed (above 5 knots)
2. Select Auto on the Boat speed calibration page
3. When the calibration is completed the Boat speed calibration scale will show the adjusted percentage value of the boat speed.



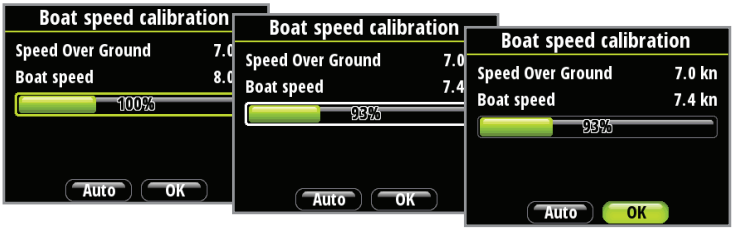
USE SOG as boat speed

If boat speed is not available from a paddle wheel sensor it is possible to use speed over ground from a GPS. SOG will be displayed as boat speed and used in the true wind calculations and the speed log.



Manual adjustment of boat speed

Adjust the boat speed manually by selecting the Boat speed percentage slider. Adjust the percentage up or down as desired. Confirm the value. Select OK once complete.



Distance reference

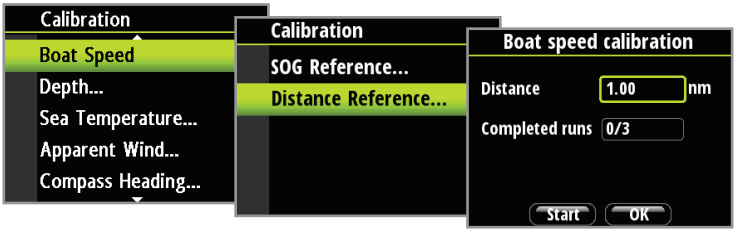
This facility enables the user to calibrate the log accurately and simply. Calculations are performed by the display that works out the boat speed over a known distance.

To calibrate the boat speed via a distance reference you will need to complete consecutive runs, under power at a constant speed made along a given course and distance.

➔ ***Note:*** To eliminate the effect of tidal conditions it is advisable to perform at least two runs, preferably three, along the measured course.

How To Calibrate via Distance Reference

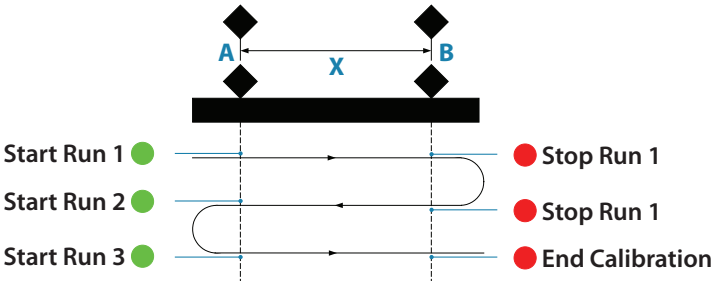
Enter the desired distance in nautical miles that you would like to calculate the distance reference over.



When the boat gets to the predetermined starting position of the distance reference calculation start the calibration timer.

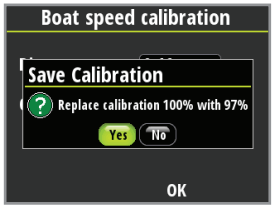
Distance reference diagram

Referring to the diagram reference diagram, A and B are the markers for each run and X is the actual distance for each run as ascertained from a suitable chart or GPS for example.



As the boat passes marks A and B on each run, instruct the system to start (Start Run) and stop (Stop Run) and finally OK to end calibration (End Cal Runs).

After the last run is completed and OK has been selected, a pop up warning will ask you if you wish to replace the current calibration with the new one. Select Yes to complete.

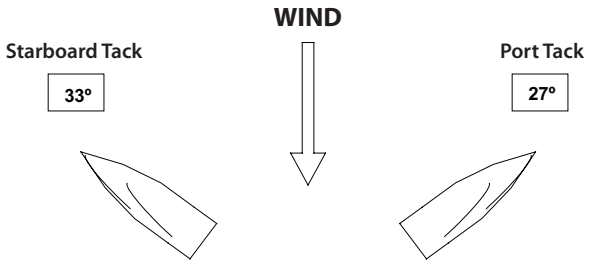


Apparent wind

This provides an offset calibration in degrees to compensate for any mechanical misalignment between the masthead unit and the center line of the vessel.

To check the masthead unit alignment error we recommend you use the following method which involves a sailing trial.

Sail on a starboard tack on a close hauled course and record the wind angle, then repeat the process on a port tack. Divide the difference between the two recorded numbers and enter this as the wind angle offset.



Starboard tack = 33º

Port tack = 27º

Difference: 33º - 27º = 6º

Offset: 6º/2 = -3º

If the starboard apparent wind angle is greater than the port angle then divide the difference by 2 and enter this as a negative offset. If the port angle is greater than the starboard then divide the difference by 2 and enter this as a positive offset.

