

↔ DOMETIC POWER & CONTROL ADAPTIVE TRIM TAB SYSTEM

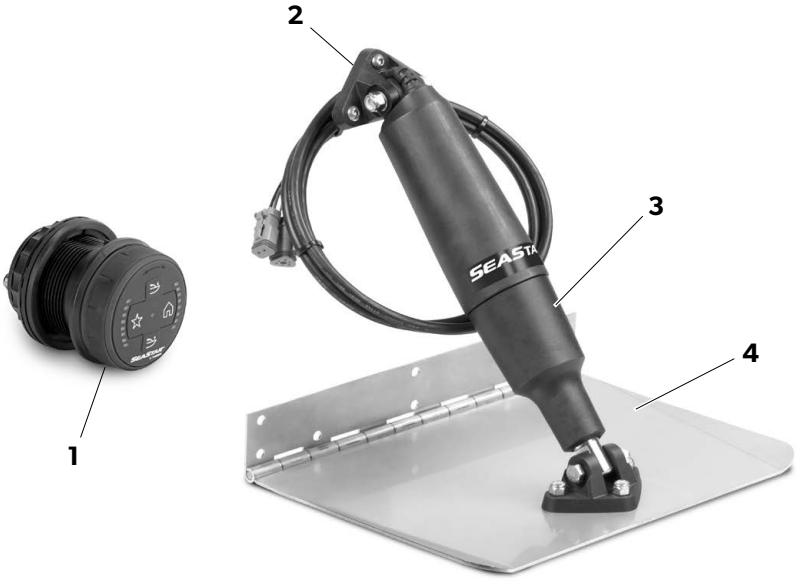


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Optimus Adaptive Trim Tab System
Adaptive Trim Tab System
Operating manual

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Please read this manually carefully before first use. Store it on your boat, or in a safe place, for future reference. If you sell your boat, hand over this manual along with it.

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1 Explanation of symbols



WARNING!

Safety instruction: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION!

Safety instruction: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.



NOTICE!

Indicates a situation that, if not avoided, can result in property damage.



NOTE

Supplementary information for operating the product.

2 General safety instructions

The manufacturer accepts no liability for damage in the following cases:

- Physical damage to the product.
- Damage due to incorrect installation or connection voltage.
- Alterations to the product.
- Use for purposes other than those described in the operating manual.

The CE declaration of conformity can be requested from the manufacturer (contact information on the back of this manual).

2.1 General safety

- Read and understand all instructions included with your system prior to use.
- Disconnect power from the actuators (with battery switches or circuit breaker) before working at the transom of the boat.
- Only use the trim tab system as intended.
- Do not use tabs as a boarding step.
- When lifting the boat, do not place the lifting straps or forks on the tabs or actuators.
- Do not push or pull on the tabs or actuators when putting the boat on or off a trailer.
- Do not tie off or secure anything to the actuators.
- See an Optimus-certified dealer for repairs if the trim tabs, actuators, or controller are modified, damaged or not working correctly.
- The controller and actuators are not user serviceable; do not attempt to disassemble.

2.2 Safe operation

- The trim tab actuators are powerful mechanical devices that can cause injury. Ensure no one is at risk of being injured before operating a tab when swimmers are in the water, or when operating the tabs on a trailer with people or children around.
- The trim tab system is not a toy. Do not allow children to operate the system.



WARNING!

Exercise sound judgment when using trim tabs in challenging sea conditions. In some cases the safest action is to run with tabs fully retracted.

3 Technical description

Your Adaptive Trim Tab System is the industry's first trim system with position feedback. This state-of-the-art system gives you immediate, precise, and repeatable control of vessel trim. With built-in intelligence, it can be integrated with Optimus Electronic Power Steering for complete vessel control. When integrated with Optimus, the system is called the Optimus Adaptive Trim Tab System.

The AdaptiveTrim Tab System consists of three primary components: the adaptive actuators, the sheet metal tabs, and the adaptive dial controller. The adaptive dial controller is unique in the industry with smart function buttons and an intuitive dial control that makes roll adjustment simple and obvious.

The system operates on 12VDC, and uses a Controller Area Network (CAN) bus for communications. The controller can control up to four trim tab actuators and precisely synchronize their movement.

