DockerPro
Userguide

DockerPro-UG-EN-V4.2

SHIPCONTROLLER

Important Information

	**Thoroughly review this manual and follow its instructions before installing and operating this device. Keep a copy of this manual for future reference.**
	**WARNING. Make sure to carefully follow the safety instructions and guidelines marked with this symbol. Not following them could cause personal injury or property damage.**

■ Meaning of the symbols used on the product, literature or packaging:

SYMBOL	MEANING
	*Read the manual* carefully and thoroughly before installing and using the system. Retain this manual for future reference; it contains vital information for the operation and maintenance of your Shipcontroller System.
	*The CE mark* on the product indicates that the manufacturer has declared conformity with all the essential requirements of European Union legislation regarding safety, electromagnetic compatibility, effectively use of radio spectrum, health, and environmental protection, allowing free circulation and sale within the European market.
	*Disposal.* The crossed-out wheeled bin symbol indicates that in the European Union, all electrical and electronic products, batteries, and accumulators must be disposed of at specific collection points when they reach the end of their life.
	*Safety Warning.* This icon indicates the imperative need to follow the accompanying instructions. Ignoring these recommendations may result in damage to people or property.
	*Note.* This icon highlights important instructions that, if not followed, may lead to improper operation of the equipment.

■ CE Declaration of Conformity:

	Hereby, Naocontrol SL declares that the Shipcontroller System is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://shipcontroller.com/files/Shipcontroller-RED-DoC-DOC23112901.pdf

■ Manufacturer Information / Contact Information:

Naocontrol, S.L.	Rafael Alberti, 29 Bajo 1 - 15008 A Coruña – SPAIN – VAT ID: ES-B70219274
Manufacturer website:	www.naocontrol.com
Product website:	www.shipcontroller.com
email:	info@shipcontroller.com

Table of contents

Safety and Environment Warnings

☞ *Please ensure to carefully read and adhere to all warnings and instructions provided in this manual, as well as in the accompanying product documentation*

Shipcontroller Installation

Installation and tuning of the Shipcontroller system should be carried out exclusively by trained and authorized technicians, following the installation instructions provided with each system.

Using Shipcontroller

Shipcontroller is designed as a steering aid for low-speed maneuvers, particularly in scenarios such as docking or anchoring. While it has been developed and manufactured to be very safe and reliable, it's essential to adhere to good seamanship and safety rules, including:

- *Ensuring the implementation of appropriate procedures and having sufficient crew and resources to maintain control of the vessel, thereby minimizing the risk of causing harm to individuals or property.*
- *Turning off the system when not in use.*

ENVIRONMENTAL WARNINGS

Restriction of Hazardous Substances (RoHS)

RoHS

This system has been designed in compliance with RoHS regulations, which restrict the use of substances harmful to the environment, such as lead, mercury or cadmium.

Using disposable or rechargeable batteries:

The remote control unit is designed to use rechargeable batteries. Batteries must be disposed of in accordance to current regulations, placing them in a suitable container.

Product Disposal:

When deciding to dispose of this product, such as at the end of its life cycle, ensure that you do so in compliance with the ordinances or regulations governing the disposal of electronic devices.

1 Introduction

The purpose of this document is to provide essential information for the installation, operation, and maintenance of the remote control unit, reference SCR756TG, and trade name ***DockerPro***, to ensure its effective and safe use.

1.1 Shipcontroller System Overview

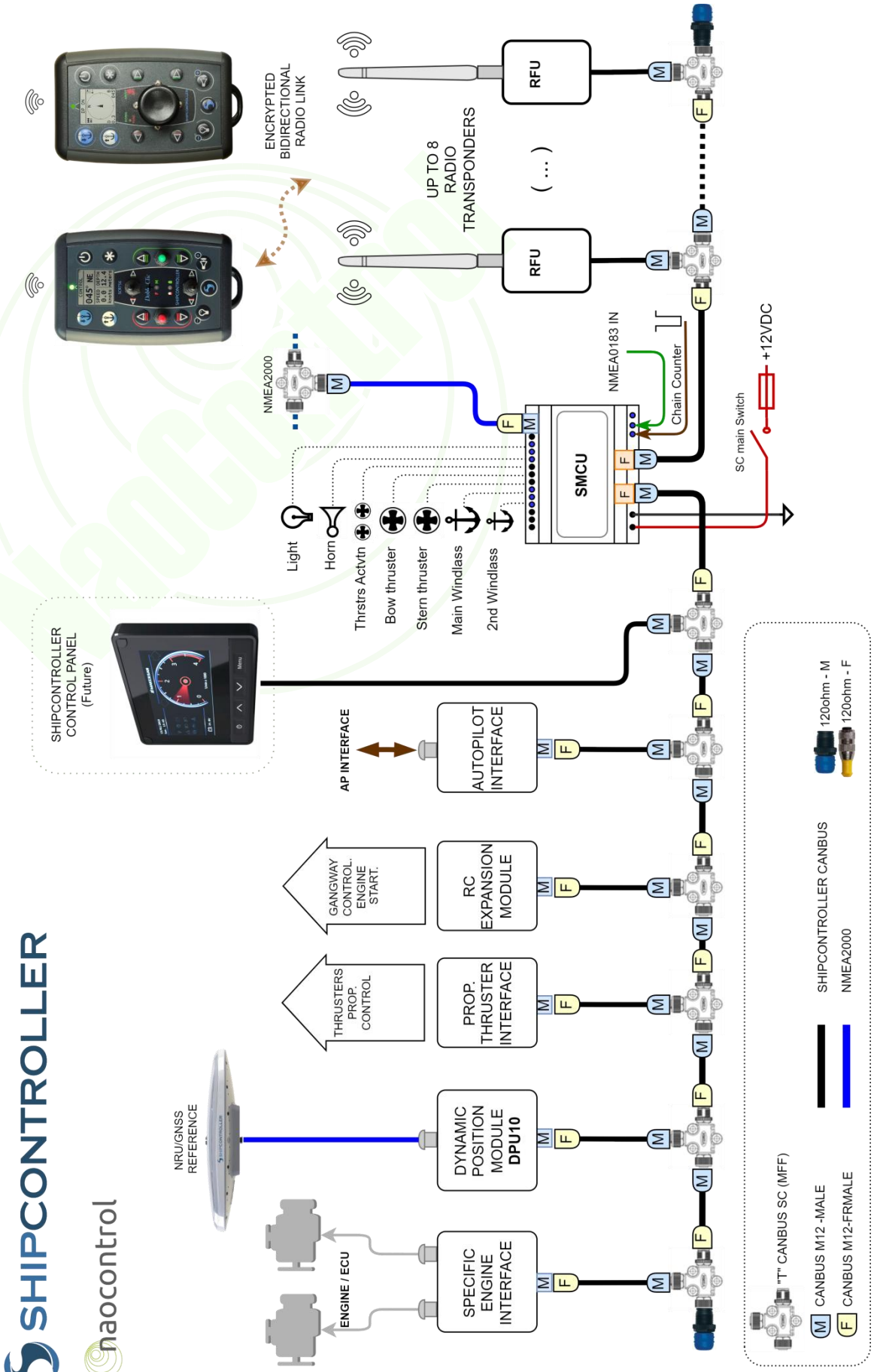
Shipcontroller is a modular remote control system, whose different components can be connected via an advanced radio system or through a CANbus.

The Shipcontroller system on your boat has been custom-configured according to the interconnection requirements to achieve control of the main propulsion elements of your boat. Other optional parts may also have been added.

The example schematic on the following page illustrates a comprehensive Shipcontroller system. Being modular, it allows for easy addition of new functionalities through modules connected to the Shipcontroller CANbus.

This example includes the Shipcontroller NET option, featuring a network of radio transponders for secure and redundant radio coverage, particularly useful on larger vessels or those with metal hulls. It also supports multiple remotes, even of different models. Here are some key modules typically found in a Shipcontroller system:

- **Shipcontroller remote(s) (SCRxxx):** As indicated, a Shipcontroller system can include different remotes, even of different models. The system ensures that only one of them can have control. The radio system includes robust encryption, and each system features different encryption keys to prevent interference from remotes of other boats.
- **SMCU Module**: Provides the communication interface (NMEA2000, Seatalk, NMEA0183) for navigation data telemetry. It also offers chain counter functions and relay outputs for windlasses, thruster control, horn, and lights.
- **RFU Radio Transponder**: Handles communication with the remotes, supporting the deployment of up to 8 units to achieve robust coverage on large vessels or boats with metal decks, or simply to attain redundancy in the radio system.
- **Engine Interface Module**: Responsible for engine control, with specific versions available for compatibility with most engine control systems on the market.
- **Proportional Thruster Interface**: Allows Shipcontroller to interact with thrusters featuring proportional control mode.
- **DPS System**: Helps maintain the ship's position and heading within operational margins and error tolerances.
- **Autopilot Interface**: Enables control of compatible autopilot systems, including activation, deactivation, and course adjustments.
- **RC Module Family**: Expands control capabilities, allowing for the control of additional equipment such as gangways and platforms.


SHIPCONTROLLER
naocontrol
ENCRYPTED BIDIRECTIONAL RADIO LINK
UP TO 8 RADIO TRANSPONDERS
RFU
RFU
(...)
NMEA2000
NMEA0183 IN
Chain Counter
SMCU
+12VDC
SC main Switch
Light
Horn
Thrstrs Actvtn
Bow thruster
Stern thruster
Main Windlass
2nd Windlass
SHIPCONTROLLER CONTROL PANEL (Future)
AP INTERFACE
AUTOPILOT INTERFACE
GANGWAY CONTROL. ENGINE START.
RC EXPANSION MODULE
THRUSTERS PROP. CONTROL
PROP. THRUSTER INTERFACE
NRU/GNSS REFERENCE
DYNAMIC POSITION MODULE DPU10
ENGINE / ECU
SPECIFIC ENGINE INTERFACE
"T" CANBUS SC (MFF)
CANBUS M12 -MALE
CANBUS M12-FRMALE
SHIPCONTROLLER CANBUS
NMEA2000
120ohm - M
120ohm - F

1.2 Remote control features overview

Core Capabilities of the *DockerPro* remote:

- Multifunction remote control system concept.
- ***OnRemoteSettings***: most system settings can be adjusted directly from the remote control.
- Robust **toggle switches and mechanical push buttons** for engine and thruster control, enabling simple and intuitive maneuvering of the ship's propulsion system.
- A bidirectional radio data link with 128-bit encryption, allowing for **powerful and secure communication** from the remote to the boat to send commands, and from the boat to the remote to constantly monitor the status of the boat systems.
- The **NET** microcode option enables a network of **up to 8 radio transponders and up to 4 remotes** with concurrency control, resulting in a high-availability, fault-tolerant radio data system.
- A sunlight-readable hybrid e-ink **display**, designed to show messages, alarms, system status, and telemetry data such as graphic sounder readings, depth, chain count, etc.
- On/off, stepped, or proportional control for one, two, or more **engines.**
- On/off, stepped, or proportional control for one, two, or more **thrusters.**
- Control of up **to two anchor windlasses**. For the primary windlass, the system additionally provides a **chain counter** and an **anchoring scope calculator**.
- Control buttons for activating the **horn and lights**.
- Optional remote control for a compatible **autopilot.**
- **Depth plot screen:** Allows you to view the depth curve to assist in safer anchoring or beach approach**.**
- **Depth Alarm**: Raises an alarm if the depth is below the configured value.
- **Thruster Inhibition**: Disables thrusters when the boat's speed exceeds the preset speed limit.
- Rechargeable internal Lithium-Polymer battery.
- IP65 watertight rating.

New features in *DockerPro* v4.0:

- ***DobleClic***: This functionality allows a button or lever to distinguish between a single and a double click, enabling different actions. For example, it allows for varying levels of thrust from the engines or thrusters using a single control lever.
- The ***PulseThrust*** technology reduces the average thrust of the thrusters by switching them on/off at precise time intervals.
- Thrusters **Hold Mode**: This mode enables simultaneous activation of both thrusters with a simple maneuver, providing just the necessary minimum thrust to keep the boat securely docked. This mode is available only for proportional or *PulseThrust* thrusters.
- Control of the Shipcontroller **Dynamic Positioning System** module (DPS), which allows us to maintain the position and heading of the ship within narrow margins of error.
- New **Menu and Screen Organization**: Structured around the "**operation mode**" concept, this organization transforms the remote into a true multifunctional system.
- The **RC mode**, which facilitates the control of remote control modules such as the engine start/stop module, the relay expansion unit, a **gangway/platform controller**, or other modules that can be incorporated later.
- The **WindlassGuardian** feature enhances anchoring operations and protects both the windlass and the bow from impacts or damage. It achieves this by automatically stopping the windlass during hoisting or just before releasing the entire rope.

2. Remote unit description

2.1 Remote Unit Elements

The figure below shows the main elements of the remote control unit:

There are four types of elements in the remote:

- **Indicators:**
  - The graphic display, the status LEDs, and the internal vibration motor.
- **Maneuver Controls**: intended to directly manage the boat's systems:
  - Engine control: two toggle levers and four buttons recognizing *Doble Clic*.
  - Thruster control: two toggle levers recognizing *Doble Clic.*
  - Two windlass control buttons.
- **Remote unit operation buttons**:
  - On-Off button.
  - Operation mode button.
  - The (SC) button (the button with the Shipcontroller logo).
- **Multifunction buttons: Horn and Light buttons**:
  - They can operate as maneuver buttons or as menu buttons, depending on the context.
  - The Function/Menu indicator will show the current operation mode for those buttons. (See section 2.1.6).