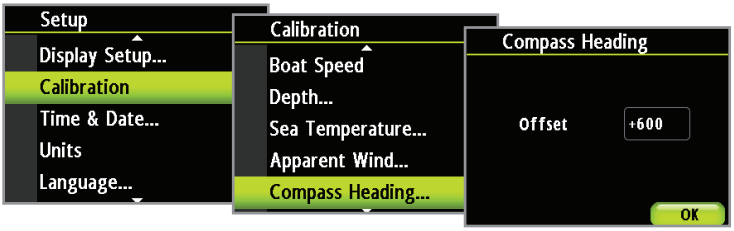
Compass heading

The compass offset compensates for fixed errors (misalignment) between the compass sensor and the direction of the boat.

To accurately enter a compass offset, the boat's heading must be referenced to, for example: a calibrated bowl compass.

The offset value will be the difference between the known source and the currently displayed heading.

Enter this value as the offset in the compass heading field as a plus or minus integer up to 180º



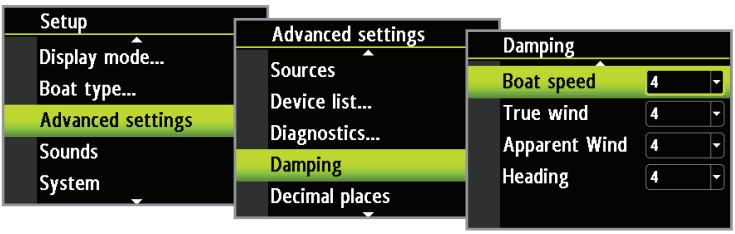
USE COG as heading

If heading data is not available from a compass sensor it is possible to use course over ground from a GPS. COG will be displayed as heading and used in the calculation of true wind direction.

→ ***Note:*** The autopilot cannot be operated using COG as the heading source. COG cannot be calculated when stationary.

Damping

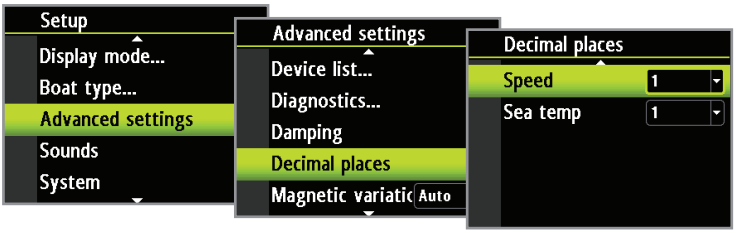
The damping rate effects the frequency that the sensor data is updated on the display, the greater the damping value the smoother the number change will be but the slower the response will be to data change.



Decimal places

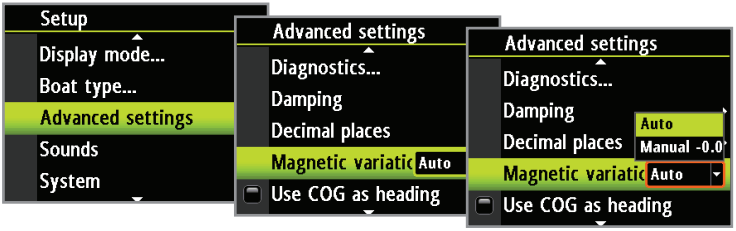
It is possible to change how many decimal places speed and sea temperature data will be displayed with.

Choose how many decimal places you wish to have shown for that specific data type.



Magnetic variation

Adjust how the system handles magnetic variation.

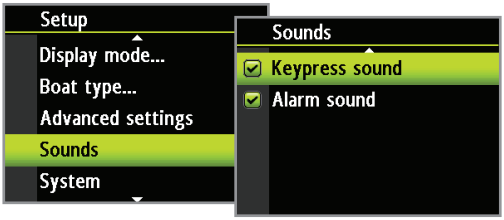


Auto: Automatically calculates variation based on position and date.

Manual: If variation is not available enter a value manually.

Sounds:

Turn the keypress and alarm sounds on or off.

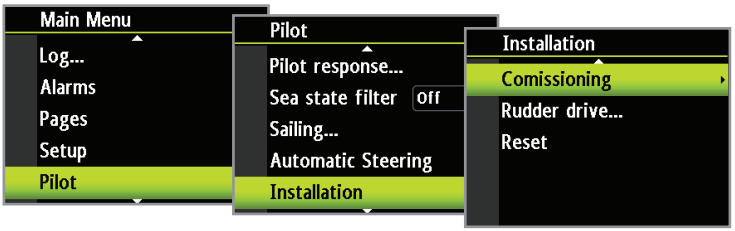


→ ***Note:*** Silencing the alarm sound does not deactivate the alarms. When an alarm is activated the warning notification will be shown on the display regardless of the sound being on or off.

Autopilot

If an AC12 or AC42 autopilot computer is connected to a Triton display and AP controller, autopilot control and setup functionality will be made available.

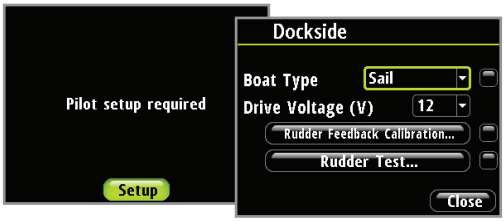
> ⚠ Warning: The installation settings must be performed as part of the commissioning of the Pilot system. Failure to do so correctly may prohibit the Pilot from functioning properly! The Installation menu can only be accessed in Standby mode.



