p70 / p70r
Pilot controller

User reference

ENGLISH
Document number: 81331-1
Date: 02-2011

Raymarine®

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Contents

Chapter 1: Important information

Safety notices

Warning: Product installation and operation

This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.

Warning: Autopilot system Installation

As correct performance of the vessel's steering is critical for safety, we STRONGLY RECOMMEND that an Authorized Raymarine Service Representative fits this product. You will only receive full warranty benefits if you can show that an Authorized Raymarine Service Representative has installed and commissioned this product.

Warning: Maintain a permanent watch

Always maintain a permanent watch, this will allow you to respond to situations as they develop. Failure to maintain a permanent watch puts yourself, your vessel and others at serious risk of harm.

Warning: Ensure safe navigation

This product is intended only as an aid to navigation and must never be used in preference to sound navigational judgment. Only official government charts and notices to mariners contain all the current information needed for safe navigation, and the captain is responsible for their prudent use. It is the user's responsibility to use official government charts, notices to mariners, caution and proper navigational skill when operating this or any other Raymarine product.

Caution: Cleaning

When cleaning this product:

- Do NOT wipe the display screen with a dry cloth, as this could scratch the screen coating.
- Do NOT use abrasive, or acid or ammonia based products.
- Do NOT use a jet wash.

Caution: Service and maintenance

This product contains no user serviceable components. Please refer all maintenance and repair to authorized Raymarine dealers. Unauthorized repair may affect your warranty.

Caution: Use the sun covers

To protect your product against the damaging effects of ultra violet light, always fit the sun covers when the product is not in use.

TFT LCD Displays

The colors of the display may seem to vary when viewed against a colored background or in colored light. This is a perfectly normal effect that can be seen with all color Liquid Crystal Displays (LCDs).

In common with all Thin Film Transistor (TFT) LCD units, the screen may exhibit a few (less than 7) wrongly illuminated pixels. These may appear as black pixels in a light area of the screen or as colored pixels in black areas.

Water ingress

Water ingress disclaimer

Although the waterproof rating capacity of Raymarine products exceeds that called for by the IPX6 standard, water intrusion and subsequent equipment failure may occur if any Raymarine equipment is subjected to commercial high pressure washing. Raymarine will not warrant equipment subjected to high pressure washing.

Disclaimers

This product (including the electronic charts) is intended to be used only as an aid to navigation. It is designed to facilitate use of official government charts, not replace them. Only official government charts and notices to mariners contain all the current information needed for safe navigation, and the captain is responsible for their prudent use. It is the user's responsibility to use official government charts, notices to mariners, caution and proper navigational skill when operating this or any other Raymarine product. This product supports electronic charts provided by third party data suppliers which may be embedded or stored on memory card. Use of such charts is subject to the supplier's End-User Licence Agreement included in the documentation for this product or supplied with the memory card (as applicable).

Raymarine does not warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Raymarine.

This product uses digital chart data, and electronic information from the Global Positioning System (GPS) which may contain errors. Raymarine does not warrant the accuracy of such information and you are advised that errors in such information may cause the product to malfunction. Raymarine is not responsible for damages or injuries caused by your use or inability to use the product, by the interaction of the product with products manufactured by others, or by errors in chart data or information utilized by the product and supplied by third parties.

EMC conformance

Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations for use in the recreational marine environment.

Correct installation is required to ensure that EMC performance is not compromised.

Suppression ferrites

Raymarine cables may be fitted with suppression ferrites. These are important for correct EMC performance. If a ferrite has to be removed for any purpose (e.g. installation or maintenance), it must be replaced in the original position before the product is used.

Use only ferrites of the correct type, supplied by Raymarine authorized dealers.

Connections to other equipment

Requirement for ferrites on non-Raymarine cables

If your Raymarine equipment is to be connected to other equipment using a cable not supplied by Raymarine, a suppression ferrite MUST always be attached to the cable near the Raymarine unit.

Declaration of conformity

Raymarine Ltd. declares that this product is compliant with the essential requirements of EMC directive 2004/108/EC.

The original Declaration of Conformity certificate may be viewed on the relevant product page at www.raymarine.com.

Product disposal

Dispose of this product in accordance with the WEEE Directive.

The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment. Whilst the WEEE Directive does not apply to some Raymarine products, we support its policy and ask you to be aware of how to dispose of this product.

Warranty registration

To register your Raymarine product ownership, please visit www.raymarine.com and register online.

It is important that you register your product to receive full warranty benefits. Your unit package includes a bar code label indicating the serial number of the unit. You will need this serial number when registering your product online. You should retain the label for future reference.

IMO and SOLAS

The equipment described within this document is intended for use on leisure marine boats and workboats not covered by International Maritime Organization (IMO) and Safety of Life at Sea (SOLAS) Carriage Regulations.

Technical accuracy

To the best of our knowledge, the information in this document was correct at the time it was produced. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Raymarine cannot accept liability for any differences between the product and this document.

Chapter 2: Handbook information

Chapter contents

2.1 Handbook information

This handbook contains important information regarding the p70 and p70r Pilot controller.

About this handbook

This handbook describes how to operate your product in conjunction with compatible peripheral equipment.

It assumes that all peripheral equipment connected to the system is compatible, correctly installed and commissioned in accordance with the products installation instruction. This handbook is intended for users of varying marine abilities, but assumes a general level of product knowledge, nautical terminology and practices.

p70 / p70r Handbooks

The p70 / p70r Pilot controller has the following handbooks available:

Description	Part number
Installation and commissioning instructions	87132
Operating instructions (quick reference)	86142
User reference handbook	81331
Mounting template	87130

Additional handbooks

Description	Part number
SeaTalk^{ng} reference manual	81300
SPX system installation guide	87072
SeaTalk to SeaTalk^{ng} converter	87121

The latest version of documents are available to download as PDF's from www.raymarine.com.

Please check the website to ensure you have the latest version.

Before using your pilot controller

Before using the pilot controller under way it is important that it is properly commissioned and set up as described in the installation instruction.

First time set up

The first ever time the pilot controller is powered on, you will be shown on-screen instructions for the initial set up. If your pilot controller has been installed by a professional installer, first time set up and commissioning may already have been carried out, if unsure check with the dealer.

The first time set up screens takes you through the following:

- Language selection
- Vessel type selection

If a pilot controller already exists on your system then this procedure may be skipped and the p70 / p70r will adopt the same settings as the already installed pilot controller.

Note: If calibration has not been undertaken then the display will alarm 'Calibration required' and then show 'Starting' on the display

Commissioning

Before using your autopilot system for the first time you must ensure that the system has been correctly commissioned in accordance with the supplied installation instruction. Commissioning procedures which must be carried out are:

- Dockside calibration (Dealer settings on SeaTalk)
- Seatrial calibration

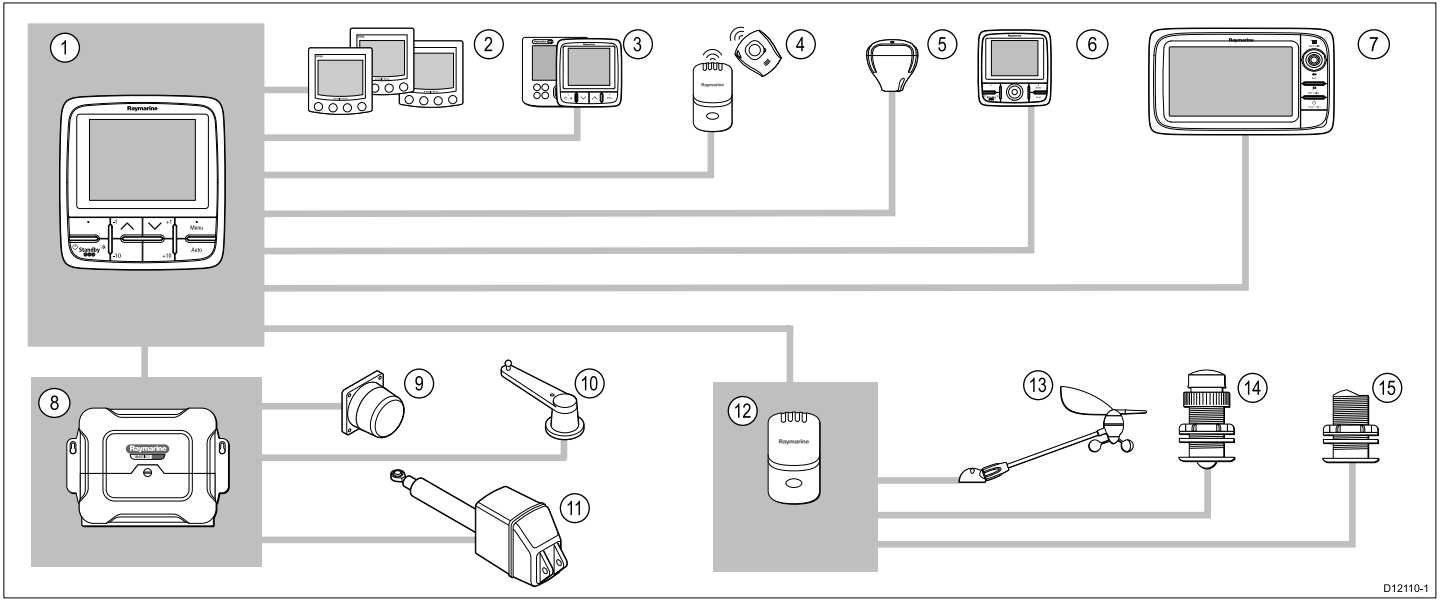
Chapter 3: Getting started

Chapter contents

3.1 p70 and p70r system integration

The p70 and p70r pilot controller is used to control your autopilot system. It can be used with Raymarine SPX, S1, S2 and S3 SmartPilot systems.

The diagram below illustrates some of the various external devices that can be connected to your pilot controller.



Item	Device type
1.	p70 Pilot controller
2.	SeaTalk Instrument displays
3.	SeaTalk^{ng} Instrument displays

Item	Device type
4.	MOB (connectivity via SeaTalk to SeaTalkng converter.)
5.	SeaTalkng GPS receiver
6.	p70r SeaTalkng Pilot controller
7.	Raymarine Multifunction displays
8.	SPX Course computer
9.	Fluxgate compass
10.	Rudder reference
11.	Drive unit
12.	Transducer pods
13.	Analogue wind transducers
14.	Analogue speed transducers
15.	Analogue depth transducers
Other devices not shown:	Smart transducers (e.g. DST800, DT800) NMEA2000 devices (e.g. engine data, fuel management system)

3.2 Pilot functions

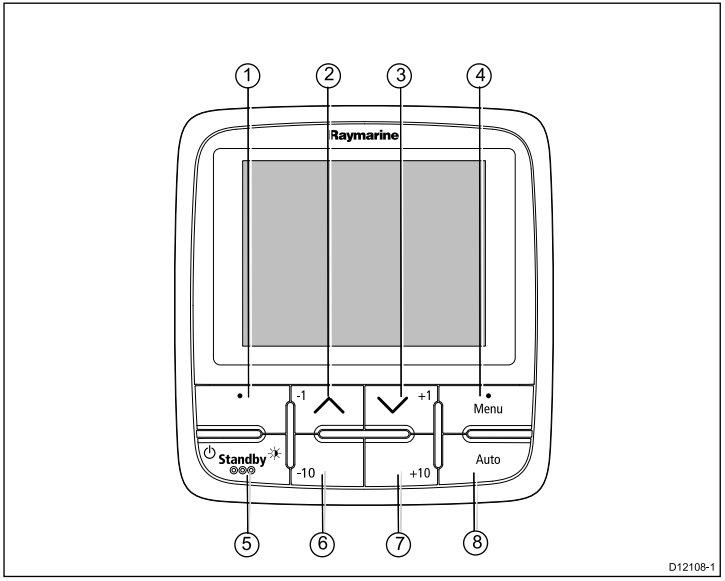
The SmartPilot has various modes:

Standby	Manual steering, activated by **STANDBY** button.
Auto	Autopilot engaged steering to a heading, activated by **AUTO** button.
Wind vane	Autopilot engaged steering to maintain a selected apparent or true wind angle, activated from the **Mode** menu, or by pressing **AUTO** and **STANDBY** together.
Track	Autopilot engaged steering to a waypoint, activated from the **Mode** menu.
Pattern	Autopilot engaged in fishing pattern mode, activated from the **Mode** menu.
Power steer (p70r rotary or joystick only)	Autopilot engaged in power steering mode, activated from the **Mode** menu.
Jog steer	Autopilot disengaged in jog steer mode (tiller drives and SeaTalk only), activated whilst in Standby mode.

3.3 Pilot controls

Control layout and functions.

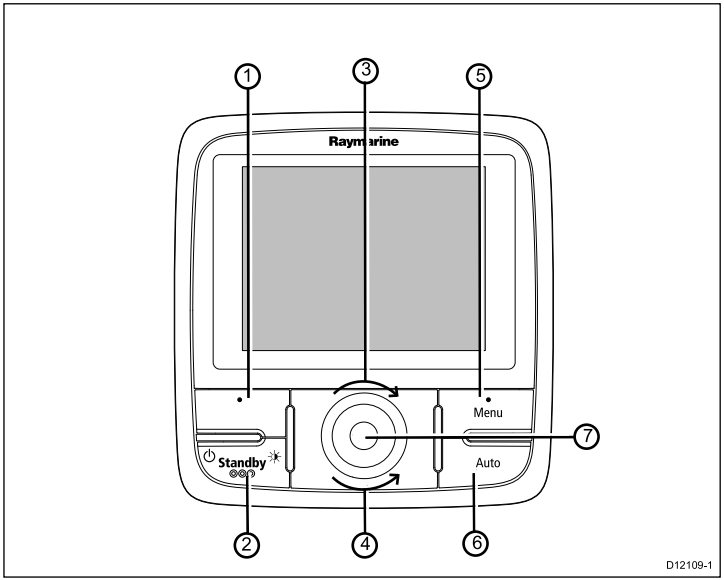
p70 8–button pilot controller



Item	Description
1.	**LEFT SOFT BUTTON** Cancel, Back, mode selection.
2.	**UP BUTTON / -1** Up navigation, Adjust Up, Decrease angle.

Item	Description
3.	**DOWN BUTTON / +1** Down navigation, Adjust Down, Increase angle.
4.	**RIGHT SOFT BUTTON** Menu, Select, OK, Save.
5.	**STANDBY BUTTON** Disengage pilot, Manual control, Power, Brightness.
6.	**–10 BUTTON** Decrease angle.
7.	**+10 BUTTON** Increase angle.
8.	**AUTO BUTTON** Engage Auto pilot.

p70r rotary pilot controller



Item	Description
1.	**LEFT SOFT BUTTON** Cancel, Back, mode selection.
2.	**STANDBY BUTTON** Disengage pilot, Manual control, Power, Brightness.
3.	**ROTARY CLOCKWISE** Down navigation in list, Adjust Up, Increase angle (locked heading), adjust numerical values, power steer.

Item	Description
4.	**ROTARY ANTI-CLOCKWISE** Up navigation in list, Adjust Down, Decrease angle (locked heading), adjust numerical values, power steer.
5.	**RIGHT SOFT BUTTON** Menu, Select, OK, Save.
6.	**AUTO BUTTON** Engage Auto pilot.
7.	**ROTARY END PUSH BUTTON** Menu, Select, OK, Save.

The pilot controller supports the following combination button presses:

Combination button press

Buttons	Action
STANDBY and **AUTO.**	Puts pilot in to Wind Vane mode.
–1 and **–10** or **+1** and **+10**.	AutoTack (in wind vane mode), AutoTurn

3.4 Instrument power

Powering the pilot controller on

1. Press and hold the **STANDBY** button for 1 second, until the Raymarine logo appears.

   The pilot controller will load to the mode page.

Powering the pilot controller off

1. From any data page press and hold the **STANDBY** button.

   After 1 second a power down pop up will appear.
2. Continue to hold the **STANDBY** button for a further 3 seconds to complete the power off.

Note: The pilot controller cannot be turned off whilst in **AUTO** mode.

3.5 Display settings

Display and shared brightness

You can change the brightness of the individual display, or networked displays.

You can only use and set shared brightness on displays which support sharing and are assigned to network groups .

You will not be able to set shared brightness levels on displays which do not support sharing.

