LECTROTAB

ELECTROMECHANICAL TRIM TAB SYSTEMS

Joystick Control
JLC Series
Installation/Operation

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Introduction

The Joystick leveling control system incorporates all the features and benefits of the SLC One Touch control. The Joystick control is designed to directly replace any Lectrotab control with only minor modifications. The Joystick control is potted and sealed to be waterproof. Actuators connect directly to the keypad, so no power module box is necessary.

The Lectrotab Joystick control (JLC) design advantages and features include:

• Easy to use “Joystick” control to raise or lower tabs
• Improved fuel efficiency and faster speeds
• Single or dual actuator/tab operation
• Single station operation or dual station operation with an additional keypad and JR cable
• Automatic deployment to last tab position when ignition key switch is turned off and back on (see program chart)
• Direct actuator connection to display
• Automatic tab retraction when connected to accessory switch or ignition key switch
• Direct replacement for any Lectrotab control with minor modifications
• Completely sealed and waterproof display
• Automatic dimming of display LED indicators in darkness and brighten in sun light
• NMEA2000 Compatible for trim tab position display on MFDs (Requires optional JLC-NMEA adapter)
• Operates on 12 or 24 Volts DC
• 2 Year Warranty

Safety

- Failure to follow all instructions listed in this manual may result in equipment failure or serious injury.
- If using trim tabs for the first time, follow the Operation section of this manual to familiarize yourself with the feel and response of your trim tab system.
- Never deploy tabs in a following sea. Keep tabs fully retracted in a following sea.
- Never deploy tabs quickly at high speeds or above cruising speeds. This may cause the boat to turn quickly and become unstable and difficult to control.
- Stay alert, watch what you are doing and use common sense when operating your trim tab system.
- Do not use the trim tab system when under the influence of drugs, alcohol or medication. A moment of inattention while operating the trim tab system my result in serious injury.

How Do Trim Tabs Work

Boaters will enjoy many performance and efficiency benefits by adding Lectrotab trim tabs. Lectrotab trim tabs improve fuel efficiency, increase boat speed, accelerate shallow water planing, eliminate porpoising, and enhance the overall boating experience with a more comfortable ride.

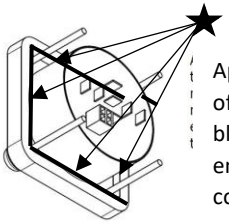
- **Improved Fuel Efficiency and Faster Speeds**
  Most importantly, the trim tabs may be adjusted to optimize speed and fuel efficiency. Typically, the bow rides high causing the stern to drag in the water at cruising or lower speeds. A boat owner will attempt to correct this problem by trimming his outdrive down to bring the bow down. This adjustment is extremely inefficient and reduces boat speed and increases fuel consumption, because trimming of the outdrive pushes water down to allow the transom to rise and bow to lower. In this scenario, the outdrive is not only propelling the boat forward but it is also pushing the bow down. The most efficient way to operate the boat is to adjust the tabs to maximize boat speed and level. The outdrive may then be adjusted so the prop shaft is parallel to the water to maximize the thrust to push the boat forward.
- **Faster Planing**
  For shallow water starts, trim tabs allow the boat to get up on plane faster. Faster planing can be accomplished by lowering the tabs to the fully deployed position. As the boat achieves plane, trim tabs may be raised until the boat is level.
- **Porpoising**
  Occasionally, an uneven load distribution or certain speeds will cause the boat to "porpoise". This problem can easily be corrected by deploying both trim tabs simultaneously a few degrees until the "porpoising" stops.
- **Boat Leveling**
  Every boat owner has experienced passengers or equipment moved to one side of the boat, which causes the boat to lean to one side and leads to difficulty in handling the boat as well as an uncomfortable ride. Trim tabs give the ability to correct this problem by deploying the tab on the same side as the boat is leaning towards which levels the boat for a more comfortable ride.
- **Head Sea**
  Rough sea conditions can also be better managed with trim tabs. Typically, in a head sea, the boat speed must be reduced causing the bow to ride high. The waves will pound and beat the boat bottom for an extremely uncomfortable and slow ride. Trim tabs can be deployed to level the boat out and allow the hull to cut through the waves for a smoother and more efficient ride.
- **A Beam Sea or Wind**
  A beam sea or wind can lead to a wet ride. To greatly reduce or eliminate the spray caused by waves or wind hitting the boat side, the windward side trim tab may be deployed to raise the windward side of the boat. Also retracting the leeward trim tab side may help.