➔ ***Note:*** Some important points regarding the installation settings:
When the Pilot is delivered from factory and ANY TIME AFTER AN AUTOPILOT RESET HAS BEEN PERFORMED, the installation settings are all reset to factory preset (default) values. The automatic interface prompt will appear and a complete setup has to be made.

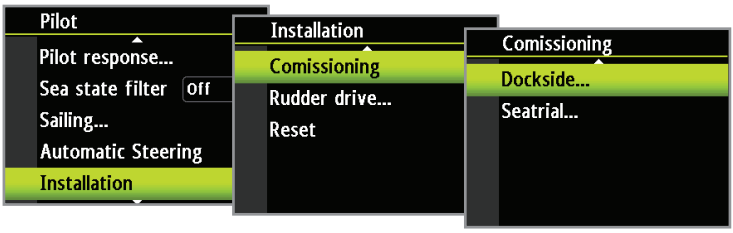
The Sea trial settings are dependent on successful completion of the Dockside settings.

➔ ***Note:*** If you select the Pilot page and the Pilot has not been commissioned you can go straight to the commissioning page by selecting Setup.



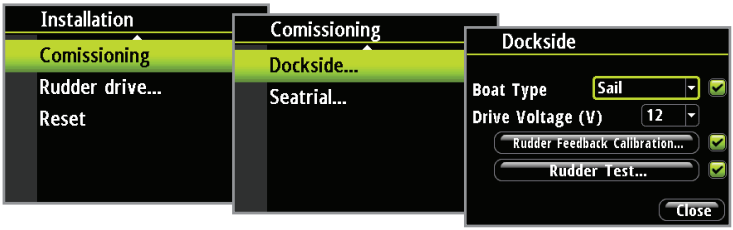
Autopilot Setup

Before the Pilot can be used you must first commission it and complete all of the dockside procedures before it is operational.



Dockside

The dockside procedures are initiated from the commissioning dialog. Completed procedures are labelled with a tick.



The following menu items are accessible and can be set up in the Installation menu:

- Boat type
- Rudder feedback
- Drive voltage
- Drive engage
- Rudder test
- Depth calibration
- Minimum wind angle
- Nav change limit

Boat Type

Type of boat selected will affect the steering parameters, and the functions available in the autopilot system. The options are: Planing, Displacement, Sail and Outboard.

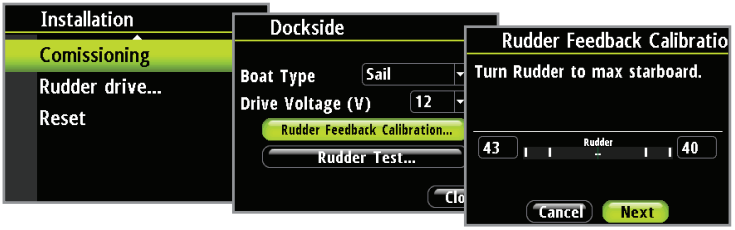
➔ ***Note:*** Wind mode is only available if boat type is set to sail.

Drive voltage (V)

Sets the drive voltage type to 12 or 24V

Rudder Feedback Calibration

Make sure the unit is installed and aligned as per instruction in the AC12/42 Installation manual. The rudder feedback calibration will set the correct relationship between the physical rudder movement and the rudder angle readout.



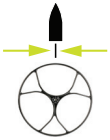
Max starboard

- Manually move the helm to starboard until the rudder stops at starboard lock hard over.
- The Max starboard angle is the angle read by the rudder feedback unit before any adjustment is made.
- If the actual rudder angle is different from the angle displayed, correct the reading with the Up/Down keys.
- Confirm Rudder feedback calibration to starboard by selecting Next.

Max port

- Manually move the helm to port until the rudder stops at port lock hard over.
- Adjust the displayed angle the same way as for starboard rudder.
- Confirm Rudder feedback calibration to port by selecting Next.

➔ ***Note:*** Many boats have ±45° (90° H.O. - H.O.) rudder angle as standard. So if you are not going to make any adjustment to the displayed angle you should still highlight the reading and confirm. This is necessary to prevent the rudder from hitting the end stops.



Set Rudder to 0 (zero)

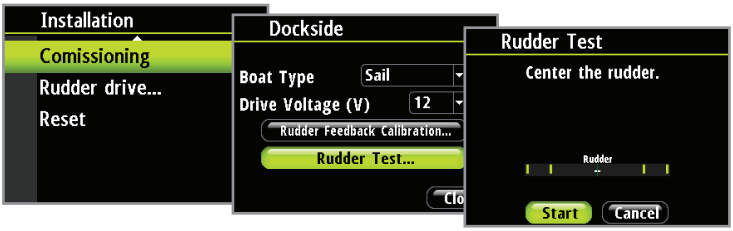
Bring the rudder to midship position and confirm. This will adjust an incorrect reading caused by misalignment of the rudder feedback unit.

Rudder Test

➔ ***Note:*** If the boat uses power assisted steering, it is important that the engine or electric motor used to enable the power assist steering be turned on prior to this test.

