CHART PLOTTER NAME	DESCRIPTION	SOFTWARE	LCD
MURENA	*5.6" Sunlight Readable Color Display* *External Smart GPS Receiver*	S3egSW7vc	5.7
MURENA iGPS	*5.6" Sunlight Readable Color Display* *Internal GPS Receiver*	S3igSW7vc	
TIGERSHARK Plus	*5.6" Gray Levels Display* *External Smart GPS Receiver*	S3egSW7m	
MILLENNIUM 7	*5.6" Gray Levels Display* *Internal GPS Receiver*	S3igSW7m	
NAUTILUS iGPS Plus	*5.6" Sunlight Readable Color Display* *External GPS Receiver*	S3egSW7c	
MILLENNIUM 7 Color	*5.6" Sunlight Readable Color Display* *Internal GPS Receiver*	S3igSW7c	
BARRACUDA	*7" Sunlight Readable Color Display* *External Smart GPS Receiver*	S3egSW7wc	8
BARRACUDA iGPS	*7" Sunlight Readable Color Display* *Internal GPS Receiver*	S3igSW7wc	
EXPLORER MK-II Plus	*Controller for Color Display* *External Smart GPS Receiver*	XSegSWctcj	K
BARRAMUNDI	*11" Color Display* *External Smart GPS Receiver & Video Input*	XSegSW11c	10.4
BARRAMUNDI Plus	*11" Sunlight Readable Color Display* *External Smart GPS Receiver & Video Input*	XSegSW11c	

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User Manual

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About this User Manual

INTRODUCTION

The chart plotter is a state-of-the-art computerized electronic chart system, designed as a sophisticated navigation aid. User friendly operations make the chart plotter easy to operate. All calculations and information necessary for navigation are performed and displayed on the screen quickly and accurately providing all of the facilities of a conventional GPS but with the added benefit of a powerful electronic chart display. The cartographic information is obtained from C-MAP NT+ C-CARD (cartography data cards) that are available through your local dealer. For additional information on C-MAP Cartography visit web site at **www.c-map.com**.

CONVENTIONS USED

Throughout this User Manual, the labelled keys are shown in capital letters enclosed in square brackets, for example [ENTER]; the software keys are shown in small capital letters enclosed in square brackets, for example [EDIT].
Menu operations are in bold characters listed by keys sequence with the menu names enclosed between inverted commas, for example **[MENU] + "MAP" + [ENTER]** means: press the [MENU] key, using the cursor key select the Map menu and then press [ENTER].

Any menu operation and function activation in this User Manual is related to 5.7 color chartplotter LCD models (see the previous table). Whenever it is necessary, a note has been inserted for the other LCD models.

HOW THIS USER MANUAL IS ORGANIZED

- **CHAPTER 1: Getting Started**
  Overview of the controls and how to start using the chart plotter.
- **CHAPTER 2: Operations**
  Description of the operation procedures of the chart plotter in detail.
- **CHAPTER 3: User Setting Up**
  Set up of the chart plotter, the charting preferences and the GPS options.
- **CHAPTER 4: C-LINK**
  C-Link system is a feature which allows to sharing the same cartographic data between two chart plotter units linked via serial I/O port.
- **CHAPTER 5: Terms**
  List of the terms and abbreviations used in the User Manual.
- **CHAPTER 6: GPS**
  GPS antenna and set up of the hardware configuration.
- **CHAPTER 7: Maintenance**
  User maintenance guidelines.
- **MURENA/MURENA iGPS**
  Introduction to the basic information on MURENA/MURENA iGPS chart plotter, its features and use. Installation of the chart plotter.
- **BARRACUDA/BARRACUDA iGPS**
  Introduction to the basic information on BARRACUDA/BARRACUDA iGPS chart plotter, its features and use. Installation of the chart plotter.

- **TIGERSHARK plus/NAUTILUS iGPS Plus MILLENNIUM 7/MILLENNIUM 7Color**
  Introduction to the basic information on TIGERSHARK Plus/MILLENNIUM 7/MILLENNIUM 7 Color/NAUTILUS iGPS Plus chart plotter, its features and use. Installation of the chart plotter.
- **BARRAMUNDI/BARRAMUNDI Plus**
  Introduction to the basic information on BARRAMUNDI/BARRAMUNDI Plus chart plotter, its features and use. Installation of the chart plotter.
- **EXPLORER MK-II Plus**
  Introduction to the basic information on EXPLORER MK-II Plus controller, its features and use. Installation of the controller.

Analytical index is to be found at the end of this User Manual.

IF YOU NEED ASSISTANCE

If your chart plotter does not operate properly, please refer to Chapter 6. Most common operating difficulties can be diagnosed using these tests.
If you still need assistance, call your local dealer, reporting the information available in the System Information page.

Important Information

WARNING

Electronic charts displayed by the chart plotter 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 a 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.

CAUTION

- Please read through this manual before the first operation. If you have any questions, please contact the Company's customer service or your local dealer.
- The chart plotter is not built water proof. Please give attention to avoid water intrusion into the chart plotter. Water damage is not covered by the warranty.
- Extensive exposure to heat may result in damage to the chart plotter.
- Connection to the power source with reversed polarity will damage the chart plotter severely. This damage is not covered by the warranty.
- The chart plotter contains dangerous high voltage circuits which only experienced technicians MUST handle.
- The C-MAP C-CARDs are available from your local dealer.
- Exposure of the display to UV rays may shorten the life of the liquid crystals used in your plotter. This limitation is due to the current technology of the LCD displays.
- Avoid overheating which may cause loss of contrast and, in extreme cases, a darkening of the screen. Problems which occur from overheating are reversible when temperature decreases.

CLEANING PROCEDURE FOR THE PLOTTER SCREEN

Cleaning your chart plotter screen is a very important operation and must be done carefully. Since the surface is covered by an antireflective coating, the procedure for cleaning all the surfaces can be performed in the following way. You use a tissue or lens tissue and a cleaning spray containing Isopropanol (a normal spray cleaner sold for the PC screen, for example PolaClear by Polaroid). Fold the tissue or lens tissue into a triangular shape, moisten the tip and use the index finger behind a corner to move the tissue across the surface, in overlapping side to side strokes. If the tissue is too wet, a noticeable wet film will be left in its path and you will need to repeat the process. If too dry, the tissue won't glide easily, and may damage the surface.

NOTE *We will not be liable for errors contained herein, or for incidental or consequential damages in connection with the performance or use of this material.*

1. Getting Started

This chapter provides basic information to get you started using the chart plotter; it will help you in becoming familiar with the chart display and the functions of the controls before you start using the chart plotter.

1.1 THE KEYBOARD

Joystick (Cursor key)

Moves the cursor on the display screen quickly and accurately and in the menu page(s) scrolls the desired option. If in Navigate (Home) mode, it allows to exit from navigate mode.

Dedicated Keys

[POWER]
- for one second turns On the chart plotter
- for three seconds turns Off the chart plotter
- adjusts the backlight and contrast of the display

[MOB]
- inserts the MOB (Man OverBoard) under the ship's position

[CLEAR]
- exits from menu or leaves a menu without making changes
- if you are not into a menu, sets the Navigate (Home) mode: the cursor is centered on ship's position

[ENTER]
- places Marks, Waypoints, destination and selects R/B; confirms selection

[MENU]
- opens the Map menu
- if pressed twice selects the Functions menu
- for 3 seconds from chart and data page allows to customize all data fields shown in the selected page

[ZOOM IN]
- shows more details of a smaller area

[ZOOM OUT]
- shows a wider, less detailed area

BARRAMUNDI/BARRAMUNDI PLUS:

[GOTO]
- selects the Goto function (instead of [ENTER])

[DATA]
- selects the configuration among cartography and text area

[INFO]
- selects the Info function

Software Keys

The software keys (soft keys) have different functions according to the modes of operation: their labels for the current functions, located on the front panel, are shown on the screen right above the keys. Also they are used from the chart screen or from the data pages to select one of the data pages available to allow faster access to the page selection executable from the Main Menu.
When the chart page is selected, the soft key labels are not shown. By pressing one of the four soft keys their labels for the current functions are shown on the screen immediately above the soft keys. When the soft key labels are shown, by

pressing the associated soft key the relative function is executed. By pressing [CLEAR] the four soft key labels disappear.

Software Keys Customization

Note that when the soft keys labels are shown the user can customize them. Pressing and holding down any of the four soft key shows a pop-up window on the top of the soft key pressed that contains all possible data pages assignable to the soft key pressed. Move the cursor key up/down to place the selector on the desired item; move the cursor key to the right or press [ENTER] to set the selected item; move the cursor key to the left or press [CLEAR] to close the pop-up window. The possible choices are:

- CHART [CHART] (Chart and data page)
- NAVIGATION [NAV] (Navigation data page)
- 3D ROAD [ROAD] (3D Road page)
- GPS STATUS [STATUS] (GPS Status page)
- GPS DATA [GPS] (GPS data page)
- DEPTH [DEPTH 1] (Depth page)
- DEPTH FULL [DEPTH 2] (Depth Full page)

BARRAMUNDI/BARRAMUNDI PLUS/EXPLORER MK-II PLUS:

- WIND DATA [WINDDTA] (Wind Data page)
- WIND SPEED [WINDSPD] (Wind Speed page)
- WIND DIRECTION [WINDDIR] (Wind Direction page)

BARRAMUNDI/BARRAMUNDI PLUS:

- VIDEOCAMERA [VIDEO] (Videocamera page)

1.2 SWITCHING ON/OFF

Before powering On the chart plotter, check for the correct voltage (10-35 volt dc) and the correct connections with the positioning instrument.

Switching On

➤ **[POWER] for 1 second**

The chart plotter shows you the logo screen, Caution Notice and then the chart screen in sequence. The chart plotter will then perform a short self test procedure that checks all internal memory and the C-CARD (if installed), and then displays any failure detected on the screen.

Switching Off

➤ **[POWER] for 3 seconds**

A countdown timer appears on the screen, if you release the key before the countdown timer reaches zero, the chart plotter will remain On.

1.3 CHANGING BACKLIGHT AND CONTRAST

You can change the level of backlight and contrast for the screen.

➤ **[POWER] + use [BRIGHT-]/[BRIGHT+] to adjust backlight levels and/or use [CONTR-]/[CONTR+] to adjust contrast levels + [ENTER]**

Now you return to the chart screen with the new backlight and contrast levels retained.

1.4 SELECTING THE LANGUAGE

It is possible to select the language in which you wish information to be displayed (for

screen labels, menus and options, but it does not affect the map information).

➤ **[MENU] + [MENU] + "GENERAL" + [ENTER'] + "Language" + [ENTER] + select the language you want + [ENTER]**

1.5 C-MAP CARTOGRAPHY INFORMATION

MAX is a major evolution of the NT/NT+ product technology. Key points are:

New Data Features

- Tides and Currents (intuitive arrows show direction and strength)
- World Background Charts with terrestrial data
- Value Added Data (Pictures and Diagrams, Land Data)
- Enhanced Port Info

New Presentation Features

- Clear View (advanced legibility techniques providing more chart data on the screen)
- Clear Info (sophisticated "Human Disctionary" to translate Nav-Aid abbreviations found on paper charts)
- Dynamic Nav-Aids (an innovative and dynamic presentation mode)T
- Flexi-Zoom (increased Under and Over Zoom between chart levels, resulting in optimal scale display for any situation)
- Dynamic Elevation Data (optimised palettes for chart plotters with 256 or more colors; inludes new NOAA palette for US market)
- Perspective View ("Real World" perspective view of the chart, updated realtime during navigation)

MAX and NT/NT+ C-CARD coexistence

- When NT+ data and MAX data cover different areas, the chart plotter gets data from both charts (depending on the current position).
- When NT+ data and MAX data cover the same area, the chart plotter gets data only from MAX chart.

1.6 USING C-MAP C-CARDS

The chart plotter has a built-in world map that can be used for Route planning. To use the chart plotter as a navigation aid, charts with detailed information for the area you wish to navigate are required. This chart cartridge is called C-CARD. See the Chapter related to your chart plotter for inserting/removing C-CARD procedure.

1.7 SIMULATION MODE

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

➤ **Place the cursor at your desired position + [MENU] + [MENU] + "ADVANCED" + [ENTER] + "SIMULATION MODE" + [ENTER] + "SIMULATION MODE" + [ENTER] + "ON" + [ENTER]**

You might insert the Speed, Heading, date and time values:

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "SIMULATION MODE" + [ENTER] + "SPEED"/"HEADING"/"DATE"/"TIME" + [ENTER] + enter values + [ENTER]**

To select the Cursor Control in Chart page use the cursor up/down to adjust the Speed and the cursor left/right to adjust the Course:

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "SIMULATION MODE" + [ENTER] + "CURSOR CONTROL" + [ENTER] + "ON" + [ENTER]**

1.8 CONTROLLING THE DISPLAY

This paragraph describes how to change the display mode and how to move around the chart by changing the chart scale.

Changing Display Mode

➤ **[MENU] + [MENU] + "PAGE" + [ENTER] + select the desired page + [ENTER]**

BARRAMUNDI/BARRAMUNDI PLUS:

➤ **[DATA] + select the desired page + [ENTER]**

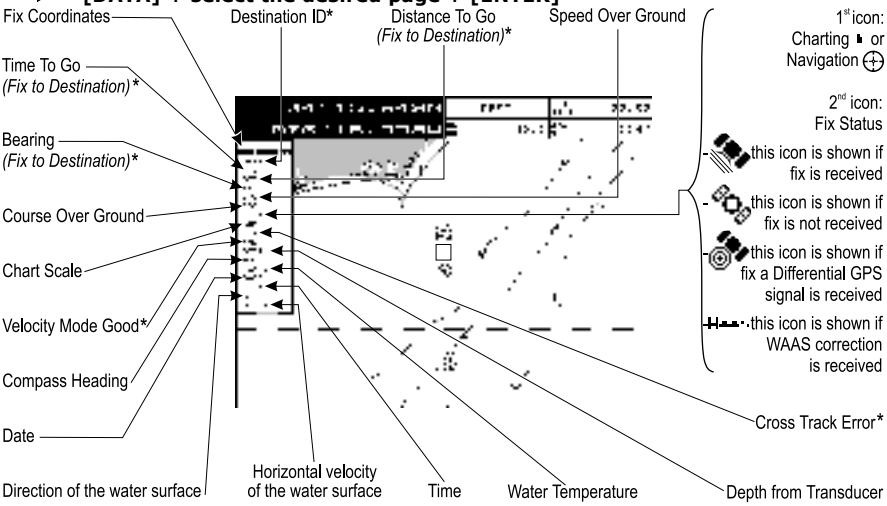


Fig.1.8 - Example of Charts and Text Area shown on the screen

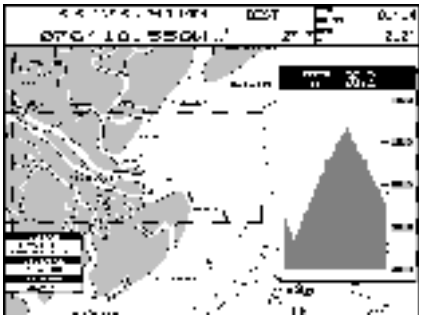


Fig. 1.8a - Example of Depth Graph page

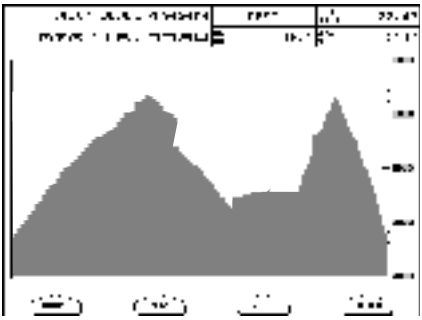


Fig. 1.8b - Example of Depth Graph Full page

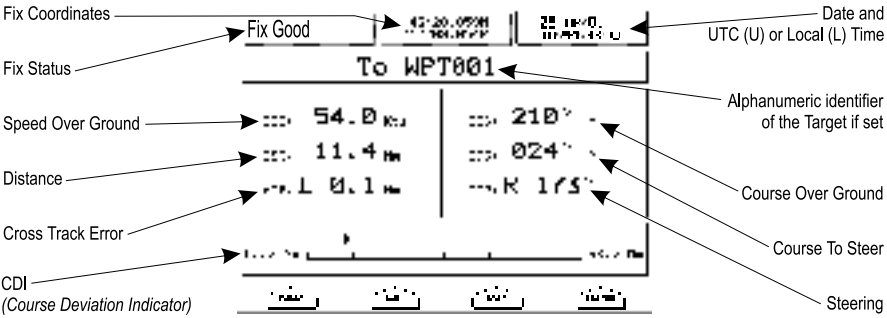


Fig. 1.8c - Example of Navigation Data page

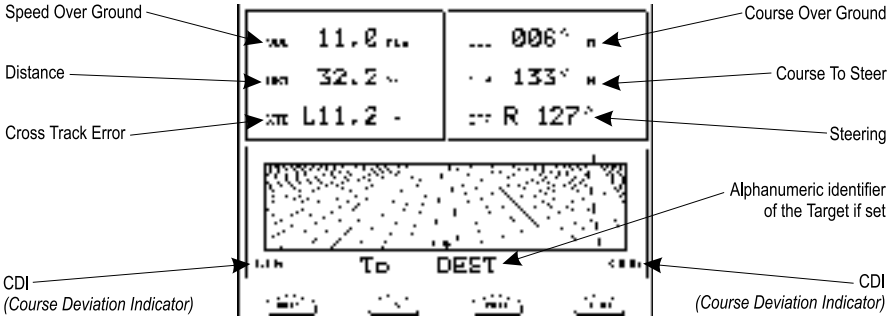


Fig. 1.8d - Example of 3D Road page

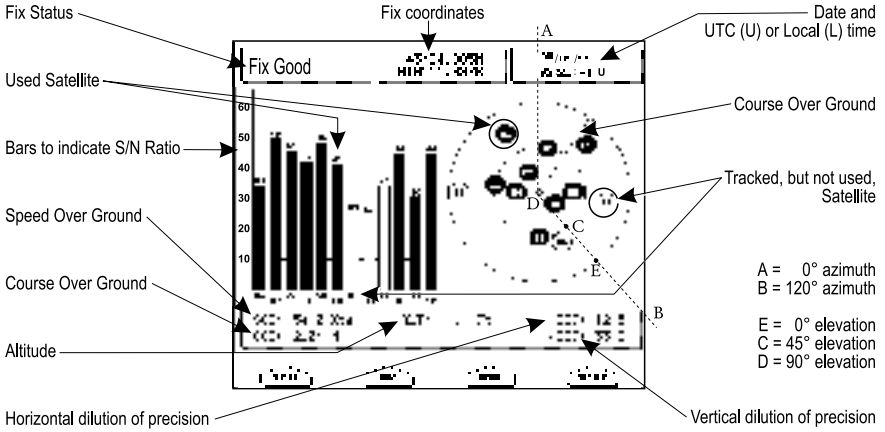


Fig. 1.8e - Example of GPS Status page

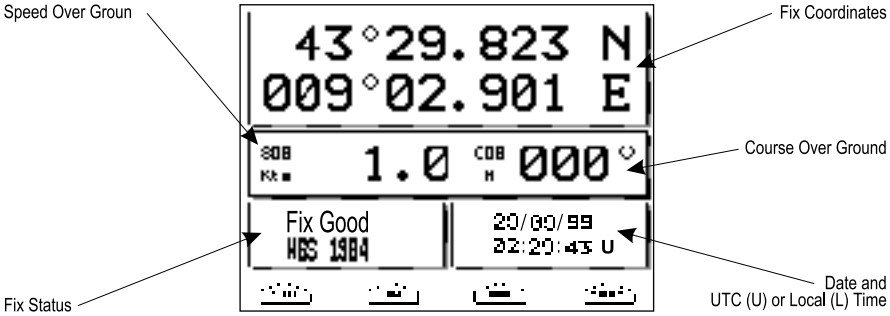


Fig. 1.8f - Example of GPS Data page

BARRAMUNDI/BARRAMUNDI PLUS/EXPLORER MK-II PLUS:
It is possible to select the Wind pages too. See the following pictures.

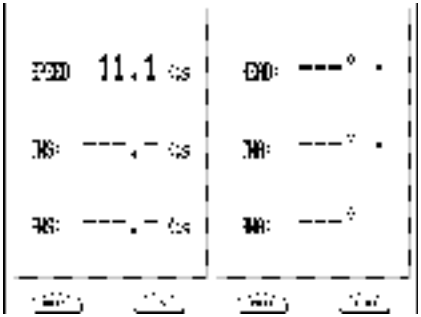


Fig. 1.8g - Example of Wind Data page

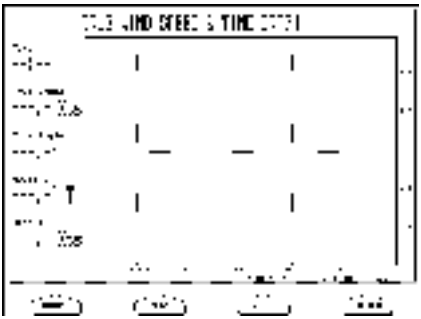


Fig. 1.8h - Example of Wind Speed page

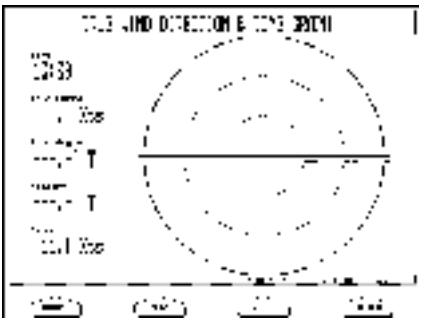


Fig. 1.8i - Example of Wind Direction page

Moving around the Chart and Changing Chart Scale

Use the cursor key to move around 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.

Finding Your Boat Position

The most common use of the chart plotter is to show your ship's current location. You can home the cursor to the ship using [CLEAR]. The Home function locks the cursor to the ship and updates the display as the ship moves.
To release the cursor from the Home Mode, use the cursor key to move the cursor away from the ship's current position.

Selecting Screen Amplifier

In Home mode the Screen Amplifier function sets up the charts on the navigation direction (course) in order to display more map details in front of the vessel's position.

- **[CLEAR] + [MENU] + [MENU] + "DISPLAY" + [ENTER] + "SCREEN AMPLIFIER" + [ENTER] + "ON" + [ENTER]**

Selecting Map Orientation

To select the orientation of your chart according to:

- **[MENU] + "MAP ORIENTATION" + [ENTER]**

The available choices are North Up, the map is shown with North upwards, and Track Up, the map is shown with the ship's current heading upwards. The Resolution angle can be set:

➢ **[MENU] + [MENU] + "DISPLAY" + [ENTER] + "MAP ORIENTATION" + [ENTER] + "TRACK UP" + [ENTER] + use cursor to insert values + [ENTER]**

The Resolution angle, which may be selected in the range [5 – 60] degrees, defines the maximum variation of the reference angle after which the map changes its orientation.

1.9 NAVIGATION TO A SINGLE DESTINATION

To place the destination at cursor coordinates and activates navigation to it:

➢ **Place the cursor on location to navigate to + [ENTER] + "GOTO" + [ENTER]**

You are now navigating to the destination drawn as a Mark with a circle around it, labeled "DEST". A straight line is shown on the screen connecting the destination with the ship's position. All navigation data is referred to this destination.

BARRAMUNDI/BARRAMUNDI PLUS:

➢ **Place the cursor on location to navigate to + [GOTO]**

1.10 RANGE/BEARING FUNCTION

The Range/Bearing function allows to measure the distance and bearing between two points on the Chart page.

Inserting R/B

➢ **[ENTER] + "R/B" + [ENTER]**

A dotted line and a circle appears on the screen. A window containing the distance and bearing values is shown. The origin of the line and the circle's centre is the cursor position: use the cursor key to move the dotted line in any direction you choose; in the same time the radius changes. Press [ACCEPT] to confirm ([CANCEL] otherwise).

Deleting R/B

➢ **[ENTER] + "R/B" + [ENTER] + [ACCEPT] + [DELETE]**

Deletes the line and the circle.

Editing R/B

➢ **[ENTER] + "R/B" + [ENTER] + [ACCEPT] + [EDIT]**

Modifies the line direction and the circle radius. Use the cursor key to move the dotted line in any direction you choose; in the same time the radius changes. Press [ACCEPT] to confirm ([CANCEL] otherwise).

1.11 MAN OVERBOARD (MOB)

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

Inserting MOB

➢ **[MOB] + [CONFIRM]**

If MOB is already placed removes the existing MOB and places a new one.
Once inserted, the system performs the following operations:

1. places the MOB icon at ship's position
2. stops navigation to an existing destination (if present)
3. sets the MOB as destination

Selecting Auto Info on MOB

- **Place the cursor on MOB symbol**

An information window appears, showing the bearing and distance to the MOB position.

Deleting MOB

- **place cursor on existing MOB + [MOB] + [CONFIRM]**

2. Operations

2.1 USER POINTS: MARKS AND WAYPOINTS

A User Point is an object that you can place on the charts to mark a specific point. The chart plotter features two types of User Points: Marks and Waypoints. A Waypoint is created entering a Route while a Mark can be created at anytime.

Creating Waypoint

See Creating a Route.

Creating Mark

- **[ENTER] + "MARK" + [ENTER]**

The new Mark appears on your cursor or ship's position if in Home Mode.

Editing User Point

To allow to modify name, symbol, color and position of the User Point.

If in Chart page:

- **Place the cursor on the desired User Point + [EDIT] + use the cursor key to modify Name/Symbol/Lat-Lon/Color (ONLY FOR COLOR CHART PLOTTER)+ [ACCEPT]**

From the User Points List page:

The User Point appears on the selected position with the new symbol and color.

NOTE *To select the User Point presentation:*

- **[MENU] + [MENU] + "DISPLAY" + [ENTER] + "USER POINTS" + [ENTER]**

There are three possible choices: by selecting OFF the User Point is not shown on the screen, otherwise by selecting ON it is shown on the Chart page shown with symbol and name; by selecting Icon only the User Point symbol is shown.

Deleting User Point

If in Chart page:

- **Place the cursor on the desired User Point + [DELETE] + [CONFIRM]**

If in User Points List page:

- **[MENU] + [MENU] + "USER POINTS" + [ENTER] + use the cursor to select the row with the desired User Point +[DELETE] + [CONFIRM]**

The User Point is deleted.

It is also possible to delete all stored User Points. If in User Points List page:

- **[MENU] + [MENU] + "USER POINTS" + [ENTER] + [DEL ALL] + [CONFIRM]**

Moving User Point

- **Place the cursor on the desired User Point + [MOVE] + move the cursor to the desired position + [ENTER]**

The User Point is placed on the screen at the new position.

Locating User Point on Map

If in Chart page:

- **[MENU] + "FIND" + [ENTER] + "USER POINTS" + [ENTER] + use the cursor to insert name of the User Point to show on map + [ENTER]**

If in User Points List page:

- **[MENU] + [MENU] + "USER POINTS" + [ENTER] + use the cursor to select the row with the desired User Point + [VIEW]**

The User Points List is closed and the map is centered on the selected User Point.

Selecting User Points List page

To give information and allow the editing of all stored User Points:

➢ **[MENU] + [MENU] + "USER POINTS" + [ENTER]**

In this page it is possible to find the User Point by entering its name:

➢ **[MENU] + [MENU] + "USER POINTS" + [ENTER] + [FIND] + [ENTER] + use the cursor to insert name + [ENTER]**

NOTE *It is not possible to edit/remove/move a Waypoint if it belongs to the active Route.*

2.2 ROUTES

A Route is made by placing a series of Waypoints or by linking existing Marks. Among the available Routes only one can be the Active Route, that is shown on the screen by straight lines and arrows to indicate the direction; the first Waypoint of this Route is surronded by a circle. The Active Route (sometimes called current) is the working Route: it can be edited by adding, removing or moving Waypoints.

