



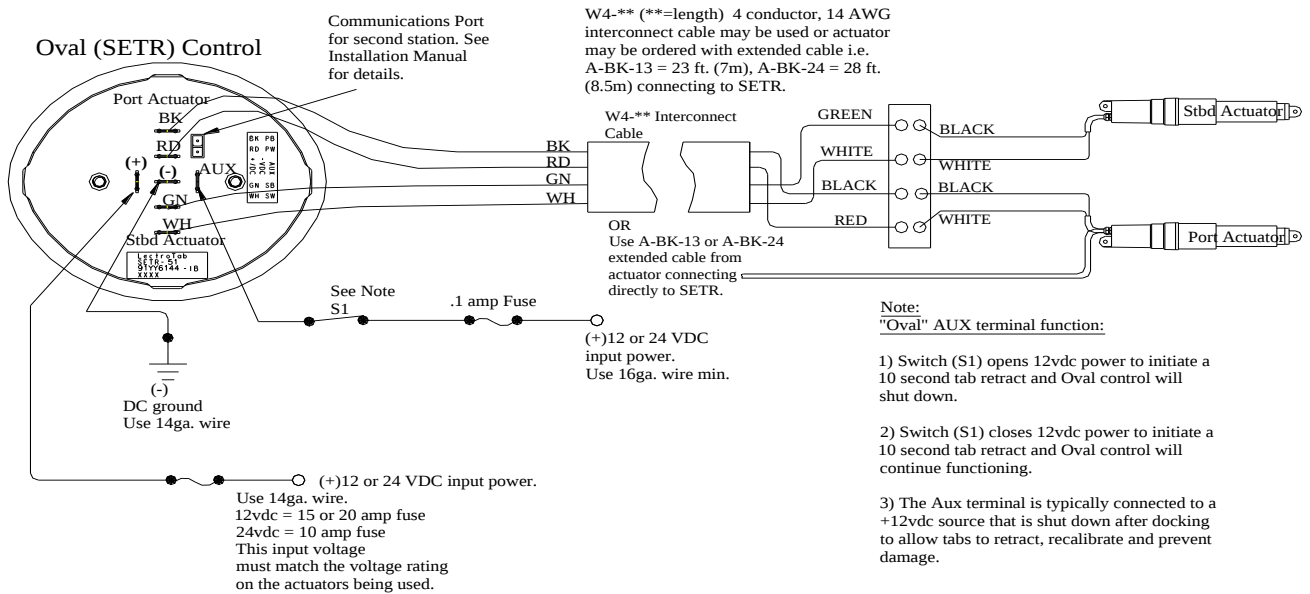
THE “OVAL” CONTROL OPERATING GUIDE MODEL SETR-60 and SETR-61



1. Power up the boat's main DC service and turn on the trim tab circuit breaker. The “Oval” will come up on standby but no LED's will be lit.
2. Turn on the switch provided by the installer which wakes up the “Oval” and puts it in service. The “Oval” will initiate a 10 second calibration sequence to synchronize the tabs and indicators at full retract, ready for use. The display will show one tab position LED, on both sides, blinking at the top, to indicate both tabs are up.
3. The top portion of the Left switch is marked Port/Bow Down. Pushing this switch deploys the right tab and its movement is indicated by the Left set of the red LED's. All LED's lit is down. The other 3 switches operate in the same manner, for port and starboard, bow up and bow down. These switches can be pushed individually, simultaneously or cross controlled, as appropriate.
4. The spot at the top center is an automatic dimmer for the tab position LED's, for nighttime operations.
5. At trip's end, when the switch which turned the “Oval” on, is turned off, the “Oval” will again initiate a 10 second calibration sequence to synchronize the tabs and indicators at full retract, and the “Oval” will revert to inoperative standby, with a 20 ma current draw.
6. If the “Oval” does not appear to be operating correctly, refer to the installation guide on the reverse side for installation insight, or call 888-LECTROTAB for assistance.
7. When leaving the boat, turn off the boat's main D.C. service to turn the 20 ma standby current off.