2.1.1 Led Status indicator

The bicolor LED indicates system status, providing visual feedback about operational conditions and alerts:

Green LED	Red LED	Meaning
On	Off	Wireless data link established and operative. Base system operative. Engine controls ready.
Blinking 1/sec.	Off	Wireless data link established and operative. Base system operative. Engine control NOT available.
Blinking 10/sec.	Off	A control button has been activated. The remote is attempting to send user commands to the base transceiver.
Off	On	No radio coverage OR The base system is powered off.
(On or Off)	Blinking 1/sec.	Low battery level.
Off	Blinking 5/sec.	Waiting for a press of the [SC] button after switching on the remote in safe mode (two phases start mode).
Blinking 1/sec.	Blinking 1/sec.	Remote unit failure.

2.1.2 Power button

This button powers the remote control unit on and off, and also displays the boat's name **and battery charge level** if you hold it down while turning on the unit.

2.1.3 Operation mode button

This button allows you to select the operation mode of the remote. Pressing it briefly will activate the operation mode selection screen. Additionally, **holding it down for more than one second cancels any active mode and returns the remote to Docking mode**.

2.1.4 Bow thruster toggle lever

This lever allows you to control the bow thruster. Thanks to the *'Doble Clic*' feature, this lever can select between two levels of thrust, if the thrusters support proportional control or have been configured with PPC.

2.1.5 Starboard engine *fast forward* button

This button activates the starboard ahead-fast command for the starboard engine. The term "fast" is relative, and does not mean high rpm or high speed. If the multi-speed option is not available, this button activates the ahead-slow command.

2.1.6 Starboard engine control lever

Push it forward to activate the ahead-slow command, or push it backward to activate astern-slow. The lever returns to the neutral (central) position by itself. Thanks to the "*Doble Clic*" feature, this lever can also activate the “fast” level of thrust.

2.1.7 Starboard engine *fast reverse* button

This button activates the starboard astern-fast command for the starboard engine. The term "fast" is relative, and does not mean high rpm or high speed. If multi-speed option is not available this button activates the starboard astern- slow command.

2.1.8 Stern thruster lever

This lever allows you to control the stern thruster. Thanks to the "*Doble Clic*" feature, this lever can select two levels of thrust.

2.1.9 Horn/ Menu (+) button

The button with a horn icon is a multi-function button. Depending on the context, it can act as:

- A button intended to activate a horn. This is the default function.
- A button that activates the menu action indicated in the bottom right corner of the display.

2.1.10 Internal vibration motor

The remote unit includes an internal vibration device used to indicate warnings, such as:

Vibration signal	Meaning
One short pulse	* Initial self-test completed. * Engine control restored.
Continuous, while activating any engine control on the remote	* No radio coverage. * Unregistered remote (in multi-remote systems). * No engine control.
Continuous, while activating any thruster control on the remote	* No radio coverage. * The Thruster inhibition feature is active and the speed is too high.
Two short pulses	Power off sequence completed.
Two long pulses	* Engine control lost.
Three long pulses	* Depth alarm warning.

2.1.11 (SC) Menu Button

This button allows the user to navigate through different screens and access the menu options. It recognizes both a short press and a long press..

2.1.2 Light/Menu (-) button

The button with a bulb icon is a multi-function button. Depending on the context, it can act as:

- A button that activates a light. This is the default function.
- A button that activates the menu action indicated in the bottom left corner of the display.

2.1.13 Port engine *fast reverse* control button

This button activates the engine fast reverse command for the port engine. The term "fast" is relative, and does not mean high rpm or high speed. If the multi-speed option is not available, this button activates the astern-slow command for the port engine.

2.1.14 Battery charge indicator

This led indicator will light up when the remote control unit is placed over a powered QI wireless charger. The possible states of this indicator are as follows:

- Off: charging adapter disconnected or turned off.
- Red: battery charging.
- Green or blue: charging completed.

2.1.15 Port engine Slow lever

Push the lever forward to activate the ahead-slow command, or pull it backward to activate the astern-slow command. The lever returns to the neutral (central) position by itself. Thanks to the "Doble Clic" feature, this lever can also activate the "fast" level of thrust.

2.1.16 Menu/Function indicator

This two-color led is used to indicate if there is any active menu on the screen, or if any special function is activated:

- **Off: normal mode**. The Horn/Light (+/-) buttons will activate the horn and lights, respectively.
- **Green: menu mode**. The Horn/Light buttons will be used to enter responses or select the options indicated on the screen. Horn/Light functions are not active.
- **Red**: Some **special function** has been activated (reserved).

2.1.17 Port engine f*ast forward* button

This button activates the ahead-fast command for the port engine. The term "fast" is relative and does not mean high rpm or high speed. If the multi-speed option is not available, this button activates the ahead-slow command instead.

2.1.18, 2.1.19 Windlass control buttons


The remote enables control of up to two separate windlasses. The primary windlass is linked with the chain counter feature. When the auto-change display function is activated, pressing any of these buttons will switch the display to chain counter mode temporarily, reverting to the previous display after a brief delay.

- The down arrow button facilitates lowering the selected anchor.
- The up arrow button facilitates lifting the selected anchor.

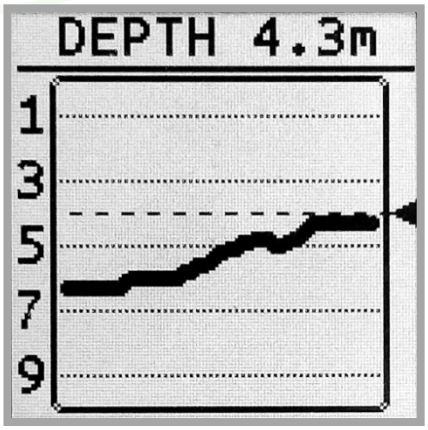
Windlass auto-stop feature:

- During Deployment: If the automatic stop function is enabled, the anchor deployment will halt upon reaching the maximum rode length. The remote will vibrate and display a warning screen.

- During retrieval: If the automatic stop function is enabled, the windlass will stop upon reaching the adjusted stop distance. The remote will vibrate and display a warning message. You can continue raising the rope by releasing and pressing the up button again.

2.1.20 Display

The remote control is equipped with a graphic display utilizing hybrid electronic ink technology. This display remains readable even in bright sunlight and extremely low-light conditions. Its remarkably low power consumption ensures an extended lifespan for the remote's rechargeable battery.



2.2 Special Features

In this section, we highlight important features that should be known before delving into the details of the remote operation:

- *Doble Clic*: getting two levels of thrust from an on/off type button on the remote.
- PPC: Precise pulse control for managing the thrust of on/off type thrusters and engines.

2.2.1 The *Doble Clic* Feature

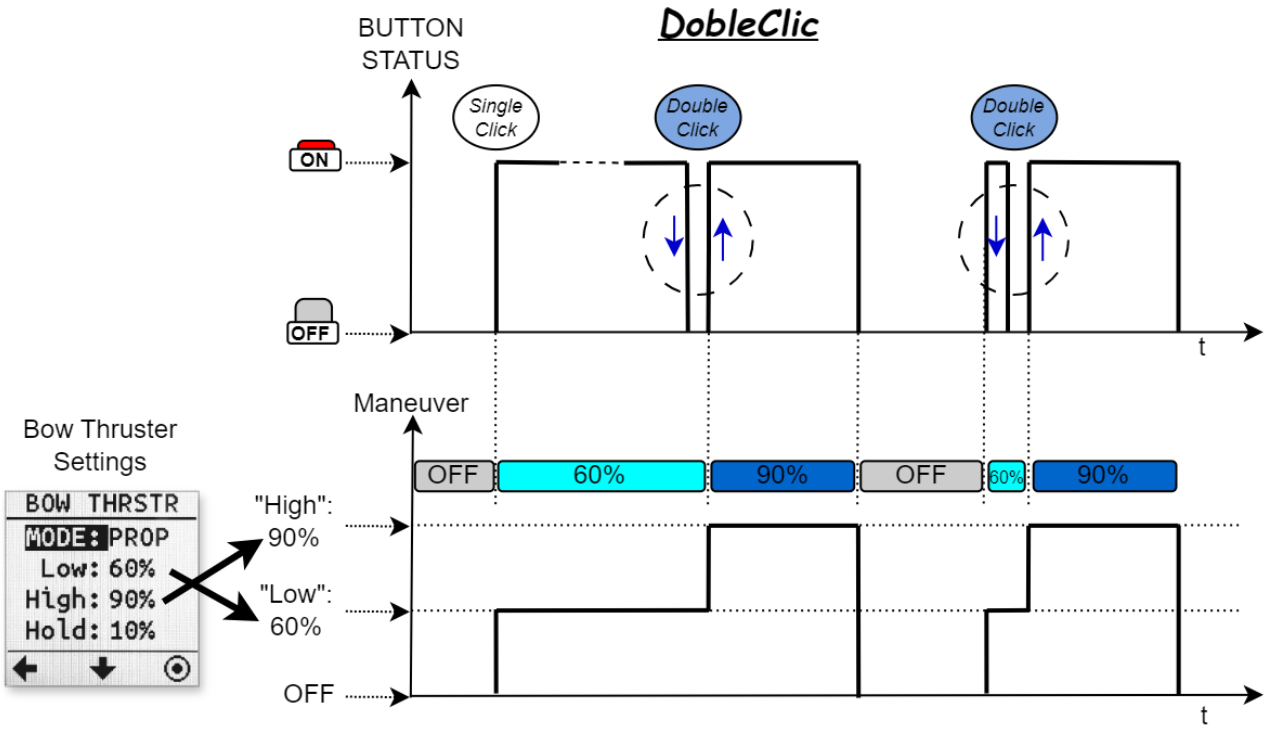
The ***DobleClic*** feature recognizes a double press of a button or switch, allowing different commands to be assigned to a single press and a double press. For example, two thrust levels can be set for a thruster or engine.

Although similar to the "click" and "double-click" of a computer mouse, it differs slightly because the button or switch must be held down for the action to take effect.

The example in the figure below illustrates a proportional bow thruster, where the remote control is configured to deliver 60% thrust with a single click and 90% thrust with a double click.

- Pressing and holding the button will activate the first thrust level.
- Releasing the button and quickly pressing it again will activate the second thrust level.

For multiple thrust levels to be possible, it's essential that the thrusters are set up for proportional control or configured with ***PulseThrust*** on the remote control.



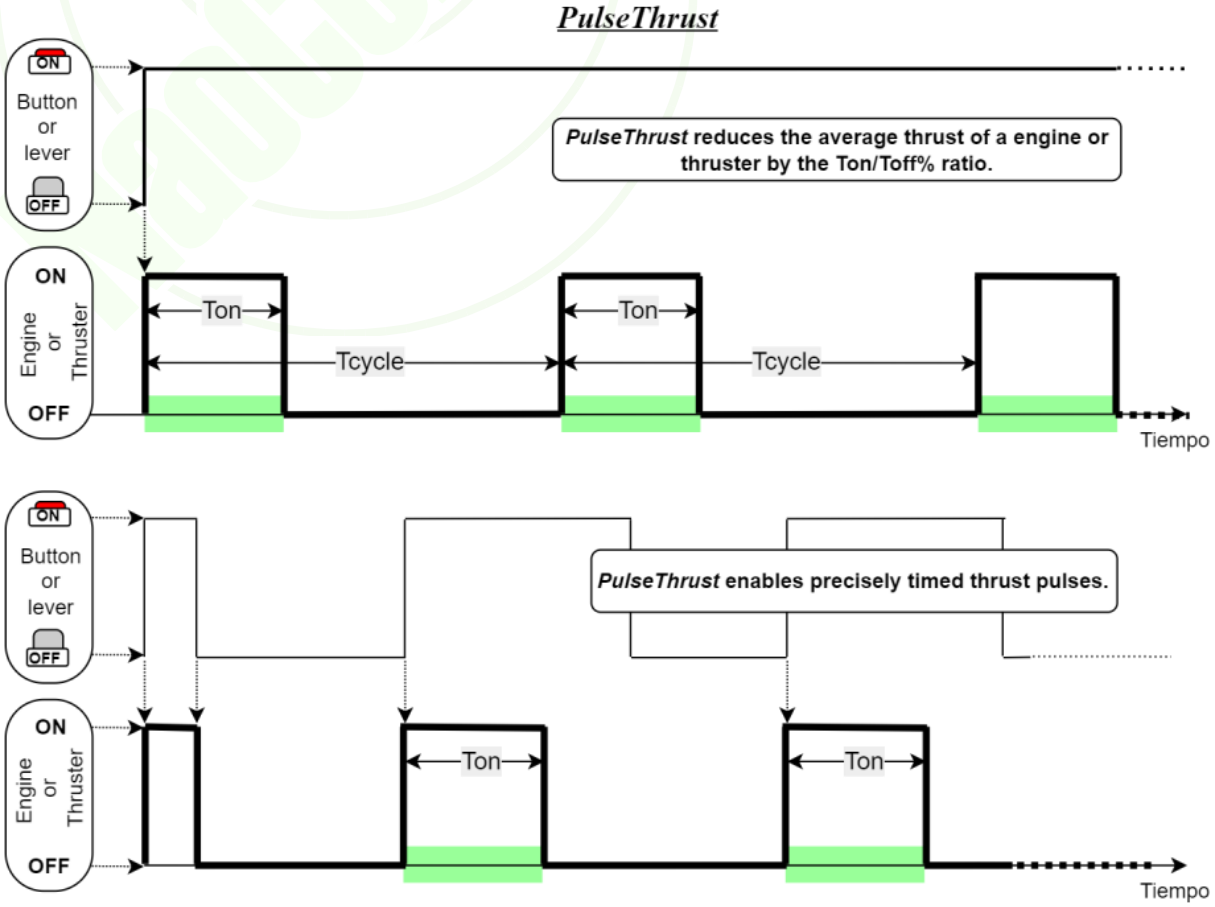
2.2.2 *PulseThrust*

PulseThrust (abbreviated as "PTH") allows the reduction of average thrust from an engine or thruster through the use of long-cycle pulse-width modulation (long-cycle PWM). It also enables the generation of thrust pulses with precise duration.