Selecting Active Route

➢ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "SELECT" + [ENTER] + use the cursor key to highlight the Route + [SELECT]**

The Route, shown by straight segments, is centered on the screen, with the cursor on the central Waypoint. This will then allow you to quickly work out which Route you have selected.
When you want to create a new Route, select an open Route position in the list using the above procedure.

Creating a Route

To create a new Route:

➢ **Place the cursor + [ENTER] + "WAYPOINT" + [ENTER]**

This places the first Waypoint of the new Route on your cursor position. If a Mark is present under the cursor position, the Mark is linked to the Route. To place the next Waypoints of the Route reapeat the above procedure.

The following functions work on the Active Route.

Inserting notes on Route

To insert a comment on the selected Route:

➢ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "SELECT" + [ENTER] + use the cursor key to highlight the Route + [NOTES]**

Another window is shown: use the cursor key to insert the notes (this is possible only if you have already created a Route). Press [ENTER] to confirm ([CANCEL] otherwise).

Hiding or Showing Route

To hide or show the selected Route on the screen:

➢ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "SELECT" + [ENTER] + use the cursor key to highlight the Route + [HIDE]/[SHOW]**

Selecting Route Color ONLY FOR COLOR CHART PLOTTER

To select Route legs color among the eight available colors:

If in Route menu page:

➢ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "COLOR" + [ENTER] + use the cursor key to select color + [ACCEPT]**

If in Select Route menu:

➤ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "SELECT" + [ENTER] + use the cursor key to highlight the Route + [COLOR] + use the cursor key to select color + [ACCEPT]**

The Route is drawn on the screen in the selected color. It is possible to select a different color for any Route.

Deleting Route

If in Route menu:

➤ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "DELETE" + [ENTER] + [CONFIRM]**

The Route legs and Waypoints are deleted. The Marks linked to the Route are not deleted. If the destination is placed on the Route, that Route cannot be deleted.

Following a Route (Activate the Navigation)

With the Route shown on the Chart page, move the cursor to the starting Waypoint in the Route and press [ENTER], select "GOTO" and press [ENTER] again.

ONLY FOR BARRAMUNDI/BARRAMUNDI PLUS:
move the cursor to the starting Waypoint in the Route and press [GOTO].

The destination is placed on the Waypoint of the selected Route and you are now navigating to it.

Inserting Waypoint

To insert a new Waypoint between two existing ones:

➤ **Place the cursor on the desired Route leg + [INSERT] + move the cursor to the new position + [ENTER]**

The new Waypoint is placed.

To add a new Waypoint to the last Waypoint of the Route:

➤ **Place the cursor + [ENTER] + "WAYPOINT" + [ENTER]**

Reversing Route

To allow a return Route to be generated from an existing Route.

If in Route Data Report page:

➤ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "REPORT" + [ENTER] + [REVERSE]**

The Route is then followed in reverse order, with Waypoints renumbered accordingly. If the destination is placed on the Route, that Route cannot be reversed.

Selecting Route Report page

To give information on Waypoints belonging to the selected Route:

➤ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "REPORT" + [ENTER]**

In this page it is possible to modify the Speed and Fuel consumption values:

➤ **[MENU] + [MENU] + "ROUTE" + [ENTER] + "REPORT" + [ENTER] + [SPEED]/ [FUEL] + use the cursor to insert values + [ENTER]**

2.3 GOTO FUNCTION

This functions allows you to place the destination point and immediately start navigating to it.

Navigation to Waypoint

➤ **Place the cursor on the desired Waypoint + [ENTER] + "GOTO" + [ENTER]**

or simply:

➤ **Place the cursor on the desired Waypoint + [GOTO]**

BARRAMUNDI/BARRAMUNDI PLUS:

➤ **Place the cursor on the desired Waypoint + [GOTO]**

A circle surrounds the Waypoint symbol. A dotted line is shown, connecting the destination with the ship's position. When the destination is placed, all navigation data are referred to it.

Deleting destination

If the destination has been placed, to stop the navigation to the Waypoint:

➤ **Place the cursor on destination icon + [STOP] + [CONFIRM]**

NOTE *If you press [NEXT]/[PREV] the destination icon is moved on the next/previous Waypoint in the Route.*

Otherwise when the cursor is placed on a generic position on the chart:

➤ **[ENTER] + "GOTO" + [ENTER] + [STOP] + [CONFIRM]**

NOTE *If you press [START], the destination icon is moved on the new cursor position.*

The symbol that identifies the destination disappears from the screen, but the Waypoint remains.

2.4 USING TRACK

A very useful feature of the chart plotter, is the ability to store and display exactly where the boat has been. This feature, referred to as Tracking, can provide invaluable information about the effect of tide and wind influence on the boat's progress as well as giving an indication of the helmsman's performance.
When this limit has been reached, the oldest points are deleted and overwritten by the newest ones.

Setting up a Track Step

Before you use the Track function, it is important to specify the Track step unit: if you select Distance, the Track point is placed when the distance from its last stored position is greater than the defined distance; if Time, the Track point is placed after the defined time.

➤ **[MENU] + [MENU] + "TRACK" + [ENTER] + "CONFIG" + [ENTER] + "RECORDING MODE" + [ENTER]**

You can select the Track step Time [1, 5, 10, 30 sec, 1 min] or distance [0.01, 0.05, 0.1, 0.5, 1.0, 2.0, 5.0, 10.0] Nm. Setting a short time/distance interval between Track points is best suited to navigate within a close or complex environment, a greater time/distance interval is best suited to a long voyage.
To select the interval at which the Track points are placed.
If you have selected Distance:

➤ **[MENU] + [MENU] + "TRACK" + [ENTER] + "CONFIG" + [ENTER] + "DISTANCE STEP" + [ENTER]**

If you have selected Time:

➤ **[MENU] + [MENU] + "TRACK" + [ENTER] + "CONFIG" + [ENTER] + "TIME STEP" + [ENTER]**

Selecting Track Pattern

To select among different pattern that you choose for the Track:

➤ **[MENU] + [MENU] + "TRACK" + [ENTER] + "CONFIG" + [ENTER] + "PATTERN" + [ENTER]**

Selecting Track Color ONLY FOR COLOR CHART PLOTTER

The previous item "Pattern" is substitued by "Color" to select among 8 different

line colors that you choose for the Track:

- **[MENU] + [MENU] + "TRACK" + [ENTER] + "CONFIG" + [ENTER] + "COLOR" + [ENTER]**

The same Track can be saved with any color.

Displaying Track

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

- **[MENU] + [MENU] + "TRACK" + [ENTER] + "CONFIG" + [ENTER] + "DISPLAY MODE" + [ENTER] + "VISIBLE"/"HIDDEN" + [ENTER]**

Activating/Deactivating Track Recording

To activate or deactivate the Tracking of the vessel while the vessel is moving:

- **[MENU] + [MENU] + "TRACK" + [ENTER] + "ACTIVATE"/"DEACTIVATE" + [ENTER]**

Clearing Track

All the Track or part of it can be cleared from the screen:

- **[MENU] + [MENU] + "TRACK" + [ENTER] + "DELETE" + [ENTER]**

[BEGIN], [END] and [WHOLE] allow to identify the start or the end point of the segment to delete.

Selecting Track Number

The chart plotter has the capability to store up to 5 Tracks. To select a Track:

- **[MENU] + [MENU] + "TRACK" + [ENTER] + "CONFIG" + [ENTER] + "ACTIVE TRACK" + [ENTER] + use the cursor key to select the number + [ENTER]**

2.5 DATA WINDOW CUSTOMIZATION ON CHART PAGE

It is possible to customize the Text Area layout among OFF, Text Area with 5 boxes and Text Area with 8 boxes:

- **[MENU] + [MENU] + "DISPLAY" + [ENTER] + "DATA WINDOW MODE" + [ENTER]**

It is also possible to edit fields shown in every screen configuration. Edit mode is activated directly from the chart display pressing

- **[MENU] hold for 3 seconds + use the cursor key to select data window to customize + [ENTER] + use the cursor key to choose selection + [ENTER]**

Once [ENTER] is pressed the data type is set. The selection window is closed and the Text Area changes according to the selected data type. Press [CLEAR] to exit the edit mode.

2.6 INFO

Placing the cursor on cartographic objects the information related to the object nearby is shown.

Setting Automatic Info

Automatic Info allows you to get the information on any cartographic object just by placing the cursor on it. You can select the type of it:

- **[MENU] + [MENU] + "DISPLAY" + [ENTER] + "Auto Info" + [ENTER]**

The possible settings are **Off** (no automatic info shown at all), **On Points** (only on points e.g. Rocks, Buoys, Lights, Tide Stations) and **On All** (on all objects, points, lines and areas).

NOTE *Choosing "On All" the Automatic Info will be shown most of the times the cursor is moved.*

Selecting Automatic Info

➤ **Move the cursor on the object**

The pop-up window with the basic info of the objects is displayed. To get full details of the object press [EXPAND].

Displaying Expanded Info page (Full Info)

To show the Expanded Info page:

➤ **Place the cursor on objects + [MENU] + "INFO" + [ENTER]**

Info on objects with Pictures

To get the information on objects with pictures.

➤ **Move the cursor on the object**

On the Quick Info, there will be the camera icon on the top bar of the window if at least one of the objects found has one or more pictures associated.

Fig. 2.6 - Example of Quick Info on objects with picture

On the Full Info, there will be the small camera icon on a corner of the square containing the object icon or a big photo icon centered on the square for the object without icon.

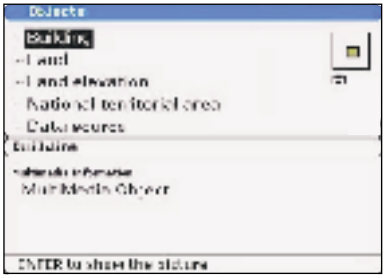


Fig. 2.6a - Example of Full Info on objects with picture

To see pictures:

➤ **Press [PICTURE] when the object with a picture is highlighted**

To change size:

➤ **Press [ENTER] when the picture is shown.**

Info Tree and Expanded Info page

The upper side of the page contains the Info Tree and the Lower side contains the expanded information. While moving the cursor through the Info Tree, all the relevant information of the selected object is shown on the lower part of the page. By pressing [CLEAR] the page is closed. If the information shown on the Lower part of the page exceeds the page size, you may scroll the page using [PAGE DN]. Use [HOME] to get back to the first page. When the selected object is a Tide Station, by pressing [ENTER] the Tide page is shown.

2.7 PORT & TIDE INFO

Getting Port Info

The object Port Marina contains the information about the services available on the selected Port Marina and the area around it. To get info on Port Marinas, move the cursor on the Port Info icon.

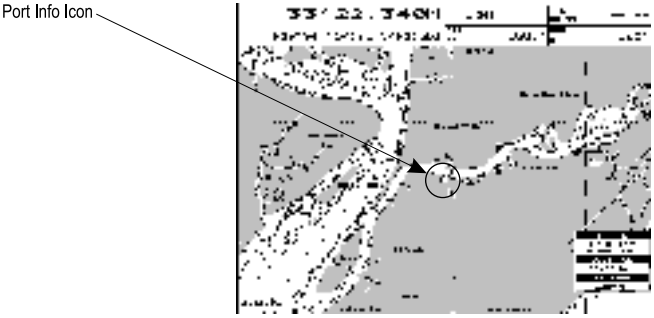


Fig.2.7 - Port Info icon

The available information is shown in the Automatic Info window where icons of the available services are shown. To expand information about that object press [EXPAND] and to expand all available information and get the details on each service of the Port Marina for that cartographic point press [EXP ALL].

NOTE *Port Info icon is visible only if the Ports + Services option is On (see Par. 4.1).*

Getting Tide Info

By placing the cursor over the Tide Station icon

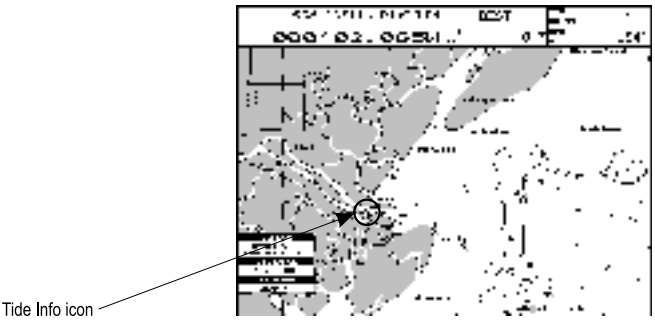


Fig. 2.7a - Tide Info icon

the chart plotter pops-up the relative automatic info window and allows displaying a graphical page with the tides prediction of the selected object.
Press [EXPAND] to display the Tide Graph page (otherwise, press [EXP ALL] to select all available information). It shows the Tide height variations during the 24 hours at any given day.

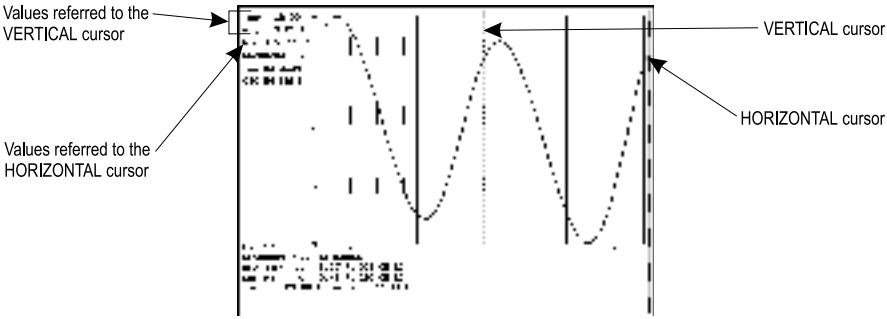


Fig. 2.7b - Tide Graph page

This screen shows that day's Tide Height graph for the area where the Tidal symbol was located. Using [ZOOM IN] and [ZOOM OUT] it is possible to display future or past tides. If you wish to quickly display the tide for a specific date, press [ENTER] and enter the required date using the cursor key followed by [ENTER] once the date is set. Using [MENU] it is possible to change time selecting between Standard and Daylight saving. To simplify reading the graph, the chart plotter displays a moveable Vertical and Horizontal slider which can be moved using the cursor key. Using the up/down cursor key, move the horizontal slider to correspond with the draft of your boat. Using the Vertical slider you can then read the times at which the graph dips below the horizontal line i.e. the times when you will be in danger of grounding.

NOTE *Tide graph is an approximation of the tide and they should be used in conjunction with traditional tide tables and navigational methods. The Tide height value represents the variation relative to the "Mean Lower Water" value.*

2.8 FIND FUNCTION

The Find function allows searching for the nearest Ports, Port Services, Tide Stations, Wrecks, Obstructions loaded on the C-CARD or it centers the screen over a selected User Point or at desired Coordinates. When the Find function is executed a list of available objects to search is shown.

NOTE *Activating the Find function a Warning message is shown if there is no C-CARD inserted.*

Finding Nearest Ports

To show the nearest ports to the boat position (or to the cursor position if the position fix is not received).

➢ **[MENU] + "FIND" + [ENTER] + "PORT" + [ENTER]**

Use the cursor key to select the port. Press [ENTER] or [FIND] to locate it on the map.

Finding All Ports

To show all ports stored on the C-CARD.

➢ **[MENU] + "FIND" + [ENTER] + "PORT" + [ENTER] + [PORTS]**

Use the cursor key to select the port and [ZOOM +]/[ZOOM -] to select next/previous page. Press [ENTER] or [FIND] to locate the selected port on the map.
Press [LIST] to rebuild and display the complete ports list.
Press [NAME] and use the cursor key to insert the port name or only a part of name

(max 15 characters), then press [ENTER]. If inserted name is found, the list with all ports containing the inserted name is shown. Repeat the operation to refine search or move through the list with the cursor key. Press [ENTER] to locate the port on the map.

NOTE *A Warning message is shown when the inserted name is not in the ports list.*

Finding Nearest Port Services

To show the nearest port services of a particular type (i.e. the nearest Hospital, sailmaker, bank, etc.).

➢ **[MENU] + "FIND" + [ENTER] + "PORT SERVICES" + [ENTER]**

The icons list of the available services is shown. Use the cursor key to select any facility and press [ENTER] or [FIND]. By selecting one of the facilities the list of the nearest ports (up to 10) in which this port facility is present, will be shown.

Finding Nearest Tide Station

To show the nearest Tide Stations to the boat position (or to the cursor position if the position fix is not received).

➢ **[MENU] + "FIND" + [ENTER] + "TIDE STATIONS" + [ENTER]**

After a few seconds a window appears. Choose the Tide Station you want and press [ENTER] or [FIND] to display the Tide Graph page. Press [CLEAR] to display the Tide Station chosen.

Finding Nearest Wrecks

To show the Nearest Wrecks loaded in the C-CARD:

➢ **[MENU] + "FIND" + [ENTER] + "WRECKS" + [ENTER]**

Press [ENTER] or [FIND] to locate the selected Wreck on the map.

Finding Nearest Obstructions

To show the Nearest Obstructions loaded in the C-CARD:

➢ **[MENU] + "FIND" + [ENTER] + "OBSTRUCTIONS" + [ENTER]**

Press [ENTER] or [FIND] to locate the selected Obstruction on the map.

Finding Cursor

To center the cursor on the screen:

➢ **[MENU] + "FIND" + [ENTER] + "CURSOR" + [ENTER]**

Finding Coordinates

To center the map at given coordinates:

➢ **[MENU] + "FIND" + [ENTER] +"COORDINATES" + [ENTER] + use the cursor to insert coordinates + [CLEAR]**

Finding User Points

To search the User Point by name:

➢ **[MENU] + "FIND" + [ENTER] + "USER POINTS" + [ENTER] + use the cursor to insert name of the Waypoint to show on map + [ENTER]**

2.9 ALARMS

The chart plotter provides alarms for various functions. You can enter the desired alarm range for each function.

Auto Off

To set the automatic shutdown of the alarms when the alarm condition disappears.

➢ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "AUTO OFF" + [ENTER]**

Arrival Alarm

To set an acoustic alarm to sound when the vessel is approaching the destination.

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "ARRIVAL ALARM" + [ENTER]**

XTE Alarm

To set an acoustic alarm to sound when the vessel is deviating from a defined course.

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "XTE ALARM" + [ENTER]**

Anchor Alarm

To set an alarm to sound when the ship moves off the current ship's position location.

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "ANCHOR ALARM" + [ENTER]**

NOTE *By the time the Anchor Alarm is set the current ship's position is saved as origin position. The alarm goes off when the ship moves away from the origin position more than the entered alalrm range.*

Depth Alarm

To set an acoustic alarm to sound when the received depth value (from the depth transducer) is too shallow.

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "DEPTH ALARM" + [ENTER]**

Grounding Alarm

To verify potential danger to navigation such shallow water (depth areas), intertidal areas, land, rocks, obstructions and shoreline constructions. The maps are scanned every 10 seconds.

If any of the above objects are found, the chart plotter notifies the danger on a dedicated warning message box. The active "Grounding Alarms" are shown in the Grounding Alarm Report page.

To activate the Grounding Alarm:

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "GROUNDING ALARM" + [ENTER]**

The chart plotter scans a sector in front of the boat. The direction is determined by the current boat heading. You can select the length and its angle is 30 degrees. The Grounding Alarm is switched Off by default after a Master Reset.

Grounding Depth Limit

To enter the minimum depth:

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "GROUNDING DEPTH LIMIT" + [ENTER]**

Grounding Alarm Range

To set the length of the sector to be detected among 0.25, 0.5, 1.0 Nm.

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "GROUNDING ALARM RANGE" + [ENTER]**

Grounding Alarm Report

To display the report of the dangerous objects currently detected.

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "GROUNDING ALARM REPORT" + [ENTER]**

When any of the searched objects is found in the scanned area, a tick marker is printed on the relative box to identify which dangerous objects have been currently detected. Once the alarm condition is no longer present, the relative tick marker is removed.

NOTE *The alarm "No data available" is shown when no specific cartographic data are found on the C-CARD or when no C-CARD is inserted.*

BARRAMUNDI/BARRAMUNDI PLUS/MURENA/MURENAIGPS:

External Alarm

When any alarm condition occurs the pin is switched from High Impedence to ground. This signal can be used by an external device (as a hooter or buzzer).

➤ **[MENU] + [MENU] + "ALARMS" + [ENTER] + "EXTERNAL ALARM" + [ENTER]**

2.10 USER C-CARD

The chart plotter allows to back up Marks, Routes and Tracks to a User C-CARD. You can also restore the data to internal memory at a later time. This allows virtually unlimited storage. The User C-CARD data storage is organized as a file system.

User C-CARD page

To display the content of a User C-CARD inserted into the C-CARD slot of your chart plotter:

➤ **[MENU] + [MENU] + "USER C-CARD" + [ENTER]**

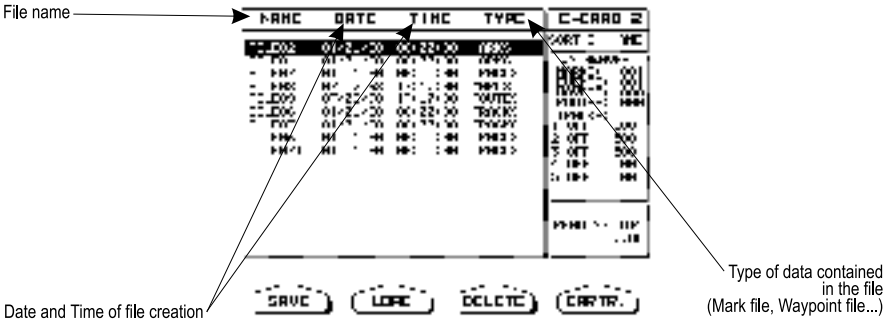


Fig.2.10 - User C-CARD Menu

Formatting User C-CARD

In order to be able to use a new User C-CARD you must format it first. This operation prepares the User C-CARD to receive and store information:

➤ **[MENU] + [MENU] + "USER C-CARD" + [ENTER] + [CARTRIDGE] + [FORMAT]**

NOTE *When a User C-CARD is formatted, all data saved on it will be deleted.*

Saving File on User C-CARD

➤ **[MENU] + [MENU] + "USER C-CARD" + [ENTER] + [SAVE] + select the file type to insert by using related soft key + insert the file name and type + [ENTER]**

When a certain type of data (Mark, Events, Route, Track) is saved, a new file is created on a User C-CARD. The file contains all points of the selected type corrently stored in the internal memory.

- Save Marks : creates a new file containing all Marks stored in the chart plotter
- Save Events: creates a new file containing all Events stored in the chart plotter
- Save Routes: creates a new file containing all Waypoints belonging to the selected Route (Route number is required)
- Save Tracks : creates a new file containing all Track points belonging to the selected Track (Track number is required)

NOTE *When naming a file, you may have trouble finding a name that uniquely identifies the file's contents. Dates, for example, are often used in filenames; however, they take up several characters, leaving you with little flexibility. The secret is to find a compromise, a point where you can combine a date with a word, creating a unique filename. The maximum length of the filename is 8 characters. The characters may be numbers (0, ..., 9), letters (A, ..., Z) and spaces (for example legal identifiers are "ABC", "AA", "12121212", "A B C", "1 A 1", and so on.*

Loading File from User C-CARD

➤ **[MENU] + [MENU] + "USER C-CARD" + [ENTER] + Select the file name in the list + [LOAD]**

The Load function copies the content of the selected file from User C-CARD to the internal memory of the chart plotter. If the selected file contains Marks/Events already present in the chart plotter memory, they are non duplicated. It is required to insert the number of the Route/Track on which loading data: if the Route/Track is not empty, it is overwrited.

Deleting File from User C-CARD

To remove files.

➤ **[MENU] + [MENU] + "USER C-CARD" + [ENTER] + [DELETE] + [CONFIRM]**

NOTE *Remember that this option permanently erases the file.*

BARRAMUNDI/BARRAMUNDI PLUS/TIGERSHARK PLUS/MILLENNIUM 7/NAUTILUS IGPS/ MILLENNIUM 7 COLOR/EXPLORER MK-II:

Selecting Slot

To select the preferred slot where to insert the User C-CARD. If the User C-CARD is not present in the selected slot, a warning message appears.

➤ **[MENU] + [MENU] + "USER C-CARD" + [ENTER] + [CARTRIDGE] + [SLOT]**

Reading User C-CARD directory

To show the list of the files present on the User C-CARD inserted into the slot:

➤ **[MENU] + [MENU] + "USER C-CARD" + [ENTER] + [CARTRIDGE] + [READ]**

Sorting User C-CARD directory

To order the file directory:

➤ **[MENU] + [MENU] + "USER C-CARD" + [ENTER] + [CARTRIDGE] + [SORT BY]**

This is possible in three different modes:

- Name : to order by the filename press [NAME]
- Time : to order by the time of file creation press [TIME]
- Type : to order by the type of data press [TYPE]

3. User Setting Up

3.1 GENERAL MENU

To set the general settings:

➤ **[MENU] + [MENU] + "GENERAL" + [ENTER].**

The possible selections are listed in the table below:

Language	:	Selects the language for screen labels, menus and options; the map information remain on the language as in the official paper charts .
Dist & Speed Unit	:	Selects the unit for Distance and Speed among Nm & Kts, Sm & Mph, Km & Kph.
Depth unit	:	Selects the unit among Ft, FM and Mt.
Altitude Units	:	Selects the unit among Ft, FL and Mt.
Temperature Units	:	Selects the unit among °C and °F.
Time Reference	:	Allows switching between UTC or local time, by entering the Local Time offset.
Time Format	:	Selects the format for the time between 12 and 24 hours.
Date Format	:	Selects the Date Format between MM-DD-YY (month-day-year) and DD-MM-YY (day-month-year).
Nav-Aids Presentation	:	Allows to set the Nav Aids presentation as US (Draw Nav-Aids using NOAA symbology) or INTERNATIONAL (Draws Nav-Aids using international symbology). When selected it affects Lights, Signals, Buoys & Beacons display.
Keypad Beep	:	Enables or disables the single audio beeps emitted any time the chart plotter keypad is pressed. If the incorrect key is pressed or the function required cannot be executed, the chart plotter emits three beeps.
Cursor Speed	:	Selects the Cursor Speed among Low, Medium or High in Chart page or into menu.

3.2 MAP MENU

ZOOM TYPE

➤ **[MENU] + "ZOOM TYPE" + [ENTER]**

Allows more expansions or compression of the chart scale while zooming in or out. Zoom Type has two options; STANDARD (default) or FLEXI-ZOOM. When in FLEXI-ZOOM mode, a short **[ZOOM...]** push causes a change of chart, whilst a long **[ZOOM...]** push (press and hold) causes a pop-up window to be displayed on a corner of the screen. The window shows the current Zoom Factor. By pressing **[ZOOM IN]**/**[ZOOM OUT]** the map is expanded or compressed according to the zoom factor selected. The Window is automatically closed if **[ZOOM...]** is not pressed for 2 seconds and the selected zoom factor will be used at the next zoom in/out.

FONTS & SYMBOLS

➤ **[MENU] + "FONTS & SYMBOLS" + [ENTER]**

On MAX charts it is possible to set the size of all names and symbols drawn on the charts, selecting between Normal size (the regular characters size) and Large size.