Display Keypad Installation & Wiring JLC-11

(For dual actuator tabs, connect actuators from same tab in parallel)

Mounting Display Keypad:

1. Locate the display keypad at the helm where it is convenient to access and view the LED indicators and a flat level surface.
2. Drill one 2.625" (67mm) hole as shown on page 6 for mounting display. Remove the aluminum mounting plate from four mounting studs. The aluminum mounting plate can be used as a drill template.
3. Apply a bead of silicone sealant around the underside of the display where the rubber overlay meets the black potting material. This will prevent water from entering under the display and reaching the wiring connections. See the diagram below.
4. Mount the display with the aluminum plate, washers and nylon nuts provided**. Only use nylon nuts provided. Do not overtighten the nylon nuts**.

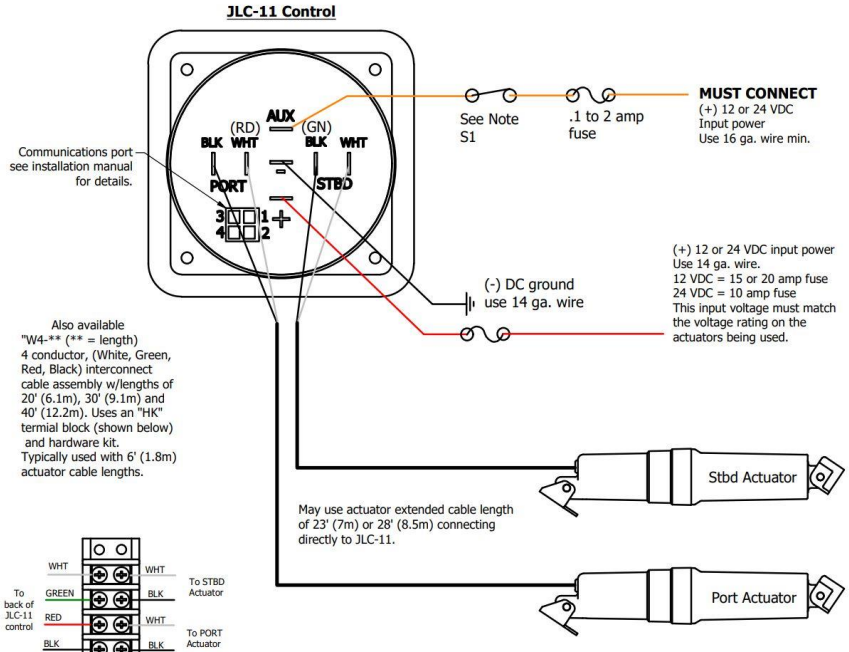


Apply a bead of silicone sealant around the underside of the display where the rubber overlay meets the black potting material. This will prevent water from entering under the display and reaching the wiring connections.