> ⚠ Warning: Stand CLEAR of the wheel and do not attempt to take manual control of the wheel during this test!

Bring the rudder manually to midship position before starting the test.



After a few seconds the autopilot Computer will issue a series of PORT and Starboard rudder commands and automatically verify correct rudder direction.

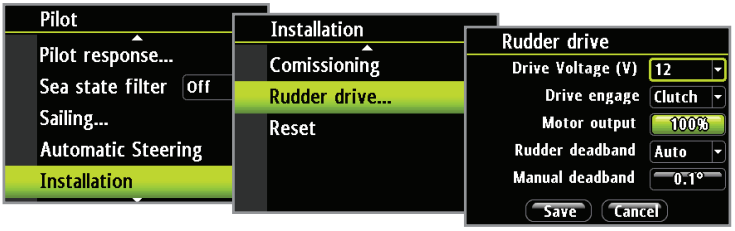
It detects minimum power to drive the rudder and reduces the rudder speed if it exceeds the maximum preferred speed (8°/sec.) for autopilot operation.

The Rudder test is verified by the display showing Completed Rev. motor, Completed Solenoids, or Failed. If Failed is given, check for correct electrical connection.

Also refer to "Alarms"

Rudder drive

Ensure that the rudder information is set correctly before you continue with the Dockside commissioning.



Drive voltage (V)

Sets the drive voltage to the type installed on the vessel 12 or 24V

Drive engage

Drive engage has the following settings: Auto and Clutch.

Clutch:

This is the default setting and it allows you to steer the boat from the helm when in Standby mode. A clutch will be engaged on the drive unit locking out the steering when Auto is selected.

Auto:

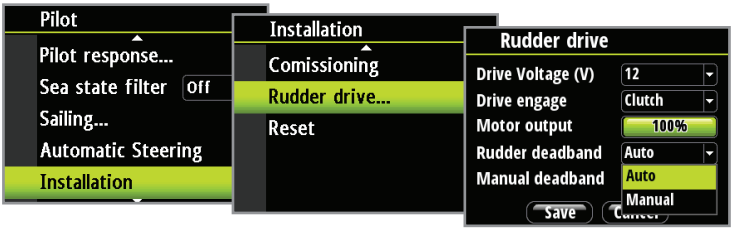
This setting is implemented for future use. Always use the Clutch (default) setting.

Motor output

The Motor output (displayed as a percentage) is the amount of available power needed to achieve correct rudder speed on automatic steering (Maximum speed is used in NFU mode). This setting will allow you to adjust the rudder speed to be different from the one automatically set in the rudder test.

Rudder deadband

The rudder deadband function is adaptive and is continuously updating. It prevents the rudder from hunting and the adaptive function optimizes the deadband to the speed of the boat and the load on the rudder.

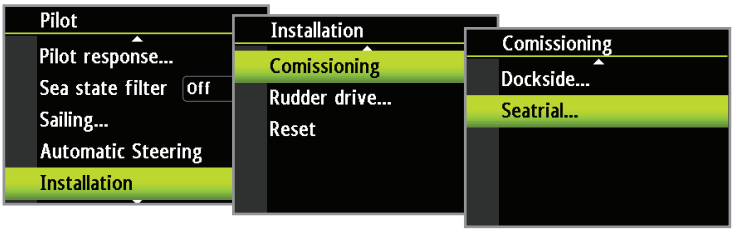


If the auto-setting does not perform properly due to high inertia from the wheel, it can be adjusted manually.

Find the lowest possible value that will prevent the rudder from continuous hunting. A wide deadband will cause inaccurate steering. It is recommended to check rudder stability in Auto mode when the boat is moving to get pressure on the rudder.

Sea trial

After completing the Pilot calibration and all settings in the installation menu, you will need to perform a final sea trial.

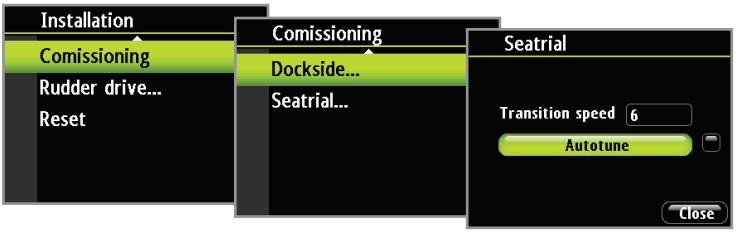


➔ ***Note:*** The sea trial should be conducted in open waters at a safe distance from other traffic.

- •Steer the boat on all cardinal headings in Auto mode
- •Start with low and medium speeds to get familiar with the response from the Pilot
- Verify the Hi/Lo transition and the effect of Lo and Hi parameter settings
- Check the effect of the Response adjust
- Set waypoints into each navigator connected to the system, and verify that the Pilot steers in Navigation mode for each Navigation source
- If the boat is a sailboat use the Wind mode and engage the Pilot at different wind angles.
- If the rudder response feels aggressive during the sea trial, you may want to reduce the rudder speed to get a smoother steering. On a sailboat you may want to have a higher rudder speed when running downwind.
- The motor Drive Out can be set with the above in mind. Never adjust in more than 10% steps with respect to the reading set during the automatic rudder test. Always perform a new Autotune after the adjustment.