This technique is particularly useful in the following situations:

- Engines idling in gear produce excessive thrust, making it difficult to control the vessel's speed during low-speed maneuvers.
- Precise-duration engine pulses are needed.
- Reduced average thrust is required for on/off thrusters, such as to achieve parallel movement with SwayEase or to use the Hold mode with on/off control thrusters.

PulseThrust cannot be used with proportional control thrusters.



2.2.3 *WindlassGuardian*

WindlassGuardian protects the anchor windlass and the bow of the boat from the shocks and strains that can occur when raising the anchor or when reaching the end of the rode while lowering it.

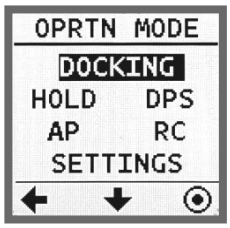
WindlassGuardian allows you to set chain counter limits for both lowering and raising the anchor, so that:

- **When raising the anchor and the limit is reached** (e.g., 1.5 m): The windlass will stop, and the remote control will display a message on the screen and notify you with a vibration. To continue raising the anchor, you must release the windlass button and press it again.

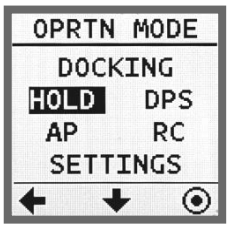
- **When lowering the anchor and the descent limit is reached**: The windlass will stop. The remote control will display a warning message and notify you with a vibration. You will not be able to continue lowering the anchor from the remote control.

The **WindlassGuardian** function requires that the chain counter feature is operational.

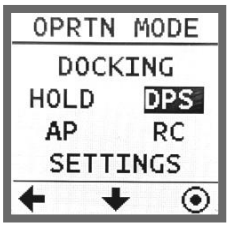
2.3 Operation Modes



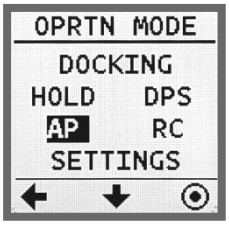
The DPS, AUTOPILOT, and RC modes will only be available if the corresponding expansion option has been installed. The HOLD mode requires proportional or PTH bow and stern thrusters.



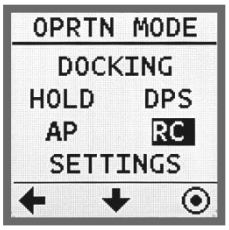
- **Docking mode**:
  - The remote starts in this mode by default. It is the appropriate mode for docking or anchoring maneuvers.
  - It allows control of the boat's propulsion using the **Joystick** and the thruster buttons:
    - Engines and thrusters control.
    - Combined maneuvers: Rotation, lateral movements**, SwayEase**.
  - It also provides control of the anchor windlass and advanced features like the WindlassGuardian system, which protects the windlass, rope, and anchor from damage.
  - Includes screens displaying:
    - Maneuver status.
    - Navigation data.
    - Chain count and anchoring scope calculator.
    - Graphic depth sounder.



- **Hold mode**:
  - Engages both thrusters at low speed with the press of a button to 'hold' the boat close to the dock.
  - The thrust of the bow and stern thrusters can be adjusted independently using the thruster control buttons.

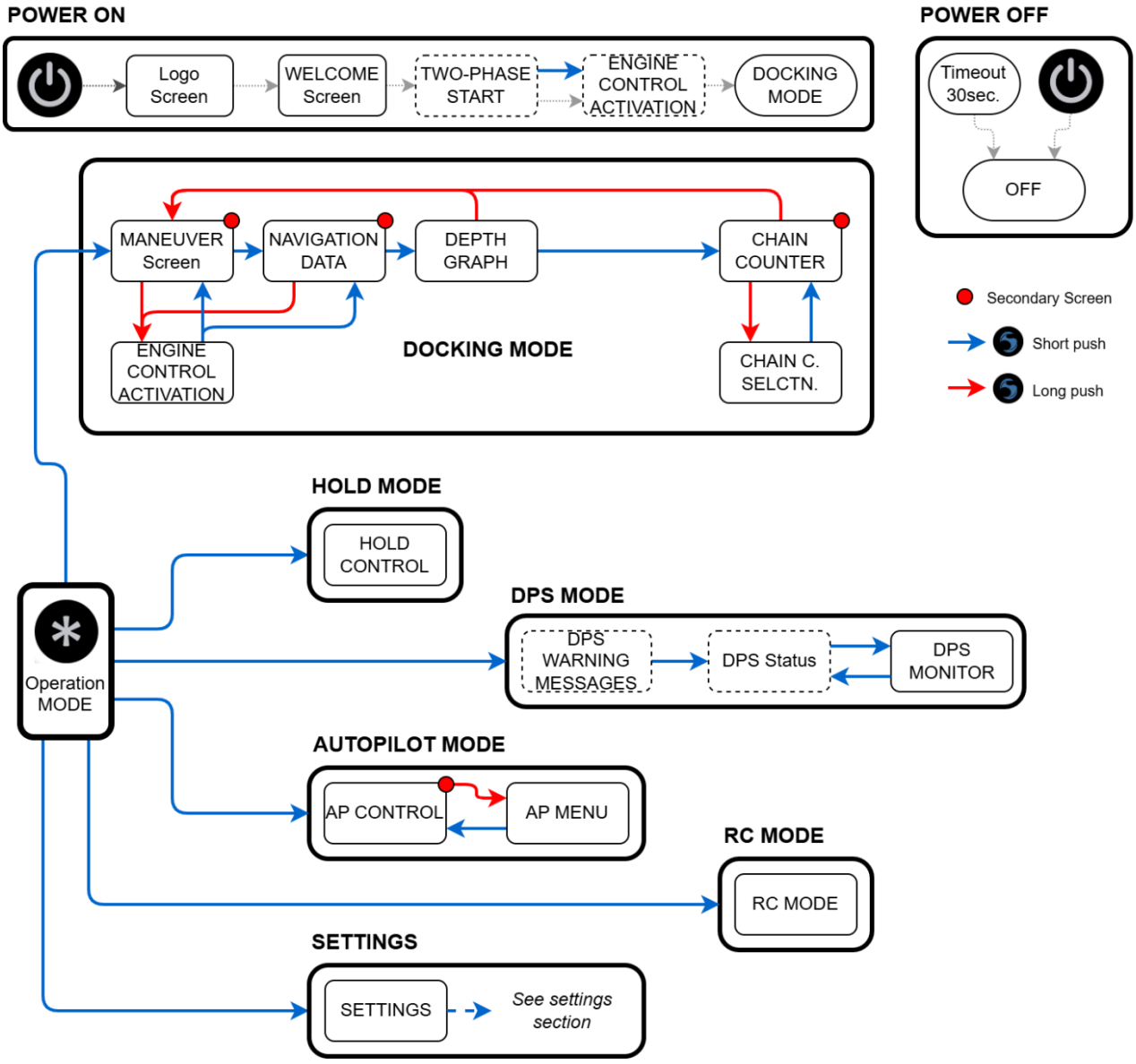


- **DPS mode**:
  - Enables/disables and monitors the status of the optional dynamic positioning module.
  - In DPS mode, propulsion control remains fully available.
- **AP (Autopilot) mode**:
  - Selecting this mode lets the remote operate a compatible autopilot system, allowing you to switch the AP status between Auto and Standby, and adjust the AP set course in increments of ±1° and ±10°.
  - While AP mode is activated, the remote's propulsion control functions are completely disabled.



- **RC (Remote control) mode**:
  - Provides access to specific screens for controlling specialized expansion modules, such as a three-axis gangway/platform controller or an engine start/stop module.
- **SETTINGS mode**:
  - Allows access to the settings menus.

The diagram below schematically illustrates the flow of menus and screens. For a flowchart of settings screens and menus, please refer to the settings section.



2.4 Boat Handling

Shipcontroller is a modular system that supports a wide variety of engine and thruster types.

In this section, we will discuss how the main propulsion systems of the ship (engines and thrusters) are controlled using the 756TG remote, and how the multiple variants of propulsion systems and their control modes are managed.

2.4.1 Boat Handling overview

The handling of the boat's propulsion is primarily managed by the engines and thrusters control buttons and levers. The availability of propulsion control and other services depends on the current operating mode.

The following table shows the availability of different controls based on the active operating mode. It is important to *remember that holding the * button for more than 1 second will deactivate any active mode, switching to Docking mode, which provides full propulsion control*.

Mode	Engine control levers and buttons	Thruster control levers	Windlass buttons	Horn and Light buttons
Docking	Engine control.	Thruster control.	Windlass control.	Horn, Light control. (Except menu screens)
Hold	Exits Hold mode.	Hold mode operation.	Windlass control.	Horn, Light control.
DPS	Engine control. DPS target is set.	Thruster control. DPS target is set.	Windlass control.	Horn, Light control. (Except DPS menu screen).
Autopilot	Disabled.	Disabled.	Disabled.	Autopilot operation.
RC	Engine control.	Thruster control.	Windlass control.	RC operation.
Settings	Engine control.	Thruster control.	Windlass control.	Menu buttons.

2.4.2 Engine control modes

Shipcontroller utilizes various interfaces to manage engine control, with capabilities that vary depending on the type of engines and, in particular, the type of electronic engine controls installed on the vessel.

In addition to basic control functionalities, **Shipcontroller** offers advanced features like PTH (PulseThrust) and proportional control, resulting in the following engine control modes:

- **SS** (Single Speed / Single Step)
  - Allows for forward and reverse engine engagement at idle RPM.
  - This is the most basic control mode, available in most setups.
- **SS+PTH** (Single Speed + *PulseThrust*).
  - Activates PTH control for engines.
  - Enables a reduced average thrust level.
  - Useful for engines with high idle thrust or when precise thrust pulses are required.
- **DS** (Dual Speed / Dual Step).
  - The engine control interface supports two distinct thrust steps: "Slow" and "Fast".
  - "Slow" typically engages the engines at idle RPM, while "Fast" slightly increases RPM for additional thrust.
- **DS+PTH** (Dual Speed + *PulseThrust*).
  - Similar to DS, but in the "Slow" step, PTH is applied to achieve reduced average engine thrust or precise thrust pulses.
- **PROP** (Proportional).
  - The engine control interface allows continuous thrust control within specified ranges. There are two variants of this control mode:
    - Stepped: The remote allows the user to adjust the thrust levels for "Slow" and "Fast", functioning like a DS system with two thrust steps.
    - Continuous: The remote allows for the adjustment of minimum and maximum thrust, with continuous control via the joystick between these values.
- **PR+PTH** (Proportional + *PulseThrust*).
  - Similar to the PROP-Stepped mode, but the "Slow" step is always set at idle rpm, with PTH applied to reduce the average engine thrust (only in the "Slow" step).

Your **Shipcontroller** system will be pre-configured at the factory with the appropriate engine mode based on your vessel's specifications. However, some adjustments may be required during installation, such as:

- Adjusting the predefined thrust levels in SS and DS systems.
- Selecting the Stepped or Continuous mode in PROP systems.
- Adjusting the Slow/Fast or Low/High thrust levels in PROP systems.
- Adjusting the Tcycle and Ton times if the PTH feature is activated.

Engine control type	SS (Single Speed)	SS + PPC	DS	DS+PPC	PROP	PROP+PPC
Controller Features:	The engine controller only allows engaging FWD and REV at idle.		The engine controller allows setting Slow-FWD, Fast-FWD, Slow-REV, and Fast-REV during system setup.		The engine controller allows adjusting thrust levels from the Shipcontroller remote menus, which can be modified by the user at any time.	
Lever FWD double click OR Fast FWD button	Engage FWD idle	Engage FWD idle	Engage FWD at install-set "Fast-FWD" speed	Engage FWD at install-set "Fast-FWD" speed	Engage FWD at user-set "Fast"speed	Engage FWD at user-set "Fast"speed
Lever FWD single click	Engage FWD idle	Engage FWD idle, applying PPC duty cycle	Engage FWD at install-set "Slow-FWD" speed	Engage FWD at install-set "Slow-FWD" speed, applying PPC duty cycle	Engage FWD at user-set "Slow"speed	Engage FWD at user-set "Slow"speed, applying PPC duty cycle
Lever idle	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Lever REV single click	Engage REV idle	Engage REV idle, applying PPC duty cycle	Engage REV at install-set "Slow-REV" speed	Engage REV at install-set "Slow-REV" speed, applying PPC duty cycle	Engage REV at user-set "Slow"speed	Engage REV at user-set "Slow"speed, applying PPC duty cycle
Lever REV double click OR Fast REV button	Engage REV idle	Engage REV idle	Engage REV at install-set "Fast-REV" speed	Engage REV at install-set "Fast-FWD" speed	Engage REV at user-set "Fast"speed	Engage REV at user-set "Fast"speed

Do not make changes to the engine control mode without prior consultation and approval from Shipcontroller technical service. An incorrect configuration change may cause the engine control to be unavailable for Shipcontroller.

2.4.3 Thruster control modes

Shipcontroller utilizes various interface adapters to manage thruster control, with different capabilities depending on the type of thrusters installed. Additionally, **Shipcontroller** offers advanced control features, such as PTH (PulseThrust) and proportional control, enhancing the system's overall flexibility.

For the simplest thrusters, which operate using an on/off mechanism, control is limited to activating thrust to port, starboard, or neutral. However, by employing the PTH feature, it is possible to control the average thrust of these thrusters.

Thrusters with proportional control allow for continuous thrust adjustment, typically ranging from 0% to 100% of maximum thrust. This makes them ideal for use with the remote's joystick, which provides smooth and continuous control.

Thruster control modes can be adjusted independently for the bow and stern, allowing different settings for each.