3.1 System components

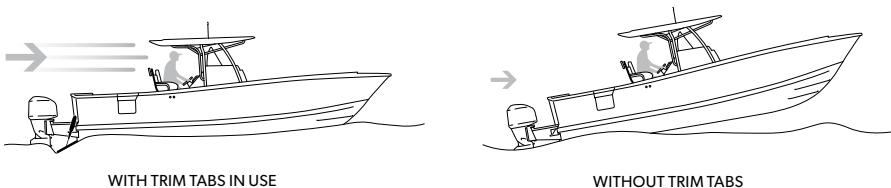
No. in fig. 1, page 1	Description
1	Adaptive Dial Controller
2	Transom bracket
3	Adaptive Actuator
4	Trim tab

3.2 Controller operating and display elements

No. in fig. 2, page 1	Description
1	☆ Favorite button
2	☉ Port tab position indicator
3	↶ Control dial
4	⤴ Bow down button
5	☉ System status indicator
6	☉ Starboard tab position indicator
7	🏠 Home button
8	⤵ Bow up button

4 Trim tab principles of operation

Trim tabs are plates, installed in pairs, used to control the pitch and roll of a boat by directing water as it flows past the transom. They work by harnessing the hydrodynamic forces exerted by moving water, so the boat must be in motion for the tabs to have an effect.



When a tab is lowered, the directed water flow will exert an upward force at the stern of the boat. If both tabs are lowered at the same time the upward force at the stern will force the bow down (pitch control). If only one tab is lowered it will force the bow down on the opposite side, causing the boat to roll (roll control). The combination of pitch and roll is the boat's attitude.

By adjusting the boat's attitude, the boat operator can get on plane faster, stay on plane at lower speeds, increase top speed, correct a small list, improve ride quality and visibility, reduce porpoising, and improve fuel economy.

5 Using the system

5.1 Basic features and operation

The dash-mounted Adaptive Dial Controller is designed for intuitive operation. The function of each interface feature is described below.

System Status Indicator

Displays the status of the trim tab system.

Steady green	System is ready
Steady magenta	Holeshot mode is activated, based on SOG
Steady lime green	Holeshot mode is activated, based on RPM
Flashing blue	System is in LED brightness adjustment mode
Flashing cyan	The system has memorized the favorite position
Steady blue	Tabs retracted automatically
Flashing yellow	Controller has a non-critical fault (see section 6)
Flashing red	Controller has a critical fault (see section 6)

Tab Position Indicator LEDs

Shows the position of port and starboard tabs. At full retraction a single LED is shown at the top. As the tabs are extended the LEDs will illuminate to show the tab position.

Bow Down



Lowers both tabs simultaneously, causing the bow to drop. Press and release to move both tabs a preset increment, or press and hold until the desired pitch is achieved. To enable fine control, the actuator speed is reduced for the first second the button is held, after which the actuators move at full speed for larger adjustments.

Bow Up



Raises both tabs simultaneously, causing the bow to rise. Press and release to move both tabs a preset increment, or press and hold until the desired pitch is achieved. To enable fine control, the actuator speed is reduced for the first second the button is held, after which the actuators move at full speed for larger adjustments.

Control Dial



Rolls the boat in the direction of rotation. Rotating the dial to starboard (clockwise) will cause the port tab to lower and the starboard tab to raise, causing the boat to roll to starboard. Turning the dial to port (counterclockwise) will have the opposite effect.

Use this control with caution: turn one click at a time and wait a moment to see how the boat reacts before making further adjustments. While this control can be used to correct a list due to uneven loading, best practice is to load your boat as evenly as possible, and to keep passenger movement at a minimum while underway at high speeds. The relative positions of the tabs are maintained when using the Bow Down and Bow Up controls, so if you've used the roll control to correct for a list it will remain corrected as you alter the bow position.

Home



Press once to retract actuators to their fully retracted home position. Use this button when:

- you encounter difficult sea conditions and need to raise the bow,
- preparing to load the boat onto a trailer,
- preparing the boat for lifting.

The home button will immediately override any automatic operation of the trim tab actuators and return them to home position. When the tabs reach the home position the trim tab position indicator LED will blink three times.

