Evolution autopilot set-up and commissioning with p70 / p70R

Evolution autopilot installation

For information on installing and connecting an Evolution autopilot system, refer to the installation instructions that accompany the EV-1 and EV-2 units, as appropriate.

Evolution autopilot operation with p70 & p70R

General operation of the Pilot Controller is the same for Evolution autopilot systems as it is with existing SXp autopilot systems. Refer to your Pilot Controller’s operation instructions. You can download the latest version from the Raymarine website: www.raymarine.com/manuals.

Initial setup and commissioning

Commissioning pre-requisites

Before commissioning your system for the first time, check that the following processes have been carried out correctly:

- Autopilot system installation completed in accordance with the Installation instructions.
- SeaTalkng® network installed in accordance with the SeaTalkng® Reference Manual.
- Where fitted, the GPS receiver has been installed and connected in accordance with the associated Installation instructions.

Check also that the commissioning engineer is familiar with the installation and components of the autopilot system including:

- Vessel type.
- Vessel steering system information.
- What the autopilot will be used for.
- System layout: components and connections (you should have a schematic of the vessel’s autopilot system).

Initial set-up

Initial set-up involves the following steps:

1. Power-up your Pilot Controller.
2. Specify your preferred language and appropriate vessel type, using the Set-up wizard.
3. Complete the calibration process, using the Dockside wizard.

For vessels without a rudder reference transducer:

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4. Once the dockside wizard is complete, specify the hard-over time (only applies to systems that do NOT include a rudder reference transducer).
5. Familiarize yourself with the important information in this document related to Compass Linearization. Follow the guidelines provided to ensure that the process is completed successfully.
6. Once you’ve successfully completed steps 1 to 5 above, familiarize yourself with the information related to the Compass Lock.

Powering the Pilot controller on

1. Press and hold the STANDBY button for one second, until the logo appears. If the unit is being switched on for the first time or after a factory reset the set up Wizard will be launched.

   Note: The logo is not displayed if the unit is in ‘Sleep mode’. In Sleep mode the unit may appear off but still has power.

2. To turn the Pilot controller off press and hold the STANDBY button. After 1 second a pop-up count down is displayed.
3. Continue to hold the STANDBY button for a further 3 seconds to power off the controller.

   Note: You cannot power off the Pilot controller whilst the autopilot is engaged.

Using the Dockside wizard

The Dockside wizard guides you through the steps for setting important preferences, such as preferred language and correct vessel type.

The Dockside Wizard contains 3 steps: Language Selection, Vessel Hull Type selection and Welcome Screen. When powering the Pilot Controller for the first time, in an unpowered system, the Set-up Wizard is displayed automatically, and the first 3 steps listed below will not be required.

With the pilot in Standby mode:

1. Select Menu.
2. Select Setup.
3. Select Set-up Wizard.
4. Select the required language.
5. Select the required vessel type.

The welcome screen will now be displayed and your choices have been saved.

6. Select OK to complete the Set-up Wizard.

Vessel hull type selection

The vessel hull type options are designed to provide optimum steering performance for typical vessels.

It is important to complete the vessel hull type selection as part of the initial set-up, as it forms a key part of the autopilot calibration process. You can also access the options at any time with the pilot in Standby by selecting MENU > Set-up > Autopilot Calibration > Vessel Settings > Vessel Hull Type. Select the option that most closely matches your vessel type and steering characteristics. The options are:

- Power
  - Power (slow turn)
  - Power (fast turn)
- Sail
  - Sail (slow turn)
- Sail Catamaran

It is important to be aware that steering forces (and therefore rate-of-turn) vary significantly depending on the combination of vessel type, steering system, and rudder type. Therefore, the available vessel hull type options are provided for guidance only. You may wish to experiment with the different vessel hull type options, as it might be possible to improve the steering performance of your vessel by selecting a different vessel type. When choosing a suitable vessel type, the emphasis should be on safe and dependable steering response.

Using the Dockside wizard

The dockside calibration process must be completed before the Evolution autopilot system can be used for the first time. The Dockside wizard guides you through the steps required for dockside calibration.

The Dockside wizard contains different steps depending on whether you have a rudder reference transducer fitted to your vessel.

Rudder Limit setting

As part of the Dockside calibration process, the system will set-up the rudder limits.

- For vessels with a rudder reference transducer — This procedure establishes the rudder limit. The rudder limit will be displayed with a message confirming that the rudder limit has been updated. This value can be changed if required.
- For vessels without a rudder reference transducer — A default of 30 degrees is displayed, and can be changed as required.