The available thruster control modes are:

- **SS** (Single Speed / Single Step).
  - This is the appropriate control mode for on/off thrusters.
  - Allows engaging the thrusters to port or starboard.
- **SS+PTH** (Single Speed + *PulseThrust* control).
  - Enables a reduced average thrust step for on/off thrusters.
  - Suitable for achieving a secondary level of thruster control (reduced thrust) or when precise thrust pulses of a defined duration are needed.
  - PTH settings can be configured independently for bow and stern thrusters.
- **PROP** (Proportional).
  - The thruster(s) have proportional control, allowing control generally between 0% and 100% of maximum thrust.
  - This mode generally requires an additional specific control interface in the Shipcontroller system.

Your Shipcontroller system will be factory-configured with the appropriate thruster mode for your ship's configuration. However, during installation, it may be necessary to make some adjustments. Please refer to the remote operation section and settings section for more details.

Do not modify the thruster control mode without prior consultation and approval from Shipcontroller technical service. Unauthorized configuration changes may render the thruster control inoperative.

3 Remote control operation

The remote control unit includes arrows and other symbols on or next to the buttons, assisting users in correlating their positions with their effects on the boat systems. Additionally, *many users find it helpful to align the orientation of the remote control unit with that of the vessel for easier use.*

3.1 Common operations

3.1.1 Power on/off

Power on:

- Press and hold the power button. *While holding down the power on button, you can read the name of the boat and other data, as well as the battery charge level.*
- Then release the button. *Do not touch any button or control lever until the remote has completed the startup procedure. The remote performs a test of the buttons and control levers; if any are activated, it will signal an alarm and turn off.*

Two-phase start procedure:

By default, the remote is configured for a two-phase startup.

After the first press of the power on button, the screen will prompt you to press the (SC) button to proceed. If you do not do so, the remote will turn off in a few seconds.

This feature enhances operational safety by making it difficult to accidentally turn on the remote and activate the motors or thrusters.

Power off:

To power off the remote unit, press and hold the power button until the power off screen is displayed. The remote will emit two short vibrations as confirmation.

Auto power-off function:

The unit will automatically power off after 30 seconds of inactivity if there is no radio coverage. In other words, if the base system is switched off, the remote will automatically shut down after 30 seconds of inactivity.

The system will also initiate an automatic shutdown if the two-phase startup procedure fails, or in the event of a critical system fault.

3.1.2 Verifying system status and radio coverage

After starting the remote unit and during its operation, **users should monitor the red-green bicolor LED**, as well as vibration signals. For a comprehensive understanding of warning signals, please refer to Section 2.1.

⚠ The loss or interruption of the radio link (resulting from the remote or base unit being switched off, due to loss of coverage, breakdown, or other cause) implies that:

- *None of the remote control or telemetry functions will be available.*
- *All the controlled systems will immediately be restored to their neutral/idle position.*
- *Immediate action is required to regain control of the ship.*

3.1.3 Navigating through menus and screens

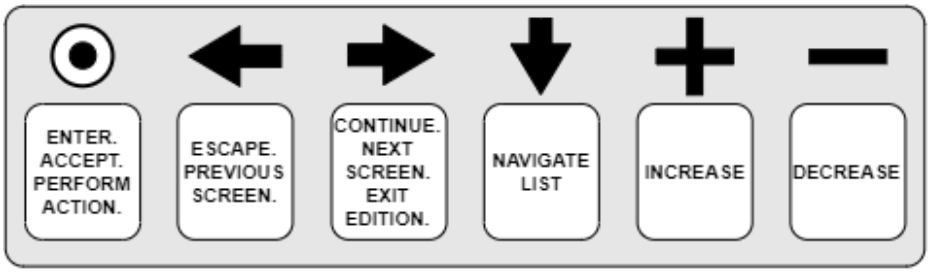
To navigate through the screens and menus of the remote, activate different operating modes, and access the system configuration menus, we will use the (*) button, the (SC) button, and the Horn and Light buttons, which have dual functions:

- As operation buttons, to control the horn and deck lights.
- As menu buttons, where they perform the function indicated on the remote screen. (See the figures).

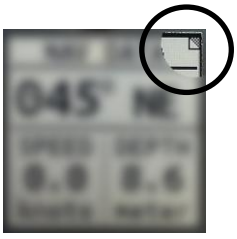
The (SC) button is always a menu button. Its function will usually be indicated on the bottom line of the screen, in the center. When the screen does not display any icon for the (SC) button, its default function will be to access the next screen.

These are the buttons on the remote that can perform menu operations (change screens, select menu options, change settings values, etc.). None of them can directly activate any of the ship's thrusters:

The figure below shows the icons that may appear on the remote's menu screens. ***Hereafter in this document, we may refer to these buttons as: (Enter), (Esc), (Next), (Nav), (+) or (-).***



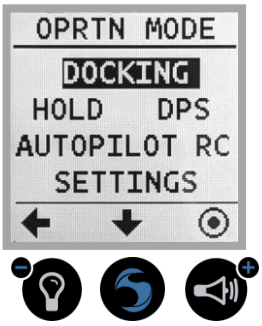
Secondary screens:



Some screens feature a symbol in the upper right corner indicating the presence of a secondary screen.

To access the secondary action screen, **press and hold the (SC)** button until the secondary screen appears.

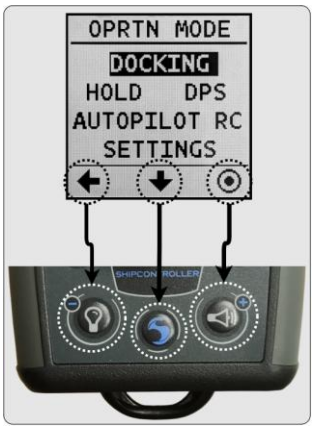
3.1.4 Operating mode selection



The mode selection screen is accessed by pressing the (*) button. If any mode is unavailable, it will appear grayed out. Upon startup, the remote defaults to the Docking mode.

To change the operation mode:

- Press briefly the (*) button (less than 1 second) to activate the operation mode screen.
- Use the ⇩ button to highlight a mode from the list.
- Push ⦿ to activate the highlighted mode.



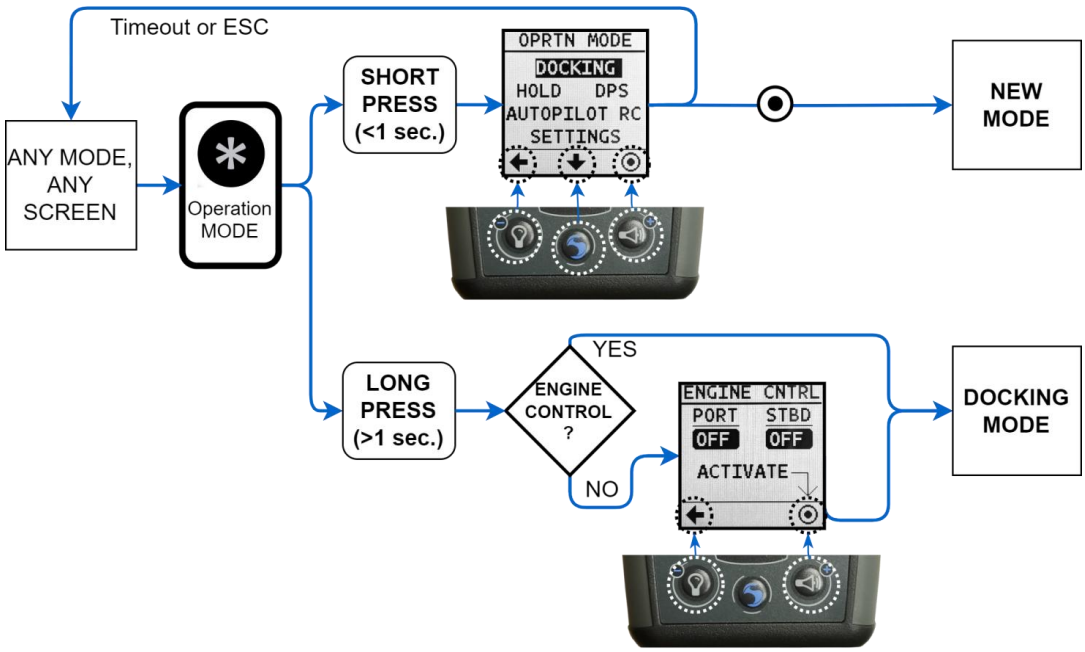
To deactivate the current mode and return to DOCKING mode:

- ***Press and hold the (*) button for more than 1 second, then release the button***.
  - If the engine control needs to be activated, the engine control activation screen will automatically be displayed.

Note:

- Unavailable modes will be grayed out and cannot be selected.
- The operation mode selection screen will disappear:
  - Automatically after 2 seconds, if no key has been pressed.
  - Upon activating a mode.
  - By pressing the ⇦ key.

The following figure shows the flowchart of the process for changing the operation mode:



3.1.5 Engine control activation

In certain engine control system configurations, the Shipcontroller may need to acquire engine control, effectively becoming another station within the electronic engine control system.

Indication of active engine control:

- If the remote lacks engine control, the status LED will blink green slowly. Attempting to use the engine controls will cause the remote to vibrate and display an error message.
- If engine control is available, the status LED will be continuously lit green.

How to activate the engine control:

- If engine control is unavailable upon remote startup, the engine control activation screen will automatically appear. **Push the activate button** to request engine control or the left arrow to return to the previous screen.
- **If engine control is lost**, you can access the activation screen at any time by pressing (*) for more than 1 second. The remote will reactivate Docking mode and automatically display the engine control activation screen if necessary.

You can also access this screen from the MANEUVER or DOCKING screens by pressing and holding the (SC) button.

3.1.6 Using the “Horn” and “Light” buttons

As outlined in section 2, these buttons serve two purposes:

- They function as menu buttons to perform the actions indicated on the screen. In this mode.
- They serve to activate the horn or the deck lights. In this case:
    - The "Horn" function operates as a momentary button, meaning the horn will sound only while we keep this button pressed.
    - Conversely, the "Light" function operates as a toggle switch: each press alternates the function's state between on and off.

3.1.7 Battery charging

The remote control unit is equipped with an internal rechargeable battery and wireless charging circuitry following the QI standard commonly found in mobile phones.

To charge the internal battery:

1. Turn off the remote control unit.
2. Activate the Qi wireless charger and position the remote unit on top of it, adjusting until the charging LED turns red.
3. Wait until the charging LED changes to green or blue.
4. Disconnect the charger once charging is complete

3.2 Docking Mode

Docking mode encompasses crucial monitoring and control functions designed to facilitate docking or anchoring maneuvers. This mode includes:

- The Station Selection Menu (Engine Control Activation).
- The MANEUVER screen, displaying the control status of engines and thrusters.
- The NAV DATA screen, presenting current heading, depth, and speed information.
- The DEPTH screen, featuring a depth graph.
- The wind screen, providing apparent wind data.
- The chain counter screen.
- The windlass selection and chain count reset menu.

In this mode, essential controls are active, including:

- Engine control.
- Thruster control.
- Main and secondary windlass control.
- Horn and Light control (except for menu screens).

If the **speed lock** feature for thrusters and windlasses is activated and the boat exceeds the set speed, both thrusters and windlass operations will be locked, accompanied by an error message displayed on the screen upon attempting to use them.

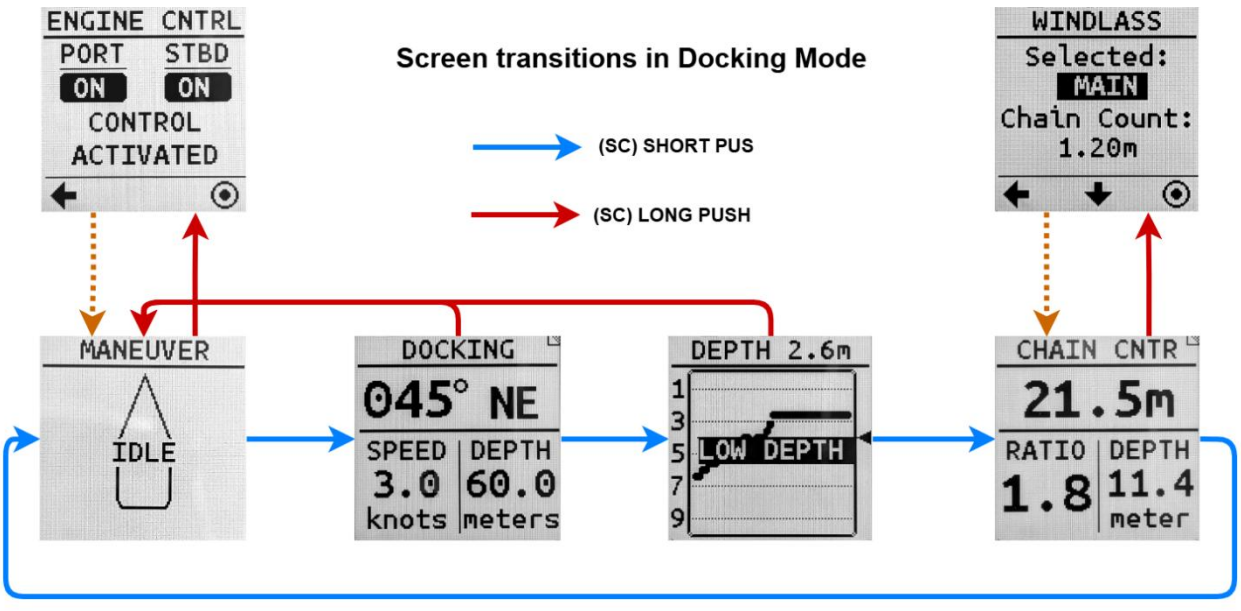
3.2.1 Entering and exiting DOCKING mode

The DOCKING mode is activated by default when the remote is started. If engine control activation is needed after starting the remote, the engine control activation menu will appear automatically.

DOCKING mode is exited when any other operating mode is activated.

3.2.2 DOCKING mode screens

The figure below shows the screen transition diagram in Docking mode, which will be described in more detail on the following pages.