Favorite



The Favorite button has two functions, described in detail in section 5.2:

1. Set and recall a Favorite trim tab position.
2. Toggle Holeshoot mode on or off.

You can switch between these functions by pressing and holding the Favorite and Bow Up buttons together for three seconds. The system status indicator will briefly flash magenta to show the Holeshoot function is enabled, or green to show the Favorite function is enabled.

5.1.1 Adjusting LED brightness

- Press and hold the Home and Favorite buttons together.
- ✓ The system status indicator flashes blue and the starboard tab position indicators all light up.
- ✓ As you continue to hold the buttons, the brightness of the LEDs will cycle through five levels.
- Release the buttons at the desired brightness level.

**NOTE: Integrated brightness control**

If your boat is equipped with Optimus Electronic Power Steering (EPS), the trim tab controller brightness can be adjusted using the CANtrak display's brightness control. See your Optimus User Manual for instructions.

5.1.2 Preparing to trailer or lift the boat

- Press the Home button.
- ✓ The actuators will retract. When both tab position indicators show only one LED, the tabs are fully retracted.
- You are ready to trailer or lift the boat.

**NOTICE! Material damage**

Trailing or lifting the boat with the trim tabs extended may cause irreparable damage to the tabs and actuators.

5.2 Advanced features and operation**5.2.1 Setting and recalling a favorite position**

With this function you can memorize a trim tab position and return to it at any time with a single press of a button.

**NOTE**

To use this function it must be enabled. See the description of the Favorite button in section 5.1.

Setting a favorite position:

- Press the Favorite button (fig. 2 1, page 1) for five seconds.
- ✓ The system status indicator will flash cyan three times to confirm the position has been saved.

Recalling a favorite position:

- Press the Favorite button.
- ✓ The tabs will adjust to the saved favorite position.

**CAUTION! Varying sea conditions**

If sea conditions have changed since you last set a favorite position, use caution when recalling it.

5.2.2 Adaptive Cruising Favorite setpoint

As you operate your boat and adjust the trim settings the system stores the latest stable setting as an Adaptive Cruising Favorite setpoint. A stable setting is one that is maintained for twenty seconds while Holeshot mode is activated and the engine RPM or speed over ground meets a preset minimum. The system status indicator will flash cyan when the system has memorized a favorite position.

The Adaptive Cruising Favorite setpoint is used by the Holeshot mode, and is only available in systems in which Holeshot mode is enabled by the builder/dealer.

5.2.3 Holeshot mode



NOTE: Holeshot mode prerequisites

- Holeshot mode requires an engine gear signal and either an engine RPM or GPS speed-over-ground source.
- If your boat is equipped with Optimus Electronic Power Steering (EPS), or has an NMEA2000 network with an engine gateway, you will likely have the engine gear and RPM signal, and you may have an SOG source.

Holeshot mode is a semi-automatic mode designed to get your boat up on plane quickly, with a minimum of operator involvement. It allows you to keep your focus on the water ahead of you and the safe operation of your boat.

When activated, Holeshot mode simplifies getting on plane. It will automatically deploy the trim tabs when it detects a Holeshot (a minimum engine RPM is reached), then retract them to the Adaptive Cruising Favorite setpoint as speed increases and the boat gets on plane.

To perform a Holeshot:

- Trim your outboard or sterndrive as you normally would for launch.
- Press the Favorite button (fig. 2 1, page 1).
- ✓ The system status indicator (fig. 2 5, page 1) will light up magenta or lime green. Magenta indicates that SOG is used to control deployment, while lime green indicates RPM is used.
- Increase throttle to your normal launch RPM.
- ✓ The Adaptive Trim Tab System manages tab deployment to get you up on lane quickly.
- Manually adjust engine trim and trim tabs as necessary for the conditions.

**WARNING!**

If sea conditions have changed since the last Adaptive Cruising Favorite setpoint was stored, the trim position may be unsuitable, and could potentially put the boat in a poor attitude for the conditions. Trim the tabs manually in this case. Always use your best judgment before activating Holeshot mode.

**NOTE: Planing time limit**

When RPM is used to control the tab deployment (i.e. no SOG source), there is a time limit between activation and when you must initiate the holeshot (by throttling up). The default limit is 15 seconds.