LECTROTAB • Linear Devices Corporation • 8790 Park Central Drive • Richmond, VA 23227 Phone: 804-261-3888, Fax: 804-264-3060,
www.lectrotab.com

"OVAL" (SETR) Control Installation Diagram



1. The "Oval" will fit nicely into a 2" to 2 1/2 "diameter hole.
2. Wire the "Oval" as noted above. If the actuator wires will not reach the control, extend them with AWG # 14 wire. Lectrotab extending cable is color coded black, red, green and white, with recommended connections as follows, **BLACK** - port actuator black. **RED** - port actuator white. **GREEN** - starboard actuator black. **WHITE** - starboard actuator white.

- IMPORTANT -

DO NOT power the "Oval's" AUX terminal directly from the trim tab fuse or circuit breaker, or from the + terminal on the "Oval". If the AUX terminal is powered from the + terminal on the "Oval", the "Oval" can only be turned off by turning off the main trim tab power. But, with no input power, the tab 10 second calibration sequence to synchronize the tabs and indicators at full retract CAN NOT WORK. No harm done, but the feature is lost. Wire the Aux terminal as noted above. For more Aux terminal wiring options, see page 8 of the "Oval" installation manual # J1107.

3. Power up the vessel's D.C. service and turn the tab circuit breaker on. Immediately, use a voltmeter to confirm the correct polarity on the "Oval's" + and - terminals. If incorrect, fix it. If the polarity is reversed, and the power remains on, the "Oval" will gradually overheat. With polarity correct, the "Oval" will be in standby mode with no LED's Lit.
4. Provide 12 or 24 VDC power, depending on the voltage rating of the actuators being used, to the AUX terminal from an existing switch or install a dedicated "Trim Tab" switch. See page 8 of the "Oval" manual, for more AUX switch options. Turn this switch ON and the "Oval" will show blinking LED's, which denotes tabs up, and, whether the tabs themselves are up, down, or in between, the "Oval" will initiate a 10 second calibration sequence in order to synchronize the tabs and the indicators at full retract, ready for use.
5. Use the "Oval" in the conventional manner per the "Operating Guide" section on the reverse side.
6. At trip's end, when the switch which is connected to the AUX terminal is turned OFF, the "Oval" will initiate another 10 second calibration sequence to synchronize the tabs and the indicators at full retract, after which, the "Oval" will revert to standby with no LED's illuminated. Standby power is 20 milliamps and goes off completely with the main trim tab input power.

NOTE

The "Oval" is shipped programmed for 8 second stroke time actuators. If 4 or 6 second actuators are being used, the "Oval" must be programmed accordingly for the position indicators to be correct. This can be done in the field, See page 7!



MODEL SETR-60 and SETR-61 Trim Tab Control



**Pictured above is the SETR-60 with black switches on a gray background. The SETR-61 is identical except for the color, wherein it has black switches on a black background. The actual size is about 4" wide, 3 ½" high and ½" deep.*

Introduction

Thanks for your interest in the Lectrotab model SETR-60/61, Sealed Electronic Trim and Retract system, with tab position indication. The SETR-60/61 "Oval" is either a stand alone or multi-station, software driven, microprocessor based control, featuring positive click switches with integrated LED position indicators, in a single waterproof unit. The SETR-60/61 "Oval" is unique in that no position feedback device is needed in the actuator. Also unique is the single component design of this control; no other interface box or components are required for operation, and all connections are made directly to the back of the control.