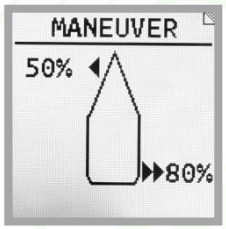


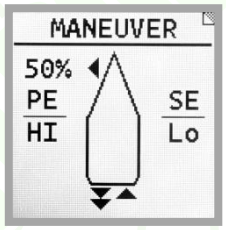
3.2.2.1 MANEUVER screen

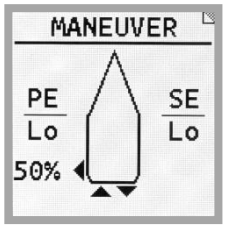
The purpose of this screen is to indicate the direction and magnitude of thrust applied by the thrusters and engines when the remote is in use.

If the "**Auto screen change**" setting is activated, this screen will automatically appear whenever you manipulate a thruster or engine control. It will then revert to the previous screen after 0.5 seconds of inactivity.

The way thrust is indicated may vary depending on the configuration of engines and thrusters. Here are some examples of maneuvering indication screens:

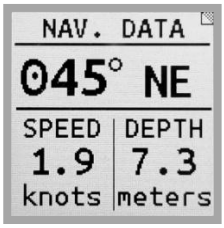






- Press and hold the (SC) button to access the ENG CNTRL action screen.
- Press the (SC) button briefly to access the next screen.

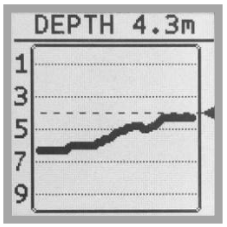
3.2.2.2 NAV DATA screen



If navigation data are available, this screen will display:

- COG (Course Over Ground) in degrees, and the matching direction of the compass rose.
- SOG (Speed Over Ground) in knots.
- Depth in meters.

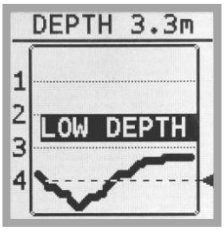
- Press and hold the (SC) button to access the ENG CNTRL action screen.
- Press the (SC) button briefly to access the next screen.
-



3.2.2.3 DEPTH PLOT screen

This screen displays a graph containing the most recent 48 depth values. The history of depth measurements is updated every second.

The vertical axis scale adjusts automatically based on the maximum and minimum depth values shown



If the depth alarm is activated, a warning message will be displayed.

- Press and hold the (SC) button to access the NAV DATA screen.
- Press the (SC) button briefly to navigate to the next screen.

3.2.3 Windlass and Chain Counter Operation

The Shipcontroller system can handle both a primary and a secondary windlass, and includes chain counter functions and special ***WinGuard*** protection features.

In this section, we will cover the following topics:

- How to use anchor hoisting and lowering maneuvers.
- Selecting primary or secondary windlass and resetting the chain counter.
- How to use the windlass control buttons to hoist and lower the anchor.
- Screens and menus related to windlass operation.
- Using the WinGuard feature to protect the windlass.

Hoisting and Lowering the Anchor

You can press the windlass control buttons to hoist or lower the anchor as long as the remote has radio coverage, except in the following cases:

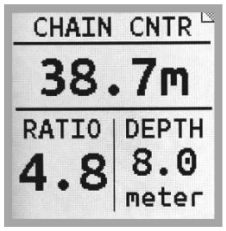
- In AP mode, windlass control is disabled (as well as all propulsion control).
- If the speed lock for windlasses and thrusters is activated, and the current speed of the boat exceeds the set limit. (A message will appear on the screen if you attempt to use the windlass).

If the automatic screen change option is enabled and the selected mode is Docking, the Chain Counter screen will automatically appear when you use the windlass buttons, and will return to the previous screen when you stop using the control buttons.

You can also press the (SC) button in Docking mode to select the Chain Counter screen.

The CHAIN CNTR screen

If navigation data telemetry is available, and the primary windlass is selected, this screen will display:



- The chain count value (in meters).
- The water depth value (in meters).
- The chain count/depth ratio. This ratio helps you determine if you have deployed enough chain to securely anchor the boat.

If the secondary windlass is selected, no chain count data will be shown. (The chain counter function is associated only with the main windlass).

Selecting primary or secondary windlass and resetting the chain counter

To perform these operations, you need to access the "WINDLASS" screen. To do this:

- From DOCKING mode, press the (SC) button repeatedly until the "CHAIN COUNTER" screen is displayed.
- Press and hold the (SC) button until the "WINDLASS" screen is displayed.

If the "Windlass memory" setting is activated, the remote will retain the latest selected windlass even after being turned off and back on again.

To choose the primary or secondary windlass:

- Use the (Nav) button to highlight the line below "SELECTED".
- Use the (Enter) button to change the active windlass.
- Press (Esc) to exit and return to the CHAIN CNTR screen.

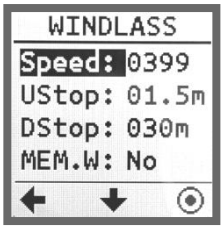
To reset the chain counter of the primary windlass:

- Use the (Nav) button to highlight the line below "CHAIN COUNT".
- Use the (Enter) button to reset the chain count.
- Press (Esc) to exit and return to the CHAIN CNTR screen.

The WindlassGuardian protection feature

(See section 2.2.3) If the automatic stop functions of **WindlassGuardian** are enabled in the remote control settings:

- The windlass will stop when raising the anchor upon reaching the set distance limit (e.g., 1.5m). The windlass will halt, and the remote control will notify you with an on-screen message and a vibration. You can continue raising the anchor by releasing and pressing the raise button again.
- When lowering the anchor, the windlass will stop if the maximum programmed length is reached. The remote control will alert you with a vibration and an on-screen message. You will not be able to continue lowering the anchor.



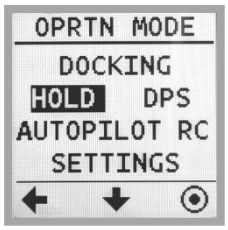
For more details on how to set the windlass adjustments, refer to the settings section.

3.2.4 Boat Handling in Docking Mode

In Docking mode, all propulsion controls (engines and thruster buttons and levers and windlass buttons) remain operational, but keep in mind:

- To control the engines, the LED status indicator must be continuously lit green.
- If the speed lock is activated and the ship's speed exceeds the set limit, the thrusters and windlass cannot be operated.

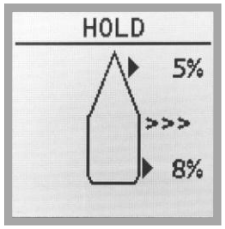
3.3 Hold mode



The HOLD function enables simultaneous activation of the bow thruster and stern thruster to the same side by simply pushing one of the thruster control levers.

HOLD mode will only be accessible if both the bow and stern thrusters have been configured to proportional or PPC mode.

3.3.1 Entering and exiting Hold mode



To enter Hold mode, follow the mode selection instructions provided in section 3.1.4; in summary:

- Press briefly the (*) button to activate the operating mode selection screen.
- Press (Nav) to highlight HOLD.
- Press the (Enter) button.

There are several ways to exit HOLD mode:

- Select a different operation mode.
- Briefly press the (SC) button to go directly to Docking mode.
- Press the (*) button to cancel any mode and return to Docking mode.

3.3.2 Hold mode operation

This function is particularly suited for use with proportional thrusters, as it allows for the activation of both thrusters with a gentle push, and enables the adjustment of each thruster's thrust directly from the remote, as needed.

- **To engage both thrusters** to one side: simply push either the bow thruster lever or the stern thruster lever in the desired direction.
- **To disengage both thrusters**: move either the bow thruster lever or the stern thruster lever to the opposite side.
- **To increase the power of a thruster**: push the lever of the thruster you wish to increase the power of; each push on the lever will increment the power by 2%.

The initial activation power value for each thruster is determined by the settings in the "Hold Thrust" parameters menu (Refer to settings sections 4.3.2.3 and 4.3.2.4).

Using the HOLD mode with on/off type thrusters that can only be activated at 100% power may not be suitable. In such cases, it is recommended to try PTH mode. If the result remains unsatisfactory or uncomfortable, it is advisable not to use the Hold function.

Hold mode is not available if there is only one thruster, or if any thruster is configured in On/Off control mode.

The HOLD function has a timeout of 600 seconds, with a warning displayed on the screen after 550 seconds.

3.3.3 Boat Handling in Hold mode

In Hold mode, all propulsion controls (Engine levers, thruster levers and windlass buttons) remain operational, but keep in mind:

- The thruster levers are used to control the Hold mode.

3.4 DPS mode

Shipcontroller DPS (Dynamic Positioning System) is an automated control system designed to maintain the ship's position and heading stable within estimated error. The DPS system is optional and may or may not be included in your Shipcontroller system.

Key components of the Shipcontroller DPS include:

- **NRU (Navigation Reference Unit)**: This unit comprises a GNSS receiver with a heading sensor and attitude sensors. It gathers the ship's position, orientation, and attitude data, which are crucial for the DPS system.
- **DPS Processor Unit**: Responsible for comparing the ship's actual position and heading with the reference position and heading. Based on this comparison, the processor calculates the necessary maneuvers using the ship's thrusters and engines to correct the ship's position and try to maintain it within the set parameters.
- **Shipcontroller Control System**: This system facilitates interaction with the ship's propulsion systems, enabling control and adjustments as needed.

To ensure the safety and optimal performance of the **DPS** system, it is essential to carefully read, acknowledge, and follow the warnings and recommendations outlined in this document:

- **Safety Warnings:** Read and follow the safety notices provided below. Always ensure that the area around the vessel is clear before activating the DPS to avoid collisions.
- **Regular Maintenance:** Perform regular maintenance on **DPS** components, such as the **NRU** and Processing Unit, to ensure proper operation.
- **Periodic Testing:** Conduct periodic tests of the **DPS** system under controlled conditions to verify that it is functioning correctly.
- **Weather Conditions:** Consider the weather conditions before using the **DPS**, as adverse conditions may affect its performance.
- **Manual Intervention:** Be prepared to manually intervene if the **DPS** system fails to maintain the desired position or heading.

By following these recommendations, you will maximize the effectiveness and safety of the **DPS** system on your vessel.

DPS WARNINGS:

Once activated, the Shipcontroller's DPS system may engage the thrusters or engines at any time. Keep a constant eye on the boat's position and heading, and make sure there are no people or things near the boat, and especially near the propellers or thrusters.

The DPS system's capability to accurately maintain position and heading is primarily constrained by the power output of the engines and thrusters available to the DPS system, as well as by the precision and accuracy of the NRU reference system.

Boat is considered underway.

Keep proper lookout.

Stay out of water, propellers are spinning.

Hold on to prevent falling, boat can move suddenly.

Read owner´s manual for safe use of the system.

There are circumstances that will prevent the DPS system from working properly:

- *Strong winds, waves and/or currents that cause a drift that cannot be corrected with the power available to the DPS control system.*
- *Inability of the thrusters or engines to operate continuously, in case of high demand by the DPS system. (For example, electric thrusters with limited battery capacity that cannot run for more than a few minutes continuously.)*
- *Failure of the GNSS satellite system, poor coverage of the GNSS signal, or loss of data quality (high PDOP, HDOP values).*

3.4.1 Entering and exiting DPS Mode.

If a Shipcontroller DPS module is installed, the DPS option will be selectable on the operating mode selection screen. To enter DPS mode, follow the mode selection instructions provided in section 3.1.4; in summary:

- Press briefly the (*) button to activate the operating mode selection screen.
- Press (Nav) to highlight DPS.
- Press the (Enter) button.

There are several ways to exit DPS mode:

- Select a different operation mode.
- Press the (*) button for more than 1 second to cancel any mode and return to Docking mode.
- Manually deactivating the DPS in the DPS operation menu. (See next section).

After turning on the remote, the first time you enter DPS mode, warning messages will be displayed on the screen. These messages will not be shown in subsequent activations of the DPS system.

3.4.2 DPS Operation

3.4.2.1 DPS Activation

The DPS system will activate when you enable DPS mode on the remote, provided the necessary conditions for DPS operation are met:

- The remote has radio coverage.
- The engine control is active.
- There is a stable and reliable GNSS position and heading data.
- The boat's speed is not excessive.

When the NRU is turned on, it may take some time to acquire position and heading. Turn on the NRU unit in advance to ensure DPS is ready when needed.

The DPS system will use the position and heading at activation as references to maintain the boat's selected position and heading.

3.4.2.2 DPS Deactivation

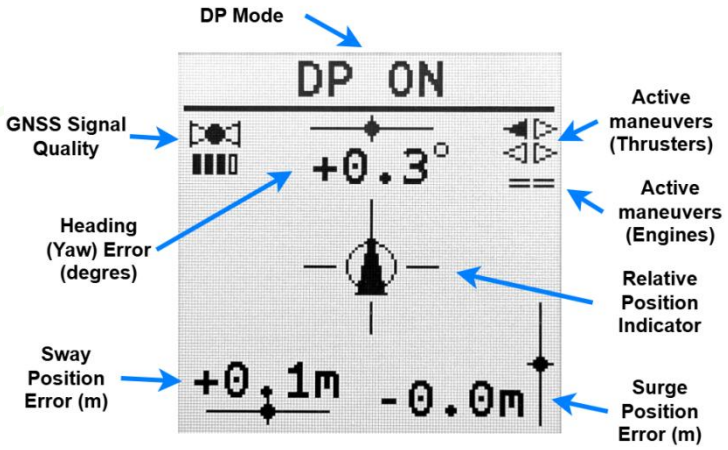
The DPS system can be deactivated in the following ways:

- **Manually:**
  - Using the DPS control menu.
  - Selecting a different operation mode.
  - Pressing the (*) button for more than 1 second to go to Docking mode.
  - Switching off the DPS system or the whole Shipcontroller system.
- **Temporarily**, if you use the propulsion controls from the remote (Engines or thruster controls).
  - When you leave those controls at rest, the DPS will reactivate, taking the current position and heading as a new reference.
- **If an error condition is detected**:
  - The remote turns off or loses radio coverage.
  - Loss of engine control.
  - Loss of position and heading signal from the NRU (or low quality signal).
  - Exceeding a preset limit in the distance between the ship and the reference position.
  - Detection of a fatal error condition in the DPS system.