Adjusting the displays brightness

To adjust the brightness of the individual display:

1. Whilst in a favorite page momentarily press the **LEFT SOFT** button.

   This will open the brightness setting screen.
2. Use the **UP** and **DOWN** buttons to change the brightness percentage to the required level.
3. Press the **RIGHT SOFT** button to confirm new brightness and go back to the favorites page you were on.

Assigning A Network Group

When assigned to a network group you can change brightness level and color scheme on displays which support sharing.

To enable shared brightness and color schemes the display must be assigned to a network group as follows:

1. Navigate to **Menu > Set Up > System Set Up > Network Group**.

   A list of network groups will be displayed:

   - None (default)
   - Helm 1
   - Helm 2
   - Cockpit
   - Flybridge
   - Mast
   - Group 1 — Group 5
2. Use the **UP** and **DOWN** buttons to highlight the required group.
3. Press the **SELECT** button to assign the display you are using to that network group.
4. Navigate to **Menu > Set Up > System Set Up > Brightness/Colour Group**.

   You will be presented with the following options:

   - This Display
   - This Group
5. Highlight and select the required setting.
6. Carry out steps 1 to 5 on all displays you wish to share.

Adjusting the shared brightness

Shared brightness is only accessible if the display has been assigned to a network group.

1. Whilst on a favorites page press the **LEFT SOFT** button to display the brightness setting.
2. Press the **LEFT SOFT** button again to access the shared brightness settings.
3. Use the **UP** and **DOWN** buttons to change the shared brightness level.

Display and system brightness can also be accessed via **Menu > Display settings > Brightness**.

Display and shared color

The p70 / p70r can set a color scheme for the individual display or for the system (if color is available on the network displays).

Color settings can be accessed via **Menu > Display settings > Colors**.

Color schemes available are:

Example	Color Scheme
	Day 1
	Day 2
	Inverse
	Red/Black

Changing the color scheme

1. From the color menu highlight a color scheme.

   Once highlighted the display will preview the selected color scheme.
2. Press **SELECT** to confirm the color scheme and return to the color settings menu.

If the unit is part of a network group, the color scheme selected will change on all displays which are part of that group. If color is not available on the networked displays they will remain unchanged.

Display response

Setting the display response

Setting the response to a low value will provide a more stable reading of current conditions. Setting response to a high value will make readings more responsive.

1. From **Menu > Display settings** select **Display Response**.
2. Use the **UP** and **DOWN** buttons to select the data type:
   - Speed
   - Depth
   - Wind speed
   - Wind angle
   - Heading
3. Press **SELECT** to set the response value:

   1 — 15
4. Press **SAVE** to save the value and return to the display response options screen.

3.6 Pilot response

The response level controls the relationship between course keeping accuracy and the amount of helm/ drive activity. Range is from 1 to 9.

Making temporary changes to pilot response

Pilot response is set up during commissioning of the SmartPilot system however you can make temporary changes to the pilot response at any time by accessing the **Pilot response** menu from;**Main menu > Pilot Response**

1. From the Main menu highlight **Pilot response** and press **SELECT**.
2. Use the **UP** and **DOWN** buttons to change the response value to the required setting.
3. Press **SAVE** to save the response value.

Setting	Options
Levels 1 to 3	Minimize the amount of pilot activity. This conserves power, but may compromise short-term course-keeping accuracy.
Levels 4 to 6	Should give good course keeping with crisp, well controlled turns under normal operating conditions.
Levels 7 to 9	Gives the tightest course keeping and greatest rudder activity (and power consumption). This can lead to a rough passage in open waters as the SPX system may ‘fight’ the sea.

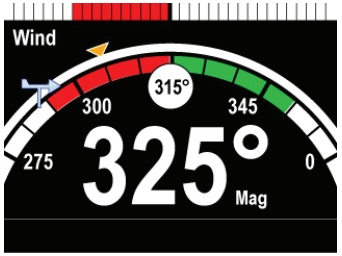
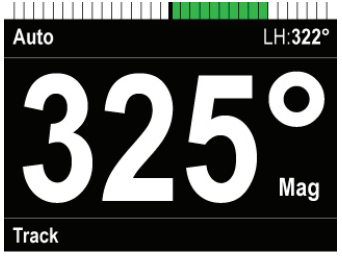
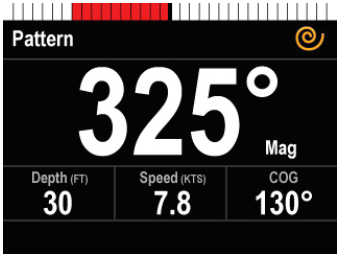
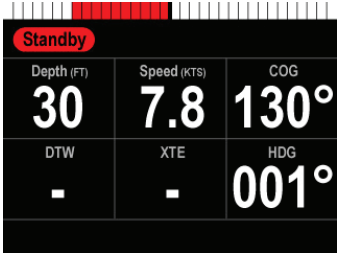
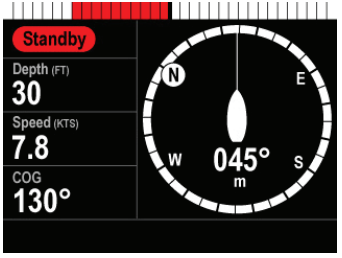
Chapter 4: Pilot views

Chapter contents

4.1 Available pilot views

Pilot views are used whilst in pilot modes to present course and system data on the pilot controller display.

There are 5 pilot views to choose from:

Description	Example
Graphical (default)	
Large	
Standard	
Multiple	
2D	

Setting the pilot view

To set the pilot view to your desired layout:

1. Go to the **Pilot view** menu: **Main menu > Pilot view**.
2. Highlight and select **View type**.
3. Highlight the required view:
   - Graphical
   - Large
   - Standard
   - Multiple
   - 2D
4. Press **SELECT** to save the view as default.

4.2 Available data

The following data is available for each pilot mode but is dependent on the view chosen:

Available data

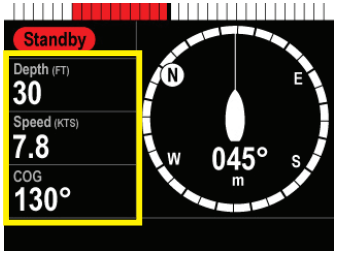
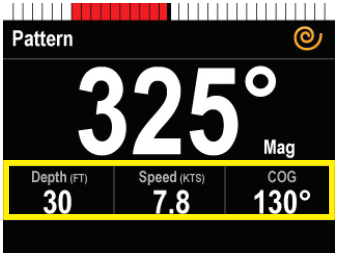
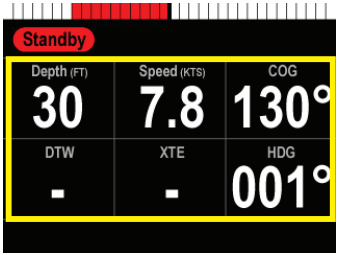
Pilot mode	Data available
Standby	• Mode name • Current heading • Data boxes • Compass north • North vector line • Wind compass bearing
Auto	• Mode name • Locked heading • Current heading • Compass north • North vector line • Wind compass bearing • Data boxes

Pilot mode	Data available
Track	• Mode name • XTE • WPT name • Current heading • DTW • TTG • XTE vector line • Compass north • North vector line • Wind compass bearing • Data boxes

Pilot mode	Data available
Wind vane	• Mode name • Lock wind angle (app/true) • Wind compass bearing • Current heading • Wind vector line • Compass north • North vector line • Wind compass bearing • Data boxes
Pattern	• Mode name • Pattern icon • Current heading • Compass north • North vector line • Wind compass bearing • Data boxes

4.3 Setting up data boxes

You can choose what data to display in the available data boxes.

3 data boxes	 D12118-1
3 data boxes	 D12119-1
6 data boxes	 D12120-1

1. Go to the **Pilot view** menu: **Main menu > Pilot view**.
2. Highlight and select **Data boxes**.
3. Highlight the data box you wish to set up:
   - up to 3 available in all views
   - up to 6 available in multiple view.
4. Press **SELECT**.
5. Highlight the required data you wish to display in the data box.
6. Press **SELECT** to save this data type in the data box and return to data box selection screen to set up the remaining data boxes.