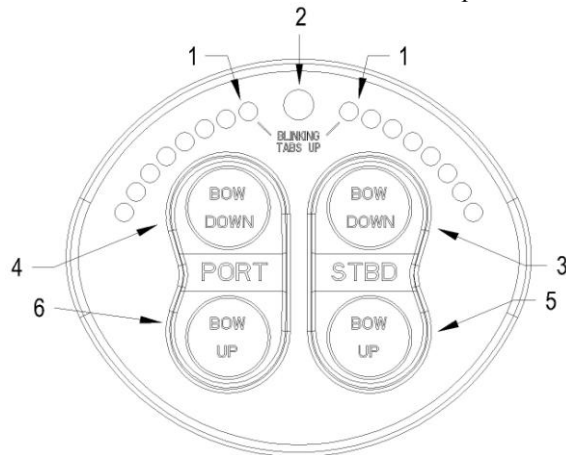
SETR-60/61, "Oval" Features

- Multi station capable, supporting up to 6 Ovals in the same trim tab system wherein each Oval is a full function control with no switchover requirements.
- High current outputs; 20 amps for both Port & Starboard actuators.
- Mirror operation at all Ovals; simultaneous use at different stations is OK.
- Independent control of Starboard and Port actuators.
- Eight LED's, operating sequentially; indicate the position of each tab.
- Automatic dimming for night operation, with each Oval dimming independently.
- Salt water hose down proof and UV protected.
- Ergonomically designed keypad for "Heads Up" operation with tactile feed back switches.
- Any Oval can operate as the master control or as a remote; therefore, only one model is required. Expanding a single station system to multi-station is a simple add-on with no changes to the original control.
- Actuators, auxiliary switch and main power connect directly to only one Oval in a multi-station system.
- Remotes connect to the master via 22 gage, 2 conductor wire, unshielded and splicable.
- To power the position indicator LED's, local D.C. power, at about 10 milliamps, needs to be connected to each remote.
- The SETR-60/61 Oval may be used on 12 or 24 VDC systems.
- Indicators are programmable for use with 4, 6 or 12 second stroke time actuators. Cannot be used with hydraulic trim tab systems.



The “Oval” Description

The SETR-Model SETR-60 and SETR-61 “Oval” control operates as described below:



- 1 Two tab position indicators display left and right tab positions on two separate sets of LEDs. One Blinking LED at the top indicates the tab on the other side is fully retracted as indicated by “Blinking Tabs Up” printed on the face of the control.
- 2 Photocell senses light level to automatically dim the trim indicator LEDs as daylight fades.
- 3 For Starboard Bow Down trim control, push the top of the starboard switch until the click is felt. The port tab will deploy and the right hand indicator will show the tab position.
- 4 For Port Bow Down trim control, push the top of the port switch until the click is felt. The starboard tab will deploy and the left hand indicator will show the tab position. Pushing both Bow Down buttons simultaneously will deploy both tabs and the indicators will show both tab positions.
- 5 For Starboard Bow Up trim control, push the bottom of the starboard switch until the click is felt. The port tab will retract and the right hand indicator will show the tab position.
- 6 For Port Bow Up trim control, push the bottom of the port switch until the click is felt. The starboard tab will retract and the left hand indicator will show the tab position.

*Pushing both buttons simultaneously will retract or deploy both tabs. Also, the tabs may be simultaneously moved in opposite directions if need be. The right indicator will move with the left tab; the left indicator moves with the right tab. However, the left switch moves the right tab and the right switch moves the left tab. See page 7 for field programming of indicator timing for use with 4, 6, or 8 second stroke time actuators. The “Oval” is shipped programmed for 8 seconds actuators.