**NOTE: Holeshot performance**

The performance of holeshot mode is sensitive to tab size, system tuning, and throttle application. If holeshot performance is unsatisfactory, contact your dealer for assistance.

**NOTE**

If you cannot activate Holeshot mode:

- Your boat may not have an engine RPM or GPS speed-over-ground source.
- Holeshot mode may be disabled. See the description of the Favorite button in section 5.1.
- Check that at least one engine is running, no engines are in reverse gear, and that an Optimus joystick (if equipped) is not active.

**NOTE: Holeshot automatic deactivation**

If Holeshot mode is activated, it will automatically deactivate when:

- all engines are switched off
- any engine is shifted into reverse
- an Optimus joystick is activated

Holeshot mode will automatically reactivate when at least one engine is running, no engines are in reverse, and the joystick is not active.

5.2.4 Automatic retraction

The trim tabs will automatically retract:

- when the ignition is switched off*,
- when the engine(s) are placed in reverse gear**,
- when Optimus joystick control or SeaStation are activated (when boat is so equipped).

5.2.5 Homing

When the trim tab controller is powered on, the system will go through a homing cycle. The trim tabs will retract at slow speed until the end of travel is detected. This ensures the accuracy of the position feedback.

During the homing cycle the tab position indicator LEDs will light up sequentially from bottom to top. When the home position is detected the top LED will blink three times.

* Battery switches must remain on.

** Requires a gear position signal. Standard on Optimus systems.

6 Faults and troubleshooting

6.1 Fault types

Non-critical faults

A flashing yellow status LED indicates a fault that does not affect the actuators. An example is a faulty dial sensor. The trim tabs would still be operable using the bow up and bow down buttons, but the dial would not work.

Critical faults

A flashing red status LED indicates a critical fault that will prevent one or both actuators from operating.

Conditions that can cause a critical fault include:

- low or high battery voltage (these will reset automatically if the voltage condition is corrected).

Actuator faults

A flashing tab position LED indicates an actuator fault. The LED corresponding to the last known position will flash.

Conditions that can cause an actuator fault include:

- an actuator harness is unplugged, corroded, or otherwise not making a connection.
- a short circuit in the actuator or harness.
- something is preventing the tab from moving.
- a mechanical fault in the actuator.

6.1.1 Fault recovery

In the event of a critical fault that does not clear you will usually need to take your boat to a marine technician (or an Optimus-certified dealer when equipped with Optimus) for diagnosis and repair. If you are on the water, experience and judgment may suggest that you return to port immediately, especially if conditions are changing. A tab position that has the boat in a good running attitude now may be a poor tab position if the wind changes.

If the tabs are stuck in a position that gives the boat a poor running attitude, the best response is to slow down. The slower the boat moves the less effect the tabs have on attitude.

6.2 Troubleshooting

Problem	Cause	Remedy
The system status LED is off.	The ignition is not on.	Turn on the ignition.
	Circuit breaker or fuse has tripped.	Reset breaker or replace fuse.
	The controller is not receiving a wakeup signal.	Optimus Adaptive Trim Tab System: if the CANtrak is on, check the connections in the CAN2 network. If the CANtrak is not on, check the Optimus EPS ignition sensing wire. Adaptive trim tab system: check the ignition sensing wire.
The system status LED is flashing yellow.	Holeshot mode is activated, but the speed source is missing.	Multi-engine boats: check that all engines are running. Contact your dealer.
	If one or both tab position indicators are off, the tab(s) have failed to home correctly.	Try pressing the Home button again. Check that nothing is physically preventing the tabs from moving to the home position. Contact your dealer.
The system status LED is flashing red. Tab position indicators are solid.	Battery voltage is too low or too high.	Check battery voltage.
The system status LED is flashing red. One or both tab position indicators are flashing.	Tab(s) with blinking position indicators are not making position.	Check that nothing is physically preventing the tabs from moving. If there is no obstruction, contact your dealer.
Holeshot mode won't enable.	Your boat is not equipped with a speed source.	Contact your dealer.
	The boat builder or system installer has deactivated this system.	Contact your dealer.
Holeshot performance is poor.	Sea conditions are different than the mode was tuned for.	Adjust trim manually.
	Holeshot settings have not been optimized for your boat.	Contact your dealer.