NORMAL size **LARGE size**

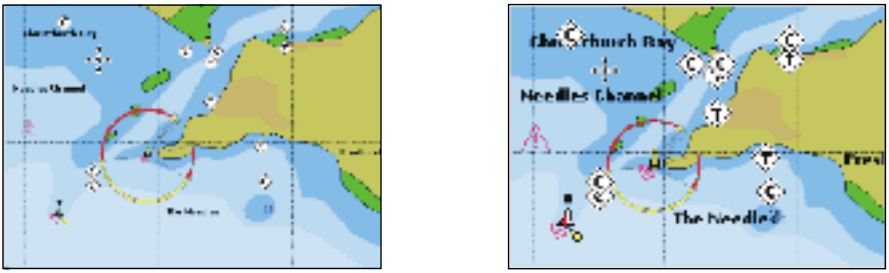


Fig. 3.2 - Example of Normal size (on the left side) and Large side (on the right side) settings

PERSPECTIVE VIEW

➤ **[MENU] + "PERSPECTIVE VIEW" + [ENTER]**

Chart data may be projected in perspective mode during navigation. This function allows setting the panoramic View of the chart. As the upper side of the map is more compressed than the lower side, a wider map area is visible. The perspective view allows showing more chart information immediately ahead and around the cursor.

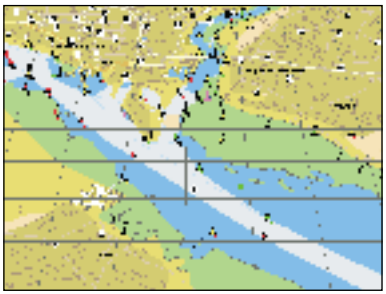


Fig. 3.2a - Perspective View

LIVE NAV-AIDS

➤ **[MENU] + "LIVE NAV-AIDS" + [ENTER]**

This function allows settings blinking lights on Nav-Aids. The blink period and color of each Nav-aid is read from the Nav-Aid attributes available on the data cartridge. When the ship is inside the Nav-Aid nominal range, the light of the Nav-Aid will start blinking.

MAP ORIENTATION

➤ **[MENU] + "MAP ORIENTATION" + [ENTER].**

The possible choices are listed in the table below:

North Up	:	The map is shown with North upwards.
Track Up	:	The map is shown with the ship's current heading upwards. If Track Up is selected, insert the Map Orientation Resolution angle in the range [5, 60] degrees.

MIXING LEVELS

➤ **[MENU] + "MIXING LEVELS" + [ENTER]**

When the map coverage at the current zoom level does not fill the entire screen, the chartplotter draws the rest of the map expanding the cartographic information read from, at most, two zoom levels above the current zoom level. For this reason the map is drawn three times: firstly it draws the two levels before the current level and then the current level. The area covered by the cartographic data read from the previous levels is identified by a dotted pattern. When the cursor is moved on an area not covered by data of the current level and the Cartography item is switched Off, the chartplotter zooms out to the first level covered by cartographic data. When the Cartography item is switched On, the cursor can be moved on the areas obtained from the previous levels but no information is provided on the objects found on that area since it is considered not suitable for navigation at that scale level.

NOTE *The Mixing Levels function works only with the new C-CARDs. It also affects the speed of the redraw of the screen. If this function is not used it may be disabled.*

SAFETY STATUS BAR

➤ **[MENU] + "SAFETY STATUS BAR" + [ENTER]**

This feature displays a status bar with six boxes showing the status of certain functions. Any warning or alarm condition is identified by the red colour to indicate possible risk.

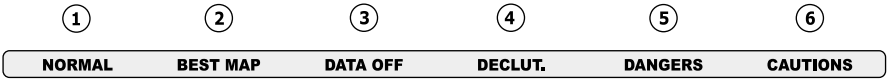


Fig. 3.2b - Safety Status Bar

Boxes definition is as follows:

1 Zoom
- Normal: when the chart is displayed at normal scale.
- U. Zoom: red when the chart is under-zoomed out more than twice normal scale, gray otherwise.
- O. Zoom: red when the chart is over-zoomed in more than twice normal scale, gray otherwise.
- C. Lock: red when the chart is zoomed in more than twice normaln scale, gray otherwise.

2 Best Map
Red when a more detailed chart is available under the cursor position.

3 Data Off
Red when at least one of the following objects or layers is turned off (by the user): Depths/soundings; Wrecks/obstructions; Tracks/routes; Attention areas; Nav-Aids.

4 Declutter
Displays red when clearing overlapping objects.

5 Dangers
Red when "Guardian Technology" detects one of the following objects: Land, Intertidal, Depth Area, Rocks, Obstructions, Shoreline Constructions, Fishing Facility, Wrecks, Dragged area, Diffusion area, Mooring facilities, Pingos and Production installations.

6 Cautions
Red when "Guardian Technology" detects cautionary or restricted area.

PALETTE ONLY FOR COLOR CHART PLOTTER

➤ **[MENU] + "PALETTE" + [ENTER].**

It is possible to set the palette used to enhance the visibility of the screen depending on the surrounding light condition. The possible choices are listed in the table below:

Normal	:	It is recommended when the chartplotter is not exposed to the direct sunlight. When this mode is set the maps are displayed in order to use colors as similar as possible to the ones used in the original paper charts.
Sunlight	:	It is designed to enhance the visibility of the screen when the chartplotter is exposed to the sunlight. The maps are much brighter than in the other modes and the depth areas are filled with white color so different depth areas are not easily distinguishable.
Night Vision	:	It is recommended when the environment is dark in order to reduce the glare of the display. The chartplotter displays maps and screen in darker colors.
NOAA	:	Allows setting NOAA paper chart colors presentation.

CURRENTS PREDICTION

➤ **[MENU] + "CURRENTS PREDICTION" + [ENTER].**

A window is shown on the low-left side of the chart. It is possible to see the variation of the Tidal arrows on the selected area at any given time. Press the dedicated keys to set the date and time manually, to decrease time and to increase time.

3.3 OTHER MAP CONFIGURATIONS

➤ **[MENU] + "OTHER MAP CONFIGURATIONS" + [ENTER].**

Allows the user to customize the following selections and is divided into: Marine Settings, Depth Settings, Land Settings and Chart Settings.

DISPLAY MODE

➤ **[MENU] + "OTHER MAP CONFIGURATIONS" + [ENTER] + "DISPLAY MODE" + [ENTER].**

Selects from a pre-defined table what cartographic objects are displayed and which display options are set. Pre-programmed settings are user selectable from Full, Medium, Low, Radar, Tides, Custom. The table below shows the selections for each mode:

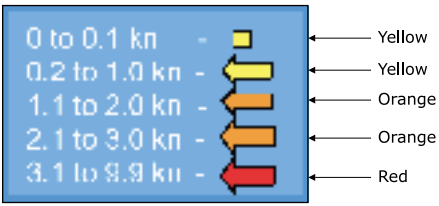
Setting	Full	Medium	Low	Radar	Tides	Custom (Default values)
Names	On	On	On	On	On	On
Buoy Names	On	Off	Off	Off	Off	Off
Nav-Aids	On	On	On	On	Off	Off
Light Sectors	On	Off	Off	Off	Off	Off
Attention Areas	On	On	On	On	On	On
Tides & Currents	On	On	On	On	On	On
Seabed Type	On	On	On	On	On	On
Ports & Services	On	On	On	On	On	On
Tracks & Routes	On	On	On	On	On	On
Underwater Objects	On	On	On	On	On	On
Depth Range	On	On	On	On	On	On
Depth Range Min	00002 Ft	00002 Ft	00002 Ft	00002 Ft	00002 Ft	00005 Ft
Depth Range Max	00010 Ft	00010 Ft	00010 Ft	00010 Ft	00010 Ft	00030 Ft *
Rocks Min	0 Ft	0 Ft	0 Ft	0 Ft	0 Ft	0 Ft
Rocks Max	32804 Ft	00016 Ft	00016 Ft	00016 Ft	00016 Ft	00030 Ft
Land Elevation values	On	Off	Off	Off	Off	Off
Roads	On	Off	Off	Off	Off	Off
POI	On	Off	Off	Off	Off	Off

Lat/Lon Grid	On	Off	Off	Off	Off	Off
Chart Boundaries	On	On	On	On	On	On
Value-Added Data	On	Off	Off	Off	Off	Off

(*) ONLY FOR COLOR CHART PLOTTER

MARINE SETTINGS

To control the display on the map of the marine features.

Names	:	Sets On/Off the displaying of the Names (local area names).
Buoy Names	:	Sets On/Off the displaying of the Buoy number. To identify better the Buoys, it is possible to show the name/number of the buoys next to the icon on the chart.
Nav-Aids	:	Sets On/Off the graphical presentation of Lights, Signals, Buoys and Beacons.
Light Sectors	:	Sets On/Off the display of Light Sectors of all the Fixed Lights, Buoys and lighthouses.
Attention Areas	:	Sets On/Off the displaying of Attention Areas (areas in which special attention by the mariner is required, because of natural or man-made hazards, or sailing regulations and restrictions. Moreover a special symbol (!) is placed inside the area selecting On option. This is valid also for the categories: FISHING FACILITY, MARINE FARM/CULTURE, MILITARY PRACTICE AREA, RESTRICTED AREA, SEAPLANE LANDING AREA. When the area is small, it is identified only by the boundary).
Tides & Currents	:	Sets On/Off the displaying of the Tides and Currents.The new worldwide database with tidal stream information is now available with MAX C-CARDs. When data/time is available, Tidal stream arrows are shown on the charts, indicating the direction and strength of the Tide. If no data/time is available from the GPS or the chart plotter is not in Simulation mode, the icon on the map is generic one. **ONLY FOR COLOR CHART PLOTTER:** The colour of the arrow denotes the strength of the current as follows:  When the chart plotter receives a valid position fix, the Tide icons are shown on the charts on the basis of the current date and time: the screen displays and changes arrows as date/time changes.
Seabed Type	:	Sets On/Off the displaying of the Seabed Type.
Ports & Services	:	Sets On/Off the displaying of the Ports and 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...).
Tracks & Routes	:	Sets On/Off the displaying of the Tracks and Routes (recommended and established routes for ships at sea, including traffic separation schemes, deep water routes).
Underwater Objects	:	Sets On/Off the display of the Underwater Objects (objects like obstruction, wreck, cable…)

DEPTH SETTINGS

To control the display on the map of the depth informations.

Depth Range	:	Sets On/Off the displaying of the Depth Areas (the sea areas included in the user selectable range of minimum and maximum depth limits).
Depth Range Min	:	Sets a minimum reference for the Depth Areas.
Depth Range Max	:	**ONLY FOR COLOR CHART PLOTTER:** Sets a maximum reference for the Depth Areas.
Rocks Min	:	Sets a min reference rocks value.
Rocks Max	:	Sets a max reference rocks value.

LAND SETTINGS

To control the display on the map of the terrestrial features.

Land Elevation values	:	The Land Elevation areas are always shown, but it is possible to set On/Off the Land Elevation display.
Roads	:	Sets On/Off the displaying of the Roads.
POIs	:	Sets On/Off the displaying of Points Of Information.

CHART SETTINGS

To control the display on the map of the chart features.

Lat/Lon Grid	:	Sets On/Off the displaying of the grid of parallels (of Latitude) and meridians (of Longitude) drawn on the map.
Chart Boundaries	:	Sets On/Off the displaying of the Chart Boundaries, wich represents the boundaries of the charts available on the chart plotter. Selecting Auto instead, if we are in background charts only the first chart levels contained in the C-CARD are displayed, if we are in a charts level contained in the C-CARD the next four charts level are displayed.
Value-Added Data	:	Sets On/Off the displaying of the Value Added Data. The Value Added Data (VAD) is a collection of additional cartographic objects which are not present on the original paper chart (from which the electronic chart derives). These objects have been obtained from other sources (that C-MAP believes to be reliable) and then merged to the electronic charts in order to provide more information useful for the navigation.VAD object can be any cartographic objects and it can be distinguished from the official-chart-objects from the Quick Info. A dedicated icon is shown on the Quick Info window to indicate that the object queried is a VAD. The same icon is also shown on the Full Info page and in addition the extended text Value Added Data is shown on the details of the VAD object.

3.4 DISPLAY MENU

To allow you to change how the chartplotter displays information. It is possible to select this menu only from the Chart Display page or the Depth Graph page in split mode.

➤ **[MENU] + [MENU] + "DISPLAY" + [ENTER]**

Auto Info	:	Allows displaying information on cartographic object when the cursor is placed on it. The Automatic Info On Points shows information when the cursor is placed on points (as Port Services, Tides, lights, wrecks, rocks, buoys, beacons, obstructions, land markers, etc.). The Automatic Info On All shows information when the cursor is placed on points, on lines (as Depth contours, Traffic Separation, Territorial Sea, Cartographic Lines etc.) on areas (Depth, Built-up, Sea, Attention, Restricted etc.) and on names (on the beginning of the text -hot spot- or on any of the characters of the name -name message box-). The details on Land, Source of Data, Cartographic Area and Spot Soundings are not shown.
Look Ahead	:	In Home mode the Look Ahead function sets up the charts on the navigation direction (course) in order to display more map details in front of the vessel's position.
Course Line	:	Selects the value among Off/2/10/30 Min/1/2 hours/Infinite.The Course Line is a 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).
Coordinates System	:	If TD is selected as Coordinate System, a new menu appears on the screen to set Chain, Pair, ASF 1/2, Alternate Solution.
Map Datum	:	Allows selecting any Geodetic Datum reference from the over 100 available on the chart plotter. Map Datum selection switches to the selected reference datum applying the datum offsets stored with the charts.
Fix Datum	:	Sets the datum reference used by the GPS receiver connected to (or integrated in) the chart plotter so that the chart plotter converts the position received from the GPS to the Map Datum currently selected in the menu in order to match the position from the GPS with the position on the charts. You must know what datum reference is used by the GPS and set it in the Fix Datum option.
External WPT	:	The coordinates of a Waypoint, received from a GPS connected to the chart plotter, can be stored into the chart plotter, if the GPS is NMEA-0183 protocol compatible and support the $BWC sentence (this symbol remains on the screen for 30 seconds). You may save it by placing a Waypoint or a Mark onto that symbol. As soon as the chartplotter receives another $BWC sentence with the coordinates of a new Waypoint, the symbol moves to the new point.

User Points	:	Sets On (icon + label), Off or Icon (only icon) the displaying of User Point.
Data Window Mode	:	Customizes the Text Area layout among Full Screen, Text Area with 5 boxes and Text Area with 8 boxes.
Cursor Window	:	Enables or disables the display of the cursor window on the screen.

3.4.1 Video Input menu
BARRAMUNDI/BARRAMUNDI PLUS

By accessing this menu it is possible to see images on the chartplotter display captured from an external video signal source, if connected to the chartplotter. Not all color chartplotters are connectable to the external video signal. Please make sure that your chartplotter is equipped with a video input connection port.

➢ **[MENU] + [MENU] + "DISPLAY" + [ENTER] + "VIDEO INPUT" + [ENTER]**

Select Video Input	:	Selects the Video Input, among None, Video 1, Video 2 or Auto Switch. If Auto Switch is selected, choose the switching time.
Activate Video Input	:	Activates the Video Mode from menu. At the activation of the Video Mode the following messages are shown on a dedicated window: "Connnected Video Input Signal is XXXX. The Video Mode will be activated". XXXX can be PAL or NTSC: the software automatically detects the type of Video Input source connected. Once the Video Mode is active use the following keys to adjust video settings: press and immediately release [POWER], use the [CONTR+]/[CONTR-] and [BRIGHT+]/[BRIGHT-] soft keys to adjust contrast and backlight; move the cursor up/down to adjust brightness and left/right to adjust colors, press [ZOOM IN]/[ZOOM OUT] to adjust hue phase. Pressing any other key exits from Video Mode.
Switching Timeout	:	Selects the timeout for the Auto Switch option among 5, 10, 30 seconds, 1, 5, 10 minutes.
Restore Defaults	:	Restores default values of Contrast, Brightness, Backlight, color saturation and Hue phase. If Video 1 or Video 2 is selected, their relative settings are set to the default values and the message "OK" is shown to the selected item. If the option All is selected, both the settings for Video 1 and Video 2 are restored to the default values and the message "OK" is shown next to Video 1, Video 2 and All.

3.5 NAV DISPLAY MENU

Allows selecting CDI Scale and Navigation Page fields. It is possible to display this menu only if the Navigation Data page or the 3D Road page has been selected.

➢ **[MENU] + "NAV DISPLAY" + [ENTER]**

CDI scale	:	Selects the CDI (Course Deviation Indicator) Scale among 0.2, 0.5, 1.0, 2.0, 4.0, 10.0 Nm.
Navigation Page	:	A new window appears with six items. Select the item you want to change and press [ENTER]: another window appears, select the fields to display in the Navigation Data page or in 3D Road page among BRG (Bearing), COG (Course Over Ground), CST (), DST (), SOA (), SOG (Speed Over Ground), STR (Steering), TRN (), VMG (Velocity May Good), XTE (Cross Track Error), DRF (Drift), SET, DPT (Depth), TEMP (Water Temperature), TTG (Time noDistance To Go).

3.6 ADVANCED MENU

➢ **[MENU] + [MENU] + "ADVANCED" + [ENTER]**

The Advanced options are arranged in sub-menus.

3.6.1 Input/Output Setup menu

GPS Connection ON PLOTTER WITH EXTERNAL SMART GPS RECEIVER

Connect the GPS to the GPS Port (serial Port 3). To choose your desired setting follow the procedure:

➢ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "Input/Output" + [ENTER] + "Port 3 Input" + [ENTER] + "NMEA-4800-N81-N" + [ENTER]**

GPS Setup Menu

To set your desired configuration for the connected GPS.

Internal GPS	:	**For Chart Plotter WITH INTERNAL GPS RECEIVER** Enables or disables the Internal GPS.
Restart GPS	:	Restarts all GPS processes. Once executed, the message "Done" is shown.
Diff. Corr. Source	:	Sets what kind of Differential Correction will be used by the GPS between WAAS and RTCM (beacon correction).
Navigation Speed	:	Sets the Navigation Speed among Low Speed, Medium Speed and High Speed.

Autopilot Connection

Connect the Autopilot to the serial Port 1, 2 and 3.

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "Input/Output" + [ENTER] + "Port 1/2/3 Output" + [ENTER]. Then choose your preferred setting among the NMEA available settings NMEA 0183 4800-N81-N, NMEA 0180, NMEA 0180/CDX) and press [ENTER] to confirm.**

External NMEA Connection

Connect the External NMEA to the serial Port 1, 2 and 3.

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "Input/Output" + [ENTER] + "Port 1/2/3 Input" + [ENTER]. Then choose your preferred setting among the NMEA available settings NMEA 1200-N81-N, NMEA 4800-N81-N, NMEA 4800-N82-N, NMEA 9600-N81-N, NMEA 38400-N81-N and press [ENTER] to confirm.**

C-COM GSM Plus Connection

To connect the modem C-COM to the chart plotter follow the procedure:

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "Input/Output" + [ENTER] + "Port 1 Input" + [ENTER] + "C-COM" + [ENTER]**

Port 1/2/3 Output Sentences

The chart plotter allows customizing the NMEA-0183 sentence transmitted on each port. Each port can transmit a different set of sentences among: GLL, VTG, BOD, XTE, BWC, RMA, RMB, RMC, APB, WCV, GGA, HSC, HDG:

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "Input/Output" + [ENTER] + "Port 1/2/3 Output Sentences" + [ENTER]**

Cable Wiring page

Shows a window containing the inteface cable wiring.

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "Input/Output"+ [ENTER] + "Cable Wiring" + [ENTER]**

3.6.2 Fix & Compass menu

To handle the functions related to navigation and to set the reference heading information such as bearing angles (True or Magnetic), the Magnetic Variation source and to enter Compass Calibration values.

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "FIX & COMPASS" + [ENTER]**

Fix Correction	:	Turns On/Off the Correction from the positioning system. If the new Correction is calculated, but the Correction is not enabled, the ship's position is not changed.
Compute Correction	:	Corrects fixes from the positioning instrument. By placing the cursor on the ship's real position and selecting this option, the error is calculated and internally memorized for appropriate correction, but not applied.
Correction Offset	:	Manual correction of fix position.
Static Navigation	:	Sets up a threshold for the speed. When the speed received from the positioning device is under that threshold, the chartplotter displays zero speed.
Position Filter	:	Selects Low/Medium/High/Off the Position Filter. In case of a jittering fix this option makes the ship' position more stable and the track smoother.
Speed Filter	:	Selects Low/Medium/High/Off the Speed Filter. When it is On, you can filter the speed of the ship, to optimize it.
Bearing	:	Selects either degrees magnetic, Auto Mag, or True. If magnetic readings are selected the

		variation is computed automatically for every zone as soon as the chart is displayed.
Magnetic Variation	:	It is possible to calculate the Magnetic Variation in an Automatic or manual mode, by inserting the step for calculation of Magnetic Variation.
Calibrate Compass	:	The variation table is used to match magnetic value readout on the chartplotter comparable with the value given by the compass of the boat. In other words, since the compass of the boat must be compensated (due to the iron masses, ...), we use the same values given by the chartplotter. This means that, for example, if the BRG to the next Waypoint readout in the chartplotter display is "X" Mag degree, if you steer the boat reading "X" Mag degree from the compass, you are driving well toward the next Waypoint.

3.6.3 C-Staff menu

The C-Staff functions are based on STAFF Concept® (Satellite Tracking Aided Fleet Fishing). The STAFF Concept® is designed for professional fishing purpose to allow monitoring the position of the vessels of a fleet from each vessel (the fleet may have until 20 vessels max).

➤ **[MENU] + [MENU] + "ADVANCED" + [ENTER] + "C-STAFF" + [ENTER]**

For more information see the specific User Manual.

3.7 C-METEO

To set up the information and the other settings relative to the display of the weather information on the map.

➤ **[MENU] + [MENU] + "C-METEO" + [ENTER]**

For more information see the specific User Manual.

3.8 FISH FINDER

The chart plotter combined with the sonar performance of the Fish Finder is one of the most advanced marine navigation system available.

➤ **[MENU] + [MENU] + "FISH FINDER" + [ENTER]**

For more information see the specific User Manual.

3.9 SYSTEM INFORMATION

To see details about the software and cartography data installed.

➤ **[MENU] + [MENU] + "About..." + [ENTER]**

Opens the System Information page.

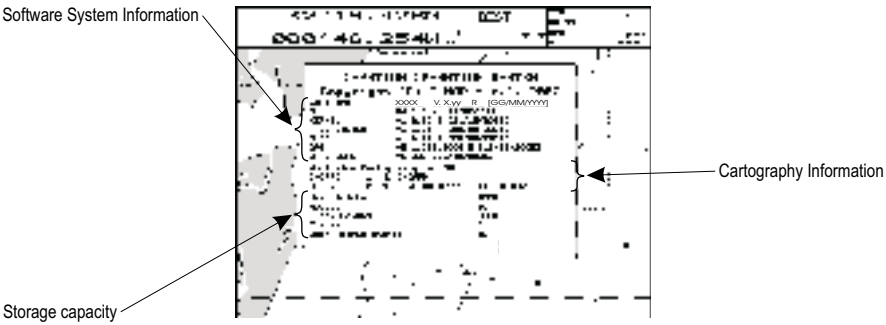


Fig.3.9 - System Information page

WORLD BACKGROUND CHARTS

The internal background charts can be updated to include the MAX A and B level charts which provide improved marine data, rivers, lakes, terrestrial data (major

streets , highways , railways, etc...), Nav-Aids, depth areas, territorial water areas, etc... by reading them from a special data C-CARDs (contact your local dealer). All units must have the WorldWide Background upload function that is activated from the system.

Worldwide Background Update

The System Update menu is entered from the About page. To select this menu follow the procedure:

- **Plug the special data C-CARD + [MENU] + [MENU] + "About..." + [ENTER] + [MENU] + "Update Worldwide Cartography" + [ENTER]**

4. C-LINK

C-Link system is a feature which allows to sharing the same cartographic data between two chart plotter units (CP) linked via serial I/O port.
In order to activate C-Link function, a "MAX data C-CARD" (called REGULAR C-CARD) must be inserted into one of the two chart plotters and a special MAX data C-CARD (called MIRROR C-CARD) must be inserted on the other chart plotter.
The two MAX data C-CARDs must have the same code and revision. So, the MIRROR C-CARD can be utilized only on a chart plotter linked to another chart plotter provided with the equivalent REGULAR C-CARD.
It is important to point out that the two chart plotters must have the update s/w versions that allow C-LINK function.

4.1 HOW C-LINK SYSTEM WORKS

When the CP is powered up, it switches into the "Stand-Alone Mode". In this work mode, the CP unit periodically scans all the available C-CARD slots searching for MIRROR C-CARDs.
When one or more MIRROR C-CARD is found (in one or both CPs) a special connection is established between the CPs to abilitate the MIRROR C-CARDs.
If a regular C-CARD which has previously activated a MIRROR C-CARD is removed, even the MIRROS card will be not read anymore on the other unit.

4.2 C-LINK SERIAL CONNECTION

The two chart plotters should be connected via serial ports. Any of the available ports can be used, the software will recognize automatically the serial ports used. A typical connection is as follows:

CP1		CP2
TX	——————>	RX
RX	<——————	TX
GND	<——————>	GND

5. C-LINK NAVIGATION DATA TRANSFER

This function allows transferring C-LINK navigation data (Route Name, Destination ID & Position, Next Waypoint ID & Position, Total Route length, Fuel Consumption Rate, ETA, TTG etc.) (Hereinafter "c-link navigation data") between two chart plotters linked through the C-LINK system.
The chart plotters can be set to operate in two modes:

- MASTER mode (Primary Chart Plotter)
- SLAVE mode (Secondary Chart Plotter)

When the navigation is activated on the Master chart plotter, the C-link navigation data will be continuously sent to the Slave until the navigation is active.
If the Master is navigating to a Single Destination, the Slave will show the Destination position and activate the navigation to it.
If the Master is navigating to a Route, the Slave will show the Route Leg composed by the Destination and the Waypoint after the Destination (Next Waypoint) and activate the navigation to it.
Any variation to the current C-link navigation data will be transferred from the Master to the Slave.
The Slave will be provided with a few dedicated pages to show the C-link navigation data received from the Master.

5.1 OPERATIONS

INTRODUCTIVE ELEMENTS

It is important remark, once more, that this function does not transfer the whole route but just the information relative to the navigation. Such information will be removed from the Slave Chart Plotter as soon as the navigation is terminated.
C-link navigation data is exchanged by using two NMEA-0183 C-MAP proprietary sentences: $PCMPN,1 and $PCMPN,2.
When the navigation is activated on the Master, it starts outputting the C-link navigation data. If the Slave is connected, all c-link navigation data received are stored in its memory and the navigation is started.
The information sent by the Master consists of the following values:

- Navigation mode (To Single Destination / to a Route)
- Route Name (*)
- Destination ID
- Destination Position
- Next Waypoint ID (*)
- Range from Destination to next Waypoint (*)
- Bearing from Destination to next Waypoint (*)
- Route Length (*)
- Distance from Destination to Last Route Waypoint (*)
- Remaining Route Legs (*)

- Planned Cruising Speed
- Average Fuel Consumption
- Initial Fuel Load

C-link navigation datacan refer to:
- Single Destination navigation
- Route Following navigation.