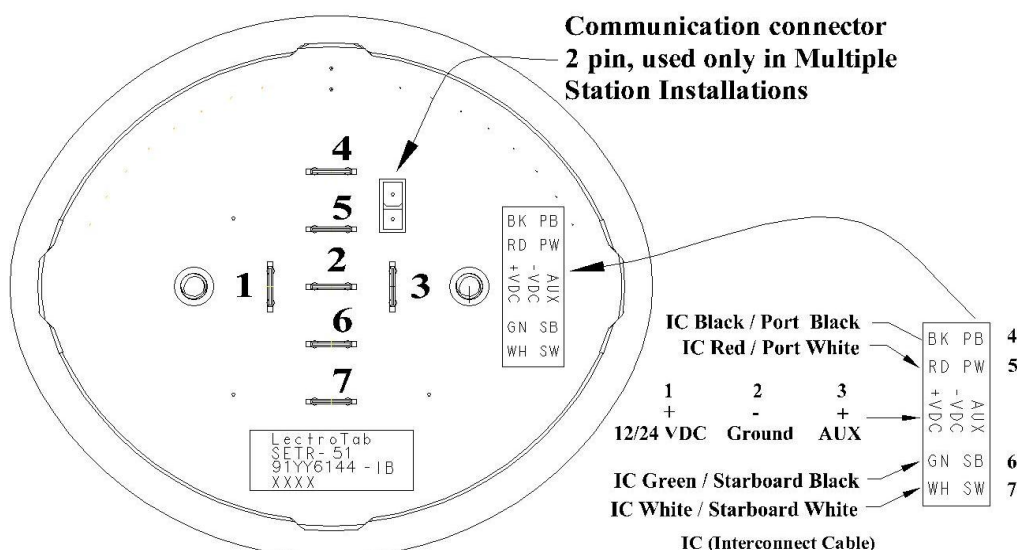
“Oval” Installation

Tools: Ordinary hand tools, mechanical and electrical, silicone sealer (don not use 3M 5200; use only silicone sealer), a drill motor, and a hole saw between 1-3/4” and 2-1/2”, but 2-1/16” works best. The “Oval” is designed for wet or dry locations. The Oval will need console space of 4” wide by 3-7/16” high. Allow for a minimum of 1” clearance depth behind the OVAL. When the center of location is determined, use a hole saw to make a 1 3/4” to 2 1/2” diameter hole in the console, being careful not to cut any wires behind the console. Use a small amount of silicone sealer around the edge of the Oval control, align to the desired orientation, and place the control in the mounting hole. Use the special bracket and self-locking 8-32 nuts to secure the control to the console using a 11/32” or 9mm socket. Torque lightly. If access to the back of the Oval is not handy after the Oval is in place, route the 7 wires which connect to the Oval through the hole and make the connections before securing the Oval in the hole. If the installation includes remote Oval’s, in addition to the seven basic wires, the two conductor communications cable will need to be connected also. In a single station installation, the two conductor communication’s cable is not used. The Oval may be installed in wet or dry locations.



“Oval” Wiring

Wiring the Oval control begins by connecting it to the standard four conductor Lectrotab interconnect cable, OR by connecting directly to the individual actuator wires, if the actuators have been supplied with long wires. With the Oval, no interface module is used. See the mechanical portion of the Lectrotab installation manual through page 7. Instead of wiring to the manual switches as shown, connect directly to the back of the Oval using ¼” female push-on connectors. Seven connections are made to the seven connection Terms on the Oval as shown below. One additional connection is the communications cable if multiple stations are used.



Terminal 1 (+ D.C. Main Power)

From the vessel's D.C. power panel, protected by a 20 amp fuse or circuit breaker for 12vdc (10amp for 24vdc), supply this Terminal with 12 or 24 VDC + (positive) power using AWG 14 wire or larger. Confirm that the tab actuators match the input voltage. Actuator Model numbers starting with A or C are 12 VDC; model numbers starting with B or D are 24 VDC.

Terminal 2 (- D.C. Power)

Connect this Terminal, using AWG 14 wire or larger, to the vessel's – (negative) ground.

Terminal 3 (AUX Terminal)

Must provide 12 or 24 VDC power, depending on the voltage rating of the actuators being used, to the AUX terminal from an existing switch or install a dedicated “Trim Tab” switch. Turn this switch ON and the “Oval” will show blinking LED's, which denotes tabs up, and, whether the tabs are up, down, or in between, the “Oval will initiate a 10 second calibration sequence in order to synchronize the tabs and the indicators at full retract, ready for use. Turning this switch off initiates another sync/retract sequence for tabs up. See page 8 for other AUX switch options.