7 Maintenance and cleaning



NOTICE! Material damage

- Do not use acetone, or cleaners containing ammonia, acids, or any other corrosive ingredients.
- Some products formulated for cleaning fiberglass hulls are known to aggressively corrode stainless steel shafts. If using a hull cleaner, avoid overspray on to the actuators. Rinse off any overspray immediately with fresh, clean water.
- Do not use sharp or hard objects to clean the controller. Damage to the keypad membrane may occur.
- The controller bezel has a drain hole at the bottom. Do not spray with water from below.

Whenever the boat is out of the water:

- Rinse the tabs and actuators with clean, fresh water. Avoid hitting the actuator with high pressure spray from a pressure washer.
- Remove any marine growth such as weeds, barnacles, and shellfish from the tabs and actuators.
- Inspect tabs and actuators for damage, corrosion, or anything that might impair function.
- Check the condition of zinc anodes, if present, and replace if necessary.
- Inspect the electrical harness for wear or damage.



NOTICE! Corrosion

- The stainless steel tabs are corrosion resistant, but not corrosion proof.
- Properly installed zinc anodes will help prevent galvanic and stray current corrosion.
- Some minor corrosion on the tabs may still occur and is not a warrantable defect.

Controller:

- Clean the controller occasionally with a damp cloth.



NOTE: Invasive species

Do your part to protect our waterways from invasive species. If trailering your boat to a different body of water than you normally boat in:

- Thoroughly inspect trim tabs and actuators for any weeds and shellfish.
- Many boat builders mount the trim tabs in hull pockets that can easily hide invasive species. Be sure to check these recesses.

8 Warranty

We warrant to the original retail purchaser that **Marine Canada Acquisition Inc. DBA SEASTAR SOLUTIONS** (herein forward referred to as SeaStar Solutions) products have been manufactured free from defects in materials and workmanship. This warranty is effective for two years from date of purchase, excepting that where **SeaStar Solutions** products are used commercially or in any rental or income producing activity, then this warranty is limited to one year from the date of purchase. We will provide replacement product without charge, for any **SeaStar Solutions** product meeting this warranty, which is returned (freight prepaid) within the warranty period to the dealer from whom such product were purchased, or to us at the appropriate address. In such a case **SeaStar Solutions** products found to be defective and covered by this warranty, will be replaced at **SeaStar Solutions'** option, and returned to the customer.

The above quoted statement is an extract from the complete **SeaStar Solutions** products warranty statement. A complete warranty policy is available in our **SeaStar Solutions** products catalogue.

For more information please visit our website:

www.seastarsolutions.com/support-2/warranty-2/seastar-solutions-warranty

8.1 Return goods procedure

Contact our warranty department at Lit-tech_web@dometic.com for instructions.

8.2 Technical support

Phone: 1.877.663.8396

email: Lit-Lit-tech_web@dometic.com

Hours: Monday to Friday 7:30 am — 4:30 pm CST

9 Disposal

Dometic cares about the life cycle environmental impact of our products. Please help us by recycling packaging materials, and properly disposing of our products at the end of their useful life.

The actuators and controller are electro-mechanical components. They contain no materials known to be hazardous. The actuators contain a mix of recyclable metal parts, recyclable copper wiring, and non-recyclable plastic components.

- ▶ Place the packaging in the appropriate recycling waste bins whenever possible.
- ▶ At end-of-life, contact your local authorities for guidance regarding the appropriate disposal of electronic and mixed metal/electronic waste.

10 Technical data

	Standard actuator	High-speed actuator
Connection voltage	12V DC nominal (9/16V min/max per SAE J1455)	
Current draw at load	9.5A at 300 lbf (1340 N) 17.5A at 600 lbf (2680 N)	16A at 200 lbf (890 N) 33A at 300 lbf (1340 N)
Maximum static load, tension	1000lbf (4.4 kN)	
Maximum static load, compression	1000lbf (4.4 kN)	
Weight, actuator	2.25" stroke: 3.6 lb (1.6 kg) 4.25" stroke: 3.9 lb (1.8 kg)	
Weight, controller	.5 lb (.24 kg)	
Weight, tab	Varies with tab, approximately .036 lb/square inch (2.54 g/square cm) of tab, exclusive of brackets and hinges	

Table 10-1.

Mobile living made easy.



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