Values identified by (*) are sent only for Route Following navigation.
The Destination Icon, Navigation leg (Fix Position to Destination), the Next Waypoint Icon and all other relevant c-link navigation data will be shown on the Slave chart plotter. Any variation of the C-link navigation data on the Master will be communicated to the Slave so to keep data aligned on both devices.

C-LINK SERIAL CONNECTIONS

The two chart plotters should be connected via serial ports. Any of the available ports can be used, the software will recognize automatically the serial ports used. A typical connection is as follows:

CP1		CP2
TX	——————>	RX
RX	<——————	TX
GND	<——————>	GND

MASTER CHART PLOTTER

Operating mode

Master mode is the default factory setting.
All regular chart plotters' functions are allowed.
As soon as the Destination is placed, the master chart plotter will start transmitting all c-link navigation data,
In Master mode the C-link navigation data received from the NMEA port is ignored. So, if the two chart plotters are both operating in Master mode, the C-link navigation data sent by the other Chart Plotter never processed.
Under such condition if the navigation is activated on one of the two Chart Plotters, a warning message will be shown to notify that the C-link navigation data will be ignored by the other Chart Plotter.

SLAVE CHART PLOTTER

Operating mode

Slave mode must be set from a dedicated menu (see *"Menu Settings"*)
When Slave mode is set, the chart plotter cannot manipulate the C-link navigation data anymore.

Stop current navigation

If the navigation was already active, it will be disabled as soon as Slave mode is set. An appropriate warning message will be shown to notify that the Navigation is already active and to confirm whether Slave mode can be set.

Inhibit Navigation operation

As soon as Slave mode is set, the destination cannot be placed anymore either the C-link navigation data is received from the Master or not. Also, when the C-link navigation data is received from the Master, it will not be allowed to deactivate the Navigation.

Inhibit Route following

While navigating to the route received from the Master the destination is reached (either applying distance or perpendicular criteria), the destination will not be moved to the next waypoint on the route.

MOB handling

If the Navigation to the external destination is active and the the MOB key is pressed on the Slave Chart Plotter, the MOB is placed but the navigation to the MOB is not activated.

Notes

While navigating to the external destination the Operating Mode is switched to Master mode, the navigation to the external destination will be terminated. An appropriate warning message will be shown to notify that the Navigation to the external destination is active and to confirm whether Slave mode can be set. Setting Slave mode, the C-link navigation data will be deleted.
The C-link navigation data are deleted at Power Off.

C-LINK NAVIGATION DATA: ACQUISITION AND DISPLAY

As soon as the C-link navigation data is received, the Slave parses the information received and executes the relative actions depending on its current working status.
When the Navigation to the external Destination is activated, the Slave Chart Plotter will show all relevant c-link navigation data exactly like when the destination is not the external one: (Destination Name, DST and BRG to Destination, calculate XTE, calculate TTG etc). These values will be displayed all places where required and they will be used to format NMEA-0183 output data.

GRAPHICAL REPRESENTATION ON MAP DISPLAY

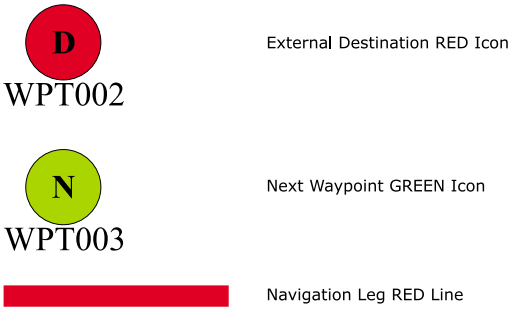


Fig. 5.1 - Graphical Displaying

ROUTE DATA REPORT

When the Navigation to the External Route is received, it will be possible to display the information related to the External Route by entering the Route Data Report.

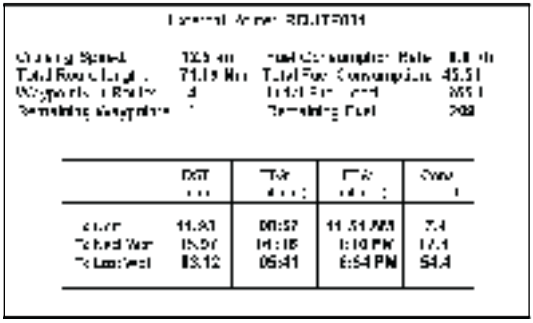
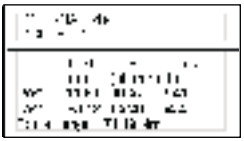


Fig. 5.1a - External route on Route Data Report

- External Route : Name of the External Route (from PCMPN,0)
- Cruising Speed : Planned Cruising Speed (from PCMPN,1)
- Fuel Consumption Rate : Planned Fuel Consumption Rate (from PCMPN,1)
- Total Route length Route : Length from First to Last Wpt. (from PCMPN,1)
- Initial Fuel Load : Volume of Fuel available before the navigation was started (Liters)
- Total Fuel Consumption : Calculated Fuel consumption to navigate the whole route.
- Waypoints in Route : No. of Wpts in the Route (from PCMPN,1)
- Remaining Waypoints : No. of Wpts from Dest to Last Wpt (from PCMPN,1)
- Distance to Destination : Distance from Ship to Destination (Calculated)
- Distance to Next Wpt : Distance to travel from ship to the Wpt after the Destination (calculated: Distance to Dest + Next Route Leg length)
- Distance to Last Wpt : Distance to travel from ship to the End of the Route (Calculated: Distance to Dest +Distance From Dest to last Wpt received from PCMPN,1)
- TTG To Destination : Estimated Time to travel the "*Distance to Last Wptt*". Calculated using Cruising Speed.
- TTG To Next Wpt : Estimated Time to travel the "*Distance to Next Waypoint*" Calculated using Cruising Speed.
- TTG to Last Wpt : Estimated Time to travel the "*Distance to Last Wpt*". Calculated using Cruising Speed
- ETA to Destination : Estimate Time of Arrival to the Destination Point. Calculated: Current Time + "*TTG To Destination"*
- ETA to Next Waypoint : Estimate Time of Arrival to the Waypoint after the Destination. Calculated: Current Time + "*TTG To Next Waypoint"*
- ETA to Last Wpt : Estimate Time of Arrival to the End of the Route. Calculated: Current Time + "*TTG To Last Wpt"*

QUICK INFO

Route Navigation: Quick Info on the Destination



Route Name, DESTINATION ID Wpt1/4

Distance, TTG and Consumption from Ship to Dest
Distance, TTG and Consumption from Ship to Last Wpt

Fig. 5.1b - Quick Info on Destination

Quick info on Single Destination

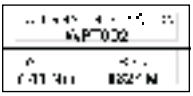


Fig. 5.1c - Quick Info on Single Destination

6. GPS

For centuries, sailors have been searching for a reliable and precise method of travelling the world's waterways. From celestial navigating to the modern navigation techniques as Loran, Decca Navigator, Omega or Transit Satnav, each system has had its problems with weather, range and reliability. Without doubt, the *"Global Positioning System",* or GPS for short, is the most significant advance in navigation: it gives the navigator a position 24 hours a day, 365 days a year in any weather condition.
GPS is a satellite based navigation system which provides suitably equipped users with accurate position, velocity and time data.
Originally the GPS, developed by the U.S. Department of Defense, was conceived for military purposes, but now it is used in a host of civilian applications.
GPS navigation uses satellite signals to determine your position in relation to a set of satellites orbiting the earth. The GPS constellation of satellites continuously send radio signals, containing the precise position for each satellite back to earth. By knowing the position of 3 or 4 satellites and calculating various time differences between transmitted signals, the GPS receiver can determine its present position anywhere on earth, and thanks to continuous updates, calculate speed and course information.

6.1 HOW GPS WORKS

Currently, the GPS constellation consists of 26 orbiting satellites (including 3 spares), but this number will increase in the future.
The GPS receiver computes an accurate position by calculating the distance to the GPS satellites that orbit the earth. Signals are required from 3 satellites for two dimensional (2D) position calculation whilst 4 satellites are required for three dimensional (3D) position calculation.
As mentioned earlier, GPS satellites are not geostationary, but they are orbiting the earth as illustrated on the following figure:

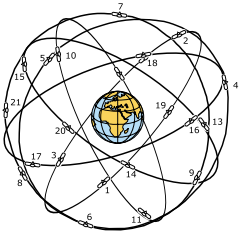


Fig. 6.1 - The GPS constellation

Note that position is repeatedly fixed through the following three steps while any 3 satellites are in line of sight.
The position calculation procedure is indicated in the following three steps:

1. GPS satellites continuously transmit their own precise orbital data and the GPS receiver computes their locations by receiving this data.

2. In this receiving process, the GPS receiver measures very accurate distances to the satellites, using the "Spread Spectrum Modulation" method. Excellence in GPS's position-fixing accuracy is mainly due to this technology.
3. When the satellite locations and their distances are known, the GPS receiver fixes its own position by triangulation:

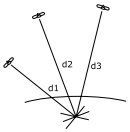


Fig. 6.1a - The GPS position calculation

As illustrated in the previous figure, the position is calculated as the meeting point of three spheres which are drawn around the three satellites with diameters d1, d2 and d3.

6.1.1 Position Fixing Accuracy: HDOP

The GPS fix accuracy is due to the locations of 3 satellites in the sky. High accuracy is obtainable when the satellites are widely scattered in the sky; on the contrary, accuracy is reduced when the satellites have gathered in a narrow space. In the following figure, in both cases it is possible to obtain the GPS fix, but in the left case the accuracy will be higher than the right:

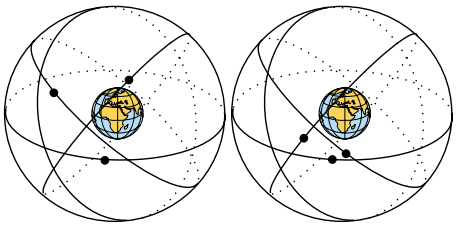


Fig. 6.1.1 - HDOP

The index for position-fixing accuracy is called HDOP (*"Horizontal Dilution Of Precision"*). The smaller the HDOP value, the more accurately the position can be fixed.

7. Maintenance

This chapter gives information on routine maintenance and problem solving associated with the chart plotter.

7.1 SYSTEM TEST

If you have connected your position-finding device according to the instructions, and chosen the proper menu selection for your device, and are still having problems with your chart plotter, the extended auto-test should help determine the problem. Make sure the chart plotter is turned Off. While pressing and holding any other key, turn the chart plotter On. A new menu will appear on the display. Use the cursor key to select the desired test: this will display in reverse video. To choose the test press [ENTER]. To exit from any submenu press [CLEAR]. To exit from the System Test turn Off the chart plotter.

7.1.1 RAM Menu

RAM Test: Verifies the integrity of the RAM chips. If on the screen the message "ERROR" appears, the RAM is physically damaged.
RAM Clear: Clears internal memory. If the chart plotter exhibits unusual behaviour, or appears to be malfunctioning, it may be possible to correct the problem by clearing RAM. This operation will erase all Marks, Routes, stored Track plots and destinations. It will also return all selections (Input Data Format, Autopilot selection, etc.) to original default values. Before this step, you have the option of saving user Marks, Track history and Routes to a User C-CARD (this is an optional purchase from your dealer). To confirm to clear RAM press [ENTER] again (but if this time you do not wish to clear RAM press [CLEAR]).

7.1.2 DIM Menu

Contrast: Each time you press the cursor key to right, the screen will decrease brightness, when you press the left key the brightness will increase.
Backlight: Sets the backlight. It operates in similar mode as Contrast.

7.1.3 Cartridges

Internal DataBase Test: Tests the WorldWideBackground.
C-CARD Test: Tests the C-CARD. There are four possible situations:

- If there is a C-CARD inserted in the slot and there is not a malfunction, the name of the C-CARD zone and the message "OK" are shown
- If there is a C-CARD inserted in the slot, but it is damaged C-CARD, the name of the C-CARD zone and/or the message "Faulty" are shown
- If there is not any C-CARD inserted in the slot, the message "not present" is shown
- If there is a User C-CARD inserted in the slot, the message "USER C-CARD" is shown

C-CARD Connector: While a C-CARD is inserted in the slot, if the counter increases, there is a malfunction reading it.

7.1.4 Modem test

Checks the Modem connections. Press [ENTER] to select the desired Port (Port 1 or Port 2 ON CHART PLOTTER WITH INTERNAL GPS RECEIVER, Port 1, Port 2 or Port 3 ON CHART PLOTTER WITH EXTERNAL GPS RECEIVER) related to the connections made, to the Port to which the Modem C-COM is connected.

7.1.5 Serial Ports

Change parameters: Changes the parameters of the serial interface. This menu allows to select the **Port** (Signal Source), the **Baud Rate** between 4800 or 9600, the **Data Bits** (Word Length) between 7 or 8, the **Parity** between even, odd or none, the **Stop Bits** between 1 or 2.

Input Data Display: Allows the chart plotter to act as a computer terminal and display the incoming data exactly as it is received. If the data displayed on the screen is unrecognizable, you may have selected the wrong input parameters for your particular receiver. Check your receiver 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 [PAGE] to stop (or continue after pause) data displaying, [ENTER] to show data in hex or ASCII mode (normal or small) and [CLEAR] to exit.

BARRAMUNDI/BARRAMUNDI PLUS/MURENA/MURENAIGPS:

7.1.6 External Alarm

To check the External Alarm signal.

Terms

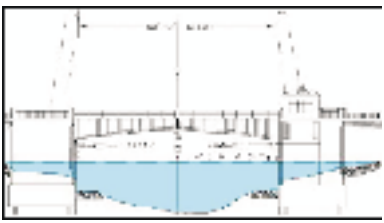
- **ALT = Altitude**
  Altitude of GPS Antenna on the medium sea level.
- **Alter = Alternate Solution (TD Coordinates System)**
  Parameter selected by the user that is applicated in the conversion of TD values to geographical coordinates Lat/Lon. It defines which of the two possible solutions can be used.
- **Arrival Time**
  The estimated time of day you will reach your destination, based on your current Speed and Track from GPS.
- **ASF = Additional Secondary phase Factor (TD Coordinates System)**
  Correction to TD values which can be inserted by the user.
- **Azimuth**
  The angular measurement from the horizon to a satellite or another object.
- **AWD = Apparent Wind Direction**
  The Direction from which the Wind appears to blow relative to a moving point (also called Relative Wind Direction).
- **AWS = Apparent Wind Speed**
  The Speed at which the Wind appears to blow relative to a moving point (also called Relative Wind Speed).
- **Beacon**
  A prominent, specially constructed object forming a conspicuous vertical mark as a fixed aid to navigation.
- **Bearings**
  To select either degrees magnetic or degrees true. If magnetic readings are selected the variation is computed automatically for every zone as soon as the chart is displayed.
- **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, underwater dangers, restrictions and regulations. They can be lighted or not and are coloured according to their international code.
- **BRG = Bearing**
  It is the 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.
- **Chain (Loran-C GRI)**
  The Loran chains are groups of transmitting stations that use timed radio pulse transmissions. In each of these chains there is a master station and two or more slave or secondary stations. Stations belonging to a same chain transmit pulses in timing groups: a different time base identifies each chain. The time base of each chain is the Group Repetition Interval or GRI. This GRI identifies the chain in unique mode. For example the GRI = 4990 identifies the chain of Central Pacific zone.
- **COG = Course Over Ground**
  Direction of the path over ground actually followed by a vessel.

- **Course Line (Time Line)**
  The Course Line is a 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).
- **CTS = Course To Steer**
  The optimum direction the boat should be steered in order to efficiently make headway back to the courseline while also proceeding toward the destination Waypoint.
- **Cultural Features**
  Any man-made topographic feature as built-up area, buildings, roads.
- **Data Window Mode**
  To customize the Text Area layout among Full Screen, Text Area with 3 boxes and Text Area with 6 boxes
- **Datum**
  The Latitude and Longitude lines printed on any map are based on certain models of the shape of the earth: these models are called Datum or Coordinate Systems. There are many different Datum in use, each one gives different Lat/Lon positions for an identical point on the surface of the earth (see also Map Datum and Fix Datum).
- **Dead Reckoning**
  It is the procedure to determine the current position of a vessel by applying to the last known position the way that has been made (since the last known position was received). This procedure is normally based on the last received GPS position, Speed and Course or to the last received GPS position, Log Speed and Heading.
- **Default**
  It indicates the original factory setting for any menu selection. The default values are set after a Master Reset (RAM Clear).
- **Depth Area**
  It is the sea area included in the (user selectable) range of minimum and maximum depth limits. The selected depth area is uniformly filled with a predefined color.
- **Depth Line**
  (Also called Bathymetric Line) It is the 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.
- **DGPS = Differential GPS**
  Provides even greater positioning accuracy than standard GPS.
- **DPT = Depth from Trasducer**
  Water Depth below the Trasducer. The Distance from the Depth Transducer to the ground.
- **DST = Distance**
  The 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**
  The predicted time of reaching a destination or Waypoint
- **File**
  Collection of information (of the same type) stored on a User C-CARD. Each

file must have a unique name, ideally one that describes its contents. Filenames are kept in a directory on each User C-CARD.

- **Fix**
  It is the current position of the vessel provided by the GPS (connected to the chart plotter or built-in) or other positioning systems.
- **Fix Status**
  It indicates the quality of the position fix signal.
- **Fuel Consumption Rate**
  It represents the estimated fuel consumption rate (per hour) of an engine boat referred to its relative estimated cruising speed.
- **GNSS = Global Navigation Satellite System**
  It is the name used to indicate any single or combined navigation system based on satellites. The current available satellites systems are: GPS, GLONASS and the combined GPS and GLONASS.
- **Goto**
  It is the 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 pre-defined Route.
- **GPS = Global Positioning System**
  It is a 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**
  The horizontal direction in which a ship actually points or heads in any moment (see also COG).
- **HDOP = Horizontal Dilution Of Precision**
  It is a parameter indicating the 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, buiding, silo, tower, mast, ..., on land which can be used in determining a location or a direction.
- **Latitude**
  The 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**
  It is the grid of parallels (of Latitude) and meridians (of Longitude) drawn on the map.
- **LOG Speed**
  Speed of the vessel relative to the water, provided by an instrument with a submerged transducer for measuring the distance/speed travelled by the vessel.
- **Longitude**
  The angular distance East or West of the prime meridian (Greenwich meridian) as measured by lines perpendicular to the parallels and coverging at the poles from 0° to 180°.
- **Loran**
  It is a positioning system which determines the current position of the vessel by measuring the difference in the times of reception of synchronized radio pulse signals transmitted by two or more fixed stations.

- **Magnetic Deviation**
  The 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**
  The 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. Tipically it represents by an icon and label under Mark.
- **Natural Features**
  Any topographic feature formed by the action of natural processes: coastlines, relief, glaciers.
- **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.
- **OSGB = Ordinance Survey of Great Britain**
  A coordinate system describing only Great Britain charts. Generally used with GBR36 datum, which also describes only Great Britain charts. This coordinate system cannot be used in any other part of the world.
- **Pair**
  The two selectable secondary stations, of a Loran-C chain, which are used to calculate the TD (Time Difference) position of a point in the map area covered by the selected Loran-C chain.
- **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, heigh, type of bridge etc.).



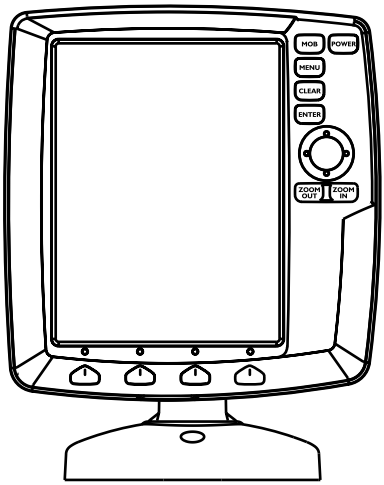
- **Port Info**
  The Port Info function is a combination of a Port Info database containing all the relevant Safety and Navigational information normally found in good pilot books and a presentation software which displays special Port Facility Symbols.

- **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.
- **RTCM = Radio Technical Commission for Maritime Services**
  The data format created by the Radio Technical Commission Maritime to transmit Differential GPS corrections.
- **SCALE**
  It 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**
  It is the 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**
  The current velocity at which the vessel is travelling, relative to a ground location. The SOG is normally provided by the GPS sensor.
- **SPD = Speed Through Water**
  The speed of the vessel relative to the water.
- **Spot Sounding**
  It is the 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**
  The difference between COG and CTS. If COG is 25° and CTS is 30°, then STR is 5° Right.
- **TD = Time Difference**
  Loran positions are determined by precise timing of the intervals between reception of pulses transmitted by pairs of stations in the selected chain. Between any two stations a ship must be located somewhere along a line of possible positions where the measured Time Difference, TD, between arrival of pulses from those stations would be observed. The TD is measured from the time of reception of the master station signal to the time of reception of the slave station signal (see also Pair).
- **Tide**
  The periodic rise and fall of the surface of oceans, bays, etc., due principally to the gravitational interactions between the Moon and Earth.
- **Tide Info**
  The Tide Info feature is the combination of a new tide heights database that will be included within new C-CARDs and new features which calculate the tide graph for all primary and secondary ports world-wide. This function can calculate 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 C-CARD.
- **Tracks + Routes**
  Recommended and established routes for ships at sea, including traffic separation schemes, deep water routes.
- **TRN = Turning**
  The difference between COG and BRG. If COG is 80° and BRG is 75°, TRN is 5°

Left.

- **TTG = Time To Go**
  The estimated time needed to reach your destination, based on your current speed and the distance to destination.
- **TWD = True Wind Direction**
  Direction 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.
- **Underwatwr 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**
  A 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**
  The 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**
  It is the 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 Augumentation 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.
- **WGS-84 = World Geodetic System 1984**
  Coordinates System or Datum developed by the Defense Mapping Agency (DMA). It is the default geodetic Datum used by the chart plotter and the GPS.
- **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**
  The distance from the ship's present position to the closest point on a line between the origin and destinations Waypoints of the navigation.

MURENA & MURENA iGPS



FEATURES & FUNCTIONS

- Direct sunlight viewable color LCD vertical display
- Worldwide Built-in Cartography showing C-MAP detail up to 2.0 NM
- Positional information from GPS
- GPS Signal Status page
- Navigation Data pages
- 500 Waypoints/Marks and 25 Routes (50 Waypoints max per Route)
- Create, Move, Insert, Edit or Erase Waypoint
- Create, Move, Edit or Erase Mark
- Navigation to Goto
- Create, Save, Name, Edit or Follow a Route
- Route Data Report and User Points (Marks/Waypoints) List pages
- Find Ports Services, Ports, Tide Stations, Wrecks, Obstructions, Cursor, Coordinates or User Points
- Display Tide info and Tide Graph page
- Automatic Info on cartographic objects or User Points
- Display vessel's position, direction and Track
- Alarms Handling
- Man OverBoard (MOB) to navigate back to a missing person or object
- Simulation Mode with cursor control

TECHNICAL SPECIFICATIONS

- Power consumption : 7.5 Watt max, 10 - 35 Volt dc
- Interface : NMEA0183
- Autopilot Interface : NMEA-0180, NMEA-0180/CDX, NMEA-0183
- Display : Sun Light Viewable Color LCD *(active area 5.6")*
- Display Resolution : 240 x 320 pixels

- Cartography : C-MAP C-CARD
- Operating temperature range : 0/+55 gradi Celsius
- Memory : Non volatile with battery back-up
- Keyboard : Silicon rubber, backlight
- Weight (with external bracket) : 600 gr. (plotter with INTERNAL GPS Receiver)
  550 gr. (plotter with EXTERNAL SMART GPS Receiver)

When the package containing the chart plotter is first opened, please check it for the following contents (if any parts are missing contact the dealer the chart plotter was purchased from):

- Bracket
- Chart plotter's protective cover
- Fuse 2 Amp. + fuseholder
- User Manual
- Flush mounting kit (ONLY on chart plotter with EXTERNAL SMART GPS Receiver)
- Smart DGPS WAAS Receiver with cable 15 mt/45 feet (ONLY on chart plotter with EXTERNAL SMART GPS Receiver)

INSERTING/REMOVING PROCEDURE

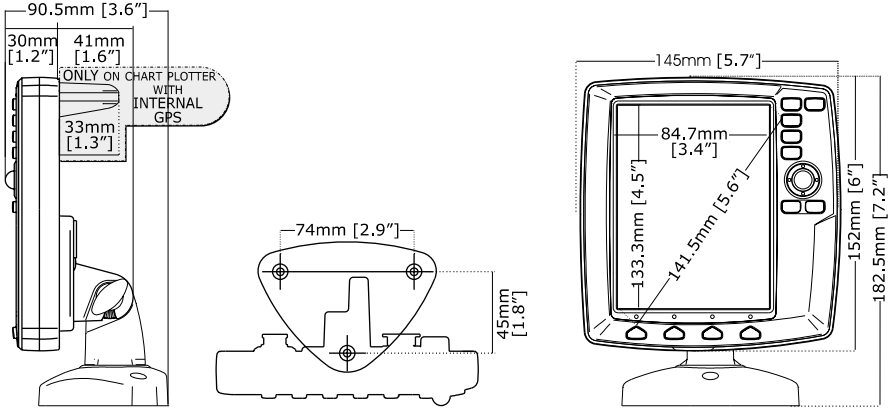
Inserting the C-CARD

Remove the front cover as explained in the following picture. Hold the C-CARD by the long inclined side so that you can see the C-MAP label. Gently push the C-CARD into the slot; push the C-CARD in as far as it will go to hold fixed into the slot and place the front cover again.

Removing the C-CARD

Remove the front cover and the C-CARD remove out of the slot.