Data boxes

The following data types are available to be displayed in data boxes:

Data types

Depth	
XTE	Cross track error
DTW	Distance to waypoint
BTW	Bearing to waypoint
AWA	Apparent wind angle
AWS	Apparent wind speed
TWS	True wind speed
TWA	True wind angle
COG	Course over ground
SOG	Speed over ground
Speed	
Average speed	
Log	

Sea temperature	
Time	
Date	
Rate of turn	
Heading	

Chapter 5: Pilot modes

Chapter contents

5.1 Standby mode

In Standby mode you have manual control of the helm and the display shows the vessel's current compass heading.

You can disengage any autopilot mode and return to manually steering at any time by pressing **STANDBY**.

5.2 Auto mode

> **Caution: Maintain a permanent watch**
>
> Automatic course control makes it easier to steer your vessel, but it is NOT a substitute for good seamanship. ALWAYS maintain a permanent watch by the helm.

Steering automatically to a heading

You can use your autopilot system to steer automatically towards a heading.

1. Steady the vessel on the required heading.
2. Press **AUTO**.

   The autopilot is now in AUTO mode and will steer to the chosen heading, shown on the display.
3. You can return to manual steering at any time by pressing **STANDBY**.

Changing course in auto mode

To change course whilst in AUTO mode:

1. Use the **–1** and **–10** button, or turn the rotary controller anticlockwise to change the vessel's course to port.

   Pressing **–1** button will increment the course to port by 1º and **–10** will increment by 10º.

   Turning the rotary controller 1 click anticlockwise will increment the course to port by 1º .
2. Use the **+1** and **+10** buttons, or turn the rotary controller clockwise to change the vessel's course to starboard.

   Pressing **+1** button will increment the course to starboard by 1º and **+10** will increment by 10º.

   Turning the rotary controller 1 click clockwise will increment the course to Starboard by 1º .

e.g. pressing the **-1** button four times, or turning the rotary 4 clicks anticlockwise will result in a 4° course change to port.

5.3 Mode page

The mode page is the initial screen displayed after set up of the device. If the device is being switched on for the first time, the user is taken to the initial Set up wizard. Once the device has been set up they will then proceed to the Mode page. The mode page is used to show what mode you are in and also relevant pilot information for that mode.

The selection of vessel type during the initial set up determines which profile and menu structure the pilot will be set to (e.g. Power, fishing or sailing boat):

The modes available will depend on the vessel type chosen during initial set up.

- Pattern 1 — Fishing boat only (this will take you to the most common pattern for the last 10 selections.
- Pattern 2 — Fishing boat only (this will take you to the second most common pattern for the last 10 selections.
- Pattern — Power and fishing boats only.
- Track — all profiles.
- Wind vane — sailing boat only.
- Power steer — all profiles (p70r rotary controller and joystick only).
- Shortcut key- allows you to set which pilot mode is mapped to the **left soft** button when in pilot view.

5.4 Patterns

A number of pre-set fishing patterns are available which can be used with their default settings or adjusted to your own preference.

The following patterns are available:

Pattern	Adjustment	Icon
Circle	Direction	
	Radius	
Zig Zag	Direction	
	Angle	
	Length	
Cloverleaf	Direction	
	Radius	
Spiral	Direction	
	Radius	
	Increment	
Circle against	Direction	
	Radius	
	Distance	
Figure 8	Direction	
	Radius	

Pattern	Adjustment	Icon
Pattern search	Direction	
	Width	
	Height	
	Width increment	
	Height increment	
180 turn	Direction	
	Radius	
Box search	Direction	
	Width	
	Height	

Using a fishing pattern

In order to use a fishing pattern:

1. Press the **RIGHT SOFT** button to open the menu.
2. Using the **UP** and **DOWN** buttons highlight **Mode** and press **SELECT**.
3. Using the **UP** and **DOWN** buttons highlight **Pattern** and press **SELECT**.
4. Using the **UP** and **DOWN** buttons highlight the fishing pattern you wish you use and press **SELECT**.
5. The pattern settings screen shall be displayed, showing the parameters currently set for the selected pattern. If you want to change any of the parameters:
   i. Select the parameter you want to change, then press **EDIT**.

ii. Use the **UP** and **DOWN** buttons to set the value you want, then press **SAVE** to save the setting and return to the Pattern settings screen.
iii. Repeat steps i and ii as necessary, for the other parameters.

6. When all parameters are set as required, and with the pattern settings screen displayed, press **AUTO**. The autopilot then steers the boat over the fishing pattern you selected.

To return to manual steering at any time, press **STANDBY**.

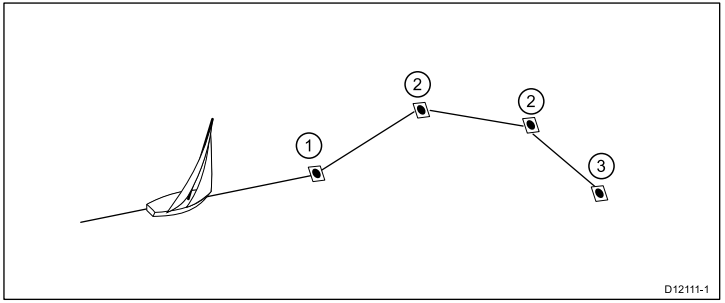
The 2 most commonly used fishing patterns are available from the **Mode** menu as **Pattern 1** and **Pattern 2**, you may select and then complete steps 5 and 6 above to quickly use your favorite patterns.

5.5 Track mode

You can use track mode to automatically steer your vessel along a route plotted on your chartplotter.

In Track mode, the SmartPilot maintains a route between waypoints created on a chartplotter system. It makes any course changes necessary to keep your vessel on course, automatically compensating for tidal streams and leeway.

Track mode is available only if you have connected the SmartPilot to a suitable navigation system which includes active navigation (Goto or Follow) in your chartplotter, and provides SeaTalk, SeaTalk^{ng}, or NMEA information.



Item	Description
1.	Route leg
2.	Waypoints
3.	Destination

Using track mode

Start with your connected chartplotter following a route.

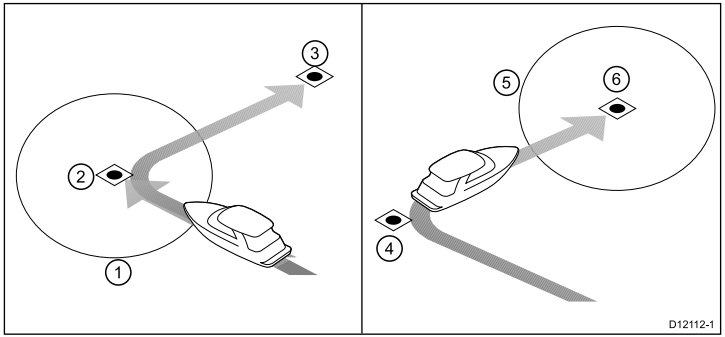
1. To enter track mode, from the **Main menu** select **Mode** .

2. From the **Select mode** screen highlight **Track** and press **SELECT**.
3. Wait for the warning to sound.

   The display will show the bearing to the next planned waypoint, and the direction in which the vessel will turn onto the track line.
4. If it is safe for the vessel to turn onto the new course, press **TRACK** .

   The autopilot turns your vessel onto the new course with the display showing the heading required for the correct track.

Waypoint arrival and advance



Item	Description
1.	Waypoint arrival circle
2.	Target waypoint
3.	Next target waypoint
4.	Previous waypoint
5.	Next waypoint arrival circlet
6.	Next target waypoint

Note: The rate of turn when in track mode is set using the TURN RATE calibration setting. Adjust this as appropriate for optimum comfort.

Note: If the vessel is more than 0.3 nm from the track, the Large Cross Track Error warning will sound.

Cross track error

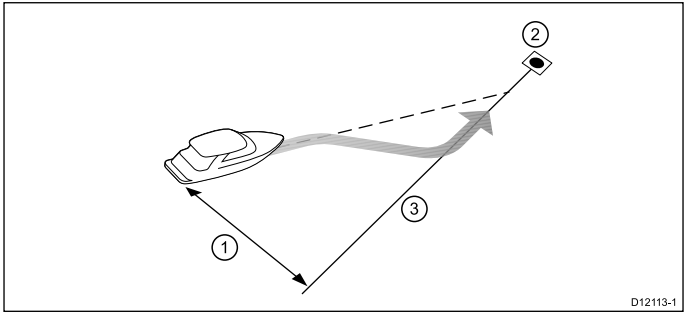
Cross track error (XTE) is the distance between the current position and a planned track line.