Hard over time

The hard over time setting can be specified as part of the Dockside wizard.

Selecting a drive type

Drive Type selection is available when the pilot is in Standby, from either the Dockside wizard, or from the Vessel setting menu:

MENU > Set-up > Autopilot Calibration > Vessel Settings

With the Drive Type menu displayed:

1. Select your drive type.

Checking the rudder alignment (Align Rudder)

This procedure establishes port and starboard rudder limits for systems using a rudder reference transducer.

The rudder check forms part of the dockside calibration process.

The following procedure only applies to vessels with a rudder reference transducer.
• If you already know the hard-over time for your vessel’s steering system: enter this time during the Dockside wizard procedure.

• If you do NOT know the hard-over time for your vessel’s steering system: skip this step during the Dockside wizard procedure by selecting SAVE, then proceed to Checking the rudder drive section in this document to complete the Dockside wizard procedure. Once the wizard is complete, proceed to Adjusting the hard-over time — SmartPilot and SPX in this document for information on how to calculate and adjust the hard-over time.

Checking the rudder drive
As part of the dockside calibration process, the system will check the drive connection. Once it has completed the check successfully, a message will appear asking if it is safe for the system to take the helm.

During this procedure the autopilot will move the rudder. Ensure it is safe to proceed before pressing OK.

When in dockside calibration mode, with the Motor Check page displayed:
1. Centre and let go of the rudder.
2. Disengage any rudder drive clutch.
3. Select CONTINUE.
4. Check it is safe to proceed before selecting OK.

For vessels with a rudder reference transducer, the autopilot will now automatically move the rudder to port and then starboard.

For vessels without a rudder reference transducer, you will be asked to confirm that the rudder has turned to port by selecting YES or NO.

6. Select OK if it is safe to engage the rudder in the opposite direction.

7. You will be asked to confirm the rudder turned to starboard by selecting YES or NO.

Dockside calibration is now complete, select CONTINUE.

Note: If you confirmed a “NO” response for the rudder movement to both port and starboard, the wizard will exit. It is possible that the steering system did not move the rudder in any direction, and it will be necessary to check the steering system before completing the Dockside wizard procedure again.

You can cancel Dockside calibration at any time by pressing STANDBY.

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Compass autopilots
The EV unit’s internal compass needs to compensate for local and the Earth’s magnetic fields. This is achieved using an automatic process known as linearization.

Initial linearization
When the EV unit is first installed and powered-up (or after a factory reset or compass reset) linearization is required. A progress bar is displayed to indicate linearization is required.

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The linearization process will start automatically after your vessel has turned approximately 100° at a speed of between 3 – 15 knots. Linearization requires no user input, however at least a 270° turn is required before linearization can complete. The progress bar will fill to indicate progress, the progress bar will turn red if the process is paused or otherwise interrupted. Time it takes to complete the linearization will vary according to the characteristics of the vessel, the installation environment of the EV unit, and the levels of magnetic interference at the time of conducting the process. Sources of significant magnetic interference may increase the time required to complete the linearization process. Examples of such sources include:
• Marine pontoon
• Metal-hulled vessels
• Underwater cables
You can speed-up the linearization process by completing a full 360° turn (at a speed of 3 – 15 knots). You can also restart

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the linearization process at any time by selecting the Restart compass menu item.

Once the initial linearization is completed the Deviation page is displayed and the current maximum compass deviation is shown.

Note: If “-” is displayed as the Deviation value, it means that linearization has not been successfully completed yet.

Adjusting the Compass Offset
With the pilot in STANDBY:
1. From the Vessel Settings menu (Menu > Set-up > autopilot calibration > Vessel Settings).
2. Select Compass Offset.
3. Use the +/- 10 button (p70) or Rotary control (p70R) to adjust the compass offset as appropriate.

The Compass Offset can be adjusted between –10° and +10°.

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Compass lock
Once you are satisfied with the compass accuracy, you can lock the setting to prevent the autopilot system from completing a further automatic linearization in the future.

This feature is particularly useful for vessels in environments that are exposed to strong magnetic disturbances on a regular basis (such as offshore wind farms or very busy rivers, for example). In these situations it may be desirable to use the Compass lock feature to disable the continuous linearization process, as the magnetic interference may build a heading error over time.

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Locking the compass
Follow the steps below to lock the compass linearization.

From the Compassing menu: (Menu > Set-up > autopilot calibration > compassing).
1. Select Compass Lock.
2. Select On.

The compass linearization is now locked.

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