IMPORTANT

Terminal 3 must be powered for the Oval to operate. But do not use a jumper from + to AUX. This will bypass the retract and indicator synchronizing feature of the Oval control. Connect the AUX terminal to a switch which the helmsman will use to turn the trim tab system off and on.

Terminal 4 and 5 (Port Actuator)

Connect the port tab actuator black wire, or the Lectrotab interconnect cable black wire, to Terminal 4. Connect the tab actuator white wire, or the Lectrotab interconnect cable red wire to Terminal 5.

Terminal 6 and 7 (Starboard Actuator)

Connect the starboard tab actuator black wire, or the Lectrotab interconnect cable green wire, to Terminal 6. Connect the actuator white wire, or the Lectrotab interconnect cable white wire, to Terminal 7.

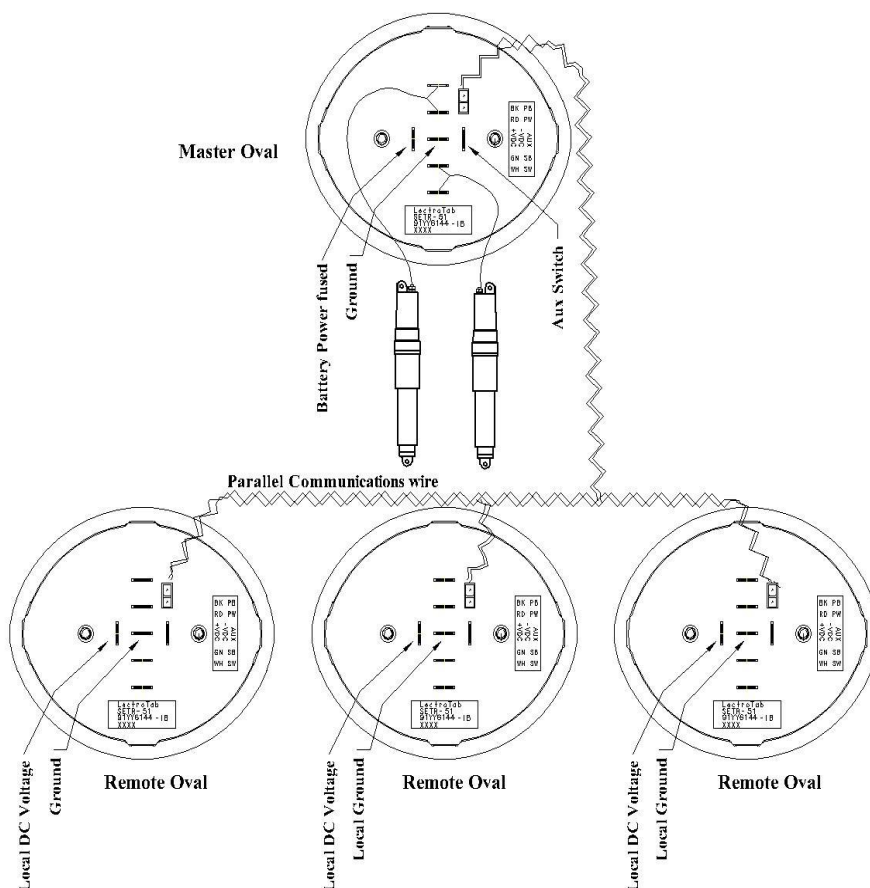


Remote “Oval” Wiring

After the initial “Oval” has been installed and tested, up to 5 more “Ovals” may be installed as remote stations. For each Oval, one Lectrotab communication wire assembly, part # SR, will be needed. This is an 18 gauge two conductor wire, blue and brown, with a special plug on one end which plugs into the Oval’s communication port on the back side of the control, to the right of Terminal 5. Wire as noted below, where in communication ports of all Ovals in the system, up to a total of 6, including the master, are electrically connected in parallel. Also, on all remote Ovals, 12 or 24 VDC power needs to be connected to each one from any convenient local source, to power the tab position indicator LED’s and the internal microprocessor. Operating current, with all LED’s lit, is 30 milliamps. Standby current is about 20 milliamps.

