

Chart Plotter










USER MANUAL

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1. Disclaimer and warnings

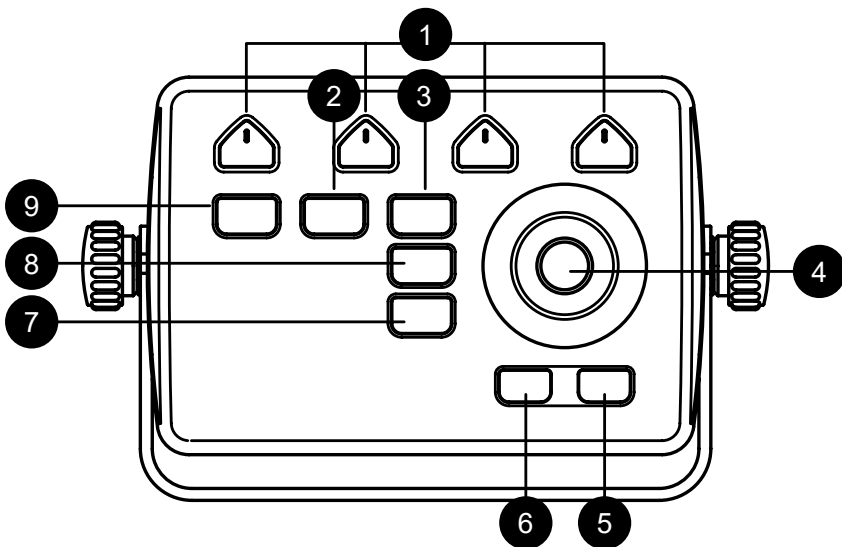
This user manual is intended to describe core functionality of the chart plotter. The information in this document is subject to change without notice. The manufacturer makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. The manufacturer reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of the manufacturer to notify any person of such revision or changes.

	Electronic charts displayed by the device are believed to be accurate and reliable, but they are not intended to replace official charts which should remain your main reference for all the matters related to the execution of safe navigation. For this reason we would like to remind you that you are required to carry on board and use the officially published and approved nautical charts.
	Please be aware that the serial ports are not opto-isolated and therefore the peripherals are electrically connected to the device. This allows the connection of high speed peripherals, like Fish Finder. If you are connecting a NMEA0183 peripheral and you would like to isolate it from the device, you have to add the opto-isolator externally.
	If water leaks into the equipment, immediately turn off the power at the switchboard. Fire or electrical shock can result.
	If the equipment is giving off smoke or fire, immediately turn off the power at the switchboard. Fire or electrical shock can result.
	Do not open the equipment. The equipment uses high voltage that can cause electrical shock.
	Keep the SD card slot's door closed to avoid water intrusion into the device
	Extensive exposure to heat may result in damage to the device.
	Please read through the device manual before the first operation. If you have any questions, please contact the Company's customer service or your local dealer.
	C-MAP media is available from C-MAP Authorized Resellers.

2. Introduction

The chart plotter is a computerized electronic chart system, designed as a navigation aid. The chartplotter integrates GPS data with an electronic navigational chart and can display additional information from AIS, fish finder and other sensors. The chart plotter is compatible with both C-Map MAX and C-Map 4D map format on micro SD Card. The C-Map charts can be purchased by C-Map authorized resellers. Navigating through chart plotter pages is possible using either keyboard or remote controller.

2.1 Keyboard

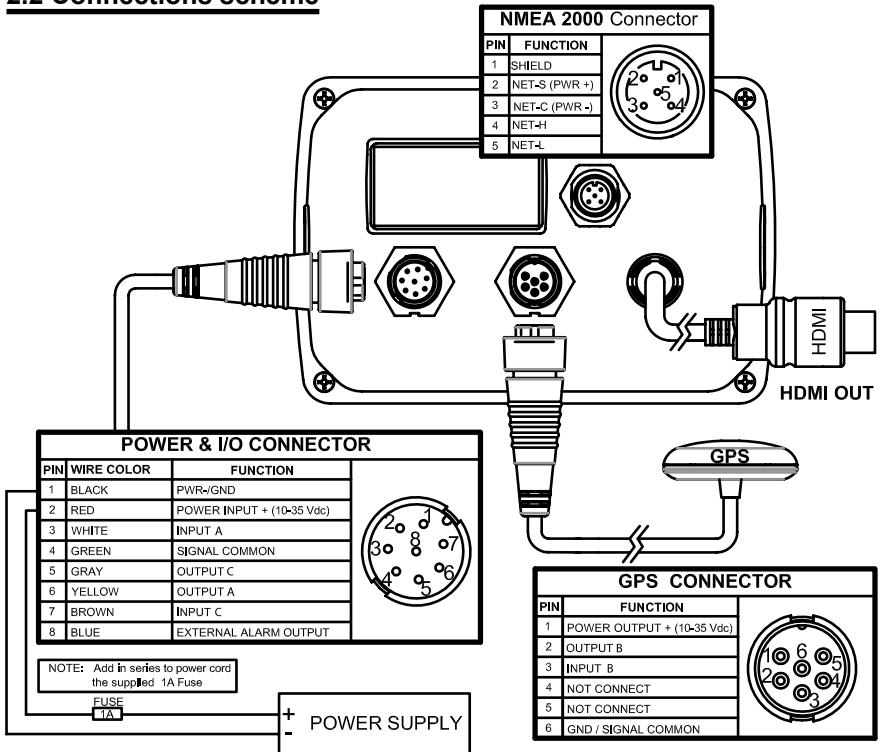


1. Function keys [F1 - F4] are special keys. Each key can perform two functions. A short press performs the function labeled on the unit face. A long press executes a second function which can be customized by user. This gives you a wider scope of functions that can be executed by pressing function keys. Read Par. 14.2 to learn how to customize the function keys.
2. [MOB] is a special key dedicated to man-over-board situation. Pressing MOB places a MOB mark on the current boat position and starts navigation to that place.
3. [MENU] opens the main menu if pressed on one of the main pages (map, Fish Finder, GPS status, Engine monitor). It selects the top bar control buttons if pressed on full menu

pages such as Marks, Routes, Tracks and others.

4. [JOYSTICK] can move the cursor around the map or through menu items. Press Up, Down, Left or Right.
5. [ZOOM IN] changes scale of the map.
6. [ZOOM OUT] changes scale of the map.
7. [ENTER] is used to confirm an action or a selection. When on map page, pressing Enter opens the contextual menu of a map object.
8. [CLEAR] exits from the current menu or, if you are on map page and the cursor is away from the boat position, centers the map on the boat position (home mode).
9. [POWER] turns the device on/off when pressed and held in. Short press allows switching Day/Night modes of the screen.

2.2 Connections scheme



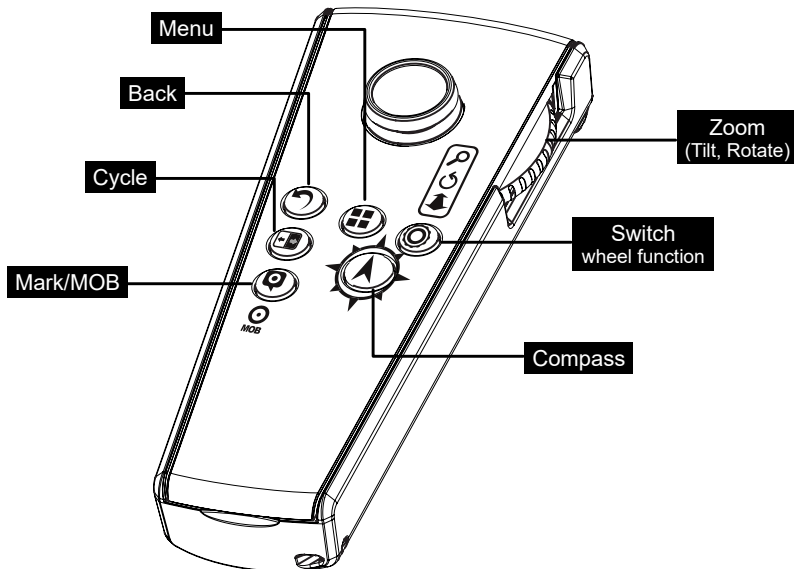
2.3 Remote Controller

You can operate on the chart plotter using the optional remote controller. The remote controller connects to chart plotter via radio signal and requires one AAA battery.

To connect the remote controller with the device:

1. On the Keyboard, press [ENTER] to open the Main Menu
2. Select "General Settings" and press [ENTER]
3. Enable connectivity with Remote Controller selecting "Remote Control" and pressing [ENTER]
4. Select PIN and press [ENTER]
5. Input the correct PIN, which you can find on the backside of your remote controller
6. Press the remote controller joystick to activate it. On the status bar (left top) of the page you will see the remote control icon. Now you can operate on chart plotter with the remote controller from distance.

The battery status can be seen either on the Remote control page when remote controller is connected, or in status bar (see par.4.1) when battery is low.



Remote controller buttons:

- [MENU]: same as chart plotter MENU.
- [BACK]: same as chart plotter CLEAR.
- [MARK]: short press puts Mark on map. Long press puts MOB on the current vessel's

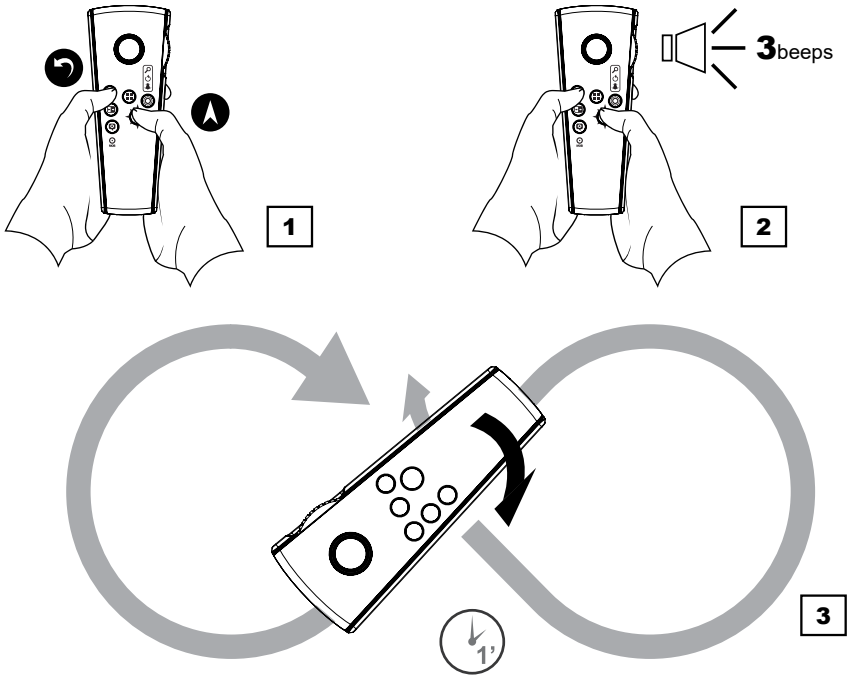
position.

- [CYCLE]: cycles through pages.
- [SWITCH WHEEL FUNCTION]: changes the function of remote controller's wheel. It has three functions on map: zoom in/out, rotate, tilt. The wheel selector can also be used to navigate through menu items as with joystick.
- [COMPASS]: point with remote controller towards any direction around you and press this button. You will see red dashed line on the map of chart plotter, showing the pointed direction.

Compass Calibration

The remote controller's inner compass needs to be calibrated.

1. Simultaneously press BACK and COMPASS on the remote controller until you here three beeps.
2. Release the buttons after you hear three beeps.
3. Start moving the remote controller slowly in a figure eight shape. The rotation must be around three axes. It might take 1 minute for calibration to complete.
4. Stop rotation after you hear three beeps. Now the compass sensor is calibrated. If you hear two beeps start compass calibration from the beginning.



3. Getting started

3.1 Switching ON

Before powering the chart plotter on, check for the correct voltage (10-35 volt) and the correct connections with other instruments. Press and hold [POWER] to turn on the device.

It might take few minutes for chart plotter to start.

3.2 Switching OFF

Press and hold [POWER] to switch the chart plotter off. A countdown timer appears on the screen. If you release [POWER] before the countdown timer reaches zero, the chart plotter will remain on.

3.3 First Setup page

When turning the device on for the first time, you will see the First Setup pages. You will see them each time after restoring to factory default settings (can be done in “General Settings” – “Log&Backup”). This set of pages allows selecting software language, chart language, units, time zone and time format. This information can be changed at any time in the “General Settings” menu.

1. Switch chart plotter ON and wait for the first Setup Page to appear on the screen.
2. Select the desired option on the corresponding page by moving joystick up/down, or keep the default value.
3. Press [ENTER] to confirm the selection.
4. Move joystick [RIGHT] to go to the next page or [LEFT] to go to the previous page.
5. On the Warning page move joystick [DOWN] to scroll the “Limitations of Use” text.
6. Press [ENTER] when you reach the end of text.

NOTE By pressing [ENTER] “OK” you accept the “Limitations of Use”. You must accept all the limitation specified in the Warning page in order to use the chart plotter.

3.4 Selecting the system language

To set the main language of software - menus, data pages, warning/alarm messages:

1. Open the Main Menu by pressing [MENU]
2. Select “General Settings”
3. Select “Software Language”
4. Select language by moving joystick [UP]/ [DOWN] and pressing [ENTER].

3.5 Selecting the chart language

To change the language of the chart information, which includes names of geographical objects on map, their description on Full Info page and list of objects found by search function:

1. Open the Main Menu by pressing [MENU]
2. Select "General Settings"
3. Select "Chart Language"
4. Select your desired chart language in the list

The selected chart language has three modes:

- **Off:** the selected language is applied only to the geographical names of the geographical area, to which this language relates. English language is used for the other than the selected language's map area. For example, if you choose Italian language and the mode is Off, the geographical names of Italy will be in Italian language, while other national territories will be in English. At the same time all objects' info pages will be in Italian.
- **International:** all map names are displayed in English regardless the map area, meanwhile the selected language is applied to full info descriptions of map objects.
- **Local:** the local languages are used for the map objects, but their full info descriptions are present in the selected language. If no local language is available, English is used instead.