Autotune

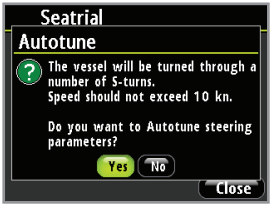
Autotune is a feature that automatically sets the most important steering parameters (Rudder and Counter Rudder) by taking the boat through a number of S-turns. The scaling factors of the parameters are also set automatically as a function of the boat type selection performed in the Dockside menu.

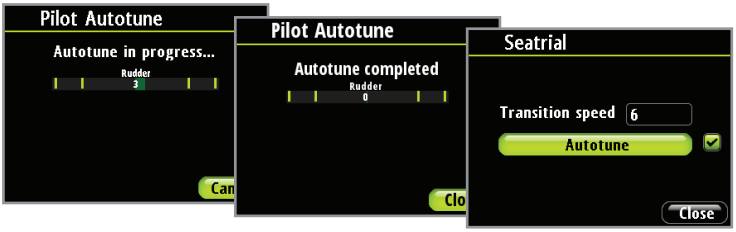


The automatic tuning process is also verifying/adjusting the Rudder zero alignment made in Dockside setup. Automatic tuning is a procedure that is not required for the Pilot to function as it is preset with steering parameters that should steer most boats in the 30 - 50 foot range.

Recommended speed during Automatic tuning should not exceed 10 knots. It should be performed in calm or moderate sea conditions. For displacement boats use a speed that is approximately half the normal cruising speed (i.e. if cruising speed is 10 knots, perform the Autotune at about 5 knots).

Select Autotune to begin the tuning process. Select yes to confirm Autotune.





After the Autotune has been completed the rudder must be controlled manually, as the autopilot has returned to Standby mode. The Automatic tuning function will take control of the boat and perform a number of S-turns.

➔ ***Note:*** Autotune must always be performed in open waters at a safe distance from other traffic. The Automatic tuning function may take from 2 to 3 minutes to complete. To stop the Autotune, press the 'Enter' key.

After the Autotune process has been completed, a tick will appear next to the Autotune tab and there should be no need for further adjustments. Fine tuning of these parameters are made by the response control, however, viewing or changing the parameters can be made in Auto mode by entering Installation in the Main menu.

Pilot response

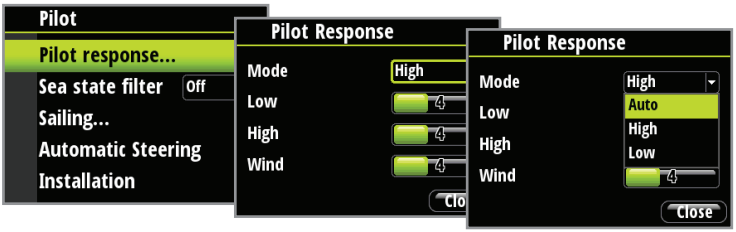
The Autotune function is so refined that the majority of boats will need no further adjustments of the steering parameters. On some boats, however, in particular sea conditions a fine tuning of the steering parameters may improve the performance of the autopilot.

The Response control allows you to make this fine tuning for each of the two (Hi/Lo) parameter sets. The response can be set to nine levels. Level 4 is default with parameter values as set by the Autotune function. If no Autotune is made (not recommended) the level 4 values are the factory default values.

- A low response level reduces the rudder activity and provides a more loose steering.
- A high response level increases the rudder activity and provides a more tight steering.
- Response level too high will make the boat start S-ing.
- When you access the RESPONSE page the highlighted Response parameter is the one that is active.

➔ ***Note:*** Adjustment of Hi and Lo values can be performed even with the boat out of the water.

Selection of Hi / Lo parameters



The Manual select item has three alternatives:

Auto – Hi – Lo.

- Auto is automatically set by speed input
- Hi or Lo must be set manually when there is no speed input

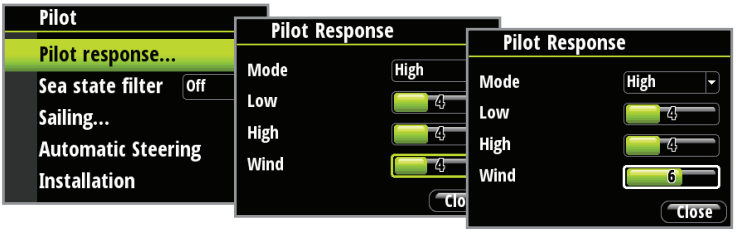
The sub-headline in the display shows the active parameter set and how it is selected.

Wind response

Verify that the difference between Set Heading and the actual heading is at an acceptable minimum.

If the difference between the set wind angle and the actual wind angle is too high, increase the Wind response to reduce the difference.

If the actual wind angle is S-ing around the set wind angle, or the rudder activity is too high, the Wind response should be reduced.