There are a number of reasons why you may have a cross track error (XTE), for example:

- Pressing the track button at a position some distance from the route.
- Course change to avoid an obstacle.
- Waypoint arrival under certain conditions.

If the cross track error is greater than 0.3 nm, the SmartPilot will sound the Large Cross Track Error warning and show whether you are to the port (Pt) or starboard (Stb) of the planned track.

Example 1



Example 1 shows the course correction which will be a turn away from the actual waypoint in order to reacquire the track line.

Item	Description
1.	Cross track error
2.	Target waypoint
3.	Track line

Note: The cross track error alarm will continue to display and sound until it is reduced to less than 0.3Nm.

Caution: Cross track error correction

When returning to TRACK mode the autopilot will correct the XTE in order to keep to the defined track leg. The direction of turn may not coincide with the bearing to waypoint and may be different from that expected.

Waypoint arrival

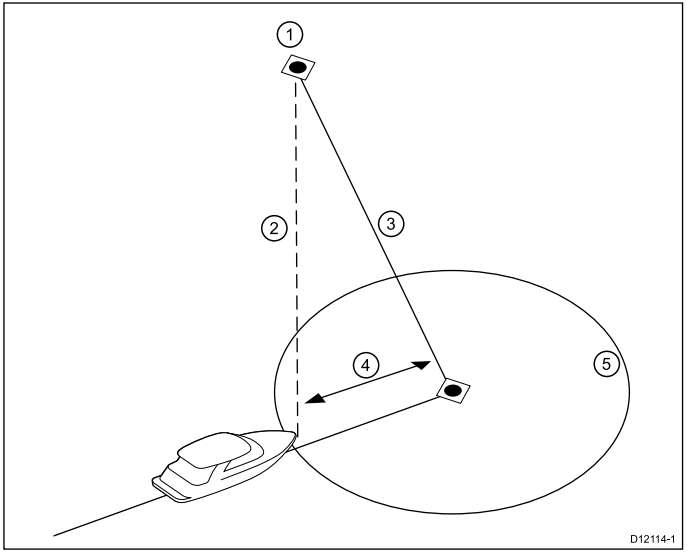
As the boat arrives at the target waypoint the chartplotter will select the next target waypoint and transmit this to the SmartPilot. It will then detect the new target waypoint name, sound a Waypoint Advance warning and display the Waypoint Advance popup. This shows the new bearing to the next waypoint and the direction the boat will turn to acquire the new track.

Waypoint arrival circle

The NEXT WPT screen and acknowledgement occur within a circle around the actual waypoint (and hence a distance from the next track leg). If you have manually changed the default waypoint arrival circle value to 0.3 nm or greater this can result in a cross track error alarm and associated course correction.

Waypoint arrival circle

Example: Cross track error (XTE) due to waypoint arrival circle



Item	Description
1.	Next waypoint
2.	Bearing to next waypoint
3.	Track line
4.	Cross track error
5.	Waypoint advance circle

Waypoint advance warning

The SmartPilot activates the Waypoint Advance warning in track mode whenever the target waypoint name changes. This occurs when:

- you select automatic acquisition by pressing **TRACK** from Auto.
- you request waypoint advance by pressing **TRACK** for 1 second in track mode (with SeaTalk navigators only).
- the boat arrives at the target and the navigator accepts the next waypoint.
- you activate the Man Overboard (MOB) function.

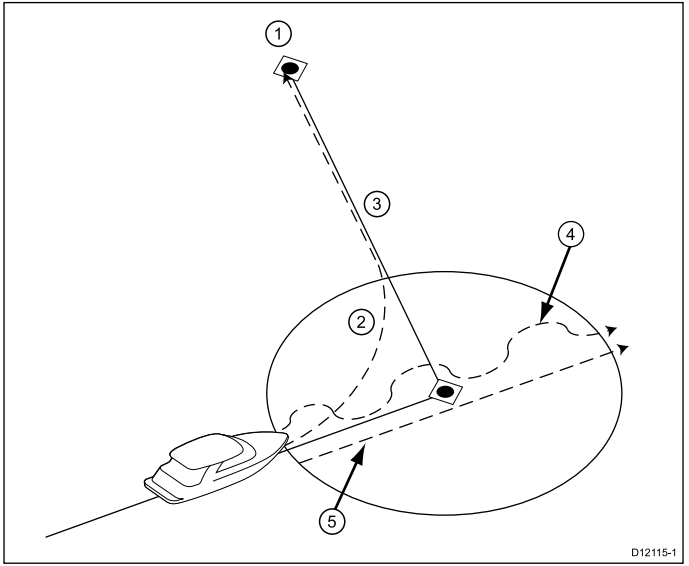
When the warning sounds, the SmartPilot continues on its current heading but displays:

- the bearing to the next waypoint.
- the direction the boat will turn to take up that bearing.

Arriving at a waypoint

As you approach each waypoint, an alarm sounds and a Track mode popup is displayed:

1. Check that it is safe to turn onto the new heading, i. e. the course to the next waypoint. If it is NOT safe, press **CANCEL** to return to the previous screen and resume the previous course.
2. alternatively, you can cancel the warning without accepting the waypoint advance by pressing:
   - **AUTO** to continue on the same heading, or
   - **STANDBY** to return to manual control.
3. If it is safe to apply the new course, press **TRACK** again to accept the new heading and proceed to the next waypoint.



Item	Description
1.	Next waypoint
2.	**TRACK** — Track to next waypoint
3.	Track line
4.	**STANDBY** mode (manual heading)
5.	**AUTO** or, **CANCEL** locked heading

Note: If you do not press **TRACK** to accept the Waypoint Advance, the SmartPilot will maintain the current heading and continue sounding the warning.

Route completion

The SmartPilot displays the ROUTE COMPLETED warning when you have reached the last waypoint on a route in Track mode.

Note: The 'Route Complete' alarm only sounds and displays in conjunction with a SeaTalk chartplotter. NMEA chartplotters do not support the 'Route Complete' function, they will display 'NO DATA'.

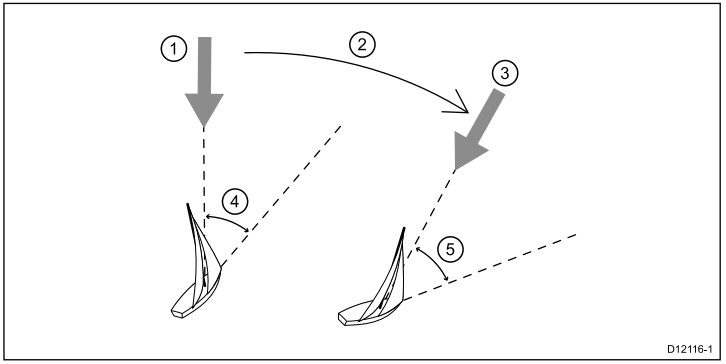
Leaving track mode

To leave Track mode:

1. Press **AUTO** to return to Auto mode (autopilot control), or.
2. Press **STANDBY** to return to Standby mode (manual steering).

5.6 Wind vane mode (Sailing boats only)

When the SmartPilot is in Wind Vane mode it uses the wind angle as the primary heading reference. As changes in the true or apparent wind angle occur, it adjusts the locked heading to maintain the original wind angle.



1.	Wind direction
2.	Wind shift
3.	New wind direction
4.	Relative wind angle
5.	Vessel turns to maintain same relative wind angle

You can only select **Wind Vane** mode if the SmartPilot is receiving suitable SeaTalk, SeaTalk^{ng}, or NMEA2000 wind direction information.

SmartPilots can maintain a course relative to either an apparent or true wind angle in Wind Vane mode. The default setting is apparent wind. If required, you can change this to true wind in the **Vessel settings** menu.

Using wind vane mode

You can select **Wind vane** mode from either **STANDBY** or **AUTO** mode:

1. Steady the vessel onto the required wind angle.
2. Select **Wind vane** mode:
   i. Wind vane mode can be selected by pressing the **AUTO** and **STANDBY** buttons together, or
   ii. selecting **Wind vane** mode from the modes menu: **Menu > Mode > Wind vane**.