3.6 Setting units, time zone and time format

To change units:

1. Open the Main Menu by pressing [MENU]
2. Select "General Settings"
3. Select "Units"
4. Choose among US, UK or European standard or manual to set each unit of measure manually and press [ENTER]

If you choose manual:

5. Select each option and press [ENTER] to confirm

To change time zone:

1. Open the Main Menu by pressing [MENU]

2. Select "General Settings"
3. Select "Time zone"
4. Choose among UTC or Manual and press [ENTER]

If you choose manual:

5. Select Time Zone and press [ENTER]
6. Select the desired zone and press [ENTER] to confirm
7. Select "Daylight Saving" and press [ENTER] to enable it (it must be enabled / disabled manually)

To change time format:

1. Open the Main Menu by pressing [MENU]
2. Select "General Settings"
3. Select "Time format"
4. Choose the date format and time format (12 / 24 h) and press [ENTER]

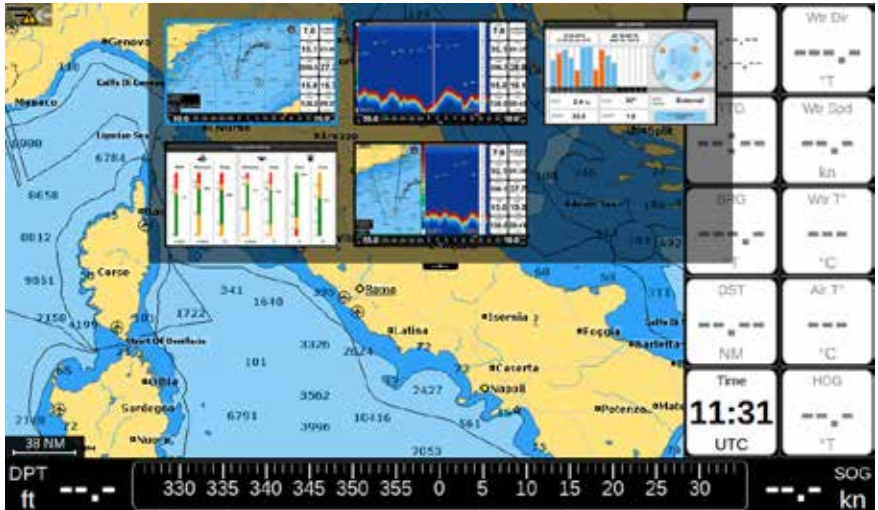
4. Controlling the display

The chart plotter displays 5 main Pages:

- Map (Par. 4.2)
- Fish Finder (Par 4.3)
- GPS status (Par. 4.4)
- Engine Monitor (Par 4.5)
- Split Map / Fish Finder page (Par. 5.5)

To change displayed page:

1. Press [MENU]
2. Select "Page"
3. Press [ENTER]
4. In the widget popup select the desired page by moving joystick cursor and press [ENTER].



4. Pages widget pop-up

A quicker way to switch between pages is to set one of the function keys (see 14.2) to "Page".

4.1 Status bar

The Status bar appears in the upper part of the screen on every page. It displays:

- GPS status depending on the quality of satellite data

- Remote controller connection status
- Fish Finder connection status.

4.2 The Map

The Map page includes:

- Map
- Compass bar
- Position box
- Data window.



Fig 4.2.1 – Map Page

During navigation you will see your Course Over Ground and bearing on the compass bar, marked with blue and red arrows respectively. The compass bar can be switched off in the General Settings, Databox Settings page. The position box appears on the left bottom of the map and shows the lat/lon and minimal depth in home mode, additionally it shows DST and BRG when in cursor mode. The data window can be customized (see Par. 4.7). Read Par. 5 on How to use C-Map data.

Press [ENTER] to open the contextual menu, and [CLEAR] to close it.

Press [MENU] to open Main Menu of the Map page.

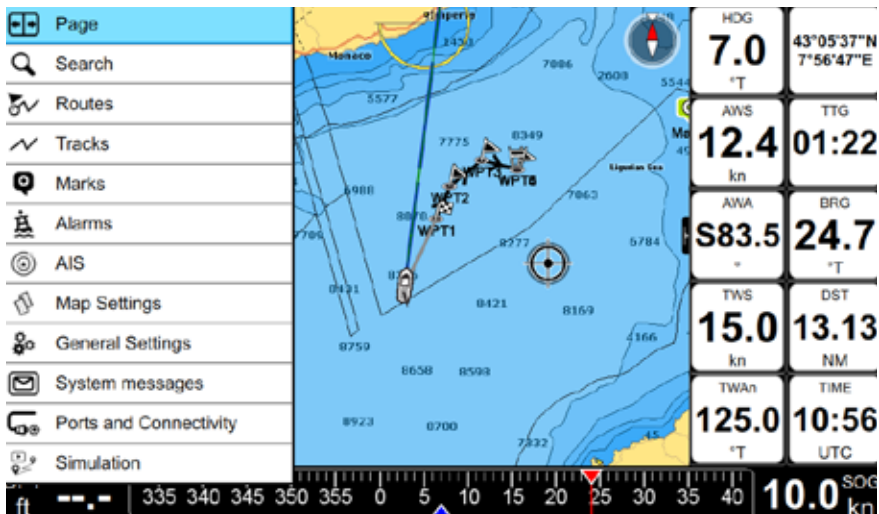


Fig 4.2.2 – Map Page Menu

4.3 Fish Finder page

The Fish Finder page is available only if a Black Box Fish Finder accessory is connected to the Chart Plotter.

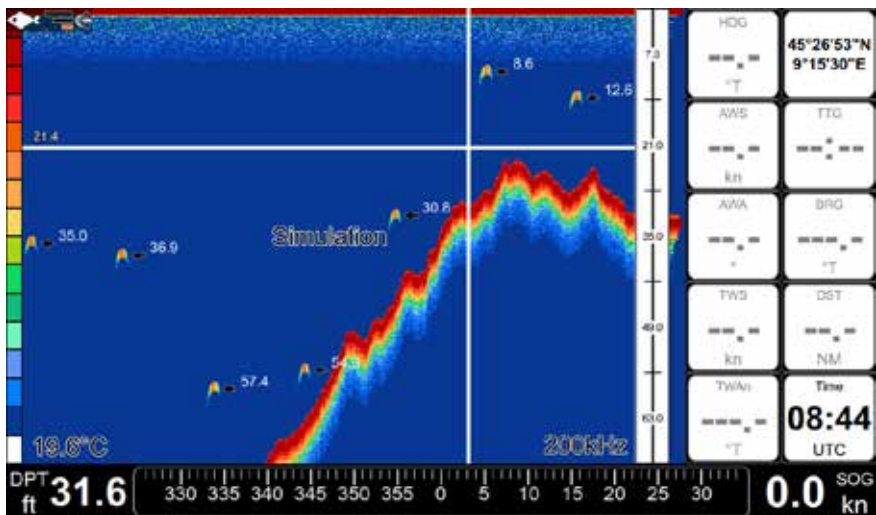


Fig 4.3.1 – Fish Finder page (simulation mode)

For more details about Fish Finder see Par. 18.
 Press [MENU] to open Main Menu of the Fish Finder page.

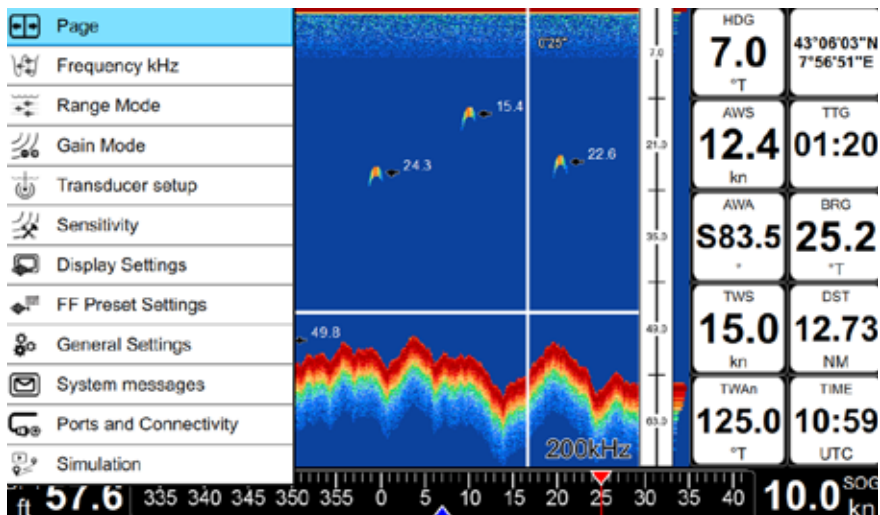


Fig 4.3.2 – Fish Finder Menu

4.4 GPS Status page

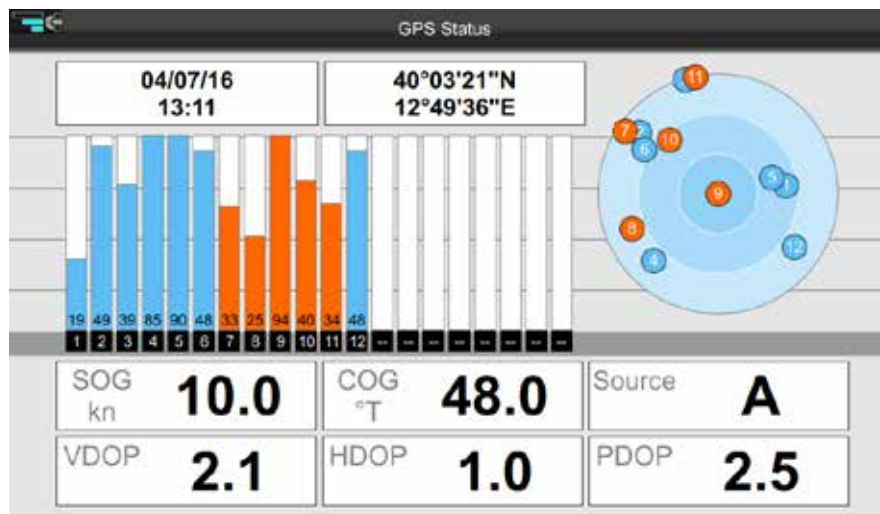


Fig 4.4 – Example of GPS Status page

4.5 Engine Monitor Display

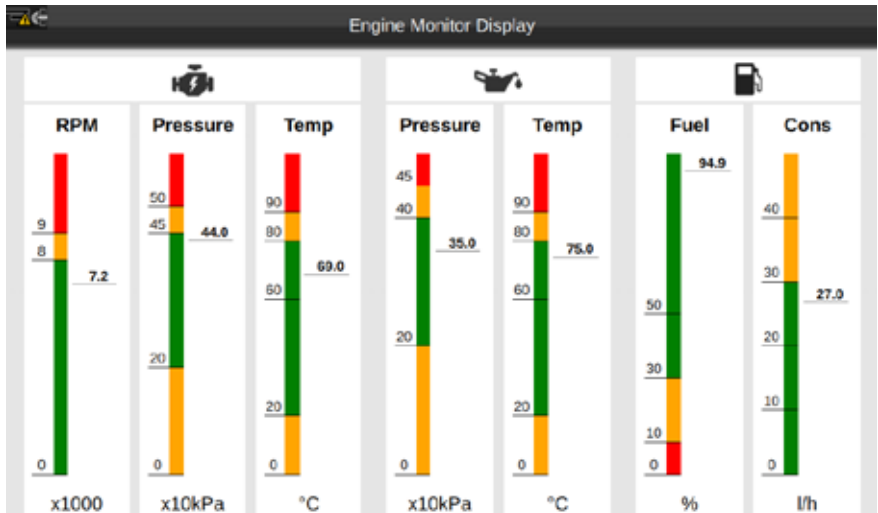


Fig.4.5 – Example of Engine Monitor Display page

The device can be connected through CAN bus to a compatible NMEA2000 engine, to display engine state and performance.

Each parameter presented with a scale divided into three zones: green (acceptable value), yellow (warning), red (critical). If the value of any of those parameters exceeds the permissible range, the corresponding top icon is highlighted with red color.

NOTE The fuel tank capacity value must be set in the Ship Profile (see Par. 14.5); please make sure you have set the correct value in the Ship Profile page.

4.6 Split page

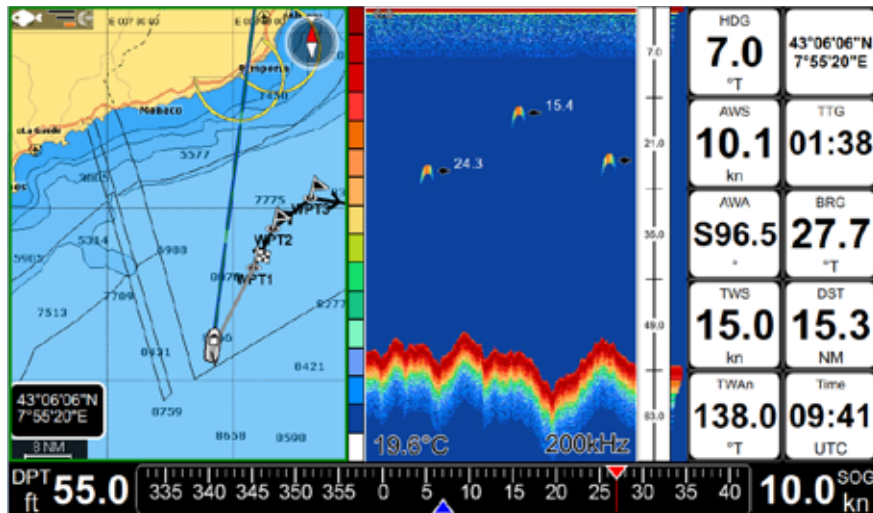


Fig.4.6 – Example of split page

The Split page is a screen split between map and Fish Finder. Each half of the split view has its own Main Menu. When you open the split page, the active view is always the map. In order to operate on the Fish Finder view, press [MENU] twice.

To Change the active view with remote controller:

1. Press [MENU] twice

OR

2. Long press [SWITCH WHEEL FUNCTION]

You will see a green transparent icon for a few seconds over the active view.

To open the contextual menu on the map view, press [ENTER] while the map view is active. To open the contextual menu on the Fish Finder view, press [ENTER] on the echogram of the Fish Finder view.

4.7 Data window customization

The Data window is a set of customizable data boxes. It is present on the map page and on the Fish Finder page. The boxes may be set up to display various sensor data. By default it consists of 10 data boxes, but you can reduce the number of displayed data boxes in General Settings, where you can turn off data window display, customize data boxes content or remove some of them.

You can choose to show either 2 columns (10 data boxes) or 1 column (5 data boxes):

1. Press [MENU]
2. Select "General Settings"
3. Press [ENTER] on "Databox Settings" (or simply move joystick [LEFT])
4. Place cursor over "1 column" (or "2 columns") and press [ENTER].

To customize data box content:

1. Move joystick [DOWN] and stop on the data box you want to customize
2. Press [ENTER]
3. Browse the list to select the desired option
4. Press [ENTER] to confirm selection or [CLEAR] to exit data box editing.