Range	Change per step	Default
1 - 9	1	4

Sea state filter

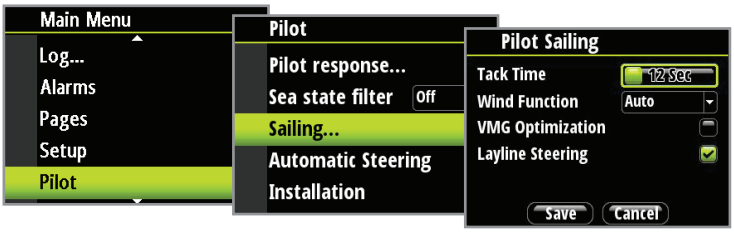
The Seastate filter is used to reduce rudder activity and autopilot sensitivity in rough weather.

Off:	Seastate filter is disabled. This is default.
Auto:	Reduces rudder activity and autopilot sensitivity in rough weather by an adaptive process. The Auto setting is recommended if you want to use the Seastate filter.
Manual	Linked to the Response control setting in the Main menu. It may be used to manually find the optimum combination of course keeping and low rudder activity in rough but steady sea conditions.

Sailing

Set how the Pilot will respond when it is set for use with a sail boat.

Note: Sailing is only available in the menu if Boat type is set to Sail in the Installation menu.



Tack time

When performing a tack in Wind mode, the rate of turn (tack time) can be adjusted. This will give single-handed sailors time to handle the boat and the sails during a tack.

A turn performed without shifting wind side, will also be made at a controlled turn rate.

Range	Change per step	Default	Units
2 - 50	1	12	Second

Tack angle

In Wind function Auto mode the set tack angle replaces a similar change of the set course using the starboard and port keys.

Range	Change per step	Default	Units
50 - 150	1	100	°

Wind function

With Wind function set to auto, the autopilot will automatically select between apparent and true wind steering. Auto is default and recommended for cruising. When the boat is running, it will also be surfing on the waves.

This may lead to significant changes in boat speed, hence changes in apparent wind angle. True wind steering is therefore used when running, while steering to apparent wind is used when beating or reaching.

When sailing in closed waters, the apparent wind angle may change temporarily due to gusts. It may then be preferred to sail to; select True.

Range	Default
Auto - Apparent - True	Auto

VMG optimizing

Optimizing the VMG to wind will be active for 5–10 minutes after a new wind angle has been set and only when beating.

Range	Default
On - Off	On

Layline steering

Layline steering is useful when navigating. Cross Track Error (XTE) from the navigator will keep the boat on the rhumb line. If the XTE from the navigator exceeds 0.15 nm, the autopilot will calculate the layline and track towards the waypoint.

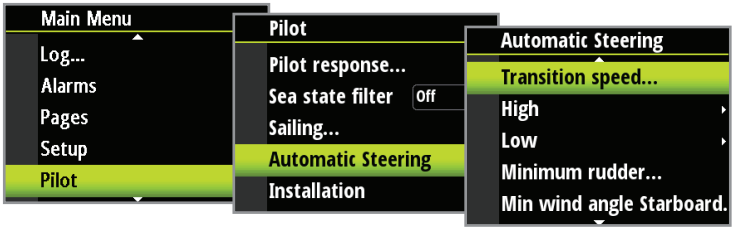
XTE will be displayed in the upper left corner above the mode index when layline steering is active

Range	Default
Off - On	Off

Automatic steering

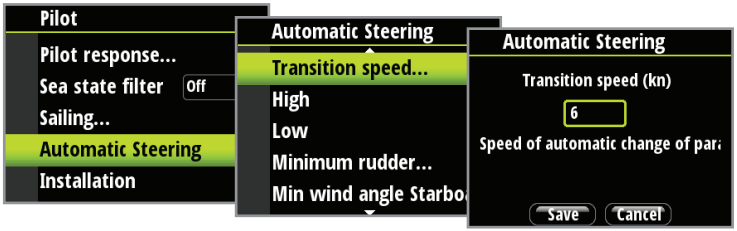
The Automatic steering menu contains steering parameters for compass steering, wind steering and nav steering. These steering parameters can be changed if needed to improve sailing performance.

From this menu you can set the transition speed, high and low boat speed parameters to account for changes in boat speed, rudder angle, wind and compass settings.



Transition speed

The Transition speed is the speed at which the Pilot will automatically change the steering parameter set from Hi to Lo parameters, or vice versa.



→ ***Note:*** The default setting of the Transition speed is 6 knots

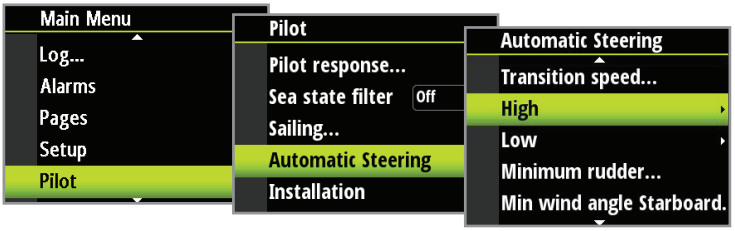
High

High value parameters for automatic steering at low speed and when running with a sailboat.

Low

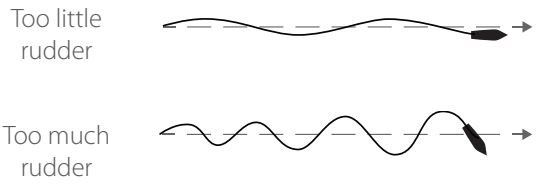
Low value parameters for automatic steering at high speed and when sailing into the wind or reaching with a sailboat.