CHART PLOTTER DIMENSIONS



INSTALLATION AND REMOVING

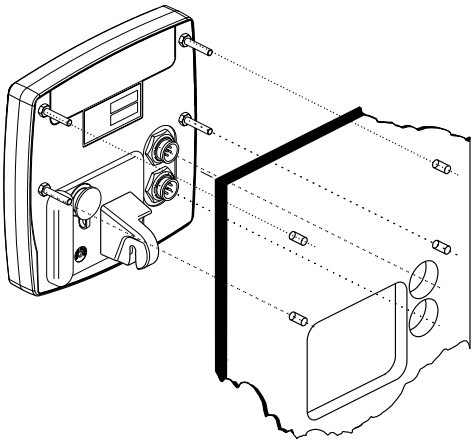


Chart plotter with External Smart GPS Receiver flush mont installation

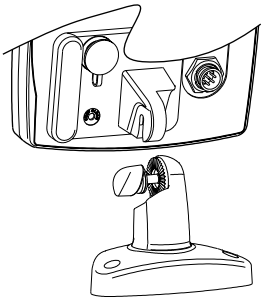
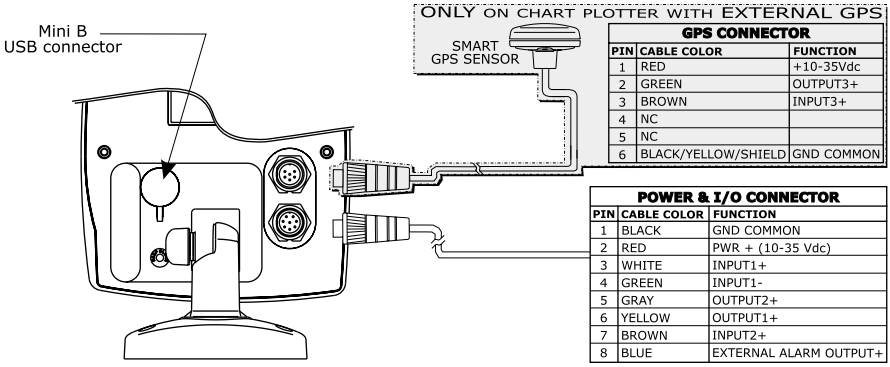


Chart plotter bracket installation

EXTERNAL WIRING



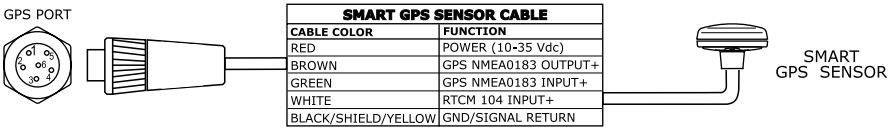
GPS CONNECTOR		
PIN	CABLE COLOR	FUNCTION
1	RED	+10-35Vdc
2	GREEN	OUTPUT3+
3	BROWN	INPUT3+
4	NC	
5	NC	
6	BLACK/YELLOW/SHIELD	GND COMMON

POWER & I/O CONNECTOR		
PIN	CABLE COLOR	FUNCTION
1	BLACK	GND COMMON
2	RED	PWR + (10-35 Vdc)
3	WHITE	INPUT1+
4	GREEN	INPUT1-
5	GRAY	OUTPUT2+
6	YELLOW	OUTPUT1+
7	BROWN	INPUT2+
8	BLUE	EXTERNAL ALARM OUTPUT+

Chart plotter External Wiring

INPUT/OUTPUT CONNECTIONS

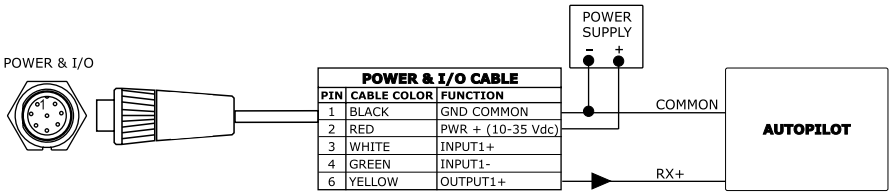
GPS Connection ON CHART PLOTTER WITH EXTERNAL SMART GPS RECEIVER



SMART GPS SENSOR CABLE	
CABLE COLOR	FUNCTION
RED	POWER (10-35 Vdc)
BROWN	GPS NMEA0183 OUTPUT+
GREEN	GPS NMEA0183 INPUT+
WHITE	RTCM 104 INPUT+
BLACK/SHIELD/YELLOW	GND/SIGNAL RETURN

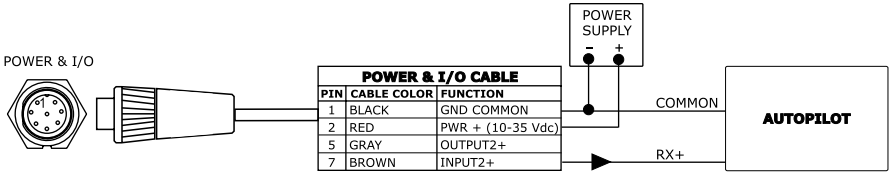
GPS Connections on Port 3

Autopilot Connection



POWER & I/O CABLE		
PIN	CABLE COLOR	FUNCTION
1	BLACK	GND COMMON
2	RED	PWR + (10-35 Vdc)
3	WHITE	INPUT1+
4	GREEN	INPUT1-
6	YELLOW	OUTPUT1+

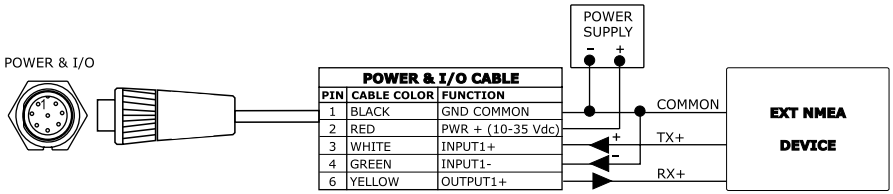
Autopilot Connections on Port 1



POWER & I/O CABLE		
PIN	CABLE COLOR	FUNCTION
1	BLACK	GND COMMON
2	RED	PWR + (10-35 Vdc)
5	GRAY	OUTPUT2+
7	BROWN	INPUT2+

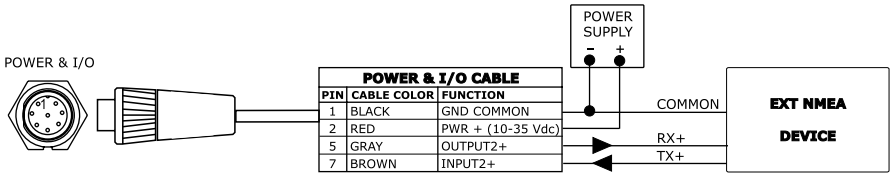
Autopilot Connections on Port 2

External NMEA Connection



POWER & I/O CABLE		
PIN	CABLE COLOR	FUNCTION
1	BLACK	GND COMMON
2	RED	PWR + (10-35 Vdc)
3	WHITE	INPUT1+
4	GREEN	INPUT1-
6	YELLOW	OUTPUT1+

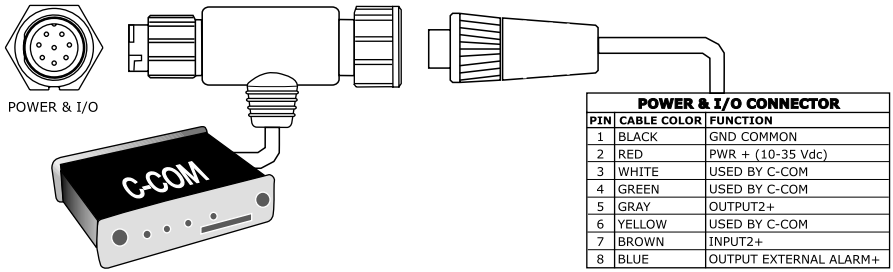
External NMEA Connections on Port 1



POWER & I/O CABLE		
PIN	CABLE COLOR	FUNCTION
1	BLACK	GND COMMON
2	RED	PWR + (10-35 Vdc)
5	GRAY	OUTPUT2+
7	BROWN	INPUT2+

External NMEA Connections on Port 2

C-COM GSM Plus Connection



POWER & I/O CONNECTOR		
PIN	CABLE COLOR	FUNCTION
1	BLACK	GND COMMON
2	RED	PWR + (10-35 Vdc)
3	WHITE	USED BY C-COM
4	GREEN	USED BY C-COM
5	GRAY	OUTPUT2+
6	YELLOW	USED BY C-COM
7	BROWN	INPUT2+
8	BLUE	OUTPUT EXTERNAL ALARM+

C-COM Connection

NOTE *The connection is valid for the C-COM IR and C-COM RS232 too.*

INSTALLING EXTERNAL SMART GPS

ONLY ON CHART PLOTTER WITH EXTERNAL GPS RECEIVER

The Smart DGPS WAAS receiver is based on a ultimate 12 channel GPS engine that delivers accuracy better than three meters by decoding the GPS correction signals from the satellite-based WAAS (*Wide Area Augmentation System*). The GPS engine, interface electronics and the passive antenna are enclosed inside the water-proof plastic housing. This provides advanced state of the art GPS performance in an easy to use package.

NOTE *If the characteristics of your Receiver should not be the same as the following explained. Contact your local dealer where the chart plotter was purchased for more information.*

Physical Characteristics

- Color : Ivory white
- Dimensions : 97mm in diameter x 32mm in height (flush mounted) or 61,5mm on flag-pole mount
- Weight : 160 grams (without cable)
- Cable : white 15 meter 8x28AWG cable

Electrical Characteristics

- Input Voltage : 10 Vdc to 35 Vdc unregulated
- Power Consumption : 1,2 Watt

GPS Performance

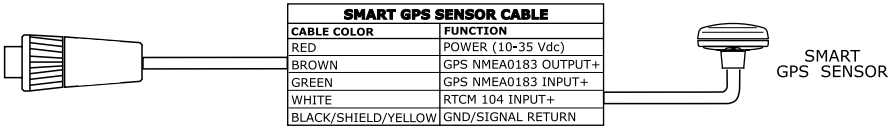
- Geodetic Datum : WGS84
- Channels : 12 parallel Channels
- Frequency : 1575.42MHz (L1, C/A code)
- Acquisition Time (Approximate)
  - Hot start : < 20 seconds
  - Warm start : < 45 seconds
  - Cold start : < 40 seconds
- DGPS Capability : RTCM SC104 v. 2,WAAS (North America), EGNOS (Europe), MSAS (Asia)
- Output Format : NMEA 0183 Version 2.0, Baud Rate 4800, N81
- Interfaces : Asynchronous serial output compatible with RS-232 (TTL voltage levels) RS-232 polarity

Environmental Characteristics

- Operating Temperature : 0° C~ +60° C
- Storage Temperature : -20° C~ +85° C
- Relative Humidity : 95% non-condensing
- Water Resistance : 100% waterproof

Wiring

See the following table for a functional description of each wire in the GPS cable.



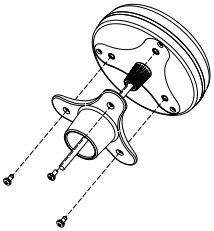
SMART GPS SENSOR CABLE	
CABLE COLOR	FUNCTION
RED	POWER (10-35 Vdc)
BROWN	GPS NMEA0183 OUTPUT+
GREEN	GPS NMEA0183 INPUT+
WHITE	RTCM 104 INPUT+
BLACK/SHIELD/YELLOW	GND/SIGNAL RETURN

Software Interface

The GPS products interface protocol design is based on the National Marine Electronics Association's NMEA 0183 ASCII interface specification. These standards are defined in "NMEA 0183 Version 2.0" (for more information see NMEA, **www.nmea.org**).

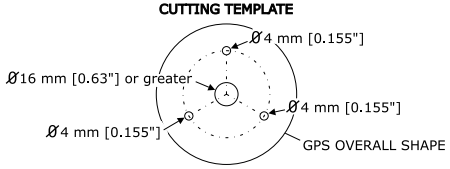
Installing

Choose a location for the antenna that has a clear view of the sky. Ensure there are no major obstructions or fixtures in the immediate proximity to the antenna. The antenna relies on direct "line of sight" satellite reception. If you are not sure that the chosen location is suitable it may be advisable to mount the antenna in a temporary manner to verify its correct operation. The thread used on the antenna (1 inch, 14 TPI) is an industry standard thread used on a wide range of mounting brackets, including the swivel joints commonly used for angled surfaces. However due to the manufacturing process of these mounting brackets you may see that there is some slop when tightening down the antenna to the bracket. This is of no concern however as the antenna must be tightened until the antenna stops rotating on the antenna mounting bracket.

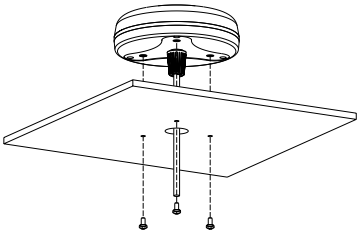


The antenna design also allows an easy flush mounting.

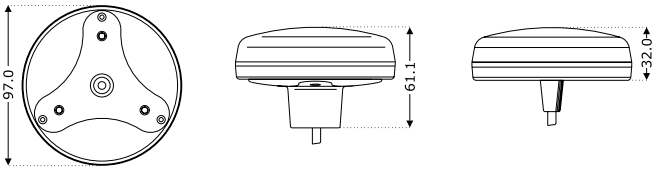
1. Apply the adhesive mounting template sheet in the area that was verified to receive satellite signal well
2. Then, following template instruction, drill a 0,63 inch (16 mm) hole and three 0,155 inch (4 mm) holes



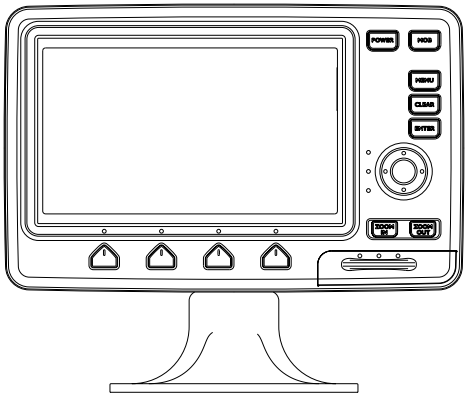
3. Remove the template and let the cable go through the central hole
4. Apply a small coat of RTV to the underside of the antenna
5. Place the antenna and then screw it with the three M3 screws



Dimensions



BARRACUDA & BARRACUDA iGPS



FEATURES & FUNCTIONS

- Direct sunlight viewable color LCD 16/9 display
- Worldwide Built-in Cartography showing C-MAP detail up to 2.0 NM
- Positional information from GPS
- GPS Signal Status page
- Navigation Data pages
- 500 Waypoints/Marks and 25 Routes (50 Waypoints max per Route)
- Create, Move, Insert, Edit or Erase Waypoint
- Create, Move, Edit or Erase Mark
- Navigation to Goto
- Create, Save, Name, Edit or Follow a Route
- Route Data Report and User Points (Marks/Waypoints) List pages
- Find Ports Services, Ports, Tide Stations, Wrecks, Obstructions, Cursor, Coordinates or User Points
- Display Tide info and Tide Graph page
- Automatic Info on cartographic objects or User Points
- Display vessel's position, direction and Track
- Alarms Handling
- Man OverBoard (MOB) to navigate back to a missing person or object
- Simulation Mode with cursor control

TECHNICAL SPECIFICATIONS

- Power consumption : 630mA max @ 10V
- Interface : NMEA0183
- Autopilot Interface : NMEA-0180, NMEA-0180/CDX, NMEA-0183
- Display : Sun Light Viewable Color LCD *(active area 7")*
- Display Resolution : 480 x 234 pixels
- Cartography : C-MAP C-CARD
- Operating temperature range : 0/+55 gradi Celsius
- Memory : Non volatile with battery back-up

- Keyboard : Silicon rubber, backlight
- Weight : 1,1 Kg

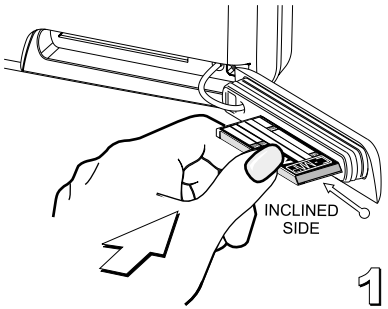
When the package containing the chart plotter is first opened, please check it for the following contents (if any parts are missing contact the dealer the chart plotter was purchased from):

- External quick disconnect bracket and I/O cable 1,5 mt/5.9"
- Chart plotter's protective cover
- Fuse 2 Amp. + fuseholder
- User Manual
- Flush mounting kit (ONLY on chart plotter with EXTERNAL SMART GPS Receiver)
- Smart DGPS WAAS Receiver with cable 15 mt/45 feet (ONLY on chart plotter with EXTERNAL SMART GPS Receiver)

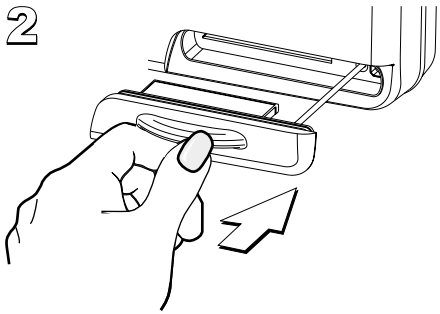
INSERTING/REMOVING PROCEDURE

Inserting the C-CARD

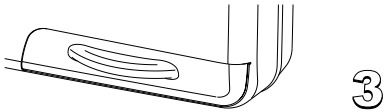
Open the door, hold the C-CARD by the long side so that you can see the "NT+" label and gently push the C-CARD into the door slot, as shown in the following picture:



Close the door pushing the C-CARD in as far as it will go to hold fixed into the chart plotter slot:

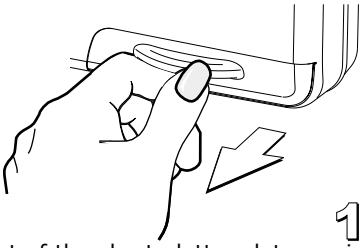


When finished the door must be right closed as shown in the following picture:

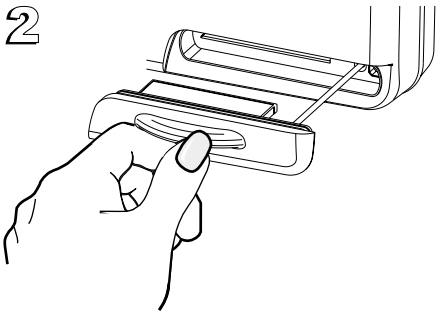


Removing the C-CARD

To remove the C-CARD inserted in the chart plotter open the door:



the C-CARD will eject out of the chart plotter slot remaining fixed into the door:



then remove the C-CARD from the slot:

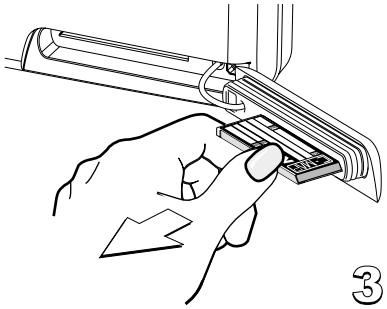


CHART PLOTTER DIMENSIONS

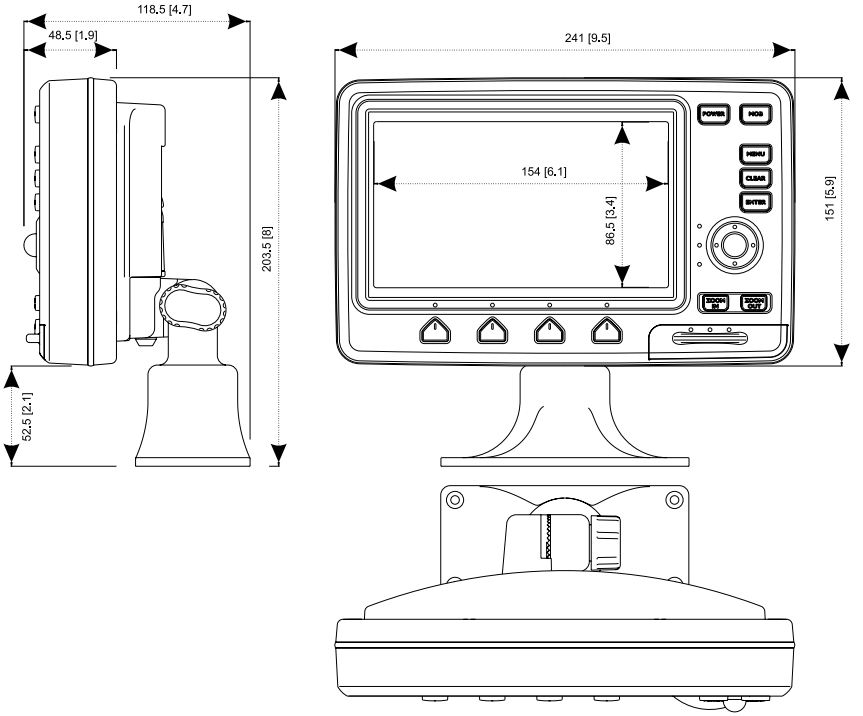


Chart plotter with External GPS Receiver Dimensions

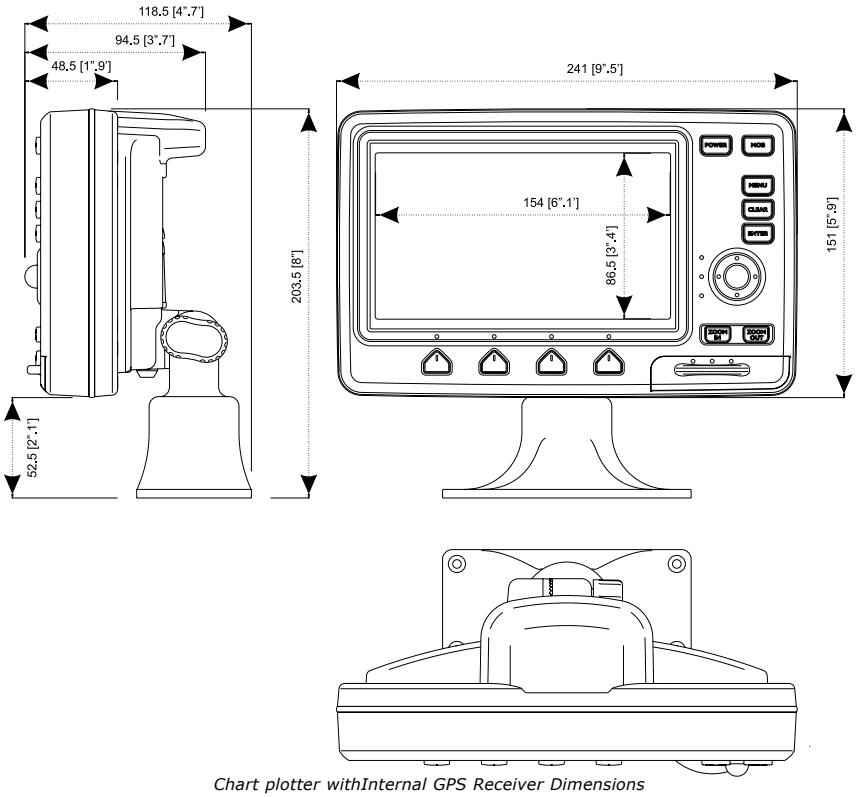


Chart plotter withInternal GPS Receiver Dimensions

INSTALLATION AND REMOVING

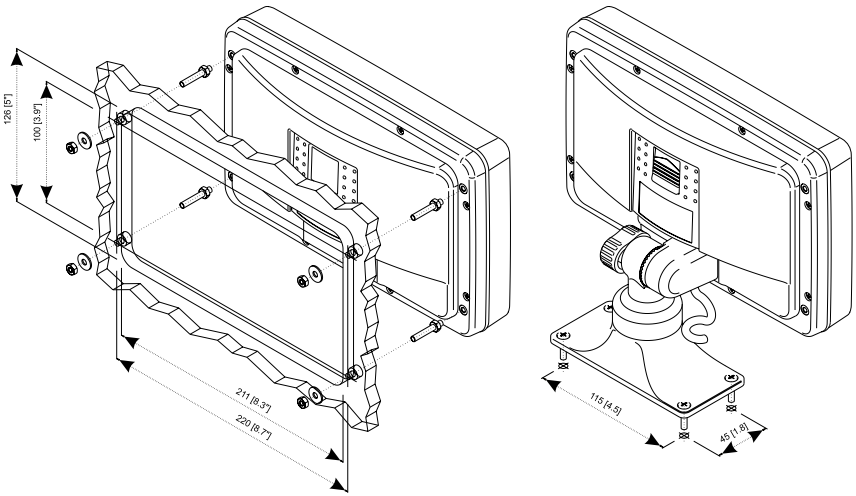


Chart plotter with External GPS Receiver installation and removing

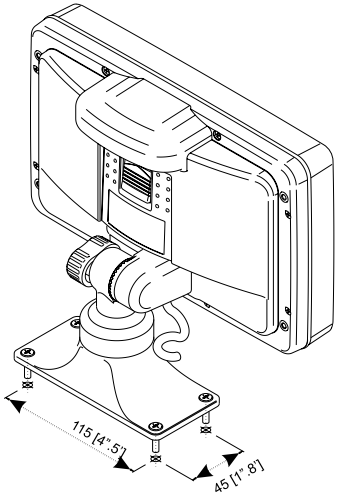
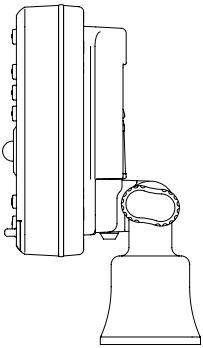


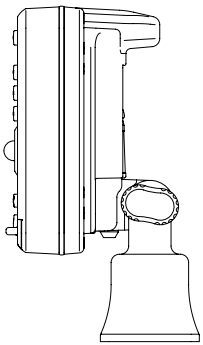
Chart plotter with Internal GPS Receiver installaion and removing

EXTERNAL WIRING



QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	**DESCRIPTION**	**FUNCTION**
BLACK	GND/COMMON	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/180CDX/C-COM
ORANGE	INPUT3+	NMEA0183/C-COM
PINK	OUTPUT3+	NMEA0183/180/180CDX/C-COM
BLUE	Signal -(common/return)	SIGNALS RETURN

External Wiring for chartplotter with external GPS receiver

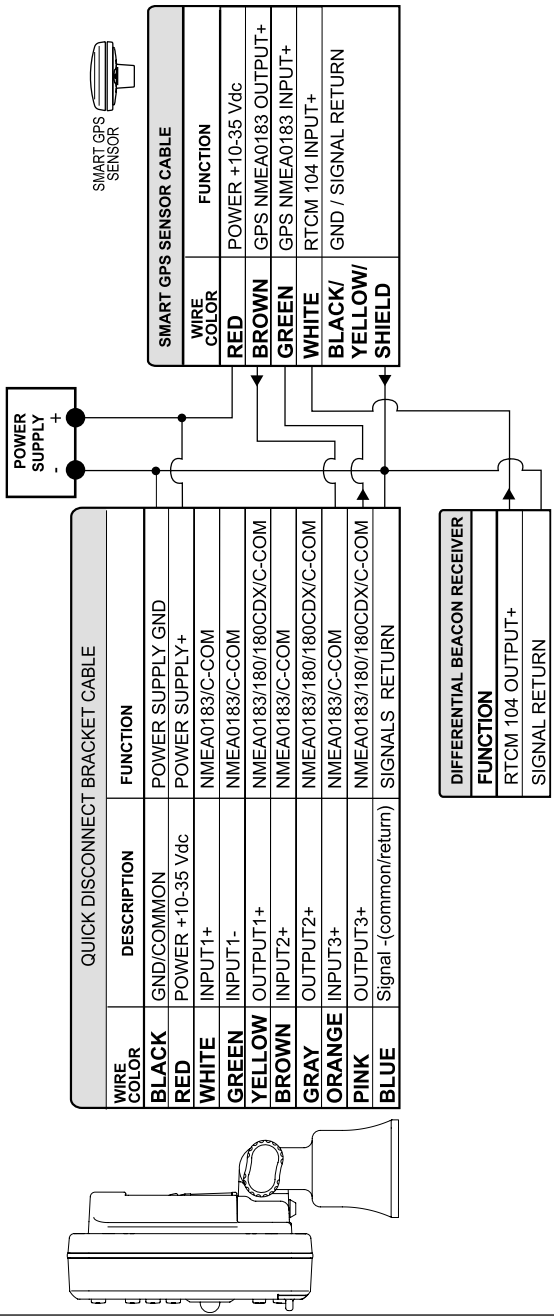


QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	**DESCRIPTION**	**FUNCTION**
BLACK	GND/COMMON	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/180CDX/C-COM
ORANGE	INPUT3+	RTCM 104 INPUT
PINK	OUTPUT3+	INT. GPS OUTPUT NMEA0183
BLUE	Signal -(common/return)	SIGNALS RETURN

External Wiring for chartplotter with internal GPS receiver

INPUT/OUTPUT CONNECTIONS

GPS Connection on chart plotter with External Smart GPS Receiver



GPS Connections on Port 3

Autopilot Connection

QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	DESCRIPTION	FUNCTION
BLACK	POWER GND	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/ 180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/ 180CDX/C-COM
ORANGE	INPUT3+	NMEA0183/C-COM
PINK	OUTPUT3+	NMEA0183/180/ 180CDX/C-COM
BLUE	Signal -(common/return)	SIGNALS RETURN

AUTOPILOT DEVICE
FUNCTION
NMEA0183/180/ 180CDX/INPUT+
SIGNAL RETURN

Autopilot Connections on Port 2

The autopilot can be connected also to the Port 1 and 3.