   This will enable Wind vane mode and lock the current wind angle. The display shows the locked heading (e.g. 128°) and the wind angle (e.g. WIND 145P indicates a wind angle of 145° to port).
3. The SmartPilot will then adjust the vessel's heading to maintain the locked wind angle.

Adjusting the locked wind angle

1. You can adjust the locked wind angle by using the **-1**, **+1**, **-10** and **+10** buttons, or the **ROTARY** controller to change course. For example, to bear away by 10° when the boat is on a starboard tack:
   i. press -10 to turn the boat 10° to port – the locked wind angle and locked heading will both change by 10°.
   ii. the autopilot will then adjust the locked heading as required to maintain the new wind angle.

Note: Because turning the vessel affects the relationship between the true and apparent wind angles, you should only use this method to make minor adjustments to the wind angle. For major changes, return to **STANDBY** mode, steer onto the new heading, then reselect **Wind Vane** mode. Refer to the p70 pilot controller installation instruction for the procedure for changing the wind reference between True and Apparent.

Leaving wind vane mode

To leave wind vane mode:

1. Press **AUTO** to return to Auto mode (autopilot control), or.
2. Press **STANDBY** to return to Standby mode (manual steering).

Wind trim

In Wind Vane mode the SmartPilot uses WindTrim to eliminate the effects of turbulence and short term wind variations. This provides smooth and precise performance with minimal power consumption. You can adjust the wind response (WindTrim) level in **Sail boat settings** menu **Main menu > Set up > Auto pilot calibration > Sailboat settings** to control how quickly the SmartPilot responds to changes in the wind direction. Higher wind trim settings will result in a pilot that is more responsive to wind changes.

Wind shift warning

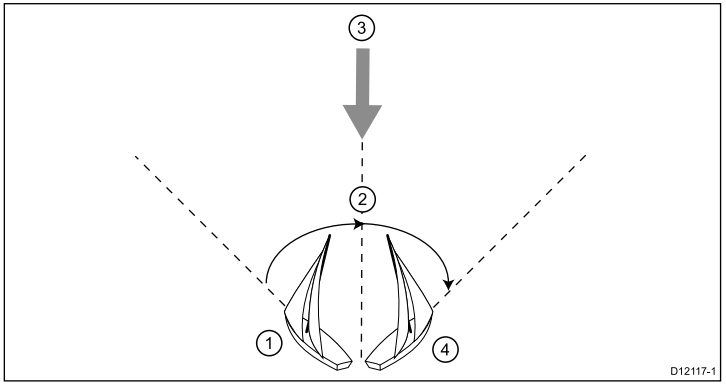
If the autopilot detects a wind shift of more than 15° it will sound the wind shift warning and display the WIND SHIFT message.

Responding to the wind shift warning

1. To cancel the warning, and retain the existing wind angle and new heading, press **CANCEL**.
2. Alternatively, to cancel the warning and return to the previous heading:
   i. adjust the locked wind angle using the **-1**, **+1**, **-10** and **+10** buttons.
   ii. press **STANDBY** to return to hand steering, steer onto the required heading, and press **CANCEL** to return to Wind Vane mode with the new wind angle.

Using AutoTack in wind vane mode

The SmartPilot has a built in automatic tack facility (AutoTack) that turns your vessel "relative" to the wind angle you're currently on, and it tacks the vessel to put you on the opposite relative wind angle.



Item	Description
1.	Starting position
2.	Tack
3.	Wind direction
4.	Final position

AutoTack is always relative to wind angle and so is not adjustable. The time delay between activating a tack and the pilot applying the helm is adjustable and can be found in the **Sail boat settings** menu: **Main menu > Set up > Auto pilot calibration > Sailboat settings > AutoTack delay >**.

1. To AutoTack to port: press the **-1** and **-10** buttons together.
2. To AutoTack to starboard: press the **+1** and **+10** buttons together.

You can also access auto tack function from the Main menu, **Main menu > Tack port** or **Main menu > Tack starboard**.

When you AutoTack in wind vane mode, the boat turns through the AutoTack angle. The SmartPilot will then trim the heading to mirror the locked wind angle from the previous tack.

Operating hints for wind vane mode

- Always trim your sails carefully to minimize the amount of standing helm.
- Reef the headsail and mainsail a little early rather than too late.
- In Wind Vane mode the SmartPilot will react to long-term wind shifts, but will not correct for short-term changes such as gusts.
- In gusty and unsteady inshore conditions, it is best to sail a few degrees further off the wind so that changes in wind direction can be tolerated.
- Avoid using Auto Tack in conditions where the wind may shift suddenly.

Caution: Allow time

Allow time for course changes

Caution: Major course changes

When making major course changes, the trim on the boat may change substantially. Due to this, the SmartPilot may take some time to settle accurately onto the new course.

Accidental gybes

The gybe inhibit feature stops the vessel from turning away from the wind if you accidently press the tack in the wrong direction, this will prevent accidental gybes. This feature can be disabled if required.

Note: For the gybe inhibit feature to work, the SmartPilot needs suitable wind information.

With gybe inhibit on:

- you will be able to perform an AutoTack through the wind.
- the autopilot will prevent the boat from performing an AutoTack away from the wind, to prevent accidental gybes.

With gybe inhibit off:

- you can perform an AutoTack through or away from the wind.

Note: Gybe inhibit is switched on as a default but can be disabled in the **Sail boat settings** menu: **Main menu > Set up > Autopilot calibration > Sailboat settings.**

5.7 Power steer

Power steer mode enables you to use the rotary controller of the p70r or a connected joystick to directly steer the vessel on manual heading.

Power steer has 2 options:

- Proportional

  — The rudder will behave in proportion to the movement of the rotary control or joystick.

- Bang Bang (Joystick only)

  — The rudder will move, and stay in the direction the joystick is moved.

Engaging power steer mode

To engage **Power steer** mode:

1. Go to the **Mode menu** found in **Main menu > Mode**.
2. Highlight **Power steer** and press **SELECT**.

You can change the type of steering at any time i.e. Proportional or Bang Bang by going to the **Power steer** settings in the **Drive settings** menu: **Main menu > Set up > Auto pilot calibration > Drive settings > Power steer**.

Note: In order to use Bang Bang mode a connected joystick is required, the p70r rotary will only perform in Proportional mode.

5.8 Jog steer (tiller pilots only)

If you have a tiller drive installed on a SeaTalk network, your vessel you can use the pilot controller to operate the ram in Jog steer mode.

Jog steer mode enables you to use the pilot controllers **–1**, **+1**, **–10**, **+10** buttons, or the **ROTARY** controller to move the ram in and out to aid connecting and disconnecting the ram.

Note: Jog Steer can only be used whilst your vessel is in **STANDBY**.

Using jog steer (tiller drives only)

1. Ensure your vessel pilot is in **STANDBY** mode.
2. Use the **–1** and **–10** buttons, or turn the rotary controller anticlockwise to retract the ram.
3. Use the **+1** and **+10** buttons, or turn the rotary controller clockwise to extend the ram.

5.9 Shortcut key

When in pilot view you can assign pilot modes to the **LEFT SOFT** button as a shortcut depending on which vessel type has been set up.

The following pilot modes can be assigned as shortcuts:

- Track (default) — All vessels
- Pattern — Power and fishing vessels
- Power steer — All vessels (Rotary only)
- Wind vane — Sailing vessels

Assigning the shortcut key

In order to assign a pilot mode as a shortcut mapped to the **LEFT SOFT** button follow the steps below:

1. Navigate to the **Shortcut** menu: **Menu > Mode > Shortcut**.
2. Select the required pilot mode.
3. Press **SAVE**.

Chapter 6: Pilot controller alarms

Chapter contents

6.1 Alarms

Alarms are used to alert you to a situation or hazard requiring your attention.

Some examples of alarms are:

- Anchor alarm — Used when anchored, this alerts you to a change in depth which could mean that the chain length requires adjusting.
- Depth and speed alarms — These alarms alert you when your depth or speed moves outside of specified limits, for example a minimum depth.
- MOB (Man Overboard) alarm — Received from an MOB system.

When an alarm occurs, a message is displayed and an audible alarm may sound.

You can either:

- Silence the alarm, or
- Silence the alarm and edit the alarm settings.