➔ ***Note:*** The two most important parameters that determine the performance of the automatic steering are Rudder Gain and Counter Rudder.

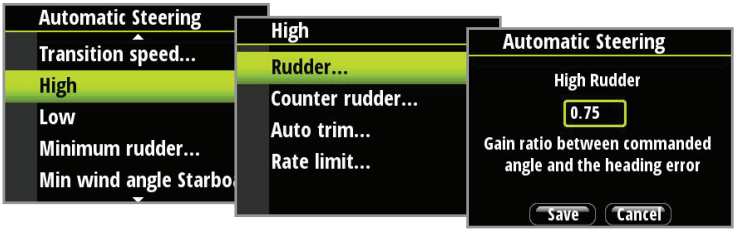


Rudder

Sets the rudder gain which is the ratio between the commanded angle and the heading error.



- Too little Rudder and the autopilot fails to keep a steady course
- Too much Rudder gives unstable steering and reduces speed
- Low speed requires more rudder than high speed



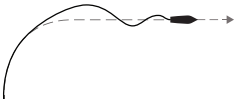
➔ ***Note:*** See also "Minimum Rudder"

Counter rudder

Counter Rudder is the parameter that counteracts the effect of the boat's turn rate and inertia. For a short time period it is superimposed on the proportional rudder response caused by the heading error. It may sometimes appear as if it tends to make the rudder move to the wrong side (counter rudder).

The best way of checking the value of the Counter Rudder setting is when making turns. The figures illustrate the effects of various Counter Rudder settings.

Counter rudder setting too low = Overshoot response



Counter rudder setting too high = Sluggish and creeping response

Correct setting of counter rudder, ideal response

Autotrim

Autotrim standard value is 40 seconds which should work well on most boats.

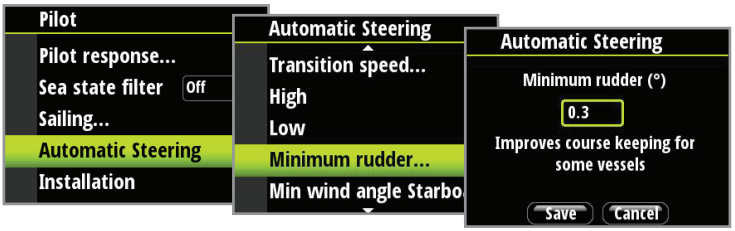
Rule of thumb: Set to same value (seconds) as the boat's length in feet.

Rate limit

Should be kept at 6.0°/second unless there is a need for more rapid response in turns.

Minimum rudder

Some boats may have a tendency to not respond to small rudder commands around a set course because of a small rudder, rudder deadband or Whirls/disturbance of the water-stream passing the rudder. Turning the Minimum Rudder function on, may improve the course keeping performance on some boats, but will increase the rudder activity.

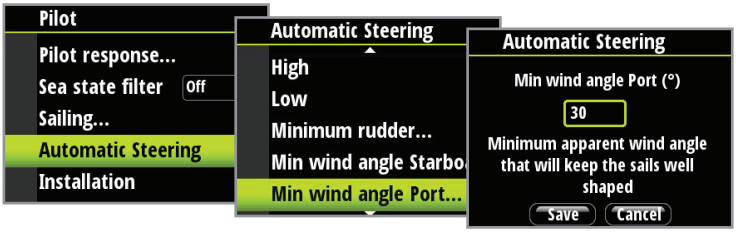


Range	Change per step	Default	Units
Off - 5	0.1	Off	°

➔ ***Note:*** During the sea trial, only set Minimum Rudder to ON if it proves to give a better course keeping performance in calm sea. It should be set after the Autotune has been performed and a possible fine tune of the Rudder parameter.

Minimum wind angle Port / Starboard

The Minimum wind angle is the apparent wind angle that the boat sails to when close hauled. This parameter will vary from boat to boat.



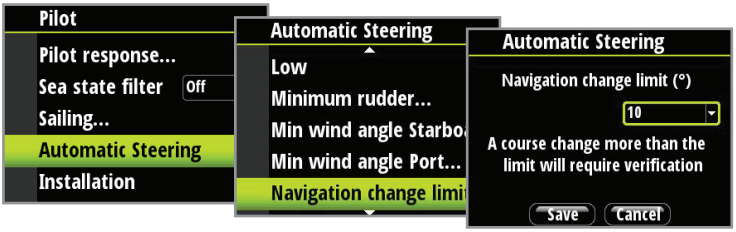
The Minimum wind angle applies for the tack-prevent function. It also applies when the autopilot is operating in WindNAV mode.

You can select different minimum wind angles for port and starboard. The difference between port and starboard will be taken into account when calculating the Distance To Turn (DTT).

Range	Change per step	Default	Units
15 - 90	1	30	°

Navigation change limit

In Navigation mode, when the required course change to next waypoint in a route is more than the set limit, you are prompted to verify that the upcoming course change is acceptable. The limit is adjustable.