5. Using C-Map Data (4D / Max)

The chart plotter has a built-in background world map, but to use the chart plotter as a navigation aid, C-Map detailed chart is required. The chart plotter is compatible with both C-Map MAX and C-Map 4D map format on micro SD Card. The C-Map chart can be purchased from C-Map authorized resellers. To use C-Map detailed chart (4D or MAX), insert the micro SD card with data to the micro SDslot of your chart plotter. The slot is located at the bottom of the device.

NOTE After inserting the C-Map chart, the chart plotter could ask to restart the device.

5.1 Moving around the Chart and Changing Chart Scale

Use the joystick keys to pan the chart. Also use [ZOOM IN] and [ZOOM OUT] to change the chart scale so that a smaller or larger area is shown on the chart.

5.2 Finding Your Boat Position

The most common use of the chart plotter is to show your boat's current location. You can home the cursor to the boat using [CLEAR]. This would center the map view on the boat position and update the display as the boat moves.

The "Screen amplifier" function helps to keep the majority of the area in front of the vessel's position, so if you turn on this function, the chart plotter will take into account your course to locate the boat at the most comfortable position in the map relatively to the actual course.

To turn Screen amplifier on/off:

1. Press [MENU]
2. Select "General Settings"
3. Select "Navigation"
4. Place cursor on "Screen amplifier" and press [ENTER]

Use the joystick to move the cursor away from the boat's current position and exit the Home Mode.

5.3 Map full info and quick info

The detailed chart has a database of information about map objects, which may be helpful for navigation. To read map full info, press [ENTER] over the desired point on map and select "Full info" in contextual menu.

There is also quick-info popup appearing automatically when you put cursor over any of the map objects. Automatic quick-info popup can be turned off:

1. Open Main Menu
2. Select "Map Settings"
3. Select "Objects on map"
4. Place cursor on "Chart Tooltip" and press [ENTER]
5. To leave Full info page and get back to map press [CLEAR]

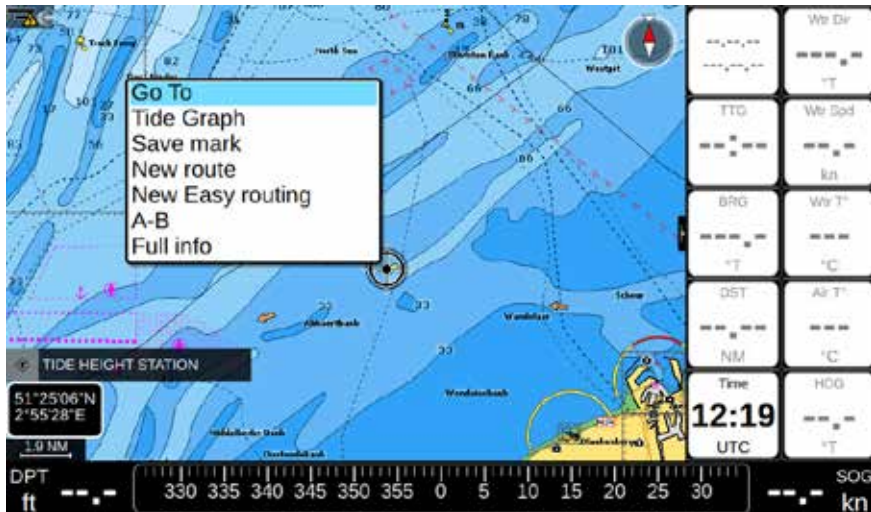


Fig.5.3. Object's full info contextual menu on Map

Full info page lists information about the selected object or map area. "Depth area" tab is present on the full info page of majority of objects, and presents information about minimal and maximal depth. Other useful navigation information is present on this page.

Full info page contains "Locate on map" and "Go To" buttons.

6. GO TO function

6.1 Navigation to a single destination [GO TO]

1. Place cursor at a desired position on map
2. Press [ENTER] to open contextual menu
3. Select “Go To”
4. Press [ENTER] to confirm selection

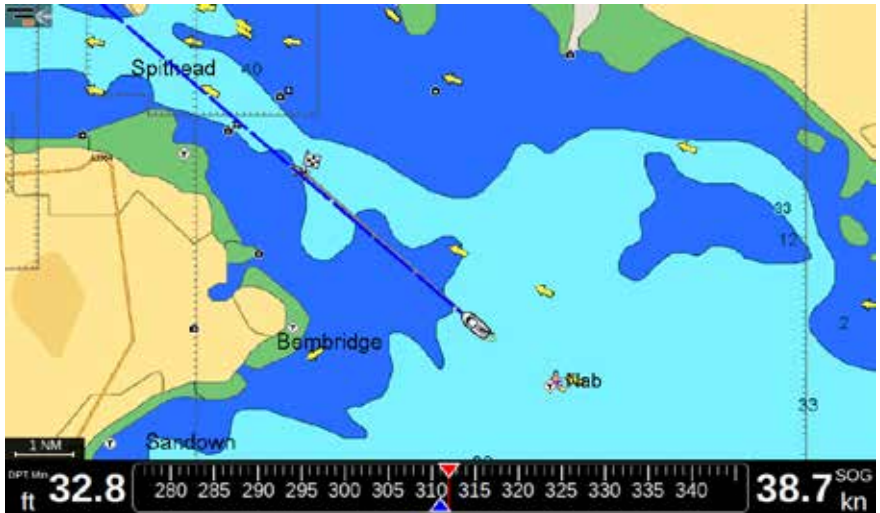


6.1.1 Map with cursor contextual menu

A straight gray line is shown on the screen connecting the destination with the initial boat's position (departure point). All navigation data in data window, such as BRG, TTG, DST, XTE, is related to the destination. When your vessel arrives at the destination, a dialog window will appear on the screen, asking whether you want to stop or keep navigating to this point.

To stop navigation:

1. Place cursor at any place on map
2. Press [ENTER]
3. Select “Stop nav”
4. Press [ENTER] to confirm selection



6.1.2 Map with Active navigation

6.2 Creating a route

A route consists of a set of waypoints.

To create a route from the routes list page:

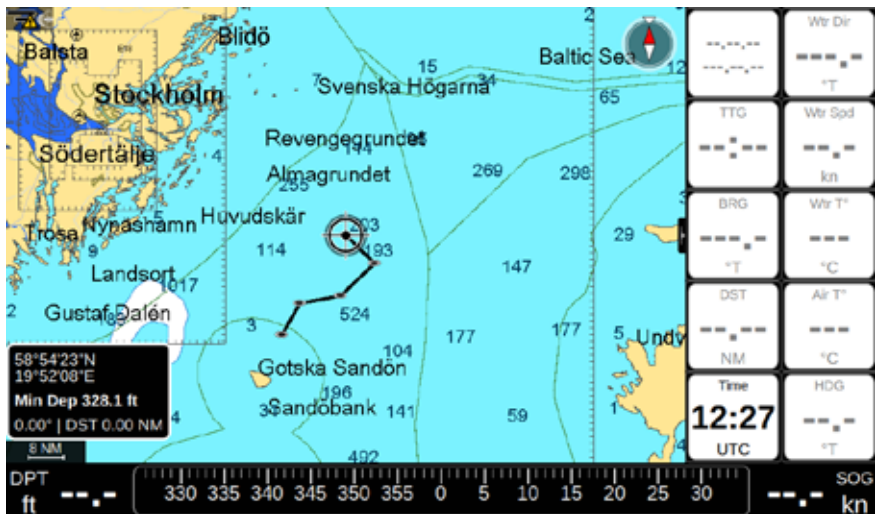
1. Press [MENU]
2. Select "Routes"
3. Press [ENTER].
4. Select "Create new" in the top bar menu
5. Press [ENTER]. A new empty route will be created with default color and name.
6. Press [ENTER] on the desired route to open its page for further editing: adding waypoints, editing route's name, description and color.

To create a route on map:

1. Place cursor on map at desired position
2. Press [ENTER]
3. Select "New Route"

Now you are in a route creation mode.

4. Move the cursor, using the joystick, to another place on map.
5. Press [ENTER] to add waypoint, or [CLEAR] to exit route creation mode.



6.2. Map in new route creation mode

After the route has been created, you will see dialog window, asking whether you want to navigate to newly created route. Press Ok to start the navigation to route.

When you create new route, it has default color and prefix “Route” with incrementing number. You can change default color or prefix:

1. In Routes list page select “More” and press [ENTER]
 2. Select “Default color” or “Default prefix”
 3. Save new default color by pressing [ENTER] on the selected color
- OR**
4. Save new default prefix by inserting it into the keyboard and pressing OK.

Read par 7.3.1 about editing a Route

6.3 Route following

A route consists of a set of waypoints. The navigation is activated step by step from a waypoint to the next one, so when this waypoint is reached, the navigation toward the next one starts. You can start navigation to the existing route, which is already created and shown on map:

1. Place cursor over one waypoint of the route
2. Press [ENTER]

3. Select “Start nav” to start navigating to route, beginning from the nearest waypoint to your boat position.

OR

4. Select “Start here” to start navigating to route, beginning from this particular waypoint.

OR

5. Select “Go To” to start navigating to the single destination (and not to route).

When you reach first waypoint, navigation will be started to the next waypoint automatically.

The current destination has a flag over it:



and the final destination has a finish icon:



If you want to prevent automatic navigation to next waypoint and receive a notification each time waypoint is reached:

1. Press [MENU]
2. Open “General Settings”
3. Select “Navigation” tab
4. Select “Automatic route following”
5. Press [ENTER] to switch this option off.

6.3.1 Route following optimization

Under normal route navigation (without optimization), the vessel is required to approach a waypoint within a certain distance (arrival radius) in order for the route to advance to the next waypoint.

With the “Route Following Optimization” option, the route is constantly recalculated (optimized) to allow automatic advancement to the next waypoint, even if the vessel never gets within the waypoint arrival zone. In this way “Route Optimization” can be thought of a “close enough” feature when absolute route following precision is not required.

By default the arrival radius is 0.05 NM, but it can be changed in the General Settings:

1. Press [MENU] on any page
2. Select “General Settings” and press [ENTER]
3. Select “Navigation” and press [ENTER]
4. Select “Arrival circles radius” and press [ENTER]
5. Select the desired distance in the wheel selector and press [ENTER]

6.3.2 Route following options

Most of the route following options can be modified from map with no need to open Route's page.

Inserting a Waypoint

During navigation you may want to first reach another point on map, and only then navigate to the initial destination.

To select a Waypoint put the cursor over the desired position and press [ENTER], in the contextual menu select "Insert Waypoint" and press [ENTER]. If the WP function is available in your function keys you can also put cursor on map on the desired position and press the proper function key.

A route will be created connecting your current position, waypoint and final destination.

Appending a Waypoint

When in navigation on an active route, you can also append a waypoint at the end of the route by clicking anywhere on the map:

1. Place cursor on the desired location on the map and press [ENTER]
2. Select "Append WP" and press [ENTER]

Skipping a waypoint

If you want to skip current destination and to navigate to the next one in route:

1. Place cursor at the waypoint which is a current destination
2. Press [ENTER]
3. Select "Skip WP"
4. Press [ENTER].

Editing the list of waypoints

To quickly access the list of all waypoints of a route and get detailed information about it:

1. Place cursor over the waypoint on map
2. Press [ENTER]
3. Select "Open WP list"
4. Press [ENTER].

Deleting a waypoint or the entire route

You can delete entire route from map. If it is an active route (so that you navigate on it), first stop navigation in order to be able to delete it.

1. Place cursor at waypoint or route leg

2. Press [ENTER]
3. Select "Delete route"
4. Press [ENTER].

You can delete a waypoint a route only if it is not a current destination. To delete waypoint use "Delete WP" option in waypoint's contextual menu.

Reversing a route

To reverse navigation direction, use "Reverse" option in waypoints contextual menu. You can reverse route from map only if you are in navigation mode.

Otherwise:

1. Open Main Menu - Routes
2. Select Reverse in route's menu
3. Press [ENTER]

Extending a route

To add waypoints to the end of an existing route:

1. Place cursor on the last waypoint in the route
2. Press [ENTER]
3. Select "Extend"
4. Press [ENTER]
5. Move cursor using joystick to place new waypoint
6. Press [ENTER] to save waypoint's position.

6.4 Easy routing

You may want to create a route in a safe way: avoiding obstacles on the route. For this purpose there is a special option "New easy routing" that detects dangerous or non-safe object in the area from your current position to the desired destination, and avoids them building a safe route.

1. Place cursor at the desired start position
2. Press [ENTER]
3. Select "New Easy routing"
4. Press [ENTER].
5. Place cursor at the desired end position.
6. Press [ENTER].

A route will be created, connecting your boat position and the destination.

You can also apply this option to the existing route: it will modify the existing route leg.

The program will find obstacles between two waypoints and re-build it so that obstacles will be avoided. The program's decision about avoiding obstacles on your way is based on information about your boat parameters (safe corridor, depth, height, length).

1. Place cursor on a route leg (a line, that connects two waypoints).
2. Press [ENTER]
3. Select "Easy routing"
4. Press [ENTER].

NOTE1 You must have an up-to-date C-Map 4D chart to use this option. This option is not supported with MAX charts.

NOTE2 You must input correct information about your boat parameters in General Settings – Ship Profile.

7. User Data

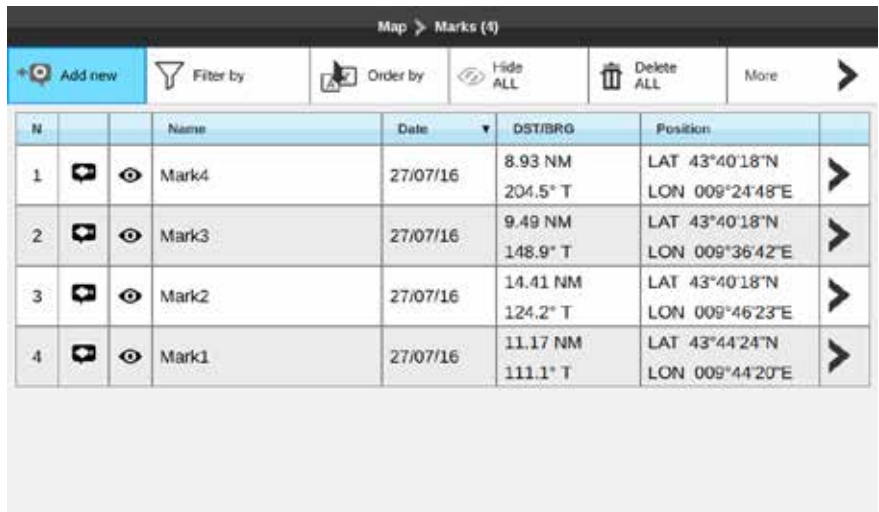
User data point is an object that you can place on the charts to mark a specific point and get it stored in chart plotter's database. The chart plotter has the following types of user data: Marks Events, Tracks, Route and Waypoints. A Mark can be created on the cursor's position while an Event is created on boat's position. Track is a boat trail. A Waypoint is a part of Route.