External NMEA Connection

QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	DESCRIPTION	FUNCTION
BLACK	POWER GND	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/ 180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/ 180CDX/C-COM
ORANGE	INPUT3+	NMEA0183/C-COM
PINK	OUTPUT3+	NMEA0183/180/ 180CDX/C-COM
BLUE	Signal -(common/return)	SIGNALS RETURN

NMEA 0183 DEVICE
FUNCTION
NMEA0183 OUTPUT+
NMEA0183 INPUT+
SIGNAL RETURN

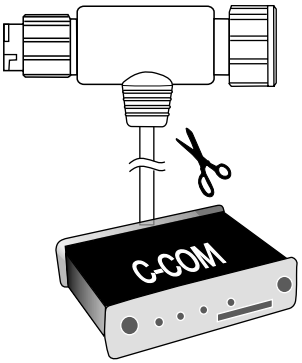
External NMEA Connections on Port 1

An NMEA device can be connected also to the Port 2 and 3. Doing connection remember that only the Port 1 is optoisolated in input.

C-COM GSM Plus Connection

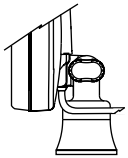
To connect the modem C-COM to the chart plotter with quick disconnect bracket follow the procedure:

1. Cut the C-COM cable about 5 cm from the "T" connector:



C-COM Cable

2. Connect the wires to the quick disconnect bracket cable as follows:



QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	DESCRIPTION	FUNCTION
BLACK	POWER GND	POWER SUPPLY GND
RED	POWER +10-35Vdc	POWER SUPPLY+
WHITE	INPUT1+	C-COM
GREEN	INPUT1-	C-COM
YELLOW	OUTPUT1+	C-COM

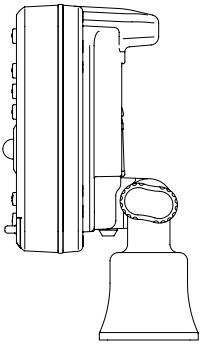
C-COM GSM Plus CABLE	
WIRE COLOR	FUNCTION
BLACK	GND
RED	POWER SUPPLY+
WHITE	C-COM TX+
GREEN	C-COM TX-
YELLOW	C-COM RX+

Connection for the Port 1

NOTE *The connection is valid for the C-COM IR and C-COM RS232 too.*

Beacon Receiver Connection

For Chart plotter WITH EXTERNAL GPS RECEIVER: To connect a Differential Beacon Receiver see previous figure GPS Connections on Port 3.
For Chart plotter WITH INTERNAL GPS RECEIVER: To connect a Differential Beacon Receiver see the following picture:



QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	DESCRIPTION	FUNCTION
BLACK	POWER GND	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/ 180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/ 180CDX/C-COM
ORANGE	INPUT3+	RTCM 104 INPUT
PINK	OUTPUT3+	NMEA0183/180/ 180CDX/C-COM
BLUE	Signal -(common/return)	SIGNALS RETURN

DIFFERENTIAL BEACON RECEIVER
FUNCTION
RTCM 104 OUTPUT+
SIGNAL RETURN

INSTALLING EXTERNAL SMART GPS

ONLY ON CHART PLOTTER WITH EXTERNAL GPS RECEIVER

The Smart DGPS WAAS receiver is based on a ultimate 12 channel GPS engine that delivers accuracy better than three meters by decoding the GPS correction signals from the satellite-based WAAS (*Wide Area Augmentation System*). The GPS engine, interface electronics and the passive antenna are enclosed inside the water-proof plastic housing. This provides advanced state of the art GPS performance in an easy to use package.

NOTE *If the characteristics of your Receiver should not be the same as the following explained. Contact your local dealer where the chart plotter was purchased for more information.*

Physical Characteristics

- Color : Ivory white
- Dimensions : 97mm in diameter x 32mm in height (flush mounted) or 61,5mm on flag-pole mount
- Weight : 160 grams (without cable)
- Cable : white 15 meter 8x28AWG cable

Electrical Characteristics

- Input Voltage : 10 Vdc to 35 Vdc unregulated
- Power Consumption : 1,2 Watt

GPS Performance

- Geodetic Datum : WGS84
- Channels : 12 parallel Channels
- Frequency : 1575.42MHz (L1, C/A code)
- Acquisition Time (Approximate)
  - Hot start : < 20 seconds
  - Warm start : < 45 seconds
  - Cold start : < 40 seconds
- DGPS Capability : RTCM SC104 v. 2,WAAS (North America), EGNOS (Europe), MSAS (Asia)
- Output Format : NMEA 0183 Version 2.0, Baud Rate 4800, N81
- Interfaces : Asynchronous serial output compatible with RS-232 (TTL voltage levels) RS-232 polarity

Environmental Characteristics

- Operating Temperature : 0° C~ +60° C
- Storage Temperature : -20° C~ +85° C
- Relative Humidity : 95% non-condensing
- Water Resistance : 100% waterproof

Wiring

See the following table for a functional description of each wire in the GPS cable.

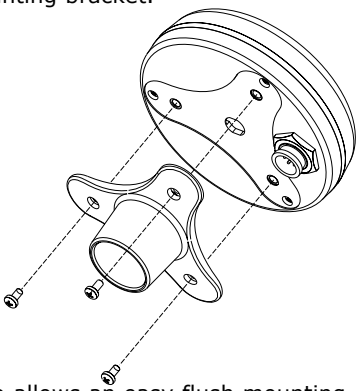
SMART GPS SENSOR CABLE	
WIRE COLOR	FUNCTION
RED	POWER +10-35 Vdc
BROWN	GPS NMEA0183 OUTPUT+
GREEN	GPS NMEA0183 INPUT+
WHITE	RTCM 104 INPUT+
BLACK/ YELLOW/ SHIELD	GND / SIGNAL RETURN

Software Interface

The GPS products interface protocol design is based on the National Marine Electronics Association's NMEA 0183 ASCII interface specification. These standards are defined in "NMEA 0183 Version 2.0" (for more information see NMEA, **www.nmea.org**).

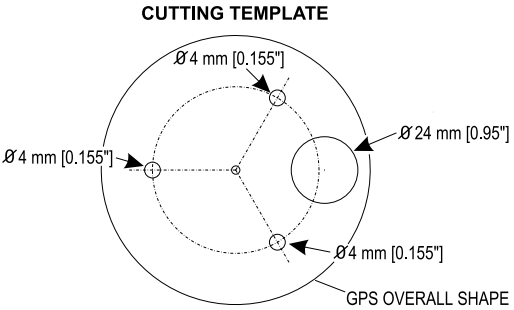
Installing

Choose a location for the antenna that has a clear view of the sky. Ensure there are no major obstructions or fixtures in the immediate proximity to the antenna. The antenna relies on direct "line of sight" satellite reception. If you are unsure that the chosen location is suitable it may be advisable to mount the antenna in a temporary manner to verify correct operation. The thread used on the antenna (1 inch, 14 TPI) is an industry standard thread used on a wide range of mounting brackets, including the swivel joints commonly used for angled surfaces. However due to the manufacturing process of these mounting brackets you may see that there is some slop when tightening down the antenna to the bracket. This is of no concern however as the antenna must be tightened until the antenna stops rotating on the antenna mounting bracket.

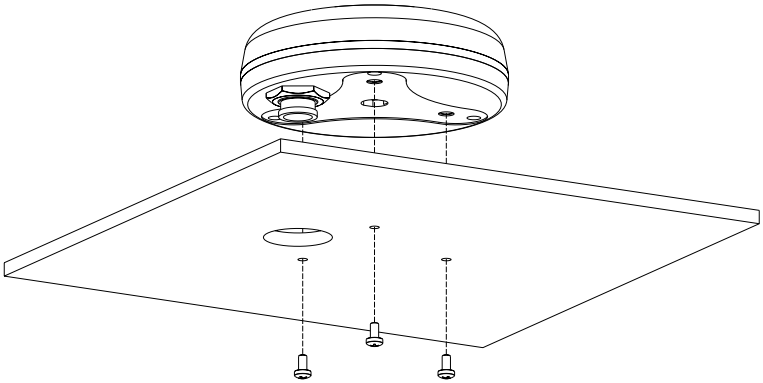


The antenna design also allows an easy flush mounting.

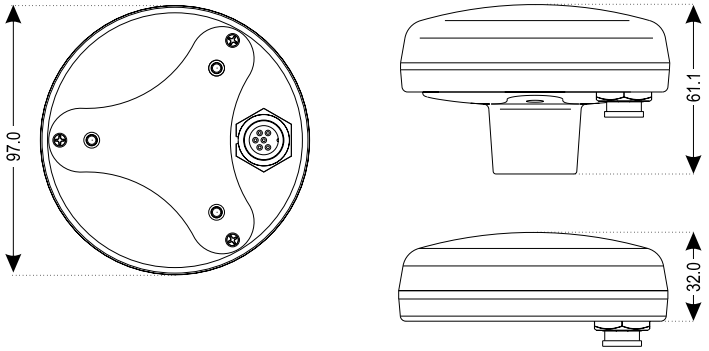
1. Apply the adhesive mounting template sheet in the area that was verified to receive satellite signal well
2. Then, following template instruction, drill a 0,63 inch (16 mm) hole and three 0,155 inch (4 mm) holes



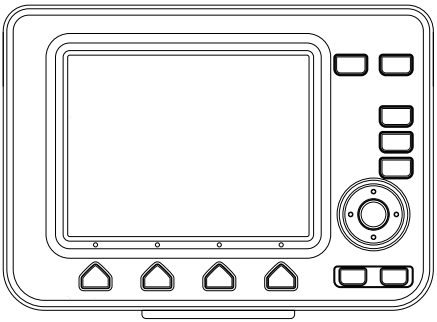
3. Remove the template and let the cable go through the central hole
4. Apply a small coat of RTV to the underside of the antenna
5. Place the antenna and then screw it with the three M3 screws



Dimensions



TIGERSHARK Plus & NAUTILUS iGPS Plus
MILLENNIUM 7 & MILLENNIUM 7 Color



FEATURES & FUNCTIONS

- Direct sunlight viewable LCD
- Worldwide Built-in Cartography showing C-MAP detail up to 2.0 NM
- Positional information from GPS
- GPS Signal Status page
- Navigation Data pages
- 500 Waypoints/Marks and 25 Routes (50 Waypoints max per Route)
- Create, Move, Insert, Edit or Erase Waypoint
- Create, Move, Edit or Erase Mark
- Navigation to Goto
- Create, Save, Name, Edit or Follow a Route
- Route Data Report and User Points (Marks/Waypoints) List pages
- Find Ports Services, Ports, Tide Stations, Wrecks, Obstructions, Cursor, Coordinates or User Points
- Display Tide info and Tide Graph page
- Automatic Info on cartographic objects or User Points
- Display vessel's position, direction and Track
- Alarms Handling
- Man OverBoard (MOB) to navigate back to a missing person or object
- Simulation Mode with cursor control

TECHNICAL SPECIFICATIONS

- Power consumption (gray levels) : 4.5 Watt max, 10–35 Volt DC
- Power consumption (color) : 7.5 Watt max, 10–35 Volt DC
- Interface : NMEA0183
- Autopilot Interface : NMEA-0180, NMEA-0180/CDX, NMEA-0183
- Display (gray levels) : transflective LCD *(active area 5.6")*
- Display (color) : Color Sun Light Viewable LCD *(active area 5.6")*
- Display Resolution : 320 x 240 pixels
- Cartography : C-MAP C-CARD
- Operating temperature range : 0/+55 gradi Celsius

- Memory : Non volatile with battery back-up
- Keyboard : Silicon rubber, backlight
- Weight (gray levels) : 800 gr.
- Weight (color) : 950 gr.

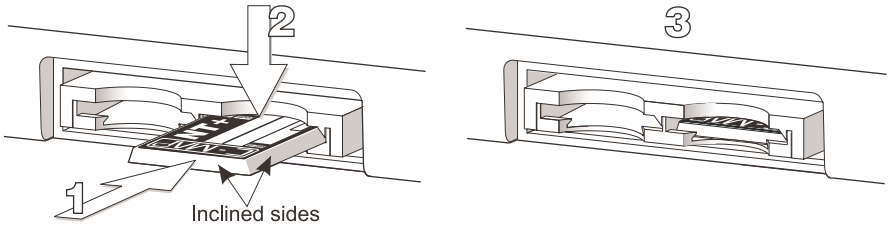
When the package containing the chart plotter is first opened, please check it for the following contents (if any parts are missing contact the dealer the chart plotter was purchased from):

- Quick disconnect bracket
- Chart plotter's protective cover
- Fuse 2 Amp. + fuseholder
- User Manual
- Flush mounting kit (ONLY on chart plotter with EXTERNAL SMART GPS Receiver)
- Smart DGPS WAAS Receiver with cable 15 mt/45 feet (ONLY on chart plotter with EXTERNAL SMART GPS Receiver)

INSERTING/REMOVING PROCEDURE

Inserting the C-CARD

Hold the C-CARD by the short inclined side so that you can see the C-MAP label. Gently push the C-CARD into one of the two slots (1); push the C-CARD in as far as it will go, then move it to the bottom (2) to hold fixed into the slot (3).



Removing the C-CARD

Press lightly the C-CARD you wish to remove (1) and move it to the top (2) until you hear a click: the C-CARD will eject out of the slot (3).

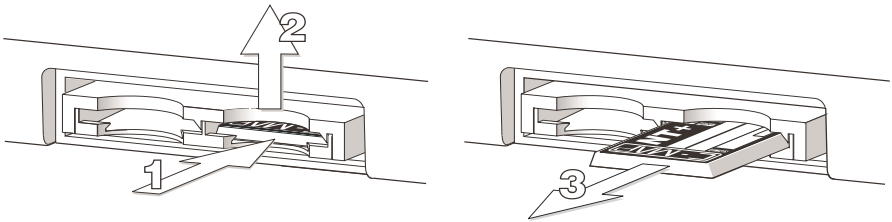


CHART PLOTTER DIMENSIONS

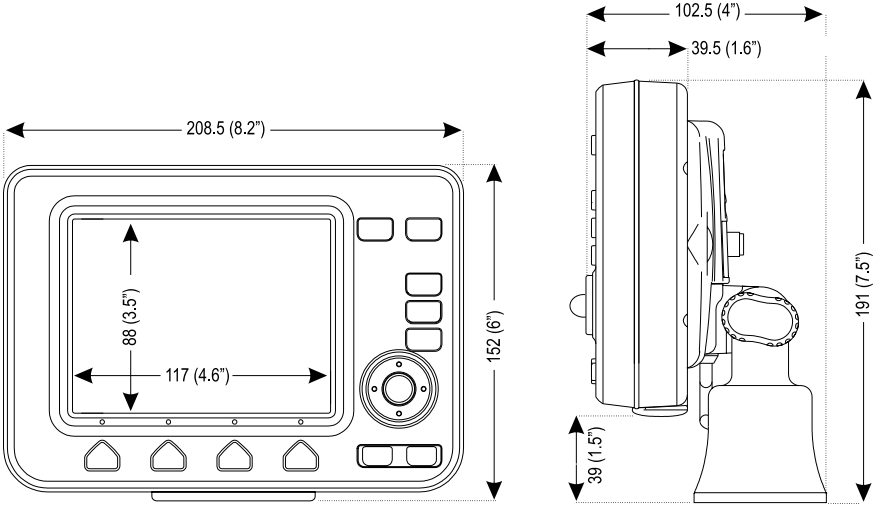


Chart plotter with External GPS Receiver Dimensions

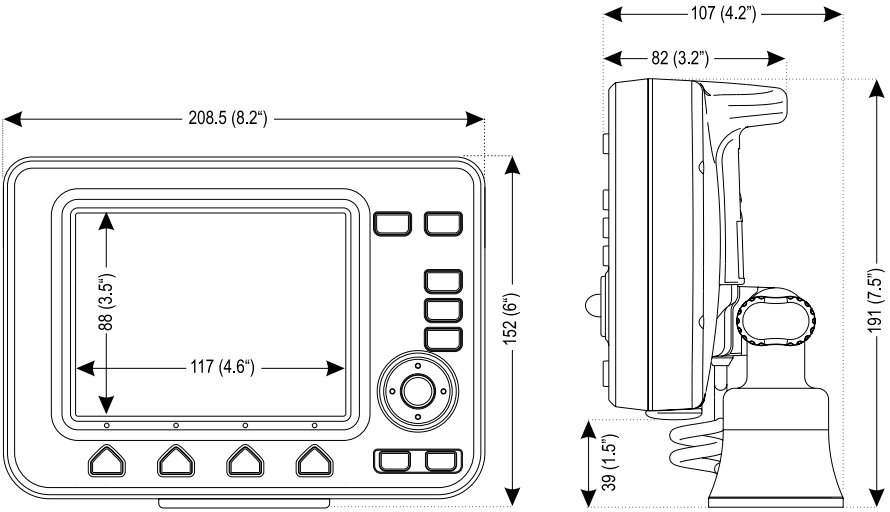


Chart plotter withInternal GPS Receiver Dimensions

INSTALLATION AND REMOVING

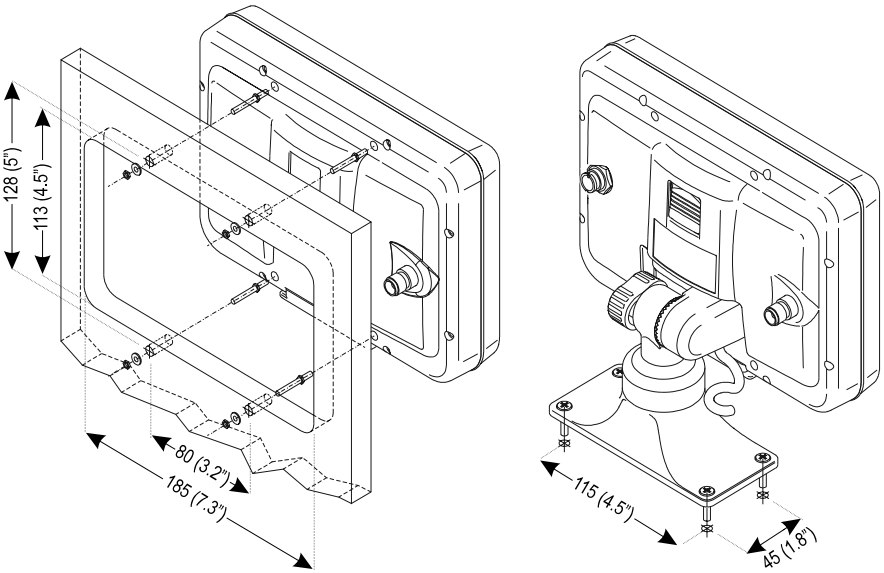


Chart plotter with External GPS Receiver installation

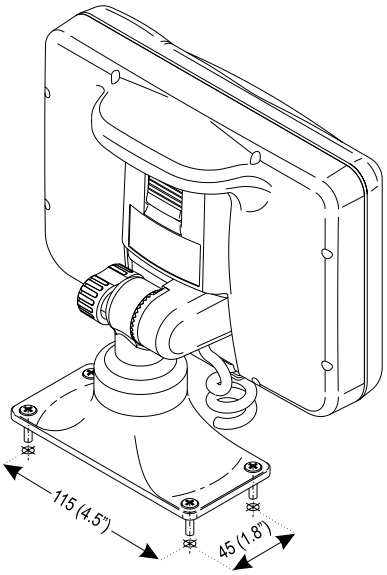


Chart plotter with Internal GPS Receiver installaion

To remove the chartplotter press the bracket button (1) as indicated in the following figures and then eject to the top the chartplotter (2):

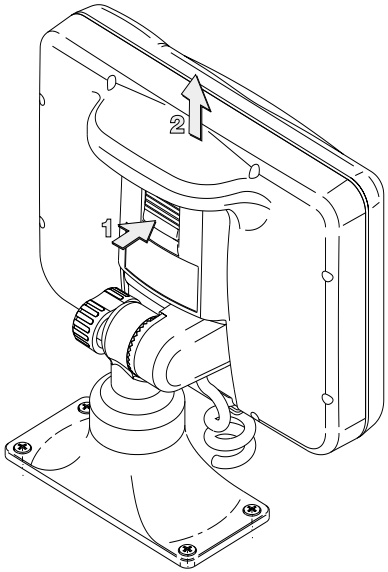


Chart plotter with External GPS Receiver removing

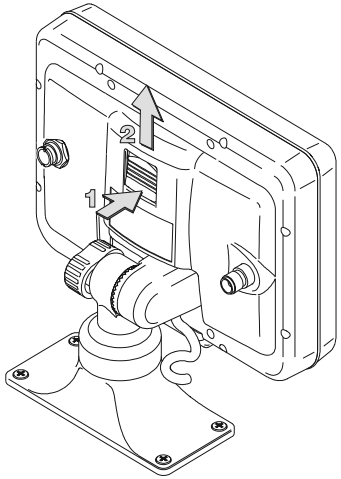
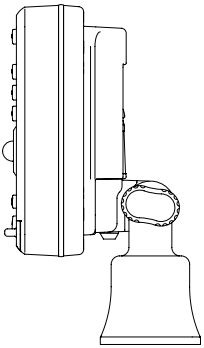


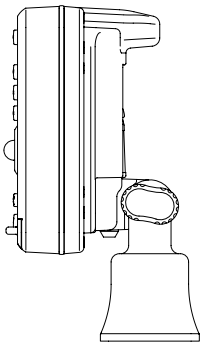
Chart plotter with Internal GPS Receiver removing

EXTERNAL WIRING



QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	**DESCRIPTION**	**FUNCTION**
BLACK	GND/COMMON	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/180CDX/C-COM
ORANGE	INPUT3+	NMEA0183/C-COM
PINK	OUTPUT3+	NMEA0183/180/180CDX/C-COM
BLUE	Signal -(common/return)	SIGNALS RETURN

External Wiring for chartplotter with external GPS receiver

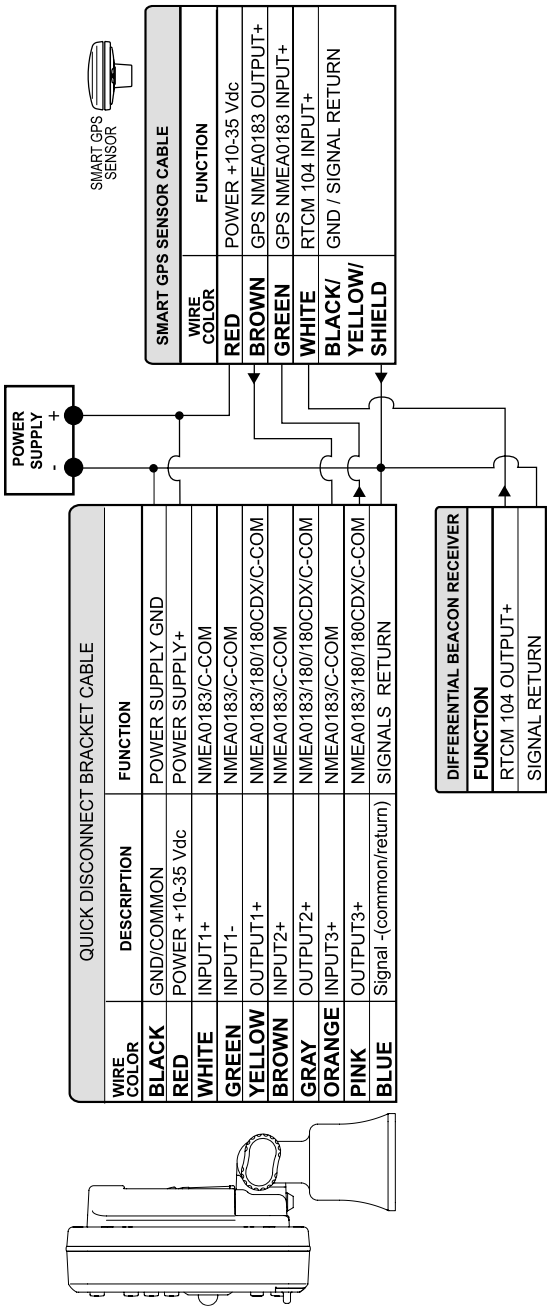


QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	**DESCRIPTION**	**FUNCTION**
BLACK	GND/COMMON	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/180CDX/C-COM
ORANGE	INPUT3+	RTCM 104 INPUT
PINK	OUTPUT3+	INT. GPS OUTPUT NMEA0183
BLUE	Signal -(common/return)	SIGNALS RETURN

External Wiring for chartplotter with internal GPS receiver

INPUT/OUTPUT CONNECTIONS

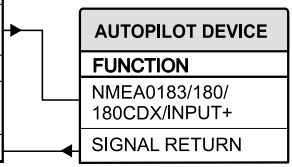
GPS Connection on plotter with External Smart GPS Receiver



GPS Connections on Port 3

Autopilot Connection

QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	DESCRIPTION	FUNCTION
BLACK	POWER GND	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/ 180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/ 180CDX/C-COM
ORANGE	INPUT3+	NMEA0183/C-COM
PINK	OUTPUT3+	NMEA0183/180/ 180CDX/C-COM
BLUE	Signal -(common/return)	SIGNALS RETURN

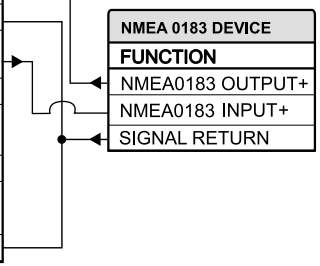


Autopilot Connections on Port 2

The autopilot can be connected also to the Port 1 and 3.

External NMEA Connection

QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	DESCRIPTION	FUNCTION
BLACK	POWER GND	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/ 180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/ 180CDX/C-COM
ORANGE	INPUT3+	NMEA0183/C-COM
PINK	OUTPUT3+	NMEA0183/180/ 180CDX/C-COM
BLUE	Signal -(common/return)	SIGNALS RETURN



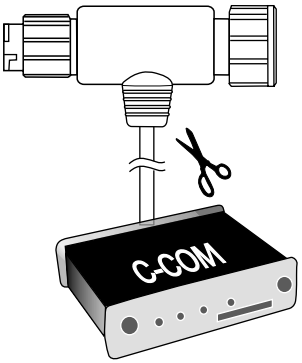
External NMEA Connections on Port 1

An NMEA device can be connected also to the Port 2 and 3. Doing connection remember that only the Port 1 is optoisolated in input.