In cases where the DPS system is disabled due to error detection, the DPS unit will activate an audible alarm, and the remote, if available, will indicate the error on the screen. The engines and thrusters will return to its neutral status immediately.

3.4.2.3 DPS Monitor screen

The DPS Monitor screen displays real-time information about the DPS status and position and heading errors.



- A **positive sway error** indicates the setpoint is to starboard (right).
- A **positive surge error** indicates the setpoint is behind the vessel.
- A **positive heading error** indicates that the setpoint lies to the **starboard side** (right) of the vessel's bow.
- **The GNSS indicator** shows the current quality level of the satellite signal using a segmented bar graph.
- **The thrust status indicators** use triangular icons that turn black when the corresponding thruster or engine is active.

➢ Press the (SC) button briefly to go to the DPS activation screen.

The DPS activation menu allows you to enable or disable the DPS system:

➢ Press the (Next) button briefly to EXIT the DPS mode and return to Docking mode.
➢ Press the (Esc) button to return to the DPS monitor screen.
➢ Press the (Enter) button to change activate or deactivate the DPS.

3.4.3 Boat Handling in DPS mode

While DPS mode is active, all maneuvering controls are available: engine and thruster levers and buttons, windlass buttons, Horn and Light buttons (except when you are on a menu screen).

Important: When you use the propulsion controls, the DPS is temporarily deactivated and will re-establish the position and heading setpoint when you release them.

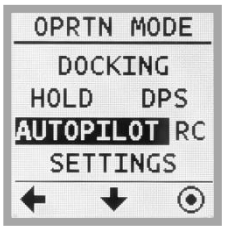
This is an important feature: For example, you can use the thrusters to change the boat's position while the DPS is active, and the DPS will automatically maintain the new position. Alternatively, you can be performing a maneuver, such as docking, and when you release the remote controls, the DPS will hold the current position.

3.5 Autopilot mode

If your Shipcontroller system incorporates an autopilot control module, you will find the AP option available on the operating mode selection screen, allowing you to activate this mode. Otherwise, this option will be grayed out and cannot be selected.

3.5.1 Entering and exiting AP Mode

To enter AP mode, follow the mode selection instructions provided in section 3.1.4; in summary:



- Press briefly the (*) button to activate the operating mode selection screen.
- Press (Nav) to highlight HOLD.
- Press the (Enter) button.

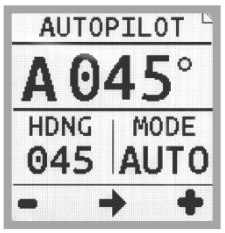
There are two ways to exit HOLD mode:

- Select a different operation mode.
- Press the (*) button for more than 1 second to cancel any mode and return to Docking mode.

3.5.2 Boat Handling in AP Mode

When AUTOPILOT mode is active, all propulsion controls on the remote will be disabled: engines levers, thruster levers and buttons, windlass control buttons, and horn and light buttons (the latter will function as menu buttons).

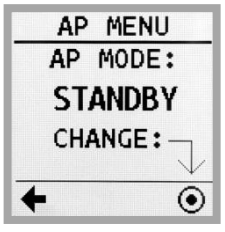
In this mode, the AUTOPILOT screen will display AP status information and allow us to execute the following commands:



- Change the AP operating mode between AUTO and STANDBY.
- If the AP is in AUTO mode, we can change the set course in increments of 1º and 10º.

The AUTOPILOT screen will display the following information:

- If the AP is in AUTO mode:
  - Autopilot course (in degrees).
  - AP heading (in degrees).
  - AP mode: AUTO.
- It the AP is in STANDBY mode:
  - Autopilot course (in degrees).
  - AP Heading (in degrees).
  - AP Mode: STBY.



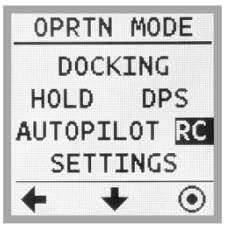
To change the autopilot set course:

- Briefly press the (+) or (-) buttons to increase or decrease the heading by 1º.
- Hold down the (+) or (-) buttons to increase or decrease the heading in 10º increments.

To change the AP operating mode:

- Press the (Next) button to access the "AP MENU" screen.
- Press the (Enter) button to change the AP operating mode.
- Press (Esc) to return to the AP control screen.

3.6 RC (Remote control) mode



The RC (Remote Control) mode will be enabled on the operation mode selection screen if a suitable expansion module is connected to the Shipcontroller system.

Three modules are currently available:

- An engine start/stop module.
- A Relay output expansion module. It allows remote control of up to 8 relay outputs.
- A three-axis gangway/platform control module.

This manual includes the usage instructions for the gangway or platform control expansion module. For other modules, please refer to the manual that comes with the product.

3.6.1 Entering and exiting RC Mode

To enter RC mode, follow the mode selection instructions provided in section 3.1.4; in summary:

- Press briefly the (*) button to activate the operating mode selection screen.
- Press (Nav) to highlight RC.
- Press the (Enter) button.

There are two ways to exit RC mode:

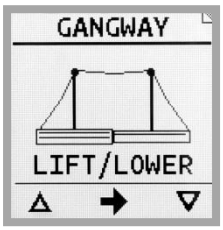
- Select a different operation mode.
- Press the (*) button for more than 1 second to cancel any mode and return to Docking mode.

3.6.2 Gangway/Platform control

It is very important to maintain direct visual contact with the platform or gangway while performing maneuvers. The remote will display a warning message each time you enter RC mode for gangway control.

To operate the gangway or platform:

- Watch the gangway/platform area
- Select the axis you want to control (up/down, extend/retract, rotate) by pressing the (Next) button.
- Use the Horn and Light buttons (+/-) as indicated on the screen to perform the corresponding movements.



3.6.3 Boat Handling in RC Mode

In RC mode, all control functions of the remote remain active, except for the Horn and Light buttons, which will be used to activate the gangway or platform operations.

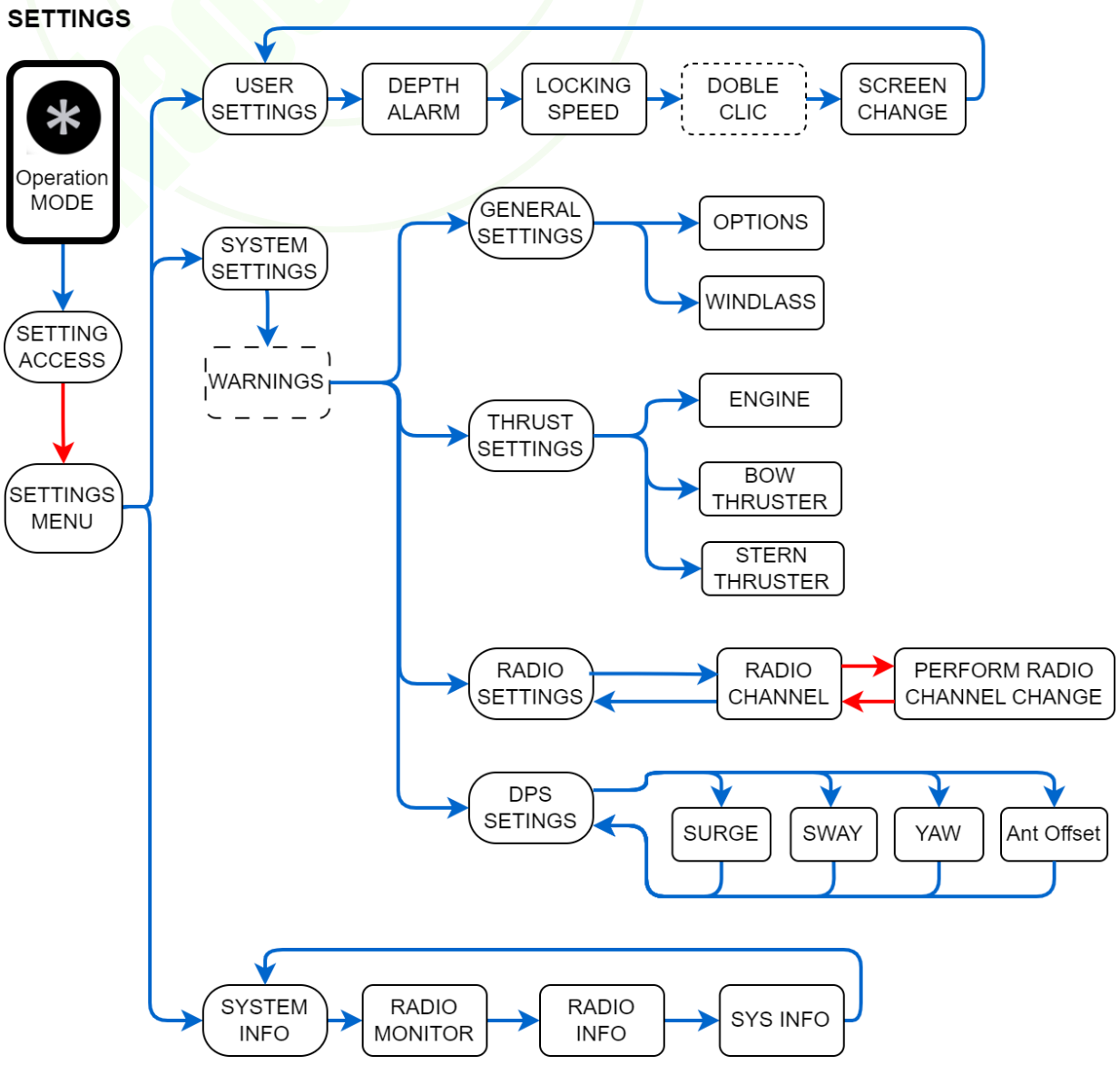
4 Remote unit settings

The settings of this unit are organized in three blocks:

- User Settings:
  - They include the settings that the user may need to access frequently, such as the depth alarm, the speed lock, and other non-critical settings.
- System settings:
  - This block incorporates propulsion control adjustments and other critical system settings.
  - Typically, access to these settings is reserved for trained technical personnel and is primarily utilized during the installation of the Shipcontroller system to configure and customize it according to the vessel's specifications.
- System information:
  - This section allows users to review usage information, radio coverage status, and other relevant system data.

Settings persistence:

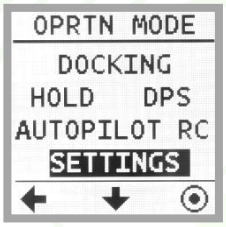
Any changes to the settings will automatically be saved into the internal permanent memory.

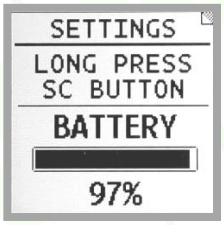


4.1 Entering settings

To access the settings menu and navigate through it, follow these steps:

1. Briefly press the operation mode selection button (*) to activate the operation mode menu.
2. Briefly press the (Nav) button to highlight the SETTINGS option.
3. Briefly press the ⦿ (Enter) button to show the settings access screen.
4. Hold down the (SC) button until the main settings menu appears.





4.2 User settings

From the main settings menu, select and activate the USER option to go to the first user setting:

4.2.1 Depth alarm

On this screen, you can adjust the triggering depth value for the depth alarm.

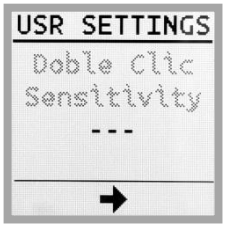
- Use the (+) or (-) buttons to increase or decrease the alarm depth value.
- To disable the depth alarm, set the alarm level to 0.
- Press the (Next) button to navigate to the next user settings screen.

4.2.2 Thruster and windlass locking speed

On this screen, you can adjust the speed of the boat at which the use of thrusters and windlasses will be disabled for use from the remote control unit.

- Use the (+) or (-) buttons to adjust the locking speed.
- To disable this feature, set the speed to 0.
- Press the (Next) button to move to the next user settings screen.

4.2.3 *Doble Clic* sensitivity



This setting is reserved for future use and currently not available for configuration.

- Press the (Next) button to access the next user settings screen.

4.2.4 Auto screen change

This setting allows you to enable or disable the automatic screen switching feature:

- Use the (+) or (-) buttons to enable/disable this option.
- Press the (Next) button to return to the main settings menu.

If automatic screen change is enabled:

- When you activate an engine or thruster control, the MANEUVER screen will automatically activate, allowing you to monitor the maneuver execution. It will return to the previous screen when the controls become inactive.
- When you operate a windlass control button, the screen will automatically switch to the CHAIN COUNTER mode. It will return to the previous screen when the windlass controls become inactive.

4.3 System Settings

Changes in SYSTEM settings should only be performed by properly trained and qualified technical personnel. Errors or incorrect settings may lead to inappropriate behavior of the ship's propulsion or maneuvering systems.

After making changes to system settings, always verify the operation of all systems managed by Shipcontroller. It's important to carefully read the instructions and safety warnings provided in this manual, as well as any warnings displayed on the SCR756 unit when accessing system settings.

Warning messages:

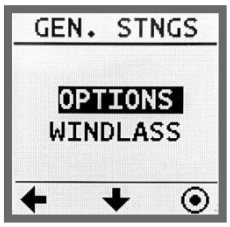
Upon entering the system settings for the first time after powering on the unit, warning messages will be displayed. Acknowledge these messages by pressing the (->) button until you enter the main system settings menu.

4.3.1 General settings

This menu gives access to the regional options configuration and windlass configuration menus.