- **WARNING** -

Do not make any connection to the # 3 AUX terminal or terminals number 4, 5, 6 or 7, on any remote unit. Only the master has these five terminals connected. All remotes use only terminals 1 and 2 and the, 2 pin communications plug.



“Oval” Operation

1. Turn on the power at the vessel’s main panel to energize the trim tab system. There will be no response by the Oval control.
2. Turn on the tab control switch the boat builder or other installer has selected to energize the Oval control. This may be an existing switch, a gearshift neutral switch or a dedicated switch marked “Trim Tabs” or other options as noted on page 8. This will “wake up” the Oval and initiate a 10 second calibration sequence in order to synchronize the tabs and indicators at full retract. The tab position indicators will show one blinking LED at the top of each 8 LED indicator. The tabs are now ready to use.
3. Refer to the “Oval Description” on page 2 for how to use the “Oval” to control the tabs.
4. When a given trip has ended, turn off the switch outlined in item 2 above. Turning the switch off will initiate a 10 second calibration sequence in order to synchronize the tabs and the indicators at full retract, ready for docking. The “Oval” display will show 2 LED’s blinking. In this position, the retracted actuator ram is protected from fouling and the retracted tabs are ready for the fork lift.



Alternative Wiring and Operation

Per the industry standard, set by most U.S. trim tab manufacturers some years ago, the Lectrotab control switches are set up to be pushed directly according to what the helmsman needs the boat to do. If the bow is high, push the upper portion of both switches to make the bow go DOWN. If the bow is high on the left, push only the LEFT switch to make the LEFT bow go DOWN. Pressing the lower part of the rocker switch causes the bow to come up: This is the way the rocker switches, or buttons, on the “Oval” are marked. Refer to the illustration on page 1. Tab position indicators it is important to know that to make the left bow go down, the right tab must go down. (Deploying the right tab at the stern causes the right stern to rise and the left bow to lower.) The “Oval” indicators on the SETR-60-61 model are opposite from where the tabs are: left indicator, right tab; right indicator left tab. As a result, when the LEFT or “Port Bow Down” button is pressed, the RIGHT tab goes down and the LEFT indicator depicts this movement.

But some like it different. If the wire pairs from each tab actuator are interchanged, the left button will actuate the left tab and the right button the right tab, but the indicators will still be opposite the buttons. If the two wires from each actuator are interchanged, the tabs will go down instead of up when the tabs are turned off, so don’t make that change with the “Oval”. But in any case, the position indicators always respond to the opposite buttons and that can’t be changed. In summary, we think it’s best to leave the “Oval” wired as presented in these instructions so that, from a safety standpoint, all Lectrotab boats operate the same, and most popular, way.

Calibration/Programming

Some Background: The “Oval” tab position indicator operates on a time basis. With our mechanical approach, as opposed to the hydraulic approach, the Lectrotab actuator inherently moves the tab at a predictable rate of time so that a simple timer can effectively keep track of tab position. The simplicity of this allows the Lectrotab indicators to operate without a feedback transducer of any sort; no additional device is needed inside, or strapped on the outside, of the actuator.