C-COM GSM Plus Connection

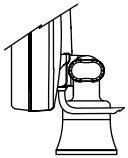
To connect the modem C-COM to the chart plotter with quick disconnect bracket follow the procedure:

1. Cut the C-COM cable about 5 cm from the "T" connector:



C-COM Cable

2. Connect the wires to the quick disconnect bracket cable as follows:



QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	DESCRIPTION	FUNCTION
BLACK	POWER GND	POWER SUPPLY GND
RED	POWER +10-35Vdc	POWER SUPPLY+
WHITE	INPUT1+	C-COM
GREEN	INPUT1-	C-COM
YELLOW	OUTPUT1+	C-COM

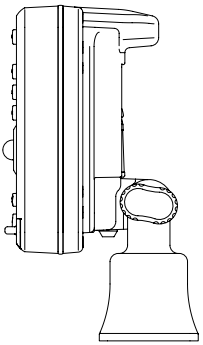
C-COM GSM Plus CABLE	
WIRE COLOR	FUNCTION
BLACK	GND
RED	POWER SUPPLY+
WHITE	C-COM TX+
GREEN	C-COM TX-
YELLOW	C-COM RX+

Connection for the Port 1

NOTE *The connection is valid for the C-COM IR and C-COM RS232 too.*

Beacon Receiver Connection

For Chart plotter WITH EXTERNAL GPS RECEIVER: To connect a Differential Beacon Receiver see previous figure GPS Connections on Port 3.
For Chart plotter WITH INTERNAL GPS RECEIVER: To connect a Differential Beacon Receiver see the following picture:



QUICK DISCONNECT BRACKET CABLE		
WIRE COLOR	DESCRIPTION	FUNCTION
BLACK	POWER GND	POWER SUPPLY GND
RED	POWER +10-35 Vdc	POWER SUPPLY+
WHITE	INPUT1+	NMEA0183/C-COM
GREEN	INPUT1-	NMEA0183/C-COM
YELLOW	OUTPUT1+	NMEA0183/180/ 180CDX/C-COM
BROWN	INPUT2+	NMEA0183/C-COM
GRAY	OUTPUT2+	NMEA0183/180/ 180CDX/C-COM
ORANGE	INPUT3+	RTCM 104 INPUT
PINK	OUTPUT3+	NMEA0183/180/ 180CDX/C-COM
BLUE	Signal -(common/return)	SIGNALS RETURN

DIFFERENTIAL BEACON RECEIVER
FUNCTION
RTCM 104 OUTPUT+
SIGNAL RETURN

INSTALLING EXTERNAL SMART GPS

ONLY ON CHART PLOTTER WITH EXTERNAL GPS RECEIVER

The Smart DGPS WAAS receiver is based on a ultimate 12 channel GPS engine that delivers accuracy better than three meters by decoding the GPS correction signals from the satellite-based WAAS (*Wide Area Augmentation System*). The GPS engine, interface electronics and the passive antenna are enclosed inside the water-proof plastic housing. This provides advanced state of the art GPS performance in an easy to use package.

NOTE *If the characteristics of your Receiver should not be the same as the following explained. Contact your local dealer where the chart plotter was purchased for more information.*

Physical Characteristics

- Color : Ivory white
- Dimensions : 97mm in diameter x 32mm in height (flush mounted) or 61,5mm on flag-pole mount
- Weight : 160 grams (without cable)
- Cable : white 15 meter 8x28AWG cable

Electrical Characteristics

- Input Voltage : 10 Vdc to 35 Vdc unregulated
- Power Consumption : 1,2 Watt

GPS Performance

- Geodetic Datum : WGS84
- Channels : 12 parallel Channels
- Frequency : 1575.42MHz (L1, C/A code)
- Acquisition Time (Approximate)
  - Hot start : < 20 seconds
  - Warm start : < 45 seconds
  - Cold start : < 40 seconds
- DGPS Capability : RTCM SC104 v. 2,WAAS (North America), EGNOS (Europe), MSAS (Asia)
- Output Format : NMEA 0183 Version 2.0, Baud Rate 4800, N81
- Interfaces : Asynchronous serial output compatible with RS-232 (TTL voltage levels) RS-232 polarity

Environmental Characteristics

- Operating Temperature : 0° C~ +60° C
- Storage Temperature : -20° C~ +85° C
- Relative Humidity : 95% non-condensing
- Water Resistance : 100% waterproof

Wiring

See the following table for a functional description of each wire in the GPS cable.

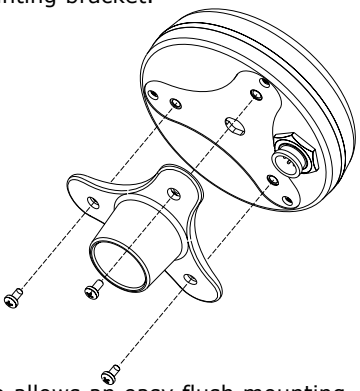
SMART GPS SENSOR CABLE	
WIRE COLOR	FUNCTION
RED	POWER +10-35 Vdc
BROWN	GPS NMEA0183 OUTPUT+
GREEN	GPS NMEA0183 INPUT+
WHITE	RTCM 104 INPUT+
BLACK/ YELLOW/ SHIELD	GND / SIGNAL RETURN

Software Interface

The GPS products interface protocol design is based on the National Marine Electronics Association's NMEA 0183 ASCII interface specification. These standards are defined in "NMEA 0183 Version 2.0" (for more information see NMEA, **www.nmea.org**).

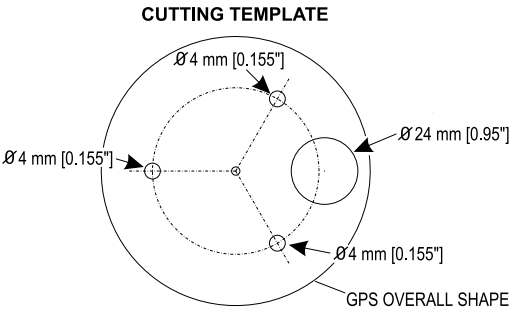
Installing

Choose a location for the antenna that has a clear view of the sky. Ensure there are no major obstructions or fixtures in the immediate proximity to the antenna. The antenna relies on direct "line of sight" satellite reception. If you are unsure that the chosen location is suitable it may be advisable to mount the antenna in a temporary manner to verify correct operation. The thread used on the antenna (1 inch, 14 TPI) is an industry standard thread used on a wide range of mounting brackets, including the swivel joints commonly used for angled surfaces. However due to the manufacturing process of these mounting brackets you may see that there is some slop when tightening down the antenna to the bracket. This is of no concern however as the antenna must be tightened until the antenna stops rotating on the antenna mounting bracket.

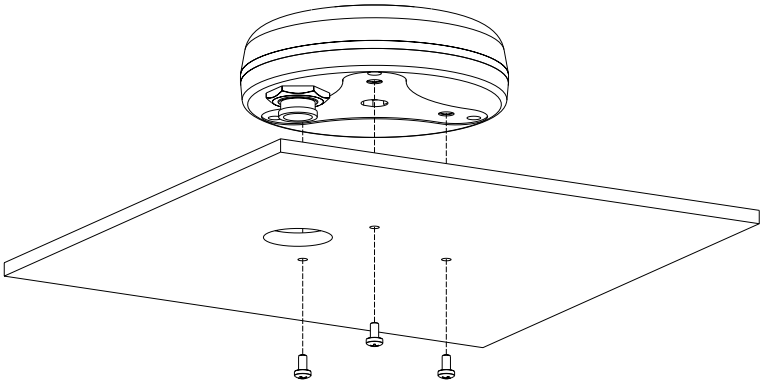


The antenna design also allows an easy flush mounting.

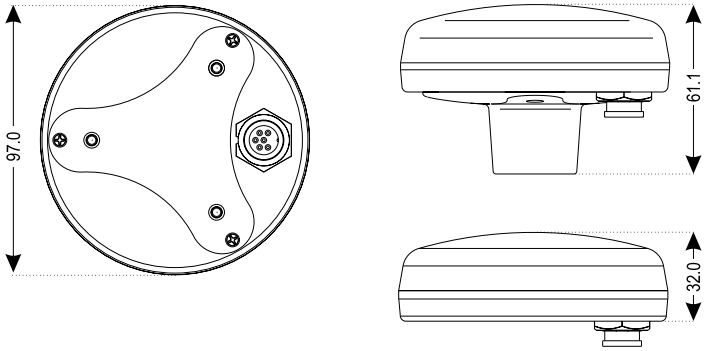
1. Apply the adhesive mounting template sheet in the area that was verified to receive satellite signal well
2. Then, following template instruction, drill a 0,63 inch (16 mm) hole and three 0,155 inch (4 mm) holes



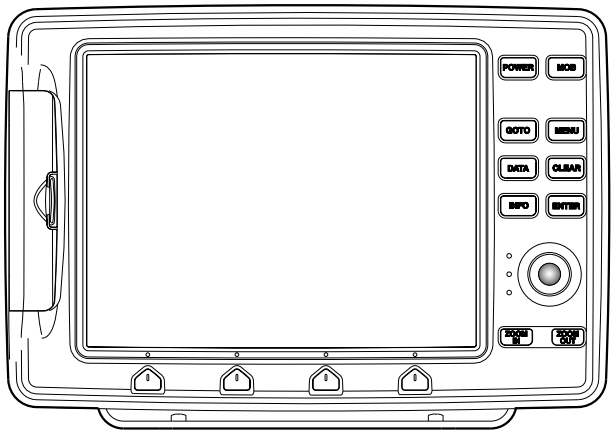
3. Remove the template and let the cable go through the central hole
4. Apply a small coat of RTV to the underside of the antenna
5. Place the antenna and then screw it with the three M3 screws



Dimensions



BARRAMUNDI & BARRAMUNDI Plus



FEATURES & FUNCTIONS

- Direct sunlight viewable color 11" LCD display
- Worldwide Built-in Cartography showing C-MAP detail up to 2.0 NM
- Positional information from GPS
- GPS Signal Status page
- Navigation Data pages
- Wind Data pages
- 1000 Waypoints/Marks and 50 Routes (50 Waypoints max per Route)
- Create, Move, Insert, Edit or Erase Waypoint
- Create, Move, Edit or Erase Mark
- Navigation to Goto
- Create, Save, Name, Edit or Follow a Route
- Route Data Report and User Points (Marks/Waypoints) List pages
- Find Ports Services, Ports, Tide Stations, Wrecks, Obstructions, Cursor, Coordinates or User Points
- Display Tide info and Tide Graph page
- Automatic Info on cartographic objects or User Points
- Display vessel's position, direction and Track
- Alarms Handling
- Man OverBoard (MOB) to navigate back to a missing person or object
- Simulation Mode with cursor control
- Video Input option

TECHNICAL SPECIFICATIONS

- Power consumption : 1280mA max @ 12V
- Power consumption (with camera connected) : 1280mA max @ 12V
- Interface : NMEA0183
- Autopilot Interface : NMEA-0180, NMEA-0180/CDX, NMEA-0183

- Video Input (color with Video Input) : PAL or NTSC video signals automatically selected
- Display : TFT trasmissive LCD *(active area 10.4")*/TFT ransflective LCD *(active area 10.4")*
- Display Resolution : 640 x 480 pixels
- Cartography : C-MAP C-CARD
- Operating temperature range : 0/+55 gradi Celsius
- Memory : Non volatile with battery back-up
- Keyboard : Silicon rubber, backlight
- Weight : 1,6 Kg

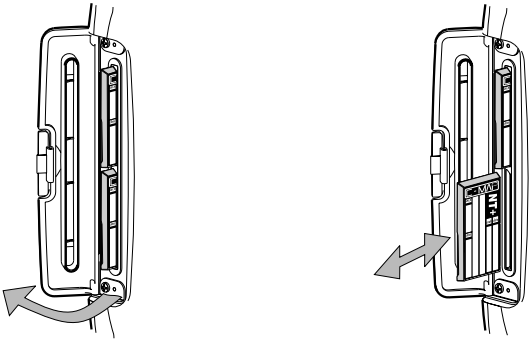
When the package containing the chart plotter is first opened, please check it for the following contents (if any parts are missing contact the dealer the chart plotter was purchased from):

- External bracket and I/O cable 1,5 mt/5.9"
- Chart plotter's protective cover
- Fuse 2 Amp. + fuseholder
- User Manual
- Flush mounting kit
- Smart DGPS WAAS Receiver with cable 15 mt/45 feet

INSERTING/REMOVING PROCEDURE

Inserting the C-CARD

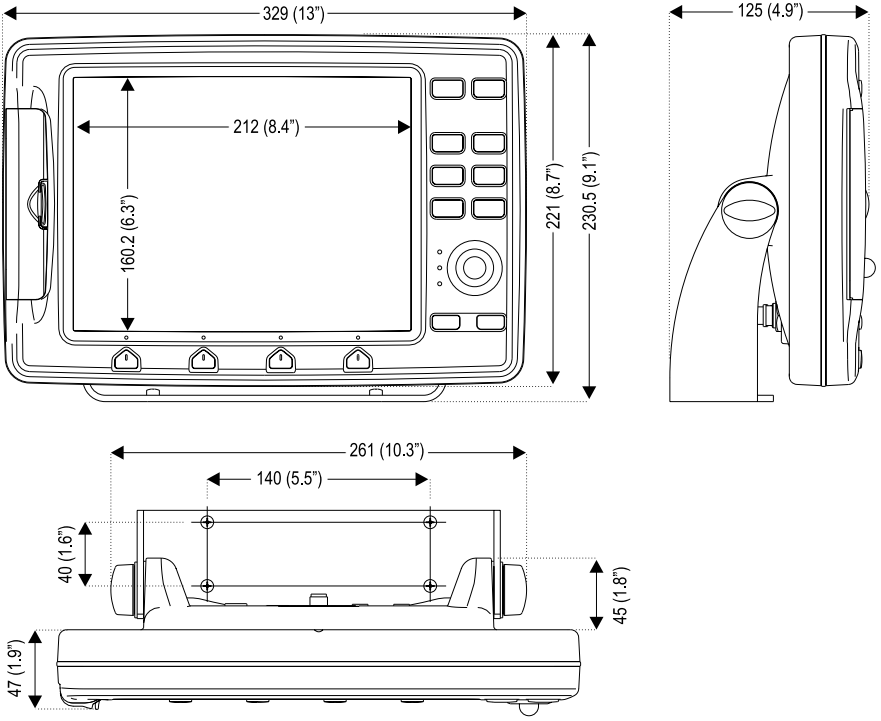
Hold the C-CARD by the short inclined side so that you can see the C-MAP label. Open the door, gently push the C-CARD into one of the two slots; push the C-CARD in as far as it will go, then close the door to hold fixed into the slot.



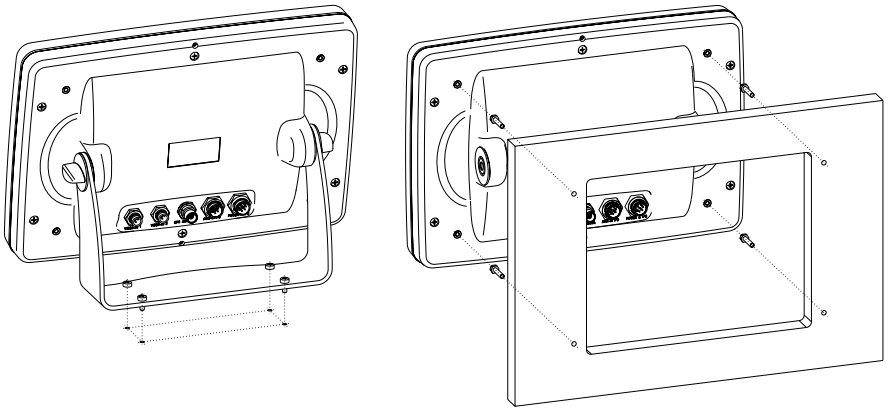
Removing the C-CARD

Open the door and remove the C-CARD out of one of the two slots (as shown in the right side of the previous picture).

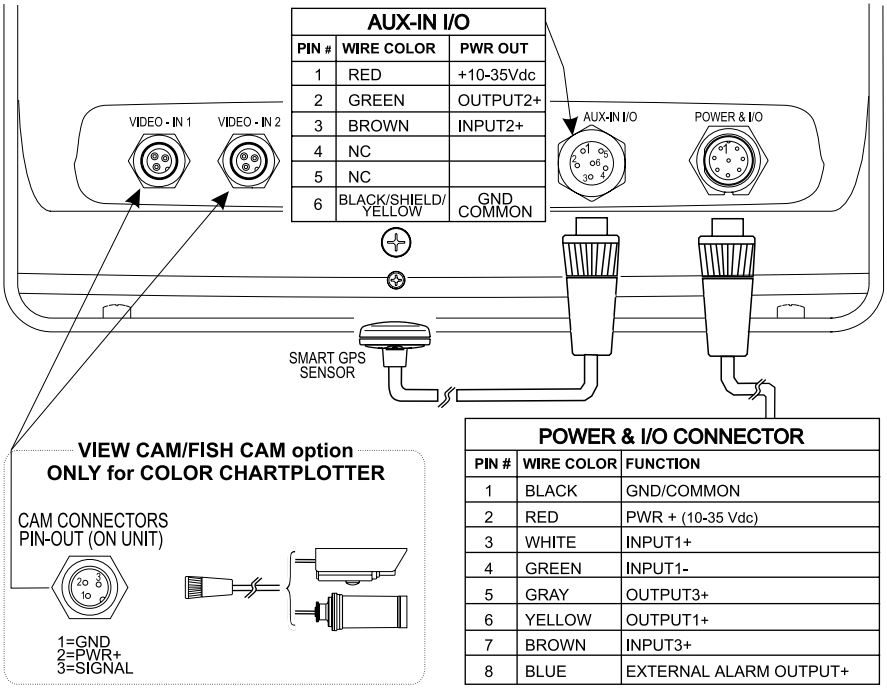
CHART PLOTTER DIMENSIONS



INSTALLATION AND REMOVING



EXTERNAL WIRING

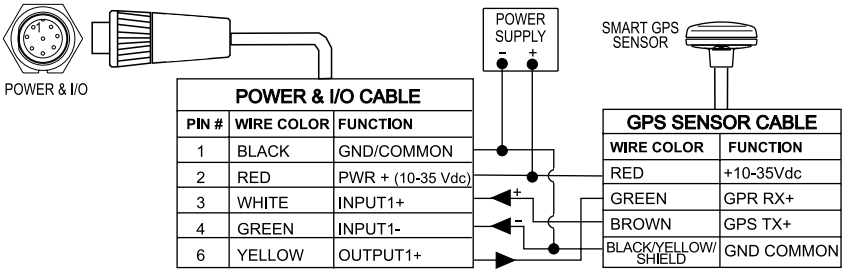


AUX-IN I/O		
PIN #	**WIRE COLOR**	**PWR OUT**
1	RED	+10-35Vdc
2	GREEN	OUTPUT2+
3	BROWN	INPUT2+
4	NC	
5	NC	
6	BLACK/SHIELD/ YELLOW	GND COMMON

POWER & I/O CONNECTOR		
PIN #	**WIRE COLOR**	**FUNCTION**
1	BLACK	GND/COMMON
2	RED	PWR + (10-35 Vdc)
3	WHITE	INPUT1+
4	GREEN	INPUT1-
5	GRAY	OUTPUT3+
6	YELLOW	OUTPUT1+
7	BROWN	INPUT3+
8	BLUE	EXTERNAL ALARM OUTPUT+

INPUT/OUTPUT CONNECTIONS

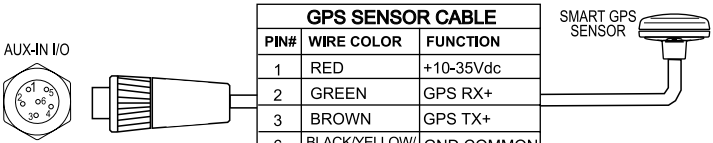
GPS Connection



POWER & I/O CABLE		
PIN #	**WIRE COLOR**	**FUNCTION**
1	BLACK	GND/COMMON
2	RED	PWR + (10-35 Vdc)
3	WHITE	INPUT1+
4	GREEN	INPUT1-
6	YELLOW	OUTPUT1+

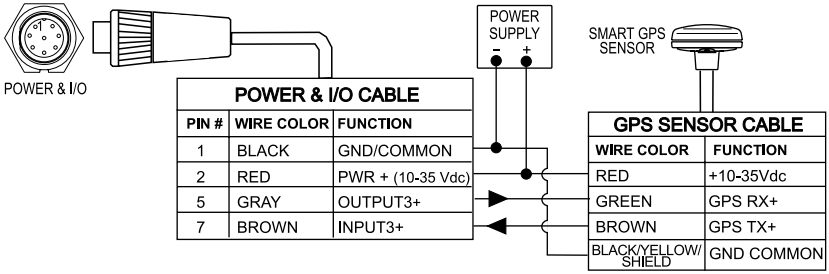
GPS SENSOR CABLE	
WIRE COLOR	**FUNCTION**
RED	+10-35Vdc
GREEN	GPR RX+
BROWN	GPS TX+
BLACK/YELLOW/ SHIELD	GND COMMON

GPS Connections on Port 1



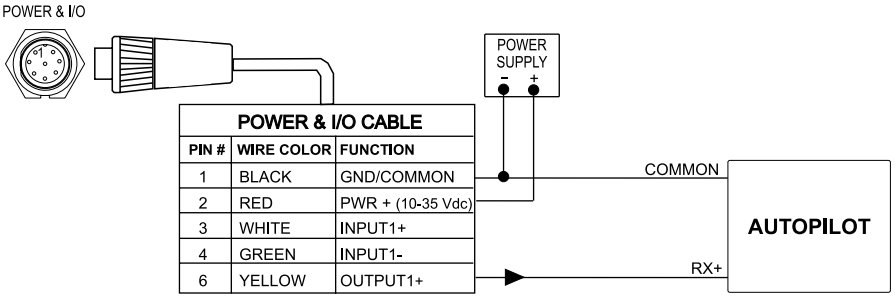
GPS SENSOR CABLE		
PIN#	**WIRE COLOR**	**FUNCTION**
1	RED	+10-35Vdc
2	GREEN	GPS RX+
3	BROWN	GPS TX+
6	BLACK/YELLOW/ SHIELD	GND COMMON

GPS Connections on Port 2

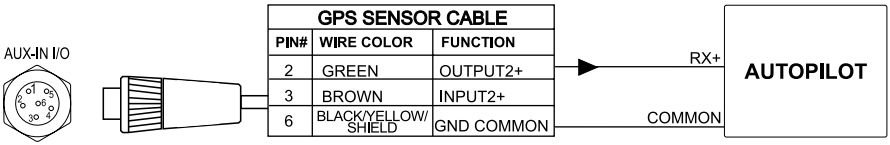


GPS Connections on Port 3

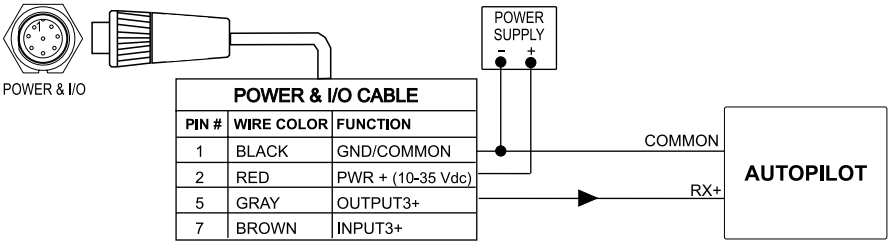
Autopilot Connection



Autopilot Connections on Port 1

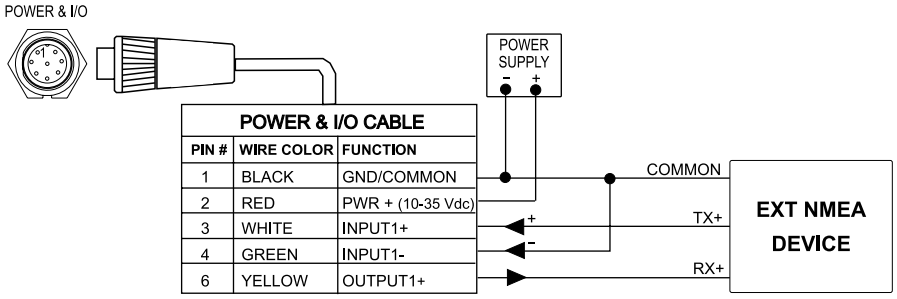


Autopilot Connections on Port 2

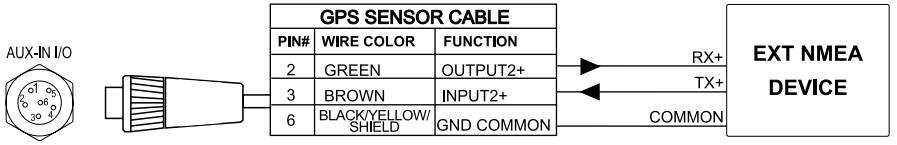


Autopilot Connections on Port 3

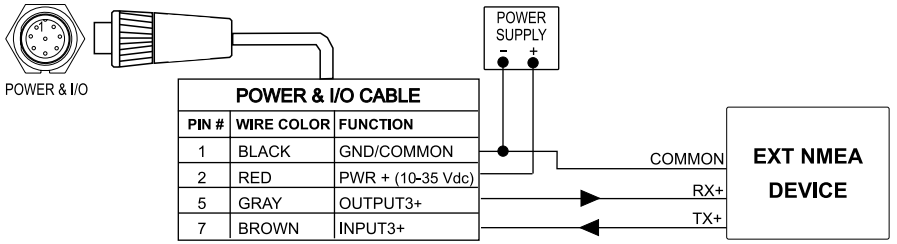
External NMEA Connection



External NMEA Connections on Port 1

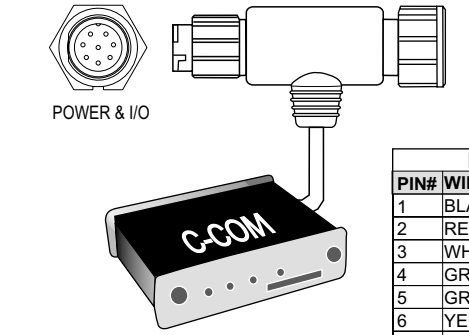


External NMEA Connections on Port 2



External NMEA Connections on Port 3

C-COM GSM Plus Connection



POWER & I/O CONNECTOR		
PIN#	WIRE COLOR	FUNCTION
1	BLACK	GND/COMMON
2	RED	PWR+ (10-35 Vdc)
3	WHITE	USED BY C-COM
4	GREEN	USED BY C-COM
5	GREY	OUTPUT3+
6	YELLOW	USED BY C-COM
7	BROWN	INPUT3+
8	BLU	OUTPUT EXTERNAL ALARM+

NOTE *The connection is valid for the C-COM IR and C-COM RS232 too.*

External Alarm Connection

POWER & I/O CONNECTOR		
PIN #	**WIRE COLOR**	**FUNCTION**
1	BLACK	GND/COMMON
2	RED	PWR + (10-35 Vdc)
8	BLUE	EXTERNAL ALARM OUTPUT+ (OPEN COLLECTOR)

INSTALLING EXTERNAL SMART GPS

The Smart DGPS WAAS receiver is based on a ultimate 12 channel GPS engine that delivers accuracy better than three meters by decoding the GPS correction signals from the satellite-based WAAS (*Wide Area Augmentation System*). The GPS engine, interface electronics and the passive antenna are enclosed inside the water-proof plastic housing. This provides advanced state of the art GPS performance in an easy to use package.