All the user data can be accessed both from map and from dedicated page in Main Menu.

Operating on map is possible via contextual menu. When you press [ENTER] on map, contextual menu appears. Using contextual menu you can add, edit or delete a user data.

7.1 Marks

Marks are a useful and easy way to mark and store any place on map. Like any other user data type, marks can be added, modified or deleted both in Marks lists and on map page.



N		Name	Date	DST/BRG	Position		
1			Mark4	27/07/16	8.93 NM 204.5° T	LAT 43°40'18"N LON 009°24'48"E	
2			Mark3	27/07/16	9.49 NM 148.9° T	LAT 43°40'18"N LON 009°36'42"E	
3			Mark2	27/07/16	14.41 NM 124.2° T	LAT 43°40'18"N LON 009°46'23"E	
4			Mark1	27/07/16	11.17 NM 111.1° T	LAT 43°44'24"N LON 009°44'20"E	

Fig. 7.1 – Marks page

To open Marks list:

1. Press [MENU]
2. Select "Marks"
3. Press [ENTER].

On this page you can observe all marks and events, that are stored on your plotter.

7.1.1 Adding new mark

To add a mark in marks list:

1. Press “Add new” button in top bar menu
2. Select the way to create a waypoint – “Use fix” or “Manually”
3. Press [ENTER]

“Use fix” creates event on fix position.

“Manually” opens Lat/Lon keyboard for inputting coordinates to add new mark.

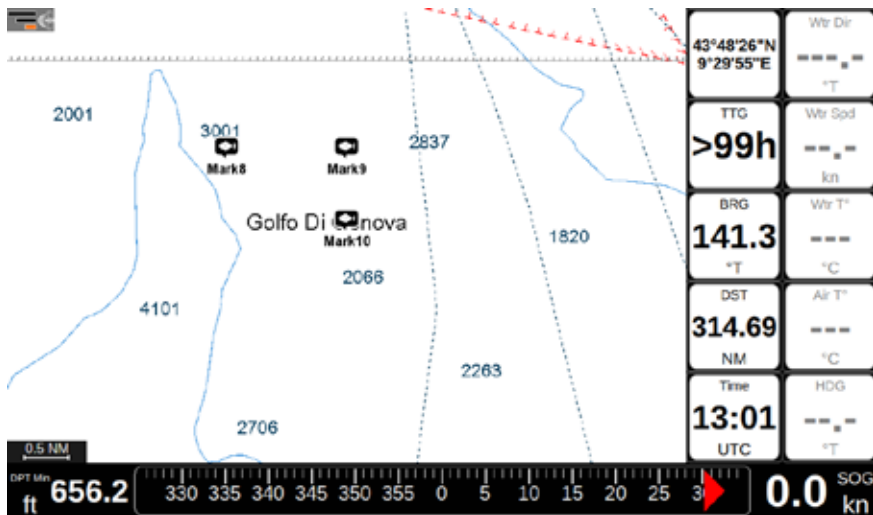


Fig.7.1.1 – Marks on map

To add a mark on map:

1. Place cursor on map at desired position.
2. Press [ENTER]
3. Select “Save mark”
4. Press [ENTER]

To add an event on map:

1. Open map page.
2. Home the cursor to the boat using [CLEAR]
3. Press [ENTER]

4. Select "Save event"
5. Press [ENTER].

7.1.2 Editing Mark's color, symbol, name and description

You can change a color, symbol, name and description of a single mark.

In Mark's list:

1. On map page press [MENU]
2. Open "Marks"
3. Select a mark in list and press [ENTER]
4. Select "Edit name and description" or "Edit color and symbol"
5. Press [ENTER].

On map:

1. Place cursor over mark
2. Press [ENTER]
3. In the contextual menu select "Name and description" or "Color and symbol"
4. Press [ENTER]
5. Introduce changes and press [ENTER] to save or [CLEAR] to exit without saving changes.

7.1.3 Editing Mark's latitude and longitude position

In Mark's list:

1. Select the mark in the list of marks and press [ENTER]
2. Select "Edit position"
3. Input Lat/Lon
4. Press "OK" to save.

OR

5. "Cancel" to exit position editing.

On map:

1. Place cursor over mark
2. Press [ENTER]
3. In the contextual menu select "Move"
4. Press [ENTER]
5. Move cursor over map
6. Press [ENTER] to save new position.

7.2 Routes

Routes can be created, modified or deleted in routes lists and on map. To open routes list:

1. Press [MENU]
2. Select “Routes”
3. Press [ENTER].

N	Name	Date	WP	Tot DST
1	Route3	27/07/16	7	3.45 NM
2	Route2	27/07/16	4	2.08 NM
3	Route1	27/07/16	2	0.00 NM

Fig.7.2 – Routes page

On this page you can observe all routes that are stored on your chart plotter, and open list of waypoints of a selected route.

7.2.1 Route filters

When you are in routes list, you can filter routes out by color, name or both.

1. Move cursor to “Filter by” and press [ENTER] to open filter window – it has a color palette and name input field
2. Select color by pressing [ENTER]
3. Move cursor to the name field and press [ENTER] to open keyboard
4. Insert name and press “OK” button or press [CLEAR] to exit keyboard
5. Press [CLEAR] to close filter window.

After filter was applied, you can execute group operations over filtered routes: delete or hide

filtered routes. When there is no filter activated, group operation will be applied to all routes. To clear filter select the cross icon in the color palette or name field of the filter window and press [ENTER].

7.2.2 Changing routes order in list

Order of routes in routes list can be changed. You can sort out the routes by number, color, status (active/inactive/hidden), name, date of creation, number of waypoints and total distance.

1. Press the “Order by” button to enable the changing order mode
2. Using the joystick, select the desired column
3. Press [ENTER] to change the order of the column
4. Press [CLEAR] to exit from the changing order mode

7.2.3 Editing a Route’s color, name and description

1. On map page press [MENU]
2. Open “Routes”
3. Select a route in list and press [ENTER]
4. Select “More” and press [ENTER]
5. Select “Edit name and description” or “Edit color”
6. Press [ENTER]

7.2.4 Checking a route

The selected route can be checked in order to find out if it is safe for navigation.

1. Press [ENTER] on the route in routes list.
2. Select “More”
3. Press [ENTER]
4. Select “Check route”
5. Press [ENTER]

Check route page will be opened, specifying obstacles for each route leg. Press “Obstacles” button to see the list of obstacles, found in route leg area.

If you have an C-Map 4D detailed chart for the route’s area, you can apply easy routing function to your route in order to make it safe for navigation.

NOTE1 Check route function requires up-to-date C-Map detailed chart.

NOTE2 Check route function requires correct information about your boat parameters in

7.3 Waypoints

Each route is a set of waypoints. List of waypoints can be accessed either from map or from route's page. Waypoints can be added to route either on map or on the route's page.

1. Open Routes page
2. Press “Add WP” on route's page top bar menu
3. Select the way to create a waypoint – “Use fix” or “Manually”
4. Press [ENTER]

N	Name	Position	DST/BRG	ETA	Tot DST	
1	WPT1	LAT 43°50'03"N LON 9°28'01"E			0.00 NM	➤
2	WPT2	LAT 43°50'03"N LON 9°28'01"E	0.00 NM 0.0° T	27/07/16 16:11	0.00 NM	➤
3	WPT3	LAT 43°50'38"N LON 9°26'44"E	1.10 NM 302.4° T	27/07/16 16:15	1.10 NM	➤
4	WPT4	LAT 43°51'27"N LON 9°26'44"E	0.81 NM 0.0° T	27/07/16 16:18	1.91 NM	➤
5	WPT5	LAT 43°51'58"N LON 9°26'36"E	0.53 NM 349.5° T	27/07/16 16:20	2.44 NM	➤
6	WPT6	LAT 43°52'46"N LON 9°26'50"E	0.82 NM 12.2° T	27/07/16 16:23	3.26 NM	➤

Fig.7.3 – Waypoints page

“Use fix” creates waypoint on fix position.

“Manually” opens Lat/Lon keyboard for inputting coordinates

7.3.1 Editing waypoint's position

To change waypoint's latitude and longitude position in waypoints list:

1. Select the waypoint in the list of waypoints and press [ENTER]
2. Select “Edit WP position”
3. Input Lat/Lon
4. Press “OK” to save

OR

5. Press “Cancel” to exit position editing

On map:

1. Place cursor over the waypoint on map
2. Press [ENTER] to open menu
3. Select “Move”
4. Press [ENTER]
5. Move cursor over map
6. Press [ENTER] to save new position

You can also change waypoint position by inputting new lat/lon position manually. In this case select “Edit Position” in waypoint’s menu on map (the same way as described above).

NOTE If waypoint is a current active destination, its position cannot be changed.

7.3.2 Changing the order of waypoints in a route

Sometimes you might want to change the order of waypoints in a route to change the route navigation order. You can easily do that by cut/paste operation in the list of waypoints.

1. Select the waypoint in the list of waypoints and press [ENTER]
2. Select “Cut WP”
3. Press [ENTER]
4. Select another waypoint in the list and press [ENTER]
5. Select “Paste before WP” or “Paste after WP”
6. Press [ENTER]

7.4 Tracks

By recording tracks you can store history about your boat moving over the map, so you can track where your boat has been.

To start track recording:

1. Press [MENU]
2. Select “Tracks”
3. Press “Start new”

You can also use functional keys to start/stop track recording.

7.4.1 Setting up a track generation interval

By default track records your position every 1 second. There are two possible algorithms of

track generation: by Distance and by Time.

- By Distance: a track point is placed when the distance from its last stored position is greater than the defined distance
- By Time: a track point is placed after the defined time

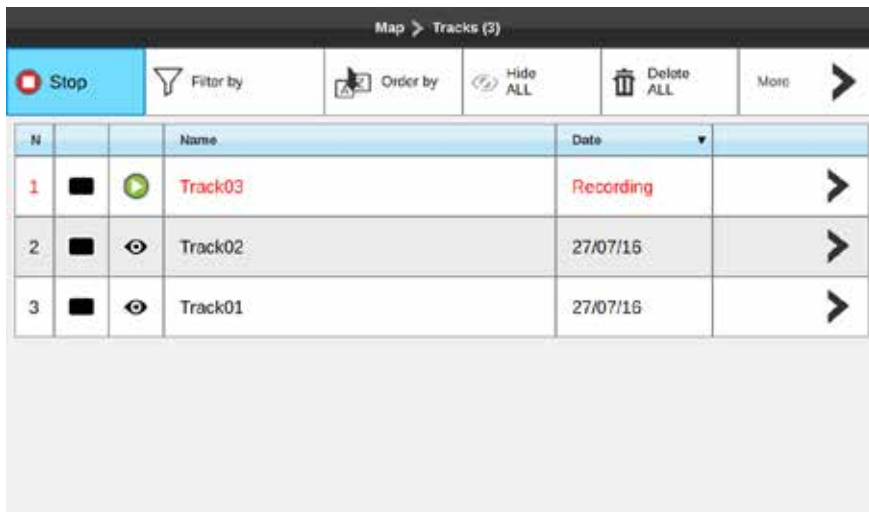


Fig.7.4 – Tracks page

You can select the track generation time interval [1, 5, 10, 30 sec, 1 min, 5 min, 10 min] or distance [0.01 - 10.0] Nm. Setting a short time/distance interval between track points is best suited to navigate within a close or complex environment, while a greater time/distance interval is best suited to a long voyage.

To select the interval at which the Track points are placed.

1. On map page press [MENU]
2. Select “General Settings”
3. Open “Navigation” tab
4. Move cursor to “Time interval” or “Distance interval” and press [ENTER] to enable

In the same page, for both options (time / distance) you can enable the “Automatic optimization of track points” function to save the points with the selected criteria but optimizing it in a smart way to save memory.

7.4.2 Displaying Track

To enable or disable the Track displaying on the map screen:

1. On map page press [MENU]
 2. Select "Tracks"
 3. Press "Hide all" to hide all tracks
- OR**
4. Select a track in list and press [ENTER]. Select "Hide" to hide only this track

7.4.3 Converting Track to Route

You can convert a track to route, so that the new route will outline the boat's track.

1. On map page press [MENU]
2. Select "Tracks"
3. Select a track in list and press [ENTER]
4. Select "Convert to route"
5. Press [ENTER]

7.4.4 Editing Track's color, name and description

1. On map page press [MENU]
2. Open "Tracks"
3. Select a track in list and press [ENTER]
4. Select "Edit name and description" or "Edit color"
5. Press [ENTER]

7.5 Locate user data on map

You can browse through list of all points (for example, marks) and then open map on the selected point's position. To do so in point's list:

1. Select the point in list (mark, waypoint, and track)
2. Press [ENTER]
3. Select "Locate on map"
4. Press [ENTER]

You will be relocated to the map page with the point centered on map.

7.6 Changing user data default color, symbol or prefix

New route, mark, event and track will be created with default color, symbol and name with incrementing number. To change defaults:

1. In Marks, Tracks or Routes list select “More” and press [ENTER]
2. Select “Default color and symbol” or “Default prefix”
3. Save new default color and/or symbol by pressing [ENTER] on the selected color and/or symbol

OR

4. Save new default prefix by inserting it with the keyboard and pressing OK

NOTE Events and waypoints prefix cannot be changed.

Displaying user data

To enable or disable all Tracks, Marks or Routes displaying on the map screen:

1. Open Marks, Tracks or Routes page
2. Select “Hide all” button to hide all user data of this type
3. Press [ENTER]

If data is hidden, the “Show all” button appears in the top bar menu. By pressing it, you can display user data on map again.

To hide/show individual mark or track:

1. Open Marks or Tracks page
2. Select the desired mark or track in the list
3. Press [ENTER]
4. Select “Hide”
5. Press [ENTER]

To hide/show individual route:

1. Open Routes page
2. Select the desired route in the list
3. Press [ENTER]
4. Select “Hide on map” button in top bar menu
5. Press [ENTER]

7.7 Exporting / importing user data

You can export or import your user data to or from a micro SD card.