Display Keypad Wiring:

1. Refer to wiring diagrams for the JLC-11 wiring connections.
2. The red (+12vdc or +24vdc) wire from the boat's fuse panel and black battery negative wires should be a minimum size of 14 AWG (2.5mm²).
3. **Important:** DC voltage source connected to JLC-11 keypad must match actuator voltage (first letter in actuator serial A, C or S =12vdc, B or D = 24vdc).
4. The AUX terminal must be connected to ignition key run position or accessory switch to automatically retract the tabs when key is switched to OFF and turn on the display when key is switched to ON.
5. For dual station connections, a second JLC-11 keypad and one JR-** (**=length in feet) serial communication cable/plug assembly is required. See wiring diagram on ***page 7*** for JR plug connection point.
6. For single station NMEA 2000 connection see wiring diagram. One JLC-NMEA adapter is required to connect to the JLC-11. A NMEA 2000 cable drop and any NMEA backbone tees must be purchased separately. For dual station NMEA 2000 systems, two JLC-11 and two JLC-NMEA adapters are required.
7. For dual actuator per tab installations, connect both actuator wires from each tab in parallel and follow the wiring diagram on page 8. Connect each actuator white wire to white wire and black wire to black wire from the same tab to the back of the keypad or terminal strip if using a W4-** cable.

"JLC-11" Control Installation/Wiring Diagram

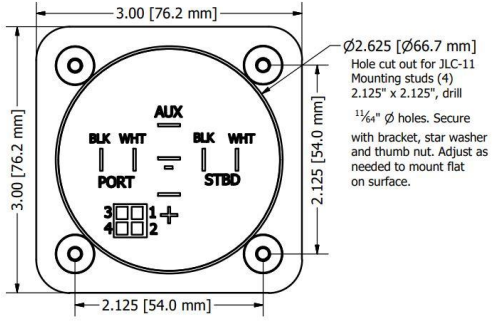


Note (for S1):
JLC-11 AUX terminal function:

1) Switch (S1) opens, 12 VDC power to initiate a 10 second tab retract and JLC-11 control will shut down.

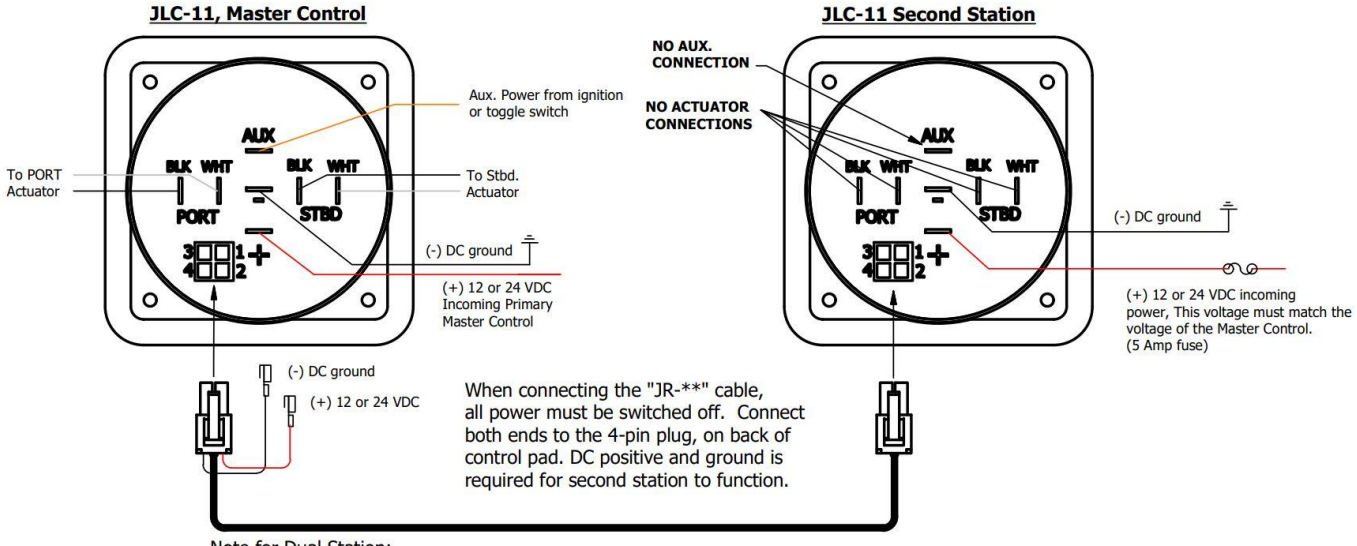
2) The AUX terminal is typically connected to a +12 VDC source that is shut down after docking to allow tabs to retract, recalibrate and prevent damage. The AUX terminal may be connected to ignition key accessory terminal or an accessory switch.