NOTE *If the characteristics of your Receiver should not be the same as the following explained. Contact your local dealer where the chart plotter was purchased for more information.*

Physical Characteristics

- Color : Ivory white
- Dimensions : 97mm in diameter x 32mm in height (flush mounted) or 61,5mm on flag-pole mount
- Weight : 160 grams (without cable)
- Cable : white 15 meter 8x28AWG cable

Electrical Characteristics

- Input Voltage : 10 Vdc to 35 Vdc unregulated
- Power Consumption : 1,2 Watt

GPS Performance

- Geodetic Datum : WGS84
- Channels : 12 parallel Channels
- Frequency : 1575.42MHz (L1, C/A code)
- Acquisition Time (Approximate)
  - Hot start : < 20 seconds
  - Warm start : < 45 seconds
  - Cold start : < 40 seconds
- DGPS Capability : RTCM SC104 v. 2,WAAS (North America), EGNOS (Europe), MSAS (Asia)
- Output Format : NMEA 0183 Version 2.0, Baud Rate 4800, N81
- Interfaces : Asynchronous serial output compatible with RS-232 (TTL voltage levels) RS-232 polarity

Environmental Characteristics

- Operating Temperature : 0° C~ +60° C
- Storage Temperature : -20° C~ +85° C
- Relative Humidity : 95% non-condensing
- Water Resistance : 100% waterproof

Wiring

See the following table for a functional description of each wire in the GPS cable.

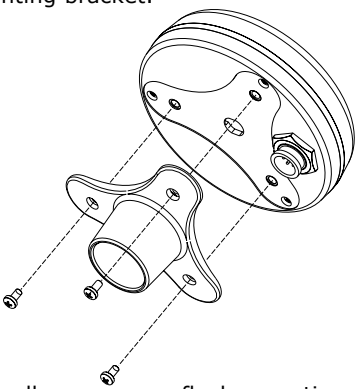
CONNECTOR, 6 pins	CABLE, Wire Color	FUNCTION	CONNECTOR, 8 pins
1	RED	+10-35Vdc	7
2	GREEN	GPS RX+	1
3	BROWN	GPS TX+	2
6	BLACK/YELLOW/ SHIELD	GND COMMON	3, 6

Software Interface

The GPS products interface protocol design is based on the National Marine Electronics Association's NMEA 0183 ASCII interface specification. These standards are defined in "NMEA 0183 Version 2.0" (for more information see NMEA, **www.nmea.org**).

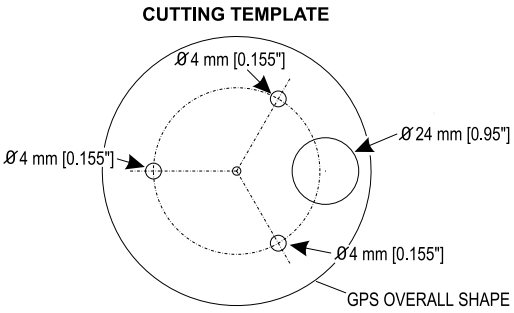
Installing

Choose a location for the antenna that has a clear view of the sky. Ensure there are no major obstructions or fixtures in the immediate proximity to the antenna. The antenna relies on direct "line of sight" satellite reception. If you are unsure that the chosen location is suitable it may be advisable to mount the antenna in a temporary manner to verify correct operation. The thread used on the antenna (1 inch, 14 TPI) is an industry standard thread used on a wide range of mounting brackets, including the swivel joints commonly used for angled surfaces. However due to the manufacturing process of these mounting brackets you may see that there is some slop when tightening down the antenna to the bracket. This is of no concern however as the antenna must be tightened until the antenna stops rotating on the antenna mounting bracket.

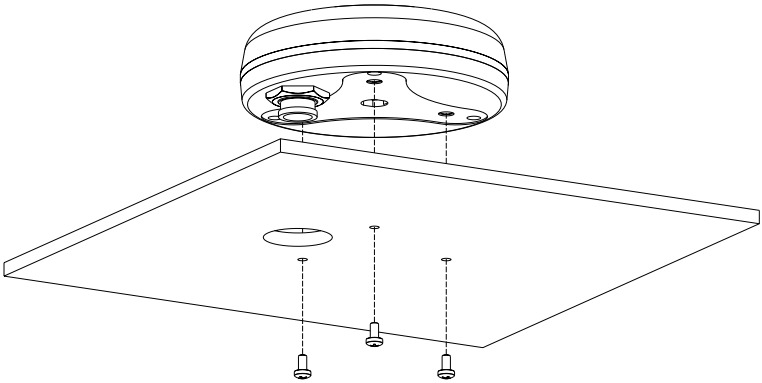


The antenna design also allows an easy flush mounting.

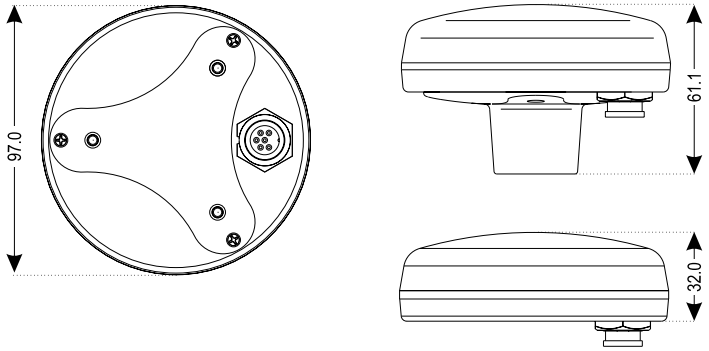
1. Apply the adhesive mounting template sheet in the area that was verified to receive satellite signal well
2. Then, following template instruction, drill a 0,63 inch (16 mm) hole and three 0,155 inch (4 mm) holes



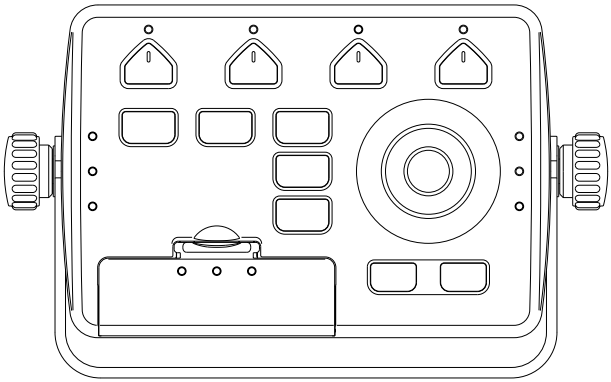
3. Remove the template and let the cable go through the central hole
4. Apply a small coat of RTV to the underside of the antenna
5. Place the antenna and then screw it with the three M3 screws



Dimensions



EXPLORER MK-II Plus



FEATURES & FUNCTIONS

- Worldwide Built-in Cartography showing C-MAP detail up to 2.0 NM
- Positional information from GPS
- GPS Signal Status page
- Navigation Data pages
- Wind Data pages
- 1000 Waypoints/Marks and 50 Routes (50 Waypoints max per Route)
- Create, Move, Insert, Edit or Erase Waypoint
- Create, Move, Edit or Erase Mark
- Navigation to Goto
- Create, Save, Name, Edit or Follow a Route
- Route Data Report and User Points (Marks/Waypoints) List pages
- Find Ports Services, Ports, Tide Stations, Wrecks, Obstructions, Cursor, Coordinates or User Points
- Display Tide info and Tide Graph page
- Automatic Info on cartographic objects or User Points
- Display vessel's position, direction and Track
- Alarms Handling
- Man OverBoard (MOB) to navigate back to a missing person or object
- Simulation Mode with cursor control

TECHNICAL SPECIFICATIONS

- Power consumption : 2.5 Watt max 35 Volt dc
- Interface : NMEA0183
- Autopilot Interface : NMEA-0180, NMEA-0180/CDX, NMEA-0183
- Display Resolution : 640 x 480 pixels
- Cartography : C-MAP C-CARD
- Operating temperature range : 0/+55 gradi Celsius
- Memory : Non volatile with battery back-up
- Keyboard : Silicon rubber, backlight
- Weight : 950 gr.

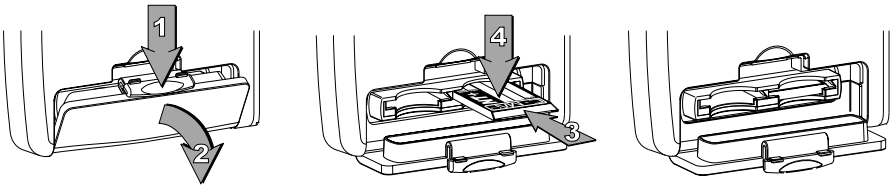
When the package containing the controller is first opened, please check it for the following contents (if any parts are missing contact the dealer the controller was purchased from):

- External bracket
- Power supply and I/O (CBC0FS0804) I/O, cable CBC0FS0603
- Fuse 1A (2 pcs) + cable fuse holder (2 pcs)
- User Manual

INSERTING/REMOVING PROCEDURE

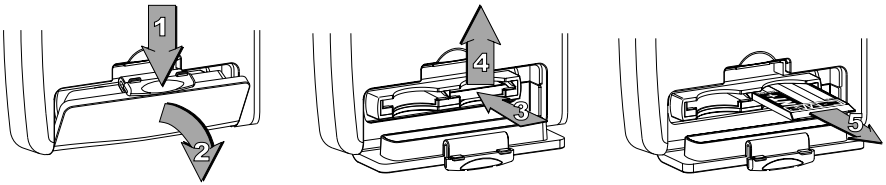
Inserting the C-CARD

Hold the C-CARD by the short inclined side so that you can see the C-MAP label. Open the C-CARD slot's door pressing (1) to the bottom (2). Gently push the C-CARD into one of the two slots; push the C-CARD in as far as it will go (3), then move it to the bottom (4) to hold fixed into the slot.

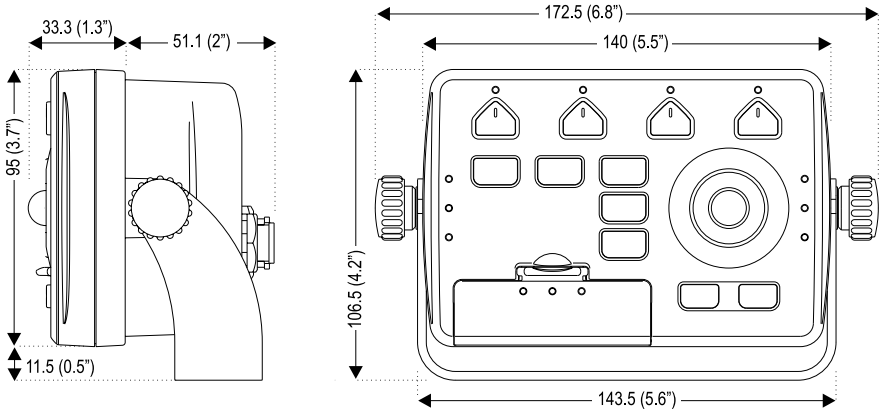


Removing the C-CARD

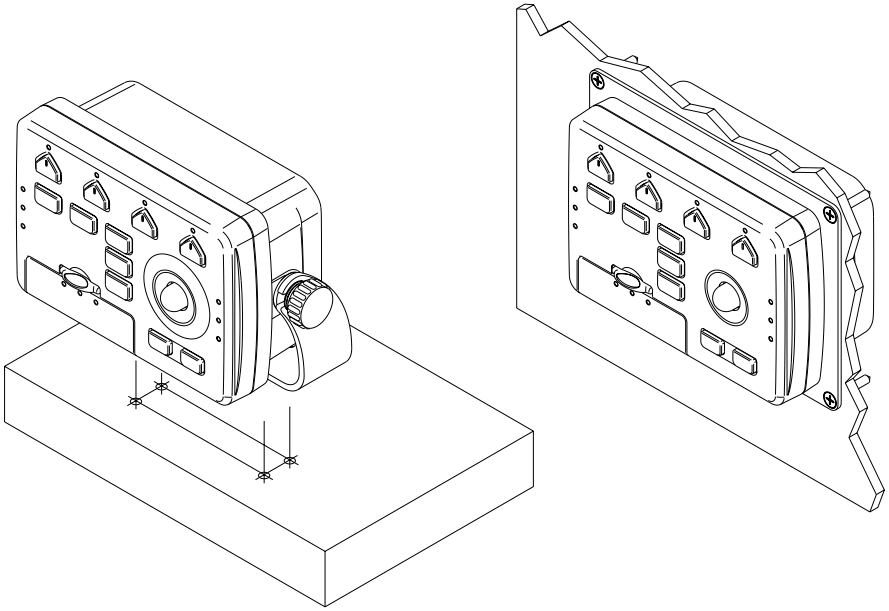
Open the C-CARD slot's door pressing (1) to the bottom (2). Press lightly (3) the C-CARD you wish to remove and move it to the top (4) until you hear a click: the C-CARD will eject out of the slot (5).



CONTROLLER DIMENSIONS

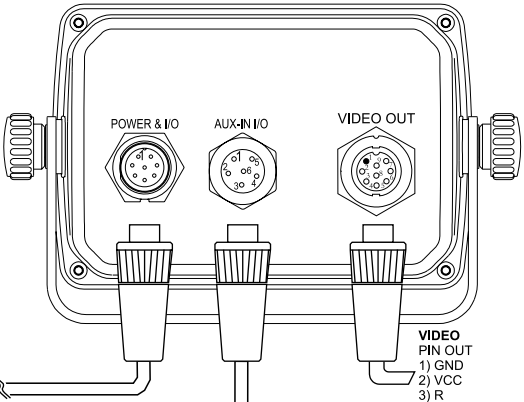


INSTALLATION AND REMOVING



EXTERNAL WIRING

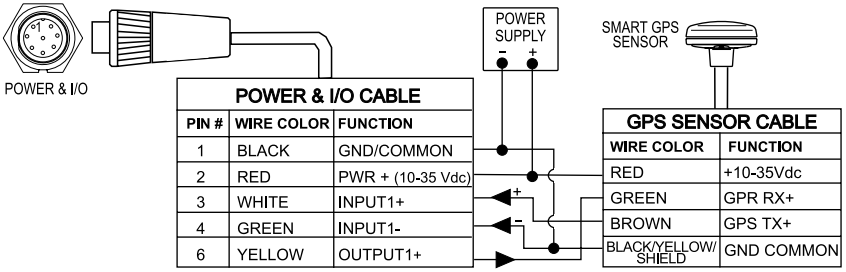
POWER & I/O CONNECTOR		
PIN	WIRE COLOR	FUNCTION
1	BLACK	GND COMMON
2	RED	PWR + (10-35 Vdc)
3	WHITE	INPUT1+
4	GREEN	INPUT1-
5	GRAY	OUTPUT3+
6	YELLOW	OUTPUT1+
7	BROWN	INPUT3+
8	BLUE	EXTERNAL ALARM OUTPUT+



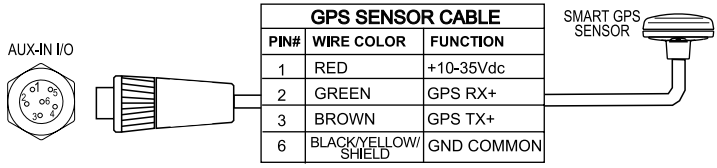
AUX-IN I/O		
PIN	WIRE COLOR	FUNCTION
1	RED	10-35 Vdc
2	GREEN	OUTPUT2+
3	BROWN	INPUT2+
4	NC	
5	NC	
6	BLACK/SHIELD/YELLOW	GND COMMON

INPUT/OUTPUT CONNECTIONS

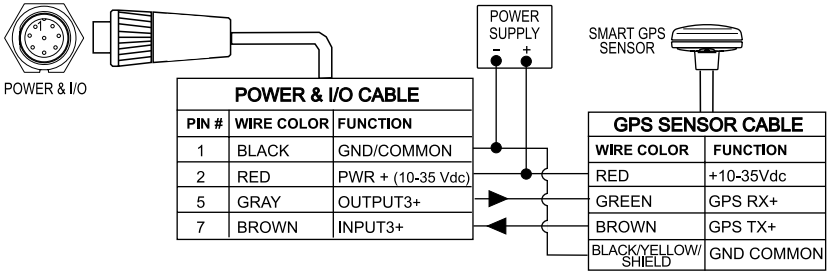
GPS Connection



GPS Connections on Port 1

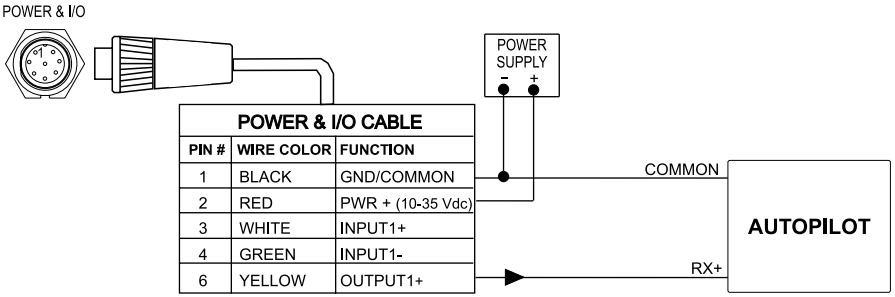


GPS Connections on Port 2

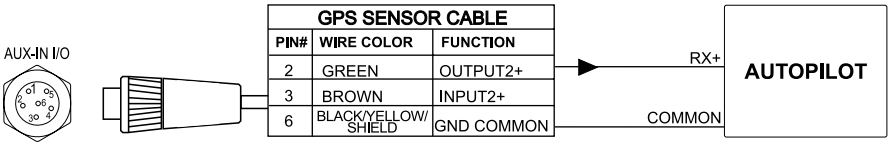


GPS Connections on Port 3

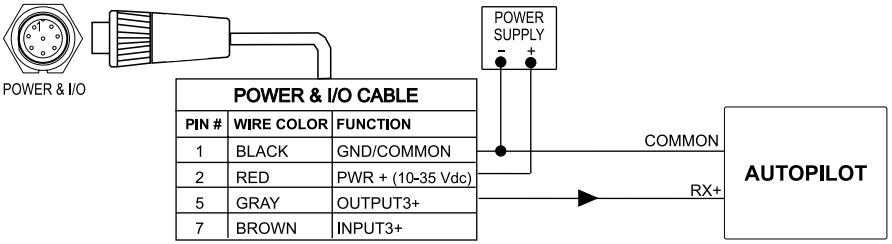
Autopilot Connection



Autopilot Connections on Port 1

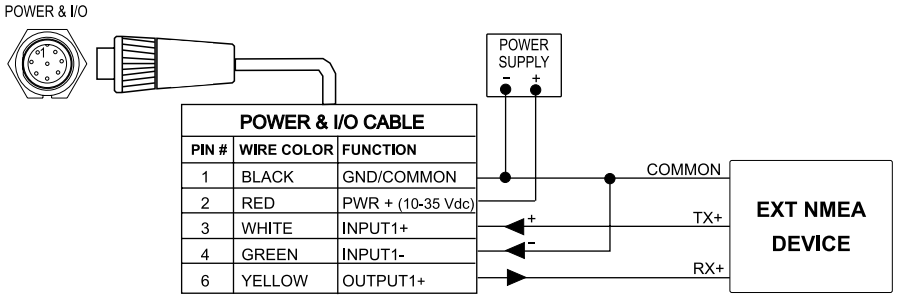


Autopilot Connections on Port 2

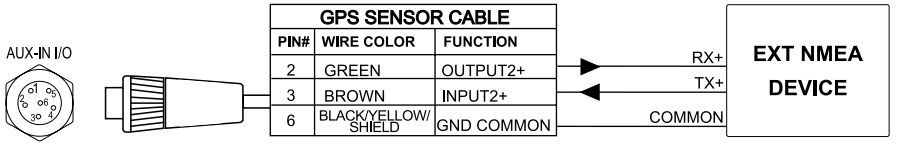


Autopilot Connections on Port 3

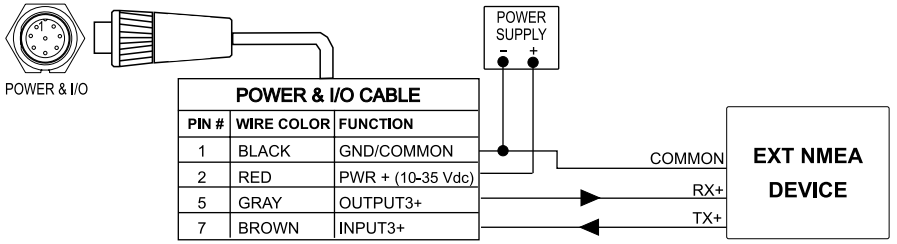
External NMEA Connection



External NMEA Connections on Port 1

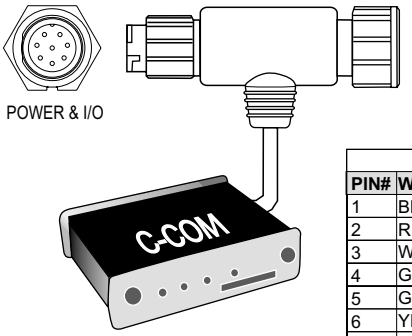


External NMEA Connections on Port 2



External NMEA Connections on Port 3

C-COM GSM Plus Connection



POWER & I/O CONNECTOR		
PIN#	WIRE COLOR	FUNCTION
1	BLACK	GND/COMMON
2	RED	PWR+ (10-35 Vdc)
3	WHITE	USED BY C-COM
4	GREEN	USED BY C-COM
5	GREY	OUTPUT3+
6	YELLOW	USED BY C-COM
7	BROWN	INPUT3+
8	BLU	OUTPUT EXTERNAL ALARM+

NOTE *The connection is valid for the C-COM IR and C-COM RS232 too.*

External Alarm Connection

POWER & I/O CONNECTOR		
PIN #	**WIRE COLOR**	**FUNCTION**
1	BLACK	GND/COMMON
2	RED	PWR + (10-35 Vdc)
8	BLUE	EXTERNAL ALARM OUTPUT+ (OPEN COLLECTOR)

INSTALLING EXTERNAL SMART GPS

The Smart DGPS WAAS receiver is based on a ultimate 12 channel GPS engine that delivers accuracy better than three meters by decoding the GPS correction signals from the satellite-based WAAS (*Wide Area Augmentation System*). The GPS engine, interface electronics and the passive antenna are enclosed inside the water-proof plastic housing. This provides advanced state of the art GPS performance in an easy to use package.

NOTE *If the characteristics of your Receiver should not be the same as the following explained. Contact your local dealer where the chart plotter was purchased for more information.*

Physical Characteristics

- Color : Ivory white
- Dimensions : 97mm in diameter x 32mm in height (flush mounted) or 61,5mm on flag-pole mount
- Weight : 160 grams (without cable)
- Cable : white 15 meter 8x28AWG cable

Electrical Characteristics

- Input Voltage : 10 Vdc to 35 Vdc unregulated
- Power Consumption : 1,2 Watt

GPS Performance

- Geodetic Datum : WGS84
- Channels : 12 parallel Channels
- Frequency : 1575.42MHz (L1, C/A code)
- Acquisition Time (Approximate)
  - Hot start : < 20 seconds
  - Warm start : < 45 seconds
  - Cold start : < 40 seconds
- DGPS Capability : RTCM SC104 v. 2,WAAS (North America), EGNOS (Europe), MSAS (Asia)
- Output Format : NMEA 0183 Version 2.0, Baud Rate 4800, N81
- Interfaces : Asynchronous serial output compatible with RS-232 (TTL voltage levels) RS-232 polarity

Environmental Characteristics

- Operating Temperature : 0° C~ +60° C
- Storage Temperature : -20° C~ +85° C
- Relative Humidity : 95% non-condensing
- Water Resistance : 100% waterproof

Wiring

See the following table for a functional description of each wire in the GPS cable.

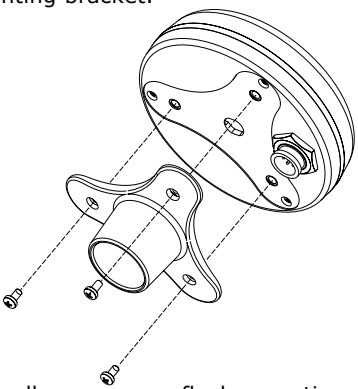
CONNECTOR, 6 pins	CABLE, Wire Color	FUNCTION	CONNECTOR, 8 pins
1	RED	+10-35Vdc	7
2	GREEN	GPS RX+	1
3	BROWN	GPS TX+	2
6	BLACK/YELLOW/ SHIELD	GND COMMON	3, 6

Software Interface

The GPS products interface protocol design is based on the National Marine Electronics Association's NMEA 0183 ASCII interface specification. These standards are defined in "NMEA 0183 Version 2.0" (for more information see NMEA, **www.nmea.org**).

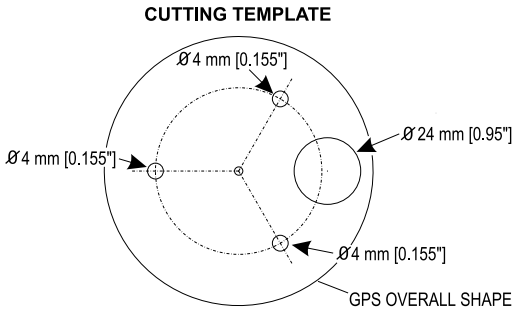
Installing

Choose a location for the antenna that has a clear view of the sky. Ensure there are no major obstructions or fixtures in the immediate proximity to the antenna. The antenna relies on direct "line of sight" satellite reception. If you are unsure that the chosen location is suitable it may be advisable to mount the antenna in a temporary manner to verify correct operation. The thread used on the antenna (1 inch, 14 TPI) is an industry standard thread used on a wide range of mounting brackets, including the swivel joints commonly used for angled surfaces. However due to the manufacturing process of these mounting brackets you may see that there is some slop when tightening down the antenna to the bracket. This is of no concern however as the antenna must be tightened until the antenna stops rotating on the antenna mounting bracket.

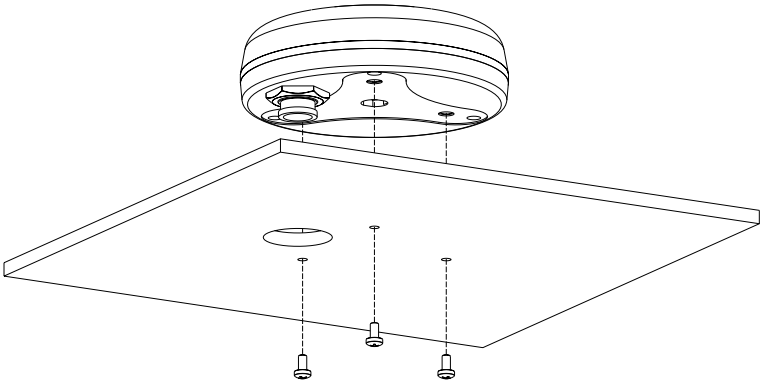


The antenna design also allows an easy flush mounting.

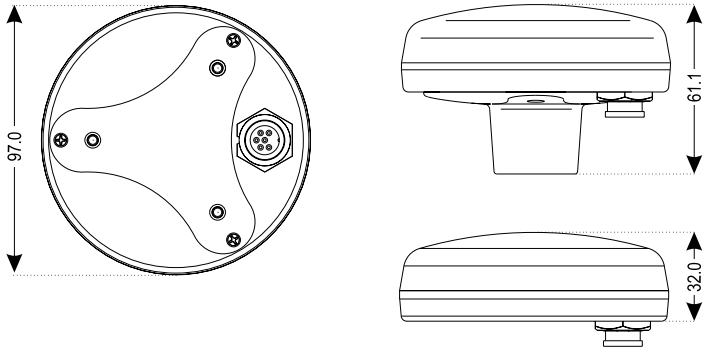
1. Apply the adhesive mounting template sheet in the area that was verified to receive satellite signal well
2. Then, following template instruction, drill a 0,63 inch (16 mm) hole and three 0,155 inch (4 mm) holes



3. Remove the template and let the cable go through the central hole
4. Apply a small coat of RTV to the underside of the antenna
5. Place the antenna and then screw it with the three M3 screws



Dimensions



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