4.3.1.1 Options

- Language: select ESP (Spanish) or ENG (English).
- PWR ON: choose the remote starting mode:
  - Norm: Normal. The remote starts after briefly pressing the power button.
  - Safe: two-phase start. After pushing the power button, the user must push the (SC) button.
- UNITS: select Ft (feet) or Meter.



4.3.1.2 Windlass settings

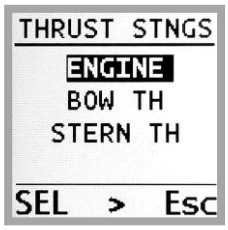
The windlass configuration screen includes the following options:

- **Speed**: Ratio of mm/turn of the reel winch. You should set this value to the middle circumference of the anchor windlass capstan. It may require testing and readjustment for accuracy.
- **UStop**: Anchor length for automatic stop when you are raising the anchor. The remote will vibrate and display a warning message on the screen. To continue raising the anchor you must release the button and press it again. This feature can be disabled by setting this parameter to zero.
- **DStop**: Maximum rope length. When the chain counter reaches this value, the windlass will stops to prevent bumps and jerks if the end of the rope is reached. Set to zero to disable.
- **MEM.W**: memorize the selected windlass. The remote will save the latest used windlass so that when you turn on the remote again the same windlass is selected.

- Press the (Nav) button to select a menu option.
- Press the (Enter) button to enter edition mode.
- Use the (+) and (-) buttons to change the parameter value.
- Press (Next) to exit edition mode.
- Press the (Esc) button to return to the previous menu.

4.4 Thrust settings

This screen will show the following options: ENGINE, BOW TH, STERN TH and ROTATION.



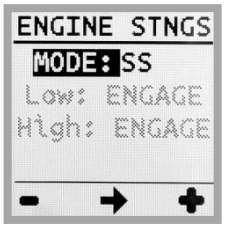
- Press the (SEL) button to select a menu option.
- Press the (>) button to enter the selected option.
- Press the (Esc) button to return to the previous menu.

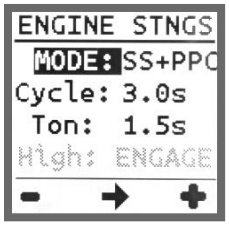
The SwayEase option will only be available if there is only one a bow thruster and two engines.

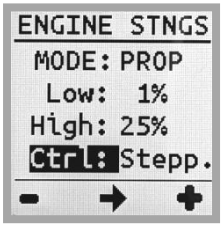
4.4.1 Engine thrust settings

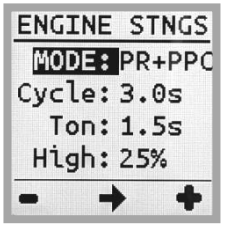
This screen allows us to adjust the engine control mode, engine thrust settings, and the PTH control mode. These adjustments are essential.

- Press the (Nav) button to select a menu option.
- Press the (Enter) button to enter edition mode.
- Use the (+) and (-) buttons to change the parameter value.
- Press (Next) to exit edition mode.
- Press the (Esc) button to return to the previous menu.









4.4.2 Thrusters settings

Thanks to the DobleClic technology, we have two levels of thrust on the remote when we use the levers or control buttons of the thrusters. We will refer to these two thrust levels for the thrusters as "Low" and "High".

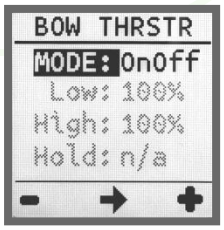
The thruster settings screens allow us to:

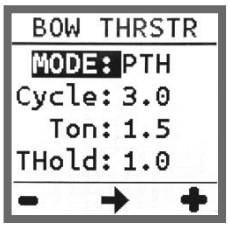
- Set the configuration of the thrusters independently for bow and stern:
  - Thruster control mode.
  - Activation of PTH control for on/off thrusters.
  - Choose the “Low”, “High” and “Hold” thrust levels for proportional thrusters (in %).
- Set the thrust balance of the bow and stern thrusters in case of two proportional thrusters.
- Set the initial thrust level for the joystick, in case of proportional control.

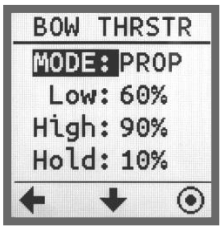
4.4.2.1 Bow / Stern thruster settings

To set the various parameters relating to the thruster control modes, do the following:

- Press (Nav) to highlight the parameter you want to change.
- Pres (Enter) to enter edition mode.
- Use the (+) and (-) buttons to change the parameter value.
- Press (Next) to exit parameter edition mode.
- Repeat the previous steps until you are finished.







4.5 Radio settings

This settings screen allows you to change the primary radio channel utilized by the Shipcontroller system. Adjusting the radio channel can be particularly beneficial in the rare instances of encountering strong interfering signals within the 2.4GHz frequency band.

While such interference is uncommon, should you experience this issue, we advise reaching out to the technical support team of your Shipcontroller distributor. They can assist in analyzing the situation and selecting an optimal channel to ensure reliable system performance.

To ensure a seamless change of the radio channel used by the remote control system, follow the steps below closely. This adjustment is crucial for maintaining optimal connectivity, especially in environments with potential signal interference.

1. **Positioning:** Begin the procedure with the remote located within 5 meters of the base transponder to ensure a strong connection.
2. **Access the Channel Change Screen:** Navigate through the system menu to find the screen dedicated to changing the radio channel.
3. **Selecting a New Channel:** Use the (+) or (-) buttons to browse through the available channels. Upon selecting a new channel, the remote will temporarily lose its connection to the base, indicated by a red LED signaling the disconnection.
4. **Initiate Channel Change:** To commence the channel change process, press and hold the (SC) button until the procedure starts.
5. **Completing the Change:** Patiently wait for the channel change procedure to fully complete. This step is crucial for ensuring the new channel is correctly set.
6. **Exiting:** After the change is finalized, exit the channel change screen by briefly pressing the (SC) button again.

If the channel change fails and the remote can't connect to the base, just repeat the procedure to fix the issue.

4.6 DPS Settings

If your Shipcontroller system is equipped with an active DPS module, a **"DPS"** option will appear in the system settings menu. If the DPS system is absent or turned off, its settings will not be accessible.

The **DPS system** is factory-calibrated for easy installation and immediate use. However, since every boat has unique hull and propulsion characteristics, a customized adjustment is essential for optimal performance.

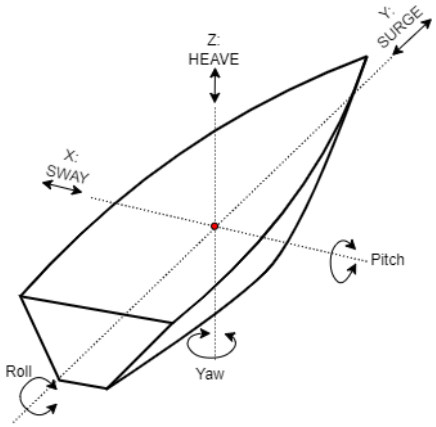
A critical component of the DPS system is the **smart antenna**, which provides precise position and heading data.

It is important to note that the ship's existing position and course receivers are likely **less accurate** than the DPS system's smart antenna. Therefore, they should not be relied upon as precise indicators of positional stability.

For best results, the **antenna should be mounted along the central bow/stern axis**, ideally near the boat's **center of rotation**. If installing the antenna in the optimal location is not possible, the system includes adjustments to compensate for positioning deviations.

DPS adjustments should be carried out by trained and authorized personnel only. Incorrect settings may lead to improper functioning of the DPS system.

Key Considerations for DPS Setup:



- Ensure that the **Shipcontroller system** (excluding DPS) is fully operational and correctly calibrated before making DPS adjustments.
- Conduct DPS adjustments in **clear waters**, maintaining a vigilant lookout, preferably in **light wind and current conditions**. Using a buoy or marker as a reference point is recommended.
- The ship's compass can be used as a **heading reference**, but the GNSS system may have significant errors compared to the DPS system's smart antenna. For **accurate position deviation information**, consult the Shipcontroller remote screen.
- Activating DPS does **not** disable direct control of the ship. **Thrusters and engines remain manually operable**. Manual control will temporarily disengage DPS, which will reactivate when released.
- The DPS system maintains position using the following **principles**:
  - **Engines** maintain the ship's longitudinal position (Y-axis, surge). Ensure the rudder is centered when using DPS.
  - **Thrusters** control lateral movement (X-axis, sway) and ship orientation (Z-axis, yaw).
- Be aware of **thruster and engine power limitations**. The DPS system may not maintain position in certain conditions. If manual positioning using thrusters and engines (with equivalent power) is difficult, the DPS system will likely face similar challenges.

4.6.1 DPS Adjustment Procedure

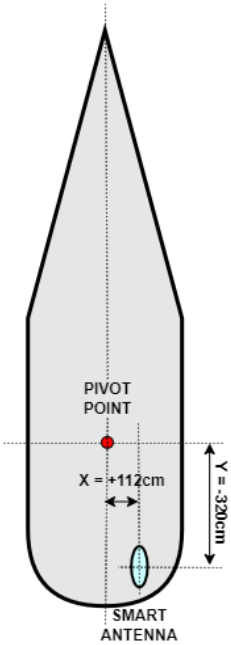
For optimal performance, follow these structured steps when adjusting the DPS system:

1. Begin with the default DPS settings for each axis to establish a baseline.
2. Perform initial adjustments in **good weather conditions**, preferably with light currents and winds.
3. Adjust the antenna offsets first (refer to section 4.6.2).
4. Adjust surge axis settings (refer to section 4.6.3).
5. Adjust sway and yaw settings (4.6.4)
6. Adjust parameters iteratively while monitoring the ship's behavior in real-time.

4.6.2 Antenna Offset

For optimal DPS accuracy, the Shipcontroller **smart antenna** should be positioned as close as possible to the vessel's **pivot point** (center of rotation). If this is not possible, the **X and Y offsets** of the antenna relative to the pivot point must be entered.

The pivot point can be determined experimentally: activate the **bow thruster at 100% to starboard** and the **stern thruster at 100% to port**; the position that remains most stationary along the vessel's axis is the approximate pivot point.

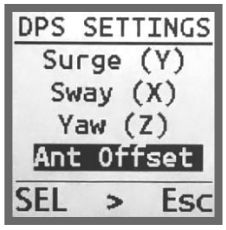


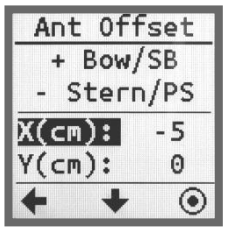
Antenna offsets are measured in **centimeters**, with the following conventions:

- If the antenna is positioned **forward** of the pivot point, the **X offset is positive**.
- If the antenna is positioned **aft** of the pivot point, the **X offset is negative**.
- If the antenna is positioned **to starboard**, the **Y offset is positive**.
- If the antenna is positioned **to port**, the **Y offset is negative**.

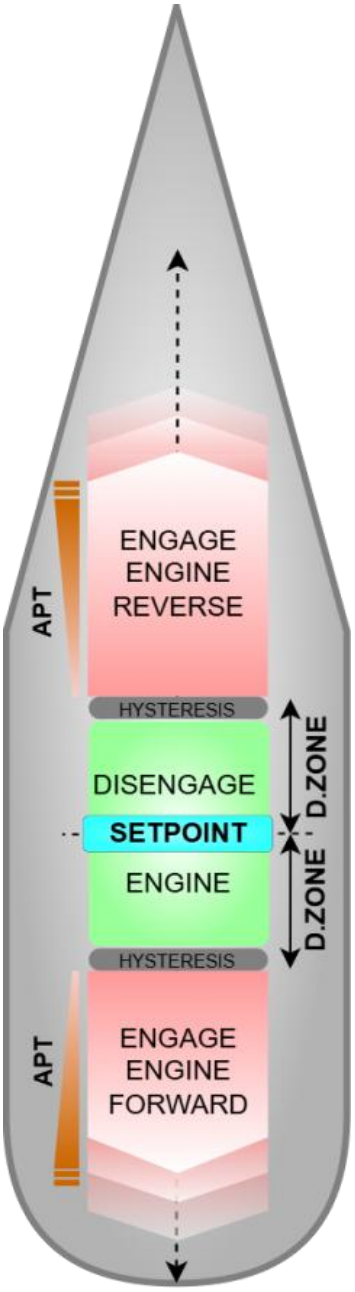
Adjusting Antenna Offsets:

1. Navigate to **Settings -> System -> DPS settings**.
2. Select **Ant. Offset** using **(Nav)** and press **(Enter)**.
3. Select **X(cm)** and press **(Enter)** to modify the value.
4. Use **(+)** and **(-)** to adjust the offset.
5. Press **(Next)** to confirm and exit edit mode.
6. Repeat the process for **Y(cm)**.





4.6.3 Surge Axis Settings

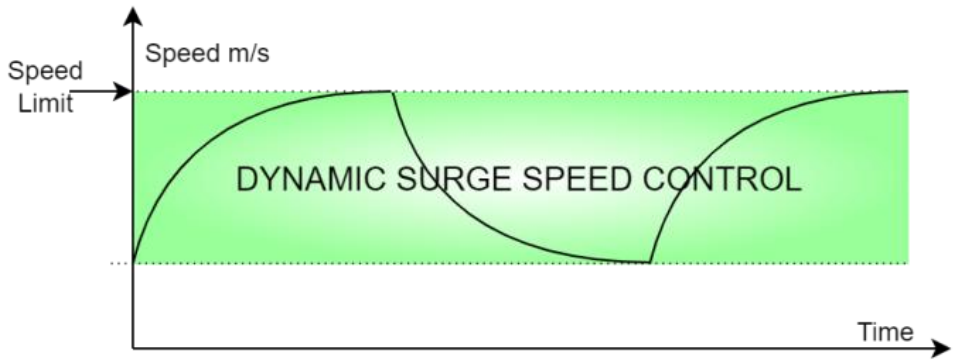


Version 4.3 of the Shipcontroller DPS system introduces an enhanced predictive control algorithm for the Surge axis (Y-axis), incorporating:

- **Anticipatory logic** to evaluate position and motion trends before activating engines.
- **Velocity-based gating** to prevent thrust activation when the vessel is already correcting itself at high speed.
- **Adaptive Pulse Thrust modulation (APT)**, where thrust is applied in short impulses with a duration **proportional to the distance from the setpoint**, allowing smooth and progressive convergence.
- **Adaptive braking**, which disables pulse modulation and applies continuous thrust when the vessel is **moving away from the setpoint**, ensuring rapid recovery and effective stopping action.