Note: With the exception of alarm clock, speed and sea temp SeaTalk systems will only be able to switch alarms on/off, SeaTalk^{ng} systems will be able to adjust settings.

Alarm settings

Most alarms are generated locally using specified thresholds. They are also transmitted to the SeaTalk and SeaTalk^{ng} networks for display at other compatible devices.

Alarm name	Alarm type	Description	Action
Calibration required		Indicates a pilot that has not been fully calibrated. Initiated in Standby mode, for a few seconds after initial power-up.	Dockside and Seatrial calibration needs to be undertaken. • Change pilot mode • Self cancelling
Off Course		Indicates Vessel is off course by more than the pre defined alarm limit. Initiated from Auto, Track & Wind modes.	• Change pilot mode • Change course • Correct course
Route Complete		Flagged by chart plotter / navigator when the last waypoint in a route has been reached.	• Change pilot mode

Alarm name	Alarm type	Description	Action
Large Cross Track Error		Indicates cross track error (XTE) is greater than 0.3nm Initiated during Track mode or on entry to Track mode from any other mode.	• Steer back manually and enter track again. • Check autopilot settings. • Reset XTE on Charplotter.
Loss of Waypoint data		Indicates the source (e.g. chartplotter) of the waypoint data has been lost	• Pilot drops out of track mode and into auto mode and continues on last locked heading. •
Wind Shift		Indicates apparent wind angle has changed by more than 15 degrees. Initiated from Wind vane mode only.	• Change pilot mode. • Change course. • Reduction of change in wind angle.

Alarm name	Alarm type	Description	Action
Auto release	Safety Alarm	Appears when the user has taken back control of the steering whilst in an engaged mode (Auto, Track, etc) using the fly-by-wire steering wheel.	• Pilot drops to standby and alarm times out after 10 seconds.
Drive stopped	Safety Alarm	Indicates a rudder stall condition has persisted or that the power has been removed from the drive unit. Initiated in Auto, Track & Wind modes.	• Check output from SPX, drive unit and connections. • Pilot drops to standby and alarm times out after 10 seconds.
No Control Head	Safety Alarm	The course computer has lost communications with the Pilot controller, this alarm is generated by the course computer.	• Check connections for short or open circuit. • Check system for device fault. • Pilot drops to standby and alarm times out after 10 seconds.

Alarm name	Alarm type	Description	Action
SeaTalk fail	Safety Alarm	Total SeaTalk data transmission problem.	• Check connections for short or open circuit. • Check system for device fault. • Pilot drops to standby and alarm times out after 10 seconds.
EEPROM corruption	Safety Alarm	A corruption of critical configuration data has occurred.	• Pilot drops to standby and alarm times out after 10 seconds.
No Pilot	Safety Alarm	The Pilot controller has lost communications with the course computer; this alarm is generated by the Pilot controller.	• Check Seatalk or Seatalk^{ng} bus wiring between SPX and Pilot controller. • Check that the course computer is powered up.
No Compass	Safety Alarm	Compass is not connected.	• Check connections and compass transducer.

Alarm name	Alarm type	Description	Action
Rate Gyro fault	Safety Alarm	The gyro sensor has failed.	• Internal Gyro failure, investigate fault and Consult a Raymarine Service Agent.
Current Limit	Safety Alarm	Drive overload current exceeded.	• Check drive unit and connections for stall or short circuit wiring • Pilot drops to standby and alarm times out after 10 seconds.
Rudder reference unit failure	Safety Alarm	Rudder Reference connection has been lost, or exceeded it's limits. Rudder reference transducer has failed while in auto. Angle is more than 50 degrees or connection to rudder reference is lost	• Pilot drops to standby and alarm times out after 10 seconds.

Alarm name	Alarm type	Description	Action
AutoLearn fail 1 (not carried out)	Safety Alarm	Autolearn has not been carried out	• Restart AutoLearn.
AutoLearn fail 2 (Manual intervention)	Safety Alarm	Manual intervention during autolearn	• Restart AutoLearn.
AutoLearn fail 3 (Compass or drive error)	Safety Alarm	Investigate compass or drive fault	• Restart AutoLearn.
AutoLearn fail 4	Safety Alarm	AutoLearn has failed due to compass or drive error.	• Restart AutoLearn.
AutoLearn fail 5	Safety Alarm	AutoLearn has failed due to motor going into current limit.	• Restart AutoLearn.
AutoLearn fail 6	Safety Alarm	AutoLearn has failed as boat went into spin i.e. motor did not drive the rudder back to opposite side.	• Restart AutoLearn.
Turn rate too high	Safety Alarm	Indicates an excessive rate of turn whilst linearizing the fluxgate compass. Initiated in Calibration mode.	• Reduce rate of turn.

Alarm name	Alarm type	Description	Action
Power & Motor Cables are swapped	Safety Alarm	If the motor pair and the power pair are swapped.	• Swap motor and power wires at the course computer
Low battery	Alarm	Will appear when Battery goes below threshold set. 10 V (default)	• Check batteries or power supply • Will silence if current goes above threshold. • Press cancel.
No Navigation data	Alarm	Indicates absence of one of the following primary control data items: • Compass – Auto, Track & Wind modes. • XTE – Track mode. • Wind angle – Wind vane mode.	• Check the correct navigation data is available for the mode selected. • Check the data source.

Alarm name	Alarm type	Description	Action
Pilot start up	Alarm	Will display start up for 20 seconds everytime the pilot is powered up	• Self cancelling.
Waypoint advance	Alarm	Indicates change in waypoint name or ID and direction to turn to new waypoint. Initiated in Track mode.	• Change pilot mode. • Accept new waypoint route.
No Wind data	Alarm	SmartPilot is in Wind Vane Mode but has not received Wind Angle data for 30 seconds.	• Check wind data source and connections. • Pilot drops out of wind vane mode and reverts to auto mode. • Change pilot mode
No speed data	Alarm	Speed data has stopped .	• Check Seatalk connections for short or open circuit. • Check system for Seatalk device fault.

Alarm name	Alarm type	Description	Action
SeaTalk 1 fail	Alarm	SeaTalk channel 1 has a communication problem.	• Change pilot mode.
SeaTalk 2 fail	Alarm	SeaTalk channel 2 has a communication problem.	• Change pilot mode.
Drive short	Warning	Indicates a short circuit in the drive unit	• Pilot will power down • User to fix short circuit
Clutch short	Warning	Indicates a short circuit in the Clutch	• Check clutch connections at SPX and drive unit • . Check drive unit clutch. • User to fix short circuit
Solenoid short	Warning	Indicates a short circuit in the solenoid	• Pilot will power down • User to fix short circuit

Chapter 7: Multiple data sources (MDS)

Chapter contents

7.1 Multiple data source (MDS) overview

MDS is a system to manage installations with multiple instances of sensors providing the same type of data to vessel displays and systems. If attached to a compliant system a MDS enabled display will let you see all vessel sensors, and select the preferred sources for your data. e.g. in a system you may have a Multi-function display with an internal GPS and an external GPS such as a RS125+, by selecting your preferred data source allows you to determine which GPS is used by your system.

Where your system has already been assigned a preferred data source your display will use that source by default. You can use the display to set the preferred data sources on your system so that any other MDS enabled devices use that data source.

Types of multiple data source you can choose from are:

- GPS Position
- Heading
- Depth
- Speed
- Wind

Note: The presence of some non-MDS compliant devices on your system may prevent MDS from working.

7.2 Viewing vessel data sources

You can view available multiple data sources on a system by following the steps below:

1. Go to the MDS menu: **Main menu > Setup > System setup > Multiple data source**.
2. Highlight the required data type:
   - GPS position
   - Heading
   - Depth
   - Speed
   - Wind
3. Press **SELECT**.

   You will be shown a list of all available data sources for the chosen data type.
4. Highlight a data type and press **SELECT**

   You will now see detailed information about the data source which will include:
   - Device
   - Serial number
   - Port ID
   - Status

7.3 Selecting a preferred data source

To select a preferred data source for your system:

1. Go to the MDS menu: **Main menu > Setup > System setup > Multiple data source**.
2. Press **OPTIONS**.
3. Highlight **Selection** and press **SELECT**.
4. Highlight **Manual** and press **SELECT**

   You will be taken back to the source options screen.
5. Highlight **Use this source** and press **SELECT**
6. To let the system automatically select a data source at the source selection screen highlight and press **AUTO**.