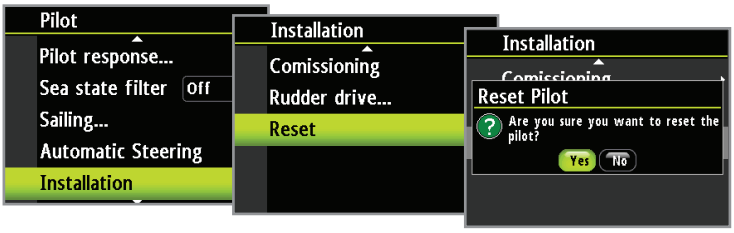


➔ ***Note:*** Nav change limit screen can also be reached from the Nav mode main screen by pressing the 'Menu' key followed by the 'Mode' key within 2 seconds.

Range	Change per step	Default	Units
10 - 30	10	10	°

Resetting the Pilot

⚠ Warning: all previous Pilot settings will be lost! Before engaging the Pilot the commissioning and calibration process must be completed.



Troubleshooting

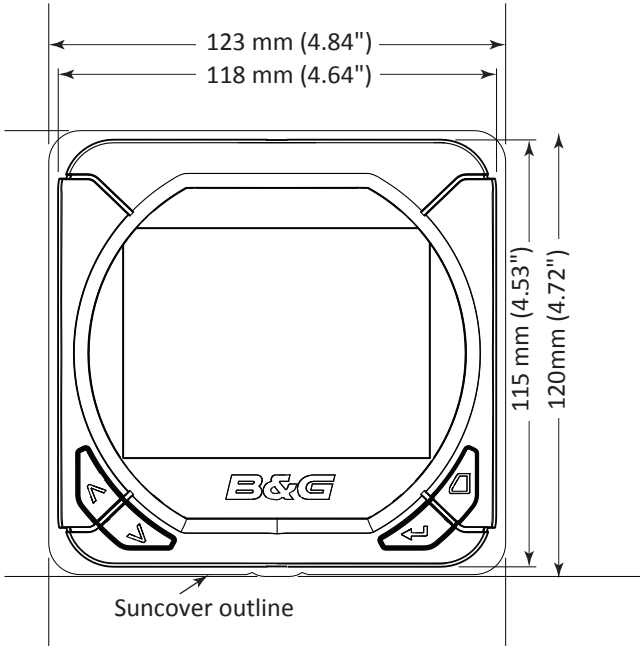
Issue	Solution
Unit does not power up	• Check that the NMEA2000/ SimNet network has 12V connected. • Try connecting to a different network cable in case power wires damaged internally.
Unit does not show data for a specific source	• In the advanced setup menu, select sources, and manually select the required data source. • Check the network connection on the data source.
Unit does not show any data from any connected source or Unit data sources intermittently drop out.	• In the advanced setup menu, select sources option, then select AUTO SELECT. • Check the Device List menu and see if any devices are detected. • Try connecting to a different network cable in case data wires damaged internally. • In the advanced setup menu, check the diagnostics page to see if any errors are occurring. • Check network topology and termination rules are correctly implemented. • Disconnect other devices from network, one-by-one, starting with 3rd party devices.

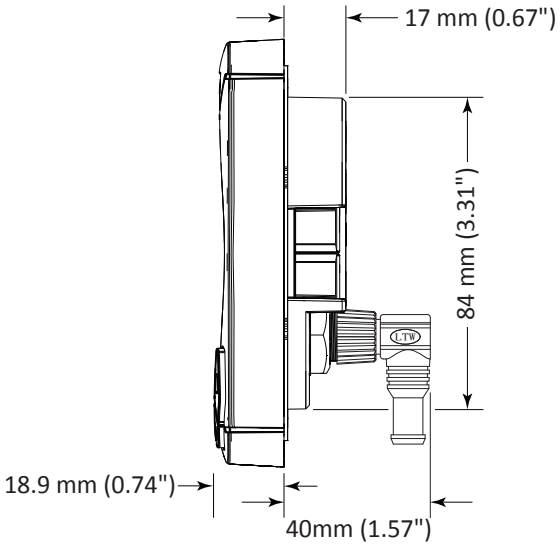
Technical Specifications

Display

Weight	0.28 kg (0.6 lbs)
Power consumption	150 mA at 13.5V
Network load	Maximum 10 Triton displays
Colour	Black
Size	4.1" (Diagonal) 4:3 Aspect ratio
Type	Transmissive TFT-LCD White LED back-light
Resolution	320 x 240 pixels
Illumination	White (day mode) / Red (night mode)
Environmental Protection	IPX7
Safe distance to compass	0.3 m (1.0 ft.)
Temperature	
Operating	0 to +55 ºC (+32 to +130 ºF)
Storage	-30 to +70 ºC (-22 to +158 ºF)

Dimensional drawing





Spares & Accessories

Part Number	Description
000-10637-001	Triton wind sensor
000-10652-001	Triton wind sensor pack with 20 meter mast cable
000-10647-001	Triton wind sensor pack with 35 meter mast cable
000-10613-001	RC42N, Rate compass, micro-c
000-10614-001	Cable, micro-c, right angle interconnect
000-10615-001	Sun cover, Triton display

➔ ***Note:*** new accessories are continuously being developed, check with your B&G dealer or on www.bandg.com for details on new products.

988-10222-001

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