To export user data:

1. Insert a micro SD card to the micro SD slot of the chart plotter
2. Press [MENU] to open main menu
3. Select "General Settings"
4. Press [ENTER]
5. Move cursor down and select "Log&Backup" tab
6. Move cursor left
7. Press [ENTER] on "Export user data"
8. Move cursor to select "Ok" and press [ENTER].

OR

9. Press [ENTER] to open software keyboard to modify user data file name
10. Insert new name and press "Done"
11. Press "Ok"

NOTE Do not eject the micro SD card until message "Procedure completed" appears on your screen.

To import user data from a micro SD card to your device:

1. Insert a micro SD card to the slot of the chart plotter
2. Press [MENU] to open main menu
3. Select "General Settings"
4. Press [ENTER]
5. Move cursor down and select "Log&Backup" tab
6. Move cursor left
7. Select "Import user data"
8. Press [ENTER]
9. Select the file in the list of available user data files, present on the micro SD card
10. Press [ENTER]
11. Select "Add" in the dialog that appears to add the user data without removing the existing user data on the chart plotter.

OR

12. Select "Substitute" in the dialog to remove the existing user data on the chart plotter and substitute it with the user data from the micro SD card.

The acceptable file formats for importing user data are gpx and db.

8. A-B function

The A-B function allows measuring the distance and bearing between two points on the map page.

You can access the A-B function in the contextual menu of map.

1. Open the map page
2. Press [ENTER]
3. Select "A-B"
4. Press [ENTER]. The "A" point is positioned on the cursor position.
5. Use the joystick to move the cursor to the desired place. You will see the "B" point at the other end of line.

The distance between "A" and "B" (DST) and the Bearing (BRG) to reach "B" from "A" are displayed

To exit A-B mode press [ENTER] or [CLEAR]. This action deletes the "A" and "B" points and the connecting line.

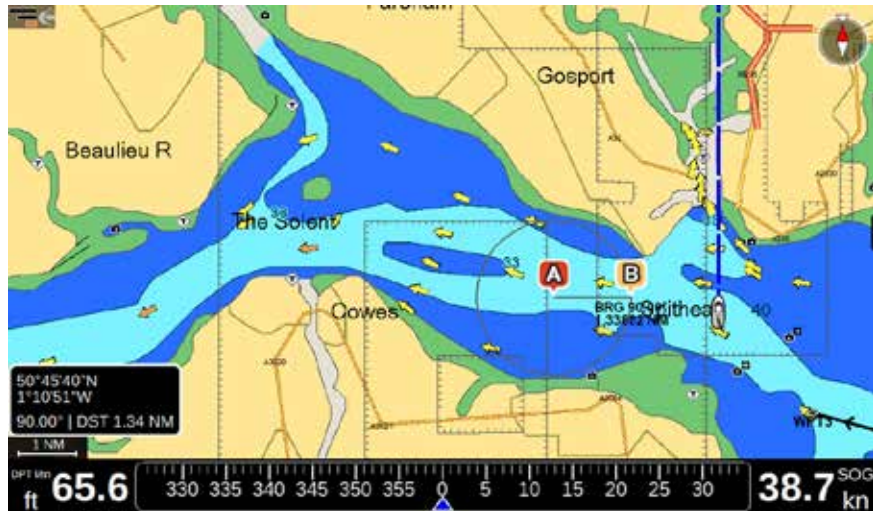


Fig.8 – A-B function

9. Search function

Search function is aimed to help you to find objects on map. Objects are found in a range around cursor position, which you can vary.

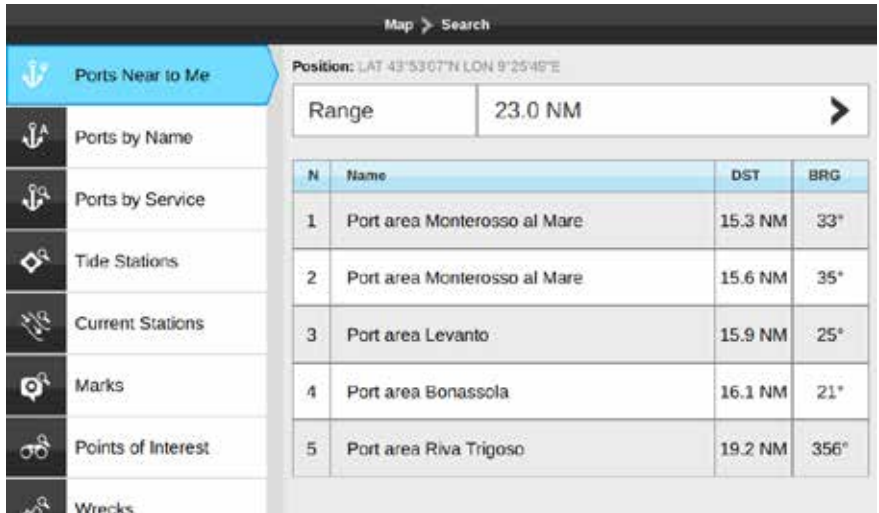


Fig.9 – Search menu

NOTE Search function requires detailed C-Map chart, unless you search Marks.

In the map page:

1. Press [MENU]
2. Select "Search"
3. Press [ENTER]
4. Select the object to search and press [ENTER] You can search different objects:
 - Port areas
 - Ports
 - Tide Stations
 - Current Stations
 - Marks
 - Points of interest
 - Wrecks
 - Obstructions
 - Lakes
5. The search operation may take some time, depending on the specified range

of search. The larger range is covered by search, the longer it takes. You can interrupt search operation by pressing [ENTER] on the "Searching..." status window.

6. The full info page of the selected object opens, where you can read information about the object, as well as locate the object on map or start navigation to it.

10. Tide info

The Tide Graph page displays a graphical page with the tides prediction of the selected object.

1. Search for a Tide Station
2. Select a station and press [ENTER]
3. In the Full info page press “Tide Graph”

Otherwise

4. Press the Tide Station icon on the map
5. In the Full info page press “Tide Graph”

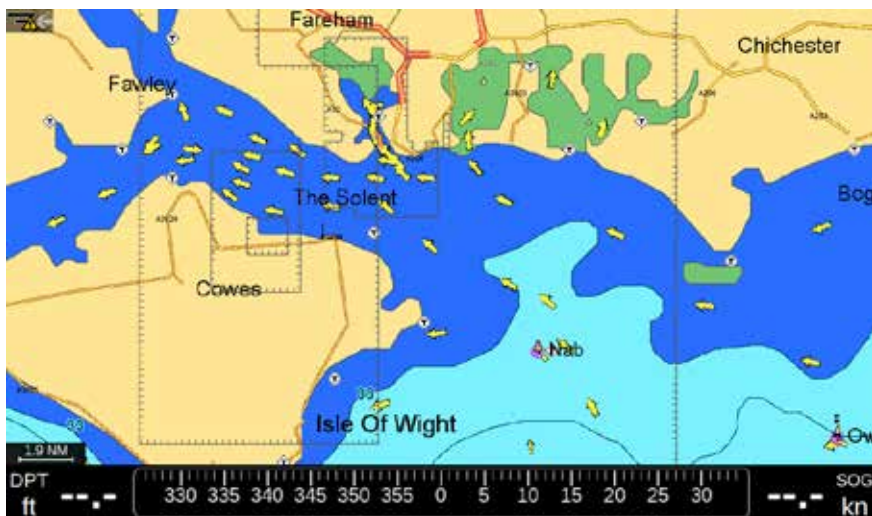


Fig.10 – Tide Station on Map

On the Tide Graph page you can see the information about sunrise and sunset time for the selected date. To change the date on the Tide Graph page:

1. Press [ENTER] on the “Change” button
2. Set date, month and year by moving joystick
3. Press [ENTER] to save change and close the “Change date window”

The tide graph will show the information for the new date.

Press [DOWN] in order to select the tide graph. You can move cursor along the tide graph to see its height for the specific time pressing left or right. Press [UP] in order to move cursor back to the “Change date” button.

Press [CLEAR] to exit Tide Graph page.



Fig.10.1 – Tide Graph page

11. MOB

If a person or object is lost overboard and you need to return to the location, use the MOB (Man Over Board) function. To activate the MOB function, a valid GPS fix must be available.

MOB function can be accessed from any page by pressing [MOB] key of the chart plotter. The MOB mark is placed on the current fix position and at the same time navigation towards the MOB position starts.

To locate MOB position on map when the MOB function is active:

1. Press [MOB]
2. Select "Locate"

MOB position will be centered on map.

To delete MOB icon and stop navigation to it:

1. Press [MOB]
2. Select "Remove"
3. Press [ENTER]
4. Select "Yes" to confirm removal action
5. Press [ENTER]

12. Alarms

The chart plotter provides alarms for various purposes: navigation, fishing, engine and AIS monitoring. You can specify the desired alarm range for most of the functions.

To open Alarms page:

1. Press [MENU] on the map page
2. Select "Alarms"
3. Press [ENTER]

An alarm is triggered when the alarm condition happens. An alarm shuts down when the alarm condition disappears. You can choose for alarm to appear with sound or without it.

1. Open Alarms page
2. Select "Audible Alarm"
3. Press [ENTER]

When audible alarms are triggered, you can turn off the sound by pressing [CLEAR]. Alarm bar will remain visible until the alarm condition is released.

When two or more alarms are activated, the messages cycle on the alarm bar.

External alarm

The External alarm is a signal triggered by the plotter on a specific wire, which can be used by an external device (as a hooter or a buzzer). When any alarm condition occurs the pin is switched from High Impedance to ground. To switch on the external alarm function:

1. Open Alarms page
2. Select "External Alarm"
3. Press [ENTER]

Navigation alarms

Navigation alarms are presented with the following alarms:

- Grounding alarm: scans map area within 1 nautical mile range in front of your course line (plus 8 degrees to the left and 8 degrees to the right direction) in order to find objects dangerous for navigation, such as shallow water (depth areas), intertidal areas, land, rocks, obstructions and shoreline constructions. You can set the minimum depth value for this alarm on Alarms page.
- Depth alarm: is automatically triggered when the depth value read by the depth transducer is too shallow.
- Anchor alarm: is triggered when the ship moves off the current ship's position location.

- XTE alarm: is triggered when the vessel is deviating from a defined course.
- Arrival alarm: is triggered when the distance to destination becomes smaller than specified in the alarm settings.
- HDOP alarm: triggered when the received HDOP value exceeds the alarm limit.

By default all navigation alarms are turned off. Customize alarm settings before beginning navigation.

NOTE The Anchor alarm turns off each time the chart plotter restarts.

Engine alarms

Engine alarms include:

- Check engine alarm
- Engine temperature alarm
- Oil pressure alarm
- Charge indicator alarm
- Water in fuel alarm
- Rev limit alarm
- Engine emergency stop mode alarm
- Fuel tank alarm: the percentage of fuel level is lower than the one set in alarm settings
- Water tank alarm: the percentage of water level is lower than the one set in alarm settings
- Black-water tank alarm: the percentage of black-water level is higher than the one set in alarm settings.

AIS alarms

The AIS alarms are available only when a compatible AIS device is connected to the chart plotter.

This collision avoidance tool warns you when your boat gets too close to another vessel or when there is a SART vessel in your AIS display range. AIS alarms are presented with the following alarms:

- CPA alarm: Closest Point of Approach, is triggered when distance to the closest point of approach is minor than the value set in alarm settings.
- TCPA alarm: Time to Closest Point of Approach, triggered when time to the closest point of approach is less then specified in alarm settings.
- SART alarm.

NOTE Consider turning CPA and TCPA alarms off or settings their values to minimum acceptable when you are approaching busy harbour entrances and rivers, otherwise they may be triggered too often.

Fish Finder alarms

The Fish Finder alarm is available only when a compatible echo sounder module is connected to the chart plotter.

Fish Finder alarms include:

- Shallow water alarm: triggered, when depth, detected by Fish Finder transducer is too shallow.
- Deep water alarm: triggered, when depth, detected by Fish Finder transducer is too deep.
- Water temperature alarm: triggered, when water temperature, detected by Fish Finder transducer is within or outside the specified range.
- Fish alarm: triggered when fish of the selected size (Small, Middle, Big, Huge) is detected by Fish Finder.
- Fish Finder alarms are turned off by default. Consider setting them up before beginning fishing.

13. Simulation mode

The built-in Simulator function allows you to become proficient in the use of the chart plotter. It simulates reception of the navigation data (Lat/Lon, Course, Speed). The simulated boat's position is placed at the then current position of cursor when the simulation is activated.

To turn fix simulation on:

1. Press [MENU]
2. Select "Simulation"
3. Press [ENTER]
4. Select "Simulation Mode"
5. Press [ENTER]
6. Move joystick [RIGHT] and press [ENTER] to change COG and SOG
7. Press [ENTER] to save the selected values or [CLEAR] to close without saving values

Open map page and press [CLEAR] to get to home mode (fix position will be centered). In simulation mode boat icon shows a "SIMUL" label on it.

You can turn on AIS, Route Following and Fish Finder simulation in the same way.

AIS simulation simulates AIS vessels around your fix position. Route Following option allows demonstrating automatic route following by the boat's icon on map. Fish Finder simulation demonstrates the simulated echogram with fish icons on it, simulated depth and water temperature.

14. General settings

To access General Settings page:

1. Press [MENU] on any page
2. Select “General Settings”
3. Press [ENTER]

This page is dedicated to setting general functions.

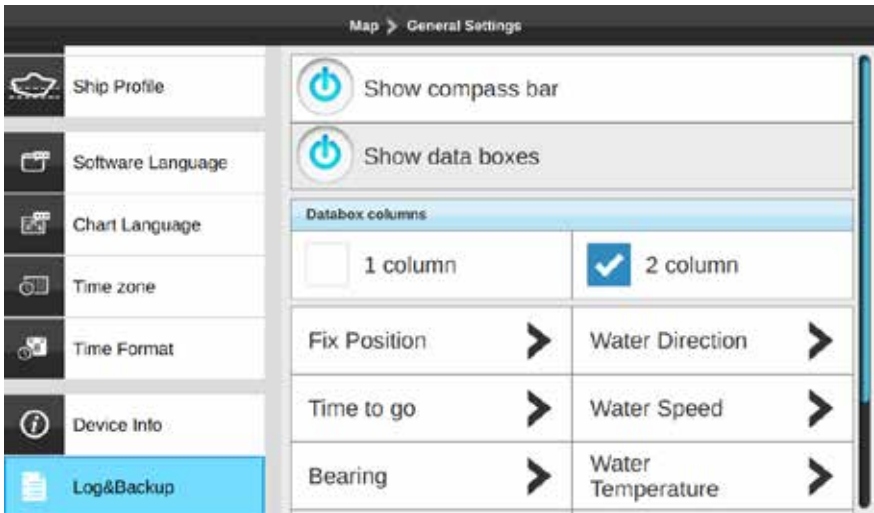


Fig.14 – General settings menu

14.1 Export/Import User Settings

Exporting and importing user settings to micro SD card can be done on Log&Backup page.