Where displays on your system are not capable in participating in MDS you will be shown a list of the devices that do not support this feature.

Chapter 8: Set up menu options

Chapter contents

8.1 Set up menu

The set up menu provides a range of tools and settings to configure the pilot controller.

Menu item	Description	Options
Auto Pilot calibration	Pilot commissioning / calibration settings	**SeaTalkng** • Vessel settings. • Drive settings. • Sailboat settings. • Commissioning. **SeaTalk** • User settings. • Dealer settings. • Seatrial calibration.
User preferences	Set user preferences such as: Time & Date, Units of measurement, Language, Vessel type, Vessel details, and Variation.	User preferences menu.
System set up	Set system grouping, display and system color and brightness, Multiple data sources and about system set up.	System set up menu.
Simulator	Enables or disables simulator mode, which allows you to practice operating your instrument display without any data from any other external unit.	• On • Off
Factory reset	Delete user settings and Restore unit to factory default settings.	• Yes • No
Diagnostics	Information About the display and system and key beep on / off setting.	• Yes • No

8.2 System setup menu

The **System setup** menu enables users to customize user settings as detailed in the table below:

Menu item	Description	Options
Network group	This allows you to add multiple units together in a group so that when the color scheme or brightness is changed on one unit the changes are applied to all units in the group.	**Pre-defined groups** • None • Helm 1 • Helm 2 • Cockpit • Flybridge • Mast **Undefined** • Group-1 — Group-5
Brightness / color group	This enables you to synchronize the displays brightness and color to be the same as the other units in the same network group.	**Sync brightness / color** • This display • This group

Menu item	Description	Options
Multiple data sources	This allows you to view and select preferred data sources. • **Select data source** • **Data source found** • **Data source details**	**Select data source** • GPS position • Heading • Depth • Speed • Wind **Data source found** • model name — serial number Port ID **Data source details** • Device name • Serial No. • Port ID • Status or No data
About system setup	System set-up provides the option to add instruments or pilot head to a group. Once in a group, tasks like changing brightness and color can be done from a single device. Multiple Data source allows you to view & manage which Data source is used on your pilot head. Data types include: GPS Position, Heading, Depth, Speed & Wind.	

8.3 User preferences menu

The **User preference** menu enables users to customize user settings as detailed in the table below:

Menu item	Description	Options
Time & date	These options enable you to customize the date and time format to your requirements. You can also specify a local time offset from Universal Time Constant (UTC), to compensate for any time zone difference.	**Date format:** • mm/dd/yy • dd/mm/yy **Time format:** • 12hr • 24hr **Time offset:** • –13 to +13 hours
Units	Enables you to specify the units used for the following key measurements: • **Speed** • **Distance** • **Depth** • **Wind speed** • **Temperature** • **Flow rate** • **Heading** • **Pressure** • **Volume**	**Speed:** • kts — knots. • mph — miles per hour. • km/h — Kilometres per hour. **Distance:** • nm — Nautical miles. • km — Kilometres. • sm — Statute miles. **Depth:** • ft — Feet • fa—Fathoms
	• **Barometric**	• m— Metres **Wind speed:** • kts — knots. • m/s — metres per second. **Temperature:** • ºC — degrees centigrade. • ºF — degrees fahrenheit. **Flow rate** • g/h (UK) — UK gallons per hour. • g/h (US) — US gallons per hour. • ltr/h — Litres per hour. **Heading:** • True • Mag — magnetic. **Pressure** • psi — pounds per square inch. • Bar — bar. • kpa — Kilo pascals.

Menu item	Description	Options
		Volume: • Gal — (US) — US gallons. • Gal — (UK) — UK gallons. • ltr — litre. **Barometric** • psi — pounds per square inch. • Bar — bar. • kpa — Kilo pascals.

Menu item	Description	Options
Language	Determines the language that will be used for all on-screen text, labels, menus and options.	• Chinese • Croatian • Danish • Dutch • English — UK • English — US • Finnish • French • German • Greek • Italian • Japanese • Korean • Norwegian • Polish • Portuguese (Brazilian) • Russian • Spanish • Swedish • Turkish

Menu item	Description	Options
Arrival alarm	Sets the radius for the arrival alarm.	**Alarm** • Off • On **Adjust radius** • 0 nm — 10 nm • 3 nm (default)
Vessel type	Determines the default setup of the unit and favorite pages	• Race sail • Sail cruiser • Catamaran • Workboat • RIB • Outboard speed boat • Inboard speed boat • Power cruiser 1 • Power cruiser 2 • Power cruiser 3 • Sport fishing • Pro fishing

8.4 Simulator

The Simulator mode enables you to practice operating your display without live data from a transducer or other connected peripherals.

The simulator mode is switched on/off in the **Simulator** option from the **Setup Menu**.

Note: Raymarine recommends that you do NOT use the simulator mode whilst navigating.

Note: The simulator will NOT display any real data, including any safety messages (such as those received from AIS units).

Note: Any system settings made whilst in Simulator mode are not transmitted via SeaTalk to other equipment.

8.5 Factory reset

Your product can be reset to factory default settings from the **Setup > Factory reset** menu.

Performing a factory reset will reset your product back to factory default settings and erase any saved data and user settings.

8.6 Diagnostics

You can access diagnostics details from the **Setup > Diagnostics** menu option and can view information relating to:

Menu item	Description	Options
About display	Allows you to view information about the instrument display you are using:	• Software version • Hardware version • Bootloader version • Temperature • Volts • Max. volts • Current • Max. current • Run time • Deviation (If available)
About system	Allows you to view information about products on the system you are using:	• Model number • Serial number • Software version • Hardware version • Volts

Menu item	Description	Options
Key beep	Enables you to turn on and off the audible beeps when keys are pressed	• On • Off
Self test	The product has a built in self test which can help to diagnose faults.	• Memory test • Button test • Display test • Buzzer test • Illumination test

Chapter 9: Maintaining your display

Chapter contents

9.1 Service and maintenance

This product contains no user serviceable components. Please refer all maintenance and repair to authorized Raymarine dealers. Unauthorized repair may affect your warranty.

9.2 Routine equipment checks

Raymarine strongly recommends that you complete a number of routine checks to ensure the correct and reliable operation of your equipment.

Complete the following checks on a regular basis:

- Examine all cables for signs of damage or wear and tear.
- Check that all cables are securely connected.

9.3 Cleaning

Best cleaning practices.

When cleaning this product:

- Do NOT wipe the display screen with a dry cloth, as this could scratch the screen coating.
- Do NOT use abrasive, or acid or ammonia based products.
- Do NOT use a jet wash.

9.4 Cleaning the display screen

A coating is applied to the display screen. This makes it water repellent, and prevents glare. To avoid damaging this coating, follow this procedure:

1. Switch off the power to the display.
2. Rinse the screen with fresh water to remove all dirt particles and salt deposits.
3. Allow the screen to dry naturally.
4. If any smears remain, very gently wipe the screen with a clean microfibre cleaning cloth (available from an opticians).

Chapter 10: Technical support

Chapter contents

10.1 Raymarine customer support

Raymarine provides a comprehensive customer support service. You can contact customer support through the Raymarine website, telephone and email. If you are unable to resolve a problem, please use any of these facilities to obtain additional help.

Web support

Please visit the customer support area of our website at:

www.raymarine.com

This contains Frequently Asked Questions, servicing information, e-mail access to the Raymarine Technical Support Department and details of worldwide Raymarine agents.

Telephone and email support

In the USA:

- **Tel:** +1 603 881 5200 extension 2444
- **Email:** Raymarine@custhelp.com

In the UK, Europe, the Middle East, or Far East:

- **Tel:** +44 (0)23 9271 4713
- **Email:** ukproduct.support@raymarine.com

Product information

If you need to request service, please have the following information to hand:

- Product name.
- Product identity.
- Serial number.
- Software application version.

You can obtain this product information using the menus within your product.

Viewing product information

1. From the main menu scroll to **Set Up** and press the **SELECT** key.
2. From the Set Up menu scroll to **Diagnostics** and press the **SELECT** key.
3. Select **About system**.

   A range of information is displayed, including the software version and Serial number.

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