The following parameters can be adjusted to tailor the behavior of the Surge axis:

- **Dead Zone (D.ZONE):** Defines the minimum distance from the setpoint required to allow engine activation. A hysteresis factor ensures deactivation occurs at a slightly smaller distance.
  - **Minimum value:** 30 cm
  - **Maximum value:** 250 cm
- **Speed Limit:** Limits the maximum speed the vessel can reach during positioning correction. This helps manage inertia and prevents the system from needing to reverse thrust immediately after a correction.
  - **Minimum value:** 1%
  - **Maximum value:** 100%
- **APT Activation:** Enables or disables the **Adaptive Pulse Thrust Control** function. This option can be configured by the installer depending on the vessel's inertia and propulsion response.
  - **Minimum value:** Off / Disabled
  - **Maximum value:** On / Enabled



Tips for Adjusting the Surge Axis:

- **Environmental conditions affect the DPS response.** In calm conditions, a well-tuned DPS system will result in fewer engine activations. As wind and current increase, the DPS will adjust by increasing the frequency of engine activations.

- **For higher positioning accuracy, reduce D.ZONE.** However, this will cause more frequent engine activations. Conversely, **increasing D.ZONE** allows for greater position error but reduces activation frequency.

- **It is normal** for the engines to engage periodically if the vessel is affected by wind or current along the Surge axis, as they work to maintain position.

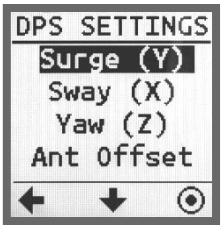
- **If the vessel oscillates back and forth** (engines activate for a correction but overshoot the setpoint, requiring reverse thrust), **decrease SPEED LIMIT.** This is especially important when environmental conditions are stable.

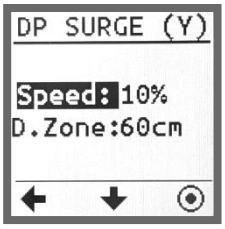
- **If the engines deactivate and reactivate before reaching the stop zone,** increase SPEED LIMIT.

- Summary**:**
    - Vessel **oscillates forward and backward:** Decrease **Speed Limit**, Increase **D.Zone**.
    - Vessel **requires multiple thrust activations to reach the stop zone:** Increase **Speed Limit**.

Adjusting Surge Settings:

1. Navigate to **Settings -> System -> DPS settings**.
2. Select **Surge (Y-axis)** using **(Nav)** and press **(Enter)**.
3. Select **D.ZONE** and press **(Enter)** to modify the value.
4. Use **(+)** and **(-)** to adjust.
5. Press **(Next)** to confirm.
6. Repeat the process for **Speed Limit**.





4.6.4 Sway and Yaw Axis Settings

With Shipcontroller DPS, the Sway and Yaw axes are controlled exclusively by the thrusters in configurations that include both bow and stern thrusters. Thruster power is used to maintain the vessel's lateral position and heading.

To accommodate different thruster characteristics and vessel dynamics, specific adjustments are available for these axes. The **Sway (X-axis)** controls lateral movement, while the **Yaw (Z-axis)** manages ship orientation. These axes are adjusted using:

- **Gain:** Controls the level of thrust applied to correct position deviations.
  - Maximum value: **100**
  - Minimum value: **1**
- **Damp:** Helps reduce oscillations around the reference position.
  - Maximum value: **250**
  - Minimum value: **1**

Tips for Adjusting Gain and Damp Values

- **Default settings** are generally a good starting point.
- **Adjust the Sway axis first**, then fine-tune the Yaw axis.
- **Start with low Gain and Damp values.** This will likely result in a higher lateral position or heading error, meaning the thrusters will only activate when the position error is significant.
- **Gradually increase Gain** until the desired lateral position or heading accuracy is achieved.
- **Sway and Yaw require iterative adjustments:** After adjusting Sway, fine-tune Yaw, then recheck Sway. Multiple iterations may be necessary.
- **General rules for Sway/Yaw axis:**
  - **If position correction is too slow**, increase Gain**.**
  - **If oscillations occur (**overshoot – position is corrected too quickly), **increase Damp.**
  - To **reduce position error** on a specific axis, or if thrust activation is delayed, **increase the gain** for that axis.
  - If **gain is too high,** causing constant toggling or oscillation around the reference position, **lower the gain**.
  - **Decreasing damping** might help the ship return to its set position faster, but too little can cause oscillations around the target position

Adjusting Sway and Yaw Settings:

1. Navigate to **Settings -> System -> DPS settings**.
2. Select **Sway (X-axis) or Yaw (Z-axis)** using **(Nav)** and press **(Enter)**.
3. Select **Gain** and press **(Enter)** to modify the value.
4. Use **(+)** and **(-)** to adjust.
5. Press **(Next)** to confirm.
6. Repeat the process for **Damp** as needed.

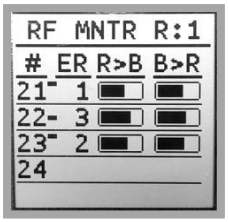
4.7 System Information

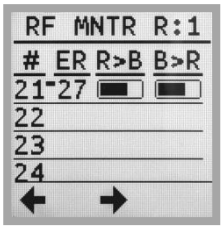
This section includes 3 informative screens:

4.7.1 Radio Monitor

This screen shows real-time radio link status and quality between the remote and base unit, with information in columns:

- **#:** Base transceiver number. Single transceiver boats have number 21. Larger setups can have up to eight, numbered sequentially.
- **Data reception indicator:** A bar next to the transceiver number moves showing CANbus data reception.
- **ER:** Error count, resetting at 99. A fast increase suggests radio coverage issues or a base transceiver fault.
- **R>B:** Relative power level (0 to 99) from the remote to the base transceiver.
- **B>R:** Relative power level (0 to 99) from the base transceiver to the remote.





- Press (Next) briefly to go to the next screen, or
- Press (Esc) to exit.

4.7.2 Radio Information

This screen provides specific details about the radio component of the system:

- **ID:** System identification. Used in conjunction with other parameters to uniquely identify the radio system.
- **SL:** Radio serial number. A unique identifier for your system.
- **MY:** Remote number. Distinguishes between multiple remotes in a system to prevent simultaneous control by two remotes.
- **PL:** Radio power level indicator. Should be set to = 4 in standard configurations.
- **CH:** Operational radio channel, represented as a hexadecimal value.

- Press (Next) briefly to navigate to the next screen, or
- Press (Esc) to exit.

4.7.3 System information

This screen shows:

- Remote serial number.
- Remote model.
- Number of times the remote has been turned on.
- Time the remote has been on

- Press (Next) briefly to go to the next screen, or
- Press (Esc) to exit.

5 Technical Information

5.1 General

Dimensions:	125mm x 79mm x 40mm
Weight:	159gr.
Operating temperature range:	0ºC ~45ºC
IP rating:	IP65

5.2 Electrical

Power source:	Internal Lithium Polymer 3.7V rechargeable battery with protective circuit.
Charging method:	Internal Qi wireless charging receiver.

5.3 Radio subsystem

Type:	Bidirectional wireless data link
RF Band:	ISM 2.4GHz
Max TX power:	10mW ERP
Modulation Technique:	DSSS + Offset QPSK
Range:	< 500m Outdoor/Line of Sight < 80m Indoor
MAC protocol	IEEE 802.15.4
Addressing:	64-bit
Data encryption:	AES, 128 bits.
Approvals:	CE (ETSI), FCC, C-TICK, IC, Telec.

6 Troubleshooting. Warning and error messages

6.1 Warning messages

Message	Meaning. *Suggested actions.*
ANOTHER REMOTE HAS CONTROL	• Another remote control has control. The Shipcontroller's concurrency control system ensures that only one remote can be active at a time. • *Power off the other remote.*
NO RADIO LINK	• The radio link between the remote and the base network cannot be established. The Shipcontroller system is off or faulty. The remote is too far from the base system. • *Check that the Shipcontroller system is powered. Check the radio coverage.*
NO ENGINE CONTROL	• You do not get engine control when you try to use the engine buttons or levers. • *Check the status of the ship's electronic control system. Check the engine control activation procedure for Shipcontroller.*
THRUSTER LOCKED BY SPEED	• The boat's speed is greater than the locking speed limit; the thruster control has been disabled on the remote. • *Decrease the boat's speed.* • *Check the locking speed setting on the remote.*
WINDLASS LOCKED BY SPEED	• The boat's speed is greater than the locking speed limit; the windlass control has been disabled on the remote. • *Decrease the boat speed.* • *Check the locking speed setting on the remote.*

6.2 Error messages

Error message	Meaning. *Suggested actions.*
BATTERY EMPTY	• The battery is empty. The remote cannot be used. • *Recharge the battery. Remember to keep the battery charged!*
RADIO MODULE ERROR	• An error in the radio subsystem has been detected. • *Power off the whole Shipcontroller system. Power off the remote. Wait 20 seconds. Power on the remote before powering on the base system.* • *Contact your service representative.*
RADIO CONFIG ERROR	• An error in the radio subsystem configuration has been detected. • *Power off the whole Shipcontroller system. Power off the remote. Wait 20 seconds. Power on the remote before powering on the base system.* • *Contact your service representative.*
PUSHBUTTON SWITCH ERROR	• There is a problem with the membrane keyboard. • *Turn off the remote control and turn it on again, taking care not to press any button or lever.* • *If the problem persists, contact the technical service.*
TOGGLE SWITCH ERROR	• There is a problem with the toggle switches. • *Turn off the remote control and turn it on again, taking care not to press any button or lever.* • *If the problem persists, contact the technical service.*
START PROCEDURE FAILED	• The two-phase power-on protocol has not been fulfilled. • *Turn on the remote control again and remember to press (SC) when prompted.* • *If you do not want to use the secure power-on protocol, change the configuration (Section 4.3.5).*

6. 3 Other issues

Symptom	Meaning. *Suggested actions.*
When turning the remote on, red and green indicators blink a few times, and then both turn off.	• **The diagnostic system has detected a fault in the remote control.** • **Contact your service representative.**
Remote control unit will not turn on.	• **Exhausted battery.** • **System Damage.** • ***Charge the battery.*** • ***Contact your service representative.***

7 Maintenance Information

EVERY YEAR:

- Inspect the wiring, connections, and components of the Shipcontroller system.

EVERY TWO YEARS:

- Thoroughly inspect the wiring and connections of the Shipcontroller system.
- Request a technical review, which involves opening the remote control and various Shipcontroller system modules to verify the tightness and good condition of connections, components, and circuit boards.
- Check the calibration of the engine control interface, especially in analog control systems.

8 Warranty Information

Naocontrol, S.L., henceforth referred to as "The Manufacturer," warrants the Shipcontroller system to be free from defects in materials and workmanship for a period of 3 years from the actual purchase date, as indicated on the purchase invoice.

Warranty Coverage:

The Warranty, at the Manufacturer's discretion, is limited to the repair or replacement of damaged components.

Exclusions from Warranty:

- Transportation costs for damaged or repaired parts.
- Costs for diagnostics, uninstallation, installation, or adjustment of the Shipcontroller system or any associated systems.
- Damage, malfunctions, or losses due to abuse, negligence, improper installation, repair, or maintenance; unauthorized alterations or modifications, errors in following manual instructions and warnings, use beyond operational ranges, or any other abnormal, excessive, or improper usage.
- Damage, malfunctions, or losses caused by accidents, natural disasters, force majeure, or water damage due to improper use.
- Damage or losses from the inability to use the product, associated systems, or the vessel where the product is installed.

Warranty Claim Procedure:

- To claim the Shipcontroller warranty, the system's identification number from the documentation or a copy of the purchase invoice is required.
- Processing the warranty through an authorized Shipcontroller installer or distributor is recommended. Alternatively, claims can be made directly with the manufacturer via email at info@shipcontroller.com for warranty assistance.

APPENDIX I: Release notes

Manual version: SCR756TG-v4.2
Firmware release: SCR75TG-v4.2

- 4.2 Firmware 4.2. New DPS screen. New DPS settings. Wind screen deprecated.
- 4.1.1 New remote name. New features.
- 4.1
  - The menu options on the screens have been replaced with icons, making navigation through the menus easier and more intuitive.
  - The procedure for activating and deactivating the remote's operation modes has been simplified.
- 3.3
  - New features have been introduced for the control of the anchor windlass, aimed at protecting both the windlass and the bow of the ship from impacts. These include:
    - Automatic stop when lifting the anchor, at an adjustable distance.
    - Automatic stop when dropping the anchor, preventing the windlass from operating further once the anchor line has reached a specified length.
  - New RC mode feature: platform/gangway control.
- 3.11
  - Important information (page 2) added.
  - Warranty information updated.
- 3.0
  - The remote's welcome screen now shows the battery charge level.
  - The DPS monitor screen shows an arrow from the center with the drift direction, when the error is greater than 75cm.
  - Added support to correct the position of the smart antenna of the DPS system. New settings: DPS Antenna Offset.
  - The DPS system activation/deactivation procedure has been simplified. DPS mode selection screen has been removed. (The DPS mode will be recorded in the DPU firmware).
  - The settings screen flowchart has changed to accommodate the new settings.

NOTES

NOTES

SHIPCONTROLLER

Scandor Agentur

shipcontroller.se | +46 8 755 52 00 | info@scandor.se