1. Insert micro SD card to the chart plotter
2. Open General Settings page
3. Select “Log&Backup”
4. Press [ENTER]
5. Select “Export configuration”
6. Confirm your action

Now on your micro SD card you can find a file with your chart plotter settings configuration. You can save it and import back to plotter at any time:

1. Insert micro SD card with a configuration file into the chart plotter
2. Open General Settings page
3. Select “Log&Backup”
4. Press [ENTER]
5. Select “Import configuration”
6. Confirm your action

By importing configurations from micro SD card you overwrite your current settings of the chart plotter.

14.2 Function Keys Settings

The Keyboard includes 4 customizable keys that you can program with any function shortcut you wish.

In order to customize a function key:

1. Open General Settings page
2. Select “Function Keys”
3. Select a function key you want to customize
4. Press [ENTER] to open list of possible values
5. Move the cursor [UP] / [DOWN] to select the desired function and confirm your choice by pressing [ENTER] or cancel and close the list by pressing [CLEAR].

For example, if you setup F1 to “Next Page” function and long press F1 while being on map page, it will cycle to the next page (Fish Finder page).

14.3 Navigation Settings

On navigation page you can configure the following settings for navigation:

- Static navigation: avoid boat position bouncing and disables COG databox if the boat is stationary (boat’s SOG is under 1.1 kn)
It is recommended to turn Static navigation on:
 1. Open General Settings page
 2. Select “Navigation”
 3. Press [ENTER]
 4. Select “Static Navigation”
 5. Press [ENTER]

- Automatic route following (see Par. 6.2)
- Route following optimization (see Par. 6.2)
- Arrival circle radius (see Par. 6.2)
- Screen amplifier (see Par. 5.2).

14.4 Keyboard Settings

On the keyboard page you can change settings for keyboard, such as beep sound on key press, cursor speed and keyboard backlight.

Beeper

By default the beep sound that accompanies every key press is turned on. To turn it off:

1. Open General Settings page
2. Select “Keyboard”
3. Press [ENTER]
4. Select “Beeper”
5. Press [ENTER].

Cursor speed

The speed of cursor movement can be changed: the scale is from 1 to 10. By default cursor speed is 5. Try different cursor speed to set up the most comfortable cursor speed.

1. Open General Settings page
2. Select “Keyboard”
3. Press [ENTER]
4. Select “Cursor speed”
5. Press [ENTER]
6. Move joystick to select the desired speed value
7. Press [ENTER].

Keyboard backlight

Keyboard backlight can be set to Auto, Custom or turned off.

- **Auto:** keyboard backlight becomes bright at night (from sunset to sunrise). After sunrise it gradually decreases until noon. In the afternoon it gradually increases.
- **Custom:** you can setup the desired fixed brightness.
 1. Open General Settings page
 2. Select “Keyboard”
 3. Press [ENTER]
 4. Move cursor down till the Keyboard backlight section
 5. Select “Off”, “Auto” or “Custom”
 6. Press [ENTER]

7. In case of “Custom” select “Brightness”
8. Press [ENTER]

14.5 Ship Profile Settings

It is important to enter correct information about your vessel's parameters on the Ship Profile page.

1. Open General Settings page
2. Select “Ship Profile”
3. Press [ENTER]

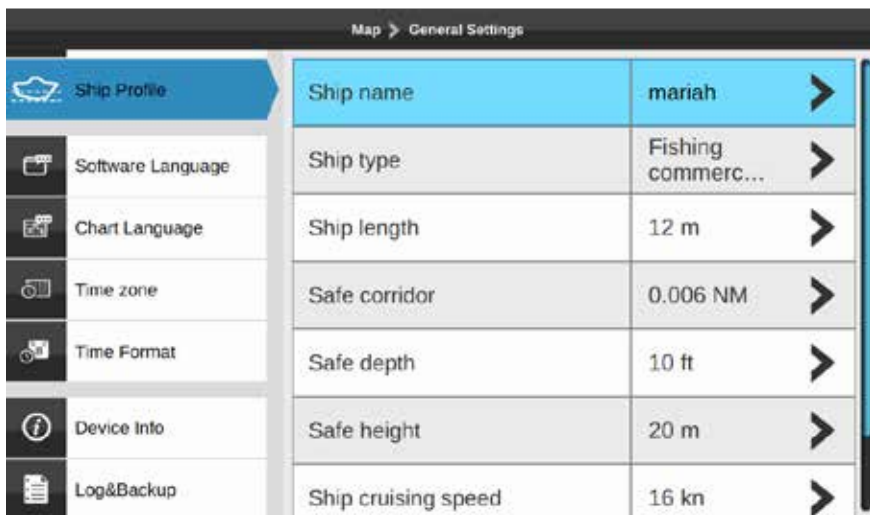


Fig.14.5 – Ship Profile page

- Ship type allows you choosing your boat's icon on the map.
- Safe depth, safe height, safe corridor information is used for check route function (see Par. 7.3).
- Fuel tank capacity information is used for detecting you fuel level on the Engine page.

NOTE In case the detected engine tank capacity differs from your ship profile data, you will be notified to edit your Ship Profile

15. Map settings

15.1 Course Predictor

The Course predictor line is a line that starts from your boat and indicates the course direction. It is presented on map with an infinite blue dashed line. You can customize it in the Course predictor settings:

1. On map press [CLEAR] to get to the home mode
2. Press [ENTER] to open ship menu
3. Select "Course Predictor"
4. Press [ENTER].

On the Course predictor page you can either turn course line off, or customize its length:

- infinite
- by time
- by distance

To set the Course predictor length from 1 to 120 minutes:

1. Open Course Predictor page
2. Select "Time"
3. Press [ENTER]
4. Move cursor down and select "Course line time"
5. Press [ENTER]
6. Select the desired value
7. Press [ENTER]

Now the course line will be finite and its length will depend on your boat's speed.

15.2 Heading Line

The Heading line is a line that starts from the boat's bow and indicates the heading direction. It is presented on map with an infinite green solid line. You can switch the heading line ON:

1. On map press [CLEAR] to get to the home mode
2. Press [ENTER] to open ship menu
3. Select "Heading Line OFF"
4. Press [ENTER].

You can switch the heading line OFF in the same way.

15.3 Map Orientation

During navigation the map can be fixed with north up, or it can be oriented as to keep the Route Up (destination), or course up. Otherwise you can choose a fixed custom map orientation, rotating the map using the remote control.

1. On map page press [MENU]
2. Select "Map Settings" and press [ENTER]
3. Select "Map Orientation" and press [ENTER]
4. Select the desired option and press [ENTER].

16. Ports settings

You can change the parameters of the serial and CAN interface on the Ports and Connectivity page.

1. Press [MENU] on any of the main pages
2. Select "Ports and Connectivity"
3. Press [ENTER]

You can find configuration pages for serial ports A, B, C and CAN port.

16.1 NMEA0183 serial ports

The chart plotter is equipped with three serial ports (COM) and one CAN port. Serial port B is dedicated to GPS data because of its special socket. You can still configure it to Fish Finder or other NMEA 0183 device alternatively.

Serial ports can be setup to receive NMEA 0183 data by selecting one of the options:

NMEA 0183 device

1. Select "NMEA 0183 device"
2. Press [ENTER]
3. Move cursor down and select "Configure baud rate"
4. Press [ENTER]
5. Select the desired baud rate and press [ENTER].

Auto-detect

Connect NMEA 0183 device to the serial port and wait for the device to be found - the port tab will become marked with a blue circle. In the Auto-detect mode baud rate is configured automatically.

16.2 Serial ports Output

The chart plotter can output NMEA 0183 or NMEA 2000 data from your serial ports or the CAN port respectively. This option is available in the "NMEA 0183 device" mode of serial ports.

To enable output for a serial port:

1. Press [ENTER] on the desired serial port (A, B or C)
2. Select "NMEA0183 device"
3. Press [ENTER]
4. Move cursor down and select "Output options"

5. Press [ENTER] to open the “Output options” page
6. Press [ENTER] on the “Enable output” button

On the “Output options” page you can select:

- the NMEA talker ID to use as a prefix for NMEA 0183 sentences
- the NMEA 0183 version (2.0, 3.0 or 4.1)
- the NMEA 0183 sentences for output

16.3 View port incoming data

View port incoming data function allows the chart plotter to act as a computer terminal and display the incoming data exactly as it is received. This option is available in the “NMEA 0183 device” mode.

If the data displayed on the screen is unrecognizable, you may have selected the wrong input parameters for your particular accessory. Check your accessory manual to be sure that you have selected the proper interface format. If the screen is blank, the connection may be interrupted, and no data is being received. Use “Resume/Pause” button at the top bar of the page to pause (or continue after pause) data displaying.

16.4 NMEA2000 port

CAN bus is a communication protocol that shares multiple data and signals through a single backbone cable. You can simply connect any CAN bus devices onto the backbone cable to expand your network onboard. With CAN bus, IDs are assigned to all the devices in the network, and the status of each sensor in the network can be detected. All CAN bus devices can be incorporated into the NMEA2000 network.

This port can be turned on/off on the CAN port settings page:

1. Press [ENTER] on the “CAN port NMEA 2000” tab
2. Select “None” to turn the port off or “NMEA 2000” to turn it on
3. Press [ENTER]

The port output function is available in the “NMEA 2000” mode.

1. Open the “Output options” page
2. Press [ENTER] on the “Enable output” button
3. Select the desired NMEA 2000 PGNs in the list below for output

17. AIS

AIS is an Automatic Identification System. The AIS allows automatic tracking of ships for identifying and locating vessels by exchanging data with other nearby ships, AIS base stations, and satellites. A vessel equipped with AIS is called a Target. Information about the Targets is being received by AIS Receiver and displayed on the screen and in the AIS page:

1. Press [MENU] on any of the main pages
2. Select "AIS"
3. Press [ENTER].

17.1 AIS Filters

Display range filter

By default the information is displayed about all targets within the display range 10 NM. The display range is the range around your boat where Targets become active. You can change the settings for display range:

1. Open AIS page
2. Select "Settings" tab
3. Press [ENTER]
4. Move joystick to the right to select the range
5. Press [ENTER]
6. Select the desired range in the list and press [ENTER].

If you disable the "Display range", all the targets received by the AIS Receiver will be displayed, unless other filter is applied.

AIS Target speed

To apply AIS target speed filter:

1. Open AIS page
2. Select "Settings" tab
3. Press [ENTER]
4. Move joystick to the "Ignore targets slower than" button
5. Press [ENTER]
6. Move joystick to the right
7. Press [ENTER].
8. Select the desired speed in the list and press [ENTER].

You won't see targets with speed slower than the selected value.

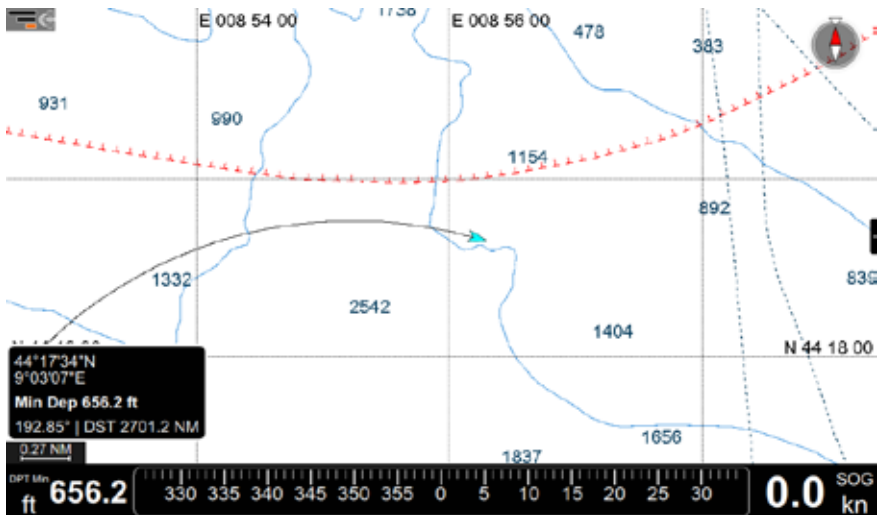


Fig. 17.1.1 – AIS Target with track shown on the map

AIS Target class

In order to apply the AIS class speed filter select the classes you want to be displayed on map and on the AIS Targets page.

AIS Target information

On the AIS Targets page you can access the following information:

- Last Position
- Status
- Call Sign
- IMO
- Destination
- Type
- Flag
- MMSI

To open AIS Target page:

1. Open AIS page
2. Select the desired AIS target in the list of AIS targets
3. Press [ENTER].

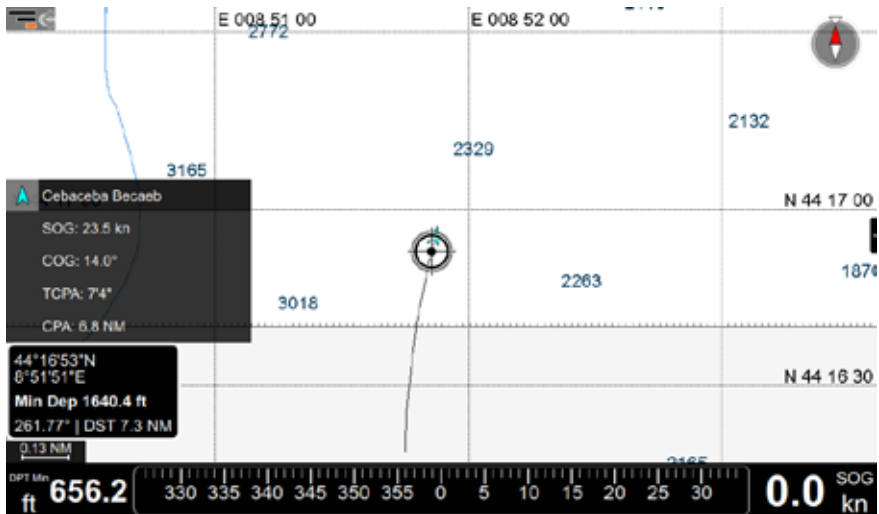


Fig. 17.1.2 – AIS Target info box

On this page you can start/stop tracking of the selected AIS Target and locate it on the map. By placing the cursor over an AIS Target icon on the map, the following information is displayed: AIS name, SOG, COG, CPA and TCPA (see Fig. 17.1.2).