Lectrotab now offers actuators with 4, 6, and 8 second stroke times, so the “Oval” is programmable accordingly. For example, when using a 4 second stroke time actuator, the 8 LED’s which make up each indicator must light up at the rate of 2 per second so that all 8 are lit to show the tab fully down in the 4 seconds it takes the 4 second actuator to lower the tab. All “Ovals” are shipped programmed for 8 seconds. To change the timing for other stroke times, proceed as follows:

1. Make sure the trim tab main power is ON (see page 3, Terminal 1).
2. Make sure the trim tab switch is OFF. (see page 3, Terminal 3).
3. Press “Port Bow Down” and hold for at least 2 seconds, and then, while continuing to hold “Port Bow Down”, turn the trim tab switch on (see page 3, Terminal 3). Some indicator LED’s will begin to flash. Release “Port Bow Down”.
4. The number of LED’s flashing indicates the timing. For example, if 8 LED’s are flashing, the “Oval” is set for 8 seconds for use with 8 second stroke time actuators, etc.
5. To decrease the timing, press “Starboard Bow Up” and one LED will extinguish each time the LED’s blink. To increase the stroke timing, press “Starboard Bow Down” and one additional LED will come on each time the LED’s blink. Make this adjustment until the number of LED’s lit is equal to the trim tab actuator’s stroke time in seconds. Choices are from 4 to 12 seconds in 1 second increments. Lectrotab currently offers 4, 6 and 8 seconds actuators.
6. To exit, press and hold “Port Bow Up” for 2 seconds, then release. This will save the setting in permanent memory, and will not be lost if the main power is turned off. At release, the “Oval” will execute full retraction of the tabs and the indicators will confirm tabs up with one LED blinking at the top
7. Turn the tab switch off and confirm a full tab retraction sequence, after which the “Oval” will shut down.

NOTE

After entering the calibration mode, and after the last button push, if the exit procedure, item 6, is not done within 90 seconds, the calibration procedure will be exited with no changes saved.



Aux Switch Options

1.) Using a dedicated “Trim Tab Switch”:

Connect terminal 3 to an existing or newly installed switch which is convenient to the helmsman to turn the “Oval” on for use, and off at trip’s end for full tab retraction and tab position indicator synchronization at tabs up.

2.) Using a conventional multifunction key or rotary switch for “OFF-AUX-IGN-START” with gasoline engine powered boats:

Connect Terminal 3 to the AUX position of this type switch. DO NOT use the ignition (IGN) position. Whenever the AUX position is turned on or off the “Oval” will respond accordingly. DO NOT use this type switch if it does not have an “AUX” position.

3.) Using a conventional multifunction key or rotary switch for “OFF-GAUGES PREHEAT” with diesel engine powered boats:

Connect terminal 3 to the gauges position of this type switch. Whenever the gauges position is turned on or off, the “Oval” will respond accordingly. DO NOT use the (GAUGES) position if turning off the gauges also stops the engine.

4.) Using the “Electronics Master Switch”:

On many boats, at the helm area, there will be a master switch for the navigation and other electronic equipment which provides a convenient way to turn all of this equipment on and off at the beginning and end of a trip. Connect Terminal 3 to this switch which, when turned off, will initiate the 10 second calibration sequence to synchronize the tabs and indicators, at full retract.

5.) Using a “Gearshift Neutral Switch”:

As noted on page 3, deenergizing the “Oval’s” terminal 3 will initiate a 10 second calibration sequence in order to synchronize the tabs and the indicators at full retract, ready for use. If Terminal 3 remains deenergized, the “Oval” will remain shut down. Alternatively, if Terminal 3 is deenergized and immediately reenergized, the “Oval” will initiate a calibration / retract sequence but will remain on. This feature will accommodate connecting Terminal 3 to a gearshift switch which is *OPEN CIRCUIT in neutral. In this case, after the engine is started and put in gear, Terminal 3 would be energized, readying the “Oval” for use. Then, at the end of the trip, or when backing down, when the gearshift is returned to neutral, or even passed through neutral to reverse, the “Oval” would initiate a calibration / retract sequence and the tabs will remain retracted, regardless of subsequent gearshift positions until, on the next trip out, the helmsman operates the control for tabs down. This scheme will provide tab retraction upon reaching the docking area instead of remaining down during the docking process waiting to be retracted when the engine is shutdown.

Of all the ways to have the tabs retract at trips end, we like the gearshift neutral approach the best.