Open AIS full info page from the map:

1. Press [ENTER] on the AIS icon
2. Select “Full info”
3. Press [ENTER].

AIS Tracks

Each AIS Target within the display range can be tracked. The track of AIS Target can be saved on the chart plotter to access any time later.

1. Open AIS page
2. Select the desired AIS target in the list of AIS targets
3. Press [ENTER]
4. Select “Start Tracking”
5. Press [ENTER]

All AIS tracks can be accessed in the “AIS Tracks” tab.

NOTE Target is removed from the screen and list of targets on the AIS page if data is not received for 5 minutes.

1. **Fish Finder icon** in the status bar, it means the fish finder is connected and active.
2. **Color bar** is a colored scale located on the left side of the screen that shows the colors used in the echogram to represent the echoes strength. The color on the top of the bar represents the maximum sonar strength, while the color on the bottom of the bar represents the minimum sonar strength.
3. **A fish icon** with the depth value, on which it was detected, can be turned off on the Display Settings page.
4. **“Simulation”** label appears only when Fish Finder Simulation is turned off (see Par. 13)
5. **Water temperature and depth** values, detected by a connected Fish Finder transducer, are displayed at the bottom left corner.
6. **Compass bar**
Fish Finder frequency is displayed at the bottom right (200, 50 or 200/50 kHz).
7. **The depth ruler** shows the range of depth, on which the Fish Finder is operating. It is a scale which reflects the depth of the area being displayed.
8. **Variable depth marker (VDM)** is a horizontal white line on the echogram with a depth label. The up/down joystick keys can move it up and down. The label displays the depth of the VDM position.
9. **The vertical time marker** is a white line on the echogram, which can be moved by left/right joystick keys along the echogram history.
10. **Data Window**
11. **The current time representation** of fish and bottom features passing through the beam of the transducer.

The compass **bar** at the bottom and the **data window** can be turned off:

1. Open General Settings page
2. Select “Databox settings” tab
3. Select “Show compass bar” or “Show data boxes”
4. Press [ENTER]

Fish Finder Main Menu

Pressing [MENU] activates the Fish Finder page menu that allows adjustments of:

- frequency
- receiver sensitivity
- range mode
- gain mode
- transducer setup
- sensitivity
- display settings

The rest of the menu items are common for all the device pages: General Settings, System Messages, Ports, Simulation, User Manual.

18.3 Echogram history

The Echogram presents an approximate picture of the surface under the Fish Finder transducer that can be scrolled to see the history of the echoes received by the transducer. To scroll the echogram:

1. Open Fish Finder page
2. Move joystick to the left

You will see the vertical white line moving along the echogram. The scrollable history is limited and covers around 2048 echoes.

In order to return the vertical time marker to the current time simply press [CLEAR].

To disable echogram scrolling option:

1. On Fish Finder page press [MENU]
2. Select "Display Settings"
3. Move joystick down until "Echogram History" is selected
4. Press [ENTER]

Placing a Mark in the Fish Finder echogram

You can place mark on any place of the echogram history shown on the screen:

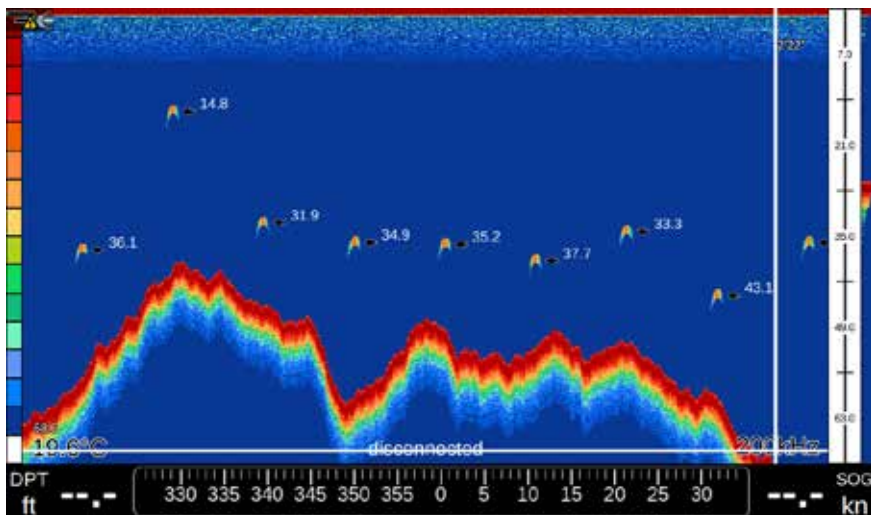


Fig 18.3 – Fish Finder History

1. Move vertical time marker with joystick to place it in the desired position
2. Press [ENTER]
3. Select “Create Mark”
4. Press [ENTER]

The mark is placed and saved at the place where your boat was located at that exact time moment.

To start navigation to the point:

1. Move vertical time marker with joystick to place it in the desired position
2. Press [ENTER]
3. Select “Go To Position”
4. Press [ENTER]

Navigation will begin to the point where your boat was at that exact time moment, to which the vertical time marker pointed.

18.4 Frequency

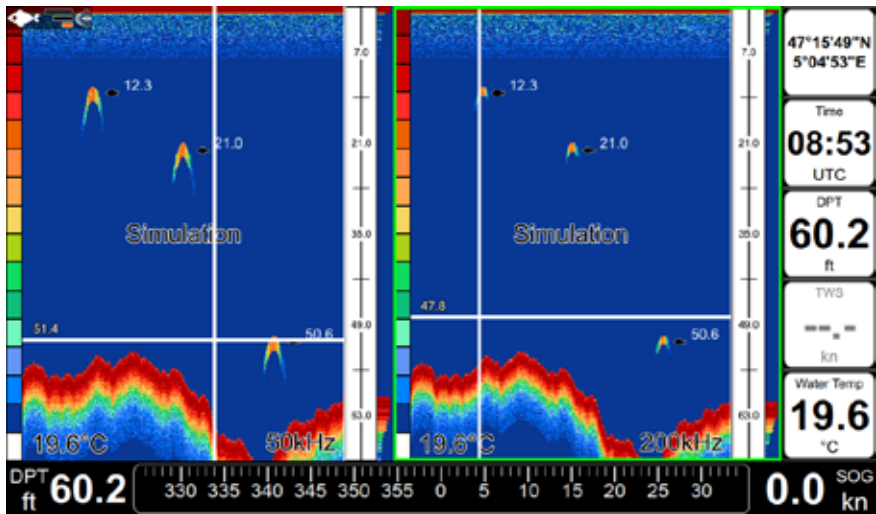


Fig 18.4 – Fish Finder page in double frequency. The green border highlights the active half.

The operation frequency can be changed: 200, 50 or 200/50 kHz.

To change the operation frequency:

1. On Fish Finder page press [MENU]
2. Select "Frequency kHz"
3. Press [ENTER]

When operating in double frequency (200/50 kHz) Fish Finder's page is divided into two sides. Move cursor between them to operate on either side:

1. Press [Menu]
2. Press [Menu] again

The active side is framed with the green color and the green transparent sign is shown for few seconds after changing the active side.

18.5 Sensitivity setup

The Sensitivity menu allows tuning the Range, Gain, Surface Noise Filter and the Sensitivity Time Constant (STC).

Quick access to Range and Gain from Fish Finder menu:

1. On Fish Finder page press [MENU]
2. Select "Range Mode" or "Gain Mode"
3. Press [ENTER]
4. In the popup that appears choose the desired mode: "Auto" or "Manual" for Gain; "Auto", "Manual" or "Bottom Lock" for Range.

The Manual and Bottom Lock adjustment can be done on Sensitivity page:

1. On Fish Finder page press [MENU]
2. Select "Sensitivity"
3. Press [ENTER]
4. Select "Range Mode" or "Gain Mode"
5. Press [ENTER]
6. Select "Manual" (or "Bottom Lock" for the Range Mode) and press [ENTER]
7. Move joystick to select the value which you want to change
8. Press [ENTER]
9. Insert the value and save it by pressing "Done" button of numeric software keyboard
10. Press [ENTER]

When in **Manual Range** Mode it is possible to set Shift (the offset from the surface) and Depth on which the Fish Finder shall operate.

When in **Auto Range** Mode the Fish Finder determines automatically the range as to keep the bottom visible in the lower left of the screen. In this mode, Shift is always set to 0.

In **Bottom Lock** Mode the Fish Finder automatically tracks the range around the bottom specified by the Bottom Range value.

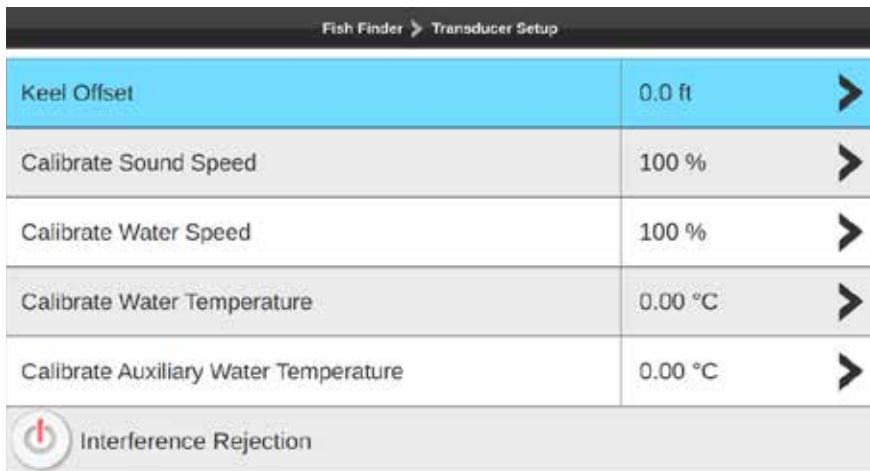
If the range is set to Manual, it can be changed by zooming in/out on the Fish Finder page. Zooming in/out can be done with ZOOM IN and ZOOM OUT keys of the chart plotter, and with the wheel of the remote control.

In the sensitivity page you can also set the sensitivity time constant and the surface noise filter:

Sensitivity Time Constant: it is a time varying gain curve, which attenuates the sonar receiver gain in shallow water, increasing the gain gradually as the depth increases. This is for the purpose of filtering out surface clutter.

Surface noise filter: implements an advanced time varying filter that allows suppressing the surface clutter efficiently while leaving fish targets visible.

18.6 Transducer setup




Fish Finder > Transducer Setup	
Keel Offset	0.0 ft >
Calibrate Sound Speed	100 % >
Calibrate Water Speed	100 % >
Calibrate Water Temperature	0.00 °C >
Calibrate Auxiliary Water Temperature	0.00 °C >
 Interference Rejection	

Fig 18.6 – Transducer setup page

On the Transducer setup page you can customize:

- Keel offset: the transducer depth offset from the surface. This makes it possible to measure depth from the surface instead of from the transducer's location.
- Calibrate sound speed: allows calibrating the value of sound speed in the water, depending on the water temperature and salinity.
- Calibrate water speed: calibrates the value of water speed sensor. The calibration value, in the range between -10% to +10%, will be applied to the water speed from

the transducer.

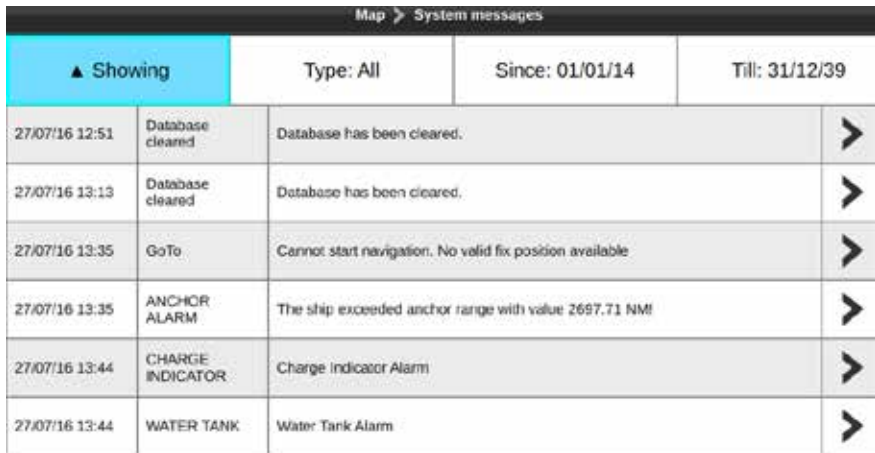
- Calibrate water temperature: calibrates the water temperature sensor. Using the readings from a precise temperature measuring device, insert here a positive/negative offset to display correct value on the Fish Finder screen.
- Calibrate auxiliary water temperature: calibrates the Aux Temperature sensor. Using the readings from a precise temperature measuring device, insert here a positive/negative offset to display correct value on the Fish Finder screen.
- Interference rejection: removes interference from other Fish Finders.

19. System messages

System messages page lists the history of all the Warning messages and Alarms with the date and time when they appeared.

To access System Messages:

1. Press [MENU] on any of the main pages
2. Select "System messages"
3. Press [ENTER]



Map > System messages				
▲ Showing		Type: All	Since: 01/01/14	Till: 31/12/39
27/07/16 12:51	Database cleared	Database has been cleared.	>	
27/07/16 13:13	Database cleared	Database has been cleared.	>	
27/07/16 13:35	GoTo	Cannot start navigation. No valid fix position available	>	
27/07/16 13:35	ANCHOR ALARM	The ship exceeded anchor range with value 2697.71 NMI	>	
27/07/16 13:44	CHARGE INDICATOR	Charge Indicator Alarm	>	
27/07/16 13:44	WATER TANK	Water Tank Alarm	>	

Fig 19 – System messages page

Filter system messages to find the desired one:

- order by date
- filter by type (Warnings or Alarms)
- filter by date

You can change the order of system messages in list: from new to old and vice versa. You can also filter them by date by choosing "Since" and "Till" date.

To save a system message or all system messages to micro SD card:

1. Insert micro SD card to the chart plotter micro SD slot
2. Open System messages page
3. Select a system message and press [ENTER]
4. Select "Save message..." or "Save all messages to micro SD card"
5. Press [ENTER].

NOTE All system messages are cleared after restoring to factory defaults

20. Updates

You can check your device Software version in the "Device Info" page.

1. Press [MENU]
2. Select "General Settings"
3. Press [ENTER]
4. Select "Device Info"
5. Press [ENTER]

Ask your customer support center for software update procedures.

21. Acronyms and definitions

- **ALT = Altitude**

Altitude of GPS Antenna on the medium sea level.