** If the neutral switch is not off at neutral, you can use a Lectrotab model # NR-12 or NR-24 relay assembly to convert a hot neutral switch to an open circuit output for use with the oval. The installation and the wiring are quite simple.*



Oval Programming Chart for SETR-60/61 Series

Enter/Adjust/Exit Program Mode:

To enter program mode main power must be on and aux 12vdc must be off.

Press and hold key noted in "**Enter**" column (see chart below) for more than 2 seconds, then apply 12vdc to Aux terminal. Release the button.

Press "STBD BOW UP or DOWN" to change the value as per Programming Details and chart below.

Press and hold "PORT BOW UP" for more than 2 seconds to exit program mode.

	Program Mode Sequence				
Function	Enter	Adjust	Exit	Range	Default
Timing	PORT BOW DOWN	STBD BOW DOWN/UP	PORT BOW UP	4 - 12sec	8sec
LED's On/Off	PORT BOW UP	STBD BOW DOWN/UP	PORT BOW UP	On/Off	On
Swap LED's	STBD BOW DOWN	STBD BOW DOWN/UP	PORT BOW UP	LED's Opposite of key/same side key	LED's Opposite of key press

Programming Details:

Timing: #LED's lit corresponds to the #seconds in actuator stroke time i.e. 8 LED's = 8 seconds, 4 LED's = 4 seconds
(Actuator's A and B series = 8 seconds, C and D series = 4 seconds and S series = 6 seconds)

LED's On/Off: 8 LED's lit on right side = LED On state, 1 LED lit on right side = LED Off state

Swap LED's: 1 LED on right and left side = LED lights opposite side of key press, 8 LED's on right and left side = LED lights same side as key press

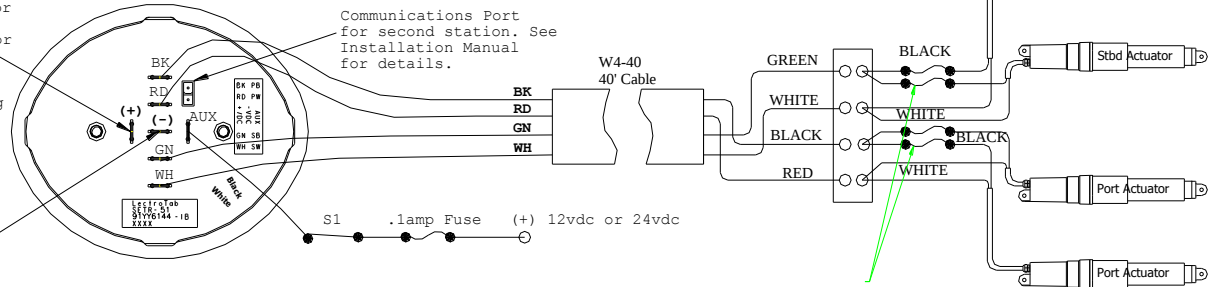
The "OVAL " Control 4-Actuator Installation Guide

(+)
12 or 24 VDC input power.

12 vdc use 30 amp fuse or circuit breaker.
24 vdc use 20 amp fuse or circuit breaker.

This input voltage must match the voltage rating on the actuators being used.

(-)
DC ground
Use 14ga. wire



AUX terminal function:

- 1) Switch (S1) opens 12vdc power to initiate a 10 second tab retract and Oval control will shut down.
- 2) Switch (S1) closes 12vdc power to initiate a 10 second tab retract and Oval control will continue functioning.
- 3) The Aux terminal is typically connected to a +12vdc source that is shut down after docking to allow tabs to retract, recalibrate and prevent damage.

Fuse Note:

For 2 actuators per tab applications, a fuse must be attached to each actuator's black wire as shown. Fuse size not to exceed 10 amps for 12vdc and 5 amps for 24vdc. Please call Lectrotab for fuse sizing (888-532-8768).