- **Alter = Alternate Solution (TD Coordinates System)**

Parameter selected by the user that is applied in the conversion of TD values to geographical coordinates Lat/Lon. It defines which of the two possible solutions can be used.

- **AWA = Apparent Wind Angle**

Angle from which the Wind appears to blow relative to a moving point (also called Relative Wind Angle).

- **AWS = Apparent Wind Speed**

Speed at which the Wind appears to blow relative to a moving point (also called Relative Wind Speed).

- **Buoy**

A floating object moored to the sea bottom in a particular (charted) place, as an aid to navigation.

- **Buoys and Beacons**

Buoys and Beacons are used to indicate to mariners recommended or established routes, under water dangers, restrictions and regulations. They can be lighted or not and are colored according to their international code.

- **BRG = Bearing**

Angle between the North (True or Magnetic) and a destination. The horizontal direction of one terrestrial point from another referring to the North (True or Magnetic). It is often used to indicate the direction to follow to reach the destination.

- **COG = Course Over Ground**

Direction of the path over ground actually followed by a vessel.

- **Course Line (Time Line)**

Graphical indication of the direction in which the Vessel is heading. The Course Line origin is the vessel's position so the time line movement is synchronized with the vessels Icon. Course Line "course" is given by the value of COG (Course Over Ground) and its length is proportional to the SOG (Speed Over Ground).

- **Default**

Original factory setting for any menu selection. The default values are set after a factory settings

- **Depth Area**

Sea areas included in the user selectable range of minimum and maximum depth limits. The sea area that is beyond the selected range is filled by a uniform white color, the sea area that is inside the selected range is filled by ordinary multicolor shading. The Spot Soundings and Depth Contours are displayed on the range only.

- **Depth Line**

(Also called Bathymetric Line) Imaginary line connecting points of equal water depth.

- **Destination**

In order to tag on the chart the point, towards which the ship is Heading, you can use a special mark, called destination. When the destination is placed, all navigation data referred to this point.

- **DPT = Depth from Transducer**

Water Depth below the Transducer. The Distance from the Depth Transducer to the ground.

- **DST = Distance**

Geographical distance between two points on the map. It is possible to select the unit among Nm, Sm and Km.

- **ETA = Estimated Time of Arrival**

Predicted time of reaching a destination or Waypoint

- **Fix**

Current position of the vessel provided by the GPS (connected to the chart plotter or built-in) or other positioning systems.

- **Fix Status**

Indicates the quality of the position fix signal.

- **Fuel Consumption Rate**

Estimated fuel consumption rate (per hour) of an engine boat referred to its relative estimated cruising speed.

- **GNSS = Global Navigation Satellite System**

Any single or combined navigation system based on satellites. The current available satellites systems are: GPS, GLONASS and the combined GPS and GLONASS.

- **Goto**

Function that defines the destination point and activates the navigation to it. The destination can be placed on any location of the map, an existing Mark point or on a predefined Route.

- **GPS = Global Positioning System**

Satellite based navigation system operated by the US Department of Defense. It gives the navigator a position 24 hours a day, 365 days a year under any weather conditions.

- **HDG = Heading**

Horizontal direction in which a ship actually points or heads in any moment (see also COG).

- **HDOP = Horizontal Dilution Of Precision**

Precision of the positioning system (GPS). The smaller HDOP value indicates higher position accurately.

- **Home mode**

All operations refer to the ship's position.

- **Landmarks**

Landmarks are any prominent object such as monument, building, silo, tower, mast, etc on land which can be used in determining a location or a direction.

- **Latitude**

Angular distance North or South of the equator measured by lines encircling the earth parallel to the equator in degrees from 0° to 90°.

- **LAT/LON**

Coordinate system using Latitude and Longitude coordinates to define a position on earth.

- **Lat/Lon Grid**

Grid of parallels (of Latitude) and meridians (of Longitude) drawn on the map.

- **Longitude**

Angular distance East or West of the prime meridian (Greenwich meridian) as measured by lines perpendicular to the parallels and converging at the poles from 0° to 180°.

- **Magnetic Deviation**

Value, expressed in degrees East or West that indicates the direction in which the north indicator on the compass card is offset from the magnetic north (the difference expressed in degrees East or West between the compass north and the magnetic north).

- **Magnetic Variation**

Angle between the magnetic and geographic meridians at any place, expressed in degrees West or East to indicate the direction of magnetic North from true North. It changes from point to point, and (at the same point) with time.

- **Mark**

Reference point related to cursor position. Typically it represents by an icon and label under Mark.

- **Navigate mode**

Operating mode (called also Home mode): all operations refer to the ship's position. Navigate or Navigation mode is also used to indicate that the destination is placed.

- **NMEA-0183**

The NMEA-0183 Data Interface Standard was developed by the National Marine Electronics Association of America. It is an international standard that enables equipment from many different manufactures to be connected together and share information.

- **Pictures & Diagrams**

The MAX data format allows assigning one or more image to any cartographic object. These Pictures are typically used to facilitate the identification of cartographic objects or places around

the map: they can be the landscape layout nearby a harbor, the shape of a bridge or of a buoy etc. On some objects, such as bridges, the image associated can represent the Diagram representing the shape of the objects and the various characteristics (length, height, type of bridge etc.).

- **Port Info**

Port Info function is a combination of a Port Info database containing all the relevant Safety and Navigational information normally found in good pilot books and presentation software which displays special Port Facility Symbols.

- **Ports & Services**

Areas along shore with facilities for mooring, downloading and uploading of ships, generally sheltered from waves and winds. Port installations are piers, wharves, pontoons, dry docks, cranes....

- **Route**

Sequence of Waypoints connected by segments (Route Legs). Among the available Routes, only one is the Active Route, which is shown by a straight line and arrows to indicate the direction.

- **SCALE**

Allows the display of Map Scale (magnitude of the reference scale expressed in the actual unit of measure) and the current Map Datum.

- **SNR = Signal to Noise Ratio**

Ratio between the magnitude of a radio signal and the magnitude of the noise (that is, the interferences). The SRN is expressed in decibels and it is associated to the GPS satellites signal quality.

- **SOG = Speed Over Ground**

Current velocity at which the vessel is travelling, relative to a ground location. The SOG is normally provided by the GPS sensor.

- **Spot Sounding**

Depth of the water in a specific and charted position. It is represented on the map by its own value expressed in the current depth unit.

- **STR = Steering**

Difference between COG and CTS. If COG is 25° and CTS is 30°, then STR is 5° Right.

- **STW = Speed Through Water**

Speed of the vessel relative to the water.

- **Tide**

Periodic rise and fall of the surface of oceans, bays, etc., due principally to the gravitational interactions between the Moon and Earth.

- **Tide Info**

Calculates the tide heights for any past or future date and as a by-product of this calculation will also display the Maximum and Minimum Tide height and time for the day selected plus the times of Sunrise and Sunset. At some chart levels, the chart plotter will display a new Tide Diamond Symbol for every Port or tide point in the database covered by that particular DATA MEDIA.

- **Tracks & Routes**

Recommended and established routes for ships at sea, including traffic separation schemes, deep water routes.

- **TTG = Time To Go**

Estimated time needed to reach your destination, based on your current speed and the distance to destination.

- **TWA = True Wind Angle**

Angle of the Wind relative to a fixed point on the earth.

- **TWS = True Wind Speed**

Velocity of the Wind relative to a fixed point on the earth.

- **Underwater Objects**

Objects like obstruction, wreck, cable...

- **User Point**

Object you place on the chart identified by its coordinates and displayed on the screen with a reference symbol (see Mark, Waypoint).

- **UTC = Universal Time Coordinated**

Time scale based on the rotation of the earth that is used by most broadcast time services.

- **UTM = Universal Transverse Mercator**

Metric Grid system used on most large and intermediate scale land topographic charts and maps.

- **Variation**

Angle between the magnetic and geographic meridians at any place, expressed in degrees West or East to indicate the direction of magnetic North from true North. It changes from point to point, and (at the same point) with time.

- **VMG= Velocity Made Good**

Destination closing Velocity. The VMG is calculated using the current speed of the vessel (SOG) and the difference between the current vessel course and the bearing to the destination.

- **WAAS = Wide Area Augmentation System**

The Federal Aviation Administration (FAA), in cooperation with other DOT organizations and DOD, is augmenting the GPS/SPS with a satellite-based augmentation system, the WAAS. It will provide a signal-in-space to WAAS users to support en route through precision approach

navigation. After achieving initial operational capability, the WAAS will then be incrementally improved over the next years to expand the area of coverage, increase the availability of precision approaches, increase signal redundancy and reduce operational restrictions.

- **Waypoint**

Any point to which one intends to navigate. A sequence of Waypoints makes up a Route plan.

- **Zoom-In**

Shows more detail in a smaller area.

- **Zoom-Out**

Operates similarly to zoom -in, but in the reverse, showing a wider but less detailed view.

- **XTE = Cross Track Error**

Distance from the ship's present position to the closest point on a line between the origin and destinations Waypoints of the navigation.

22. Technical specifications

- Dimensions: 172.5 x 106.5 x 84.4 mm (6.8" * 4.2" * 3.3") with holder
- Weight: 350 g (12.3 oz)
- Compatible with any HDMI display
- Power consumption: 1.2W typical
- Supply Voltage: 10-35 Vdc
- Cartridge slot: 1 x micro SD Card (not included)
- Back-lit keyboard
- Integrated remote control receiver (radio IF 2.4 Ghz)
- Waterproof IPx6
- Storage temperature: -20 +80 °C
- Operating temperature: -20 +60°C
- Connectors:
 - 1x Supply and data cable: 2 NMEA 0183 ports + external alarm
 - 1x NMEA 2000
 - 1x GPS: 6 pins (powered 10-35 Vdc)
 - 1x Built-in HDMI video input cable (1.5 m / 4.9 ft)

23. Contextual menu diagram

Note In navigation means that the user is following destination of any kind (mark, WP, Route etc...)

<p>Map background no nav*:</p> <ol style="list-style-type: none"> 1. Go to 2. Tide Graph** 3. Save mark 4. New route 5. New Easy routing 6. A-B 7. Full Info 	<p>Map background in navigation*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Go to 3. Tide Graph** 4. Save mark 5. New route 6. New Easy routing 7. A-B 8. Full Info 	<p>Map background in navigation (active route)*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Go to 3. Tide Graph** 4. Save mark 5. Insert WP 6. Append WP 7. New route 8. New Easy routing 9. A-B 10. Full Info
<p>Track*:</p> <ol style="list-style-type: none"> 1. Go To 2. Save Mark 3. New route 4. New Easy routing 5. Edit Color 6. Hide 7. Delete track 8. A-B 9. Full info 	<p>Track* in navigation:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Go To 3. Save Mark 4. New route 5. New Easy routing 6. Edit Color 7. Hide 8. Delete track 9. A-B 10. Full info 	<p>Route wp no nav*:</p> <ol style="list-style-type: none"> 1. Start nav 2. Start here 3. Go To 4. Save mark 5. Move 6. Edit position 7. Delete WP 8. Delete route 9. Open wp list 10. A-B 11. Full info
<p>Route wp in navigation*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Start here 3. Go To 4. Save mark 5. Move 6. Edit position 7. Delete WP 8. Open wp list 9. Reverse 10. A-B 11. Full info 	<p>Route wp in navigation, current destination*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Skip WP 3. Open WP list 4. Reverse (If not first WP) 5. A-B 6. Full info 	<p>Route last WP* no nav:</p> <ol style="list-style-type: none"> 1. Start nav 2. Start here 3. Go To 4. Save mark 5. Move 6. Edit position 7. Delete WP 8. Extend 9. Delete route 10. Open wp list 11. A-B 12. Full info

<p>Route last WP in navigation*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Start here 3. Go To 4. Save mark 5. Move 6. Edit position 7. Delete WP 8. Extend 9. Open wp list 10. Reverse 11. A-B 12. Full info 	<p>Route last WP in navigation, current destination*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Extend 3. Open WP list 4. Reverse 5. A-B 6. Full info 	<p>Route leg no nav*:</p> <ol style="list-style-type: none"> 1. Start nav 2. Start here (next wp after the leg) 3. Go To 4. Save mark 5. Insert (a WP in the selected point) 6. Leg Easy routing 7. Delete route 8. Open wp list 9. A-B 10. Full info
<p>Route leg in navigation*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Start here(next wp after the leg) 3. Go To 4. Save mark 5. Open wp list 6. Reverse 7. A-B 8. Full info 	<p>Fishfinder:</p> <ol style="list-style-type: none"> 1. Go to 2. Save mark 	<p>Mark no nav*:</p> <ol style="list-style-type: none"> 1. Go To 2. Move 3. Edit position 4. Name and description 5. Color and symbol 6. New route 7. New Easy routing 8. Delete 9. Move to vessel 10. A-B 11. Full info
<p>Mark in navigation*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Go To 3. Move 4. Edit position 5. Name and description 6. Color and symbol 7. New route 8. New Easy routing 9. Delete 10. Move to vessel 11. A-B 12. Full info 	<p>Ownship no nav:</p> <ol style="list-style-type: none"> 1. Start/Stop track 2. Save event 3. Course predictor 4. Heading line OFF/ON 5. A-B 6. Full Info 	<p>Ownship in navigation:</p> <ol style="list-style-type: none"> 1. Stop Nav 2. Start/Stop track 3. Save event 4. Course predictor 5. Heading line OFF/ON 6. A-B 7. Full Info
<p>Event no nav*:</p> <ol style="list-style-type: none"> 1. Go To 2. Description 3. Color and symbol 4. New route 5. New Easy routing 6. Delete 7. A-B 8. Full info 	<p>Event in navigation*:</p> <ol style="list-style-type: none"> 1. Stop nav 2. Go To 3. Description 4. Color and symbol 5. New route 6. New Easy routing 7. Delete 8. A-B 9. Full info 	

* When in simulation, also displaying "Move ship here **If Tide station

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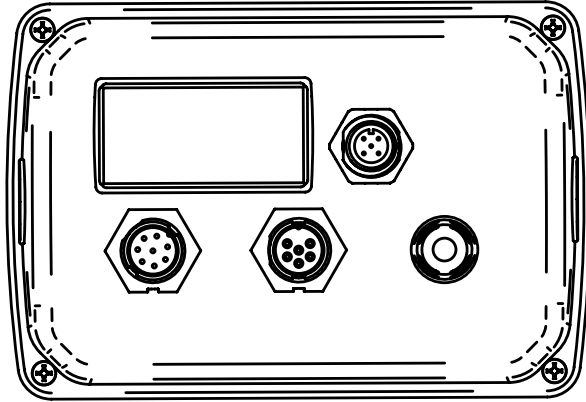
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