JLC-11 Control Dimensions



Ø2.625 [Ø66.7 mm]
Hole cut out for JLC-11 Mounting studs (4) 2.125" x 2.125", drill $^{11}/_{64}$" Ø holes. Secure with bracket, star washer and thumb nut. Adjust as needed to mount flat on surface.

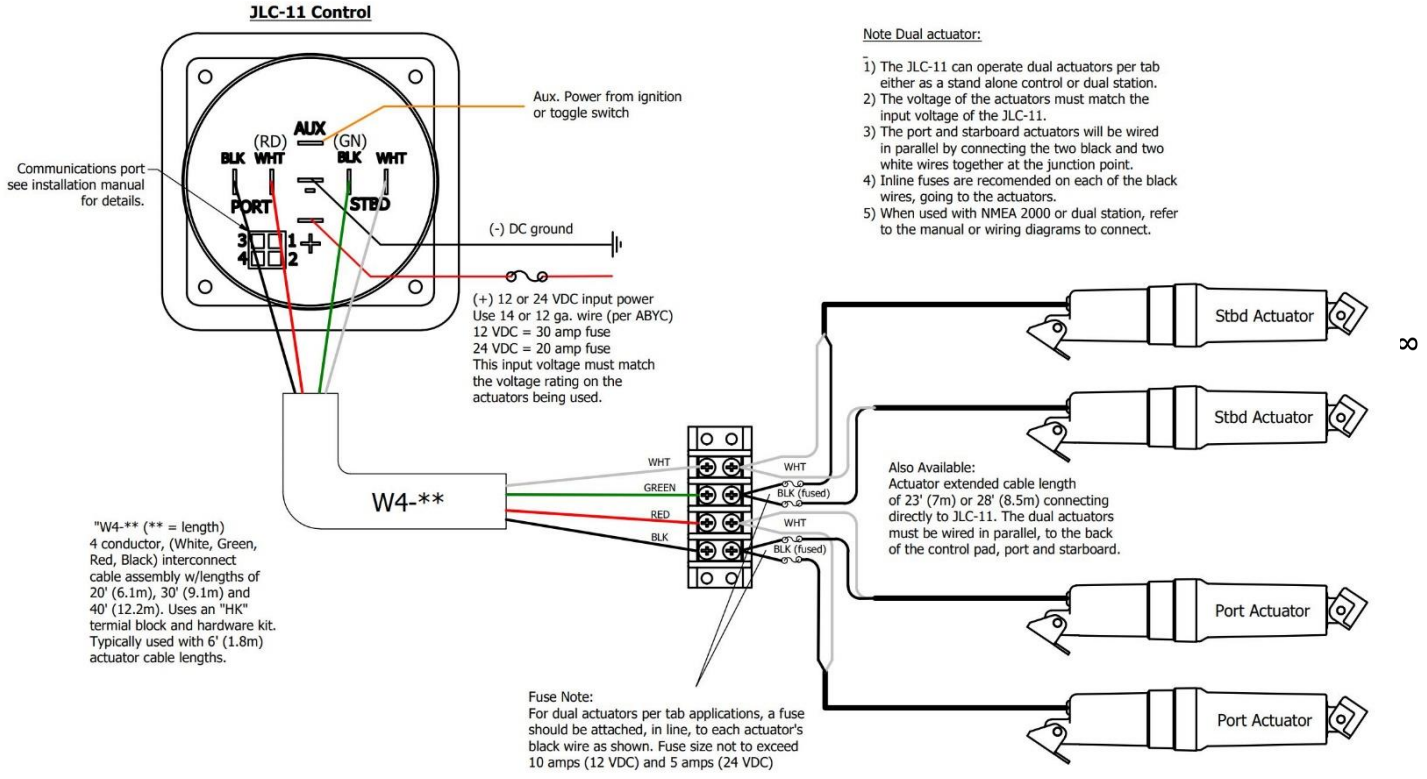
"JLC-11" Dual Station Wiring



Note for Dual Station:

1) Switch all power off.
2) For new control installations, refer to the manual that came with your JLC-11 control, for wiring and installation information.
3) The master control, will be wired per the diagram, DC positive and ground with the Aux. power input and actuators.
4) When adding the second station, it only requires the JR type communications cable, DC positive and ground. No Aux. power input or actuators.
5) The JR type communications cable, can be ordered in various pre-assembled lengths, JR-** (** = length in feet) excess cable can be coiled. The cable ends are not the same, the master end has (2) wires, one (Red) for DC positive and one (Black) for DC ground. These must connect to the master control or the second station will not operate.
6) The wires have a "piggy-back" terminal for connections. Plug this terminal on the back of the control and plug the incoming power and ground to the piggy-backs.
7) Once all connections are made per the diagram, switch the power on and check both controls to confirm that the LED's are on and the controls are moving both tabs.

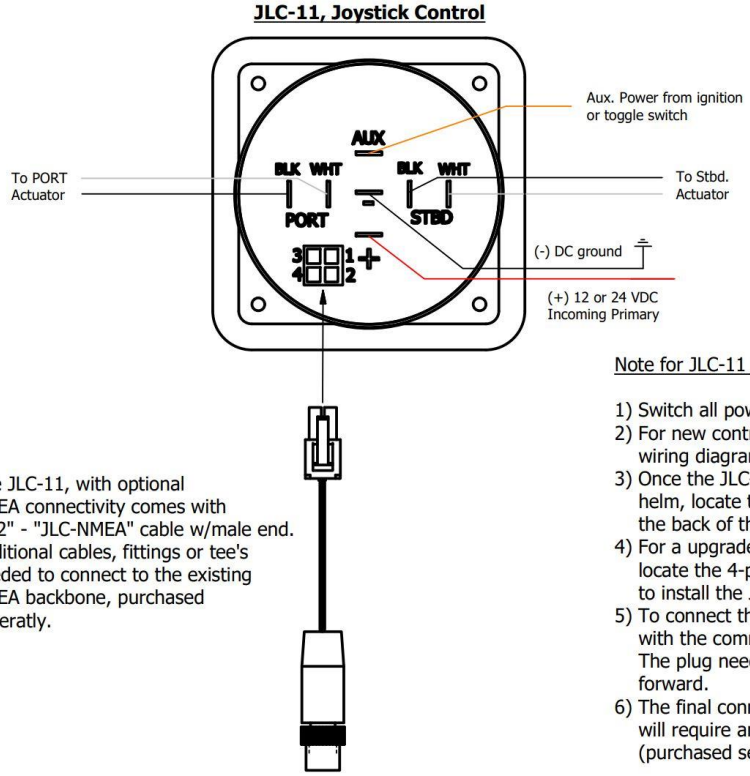
"JLC-11" Control Dual Actuator/Wiring Diagram



Note Dual actuator:

1) The JLC-11 can operate dual actuators per tab either as a stand alone control or dual station.
2) The voltage of the actuators must match the input voltage of the JLC-11.
3) The port and starboard actuators will be wired in parallel by connecting the two black and two white wires together at the junction point.
4) Inline fuses are recomended on each of the black wires, going to the actuators.
5) When used with NMEA 2000 or dual station, refer to the manual or wiring diagrams to connect.

"JLC-11" Control Installation/Wiring w/NMEA 2000

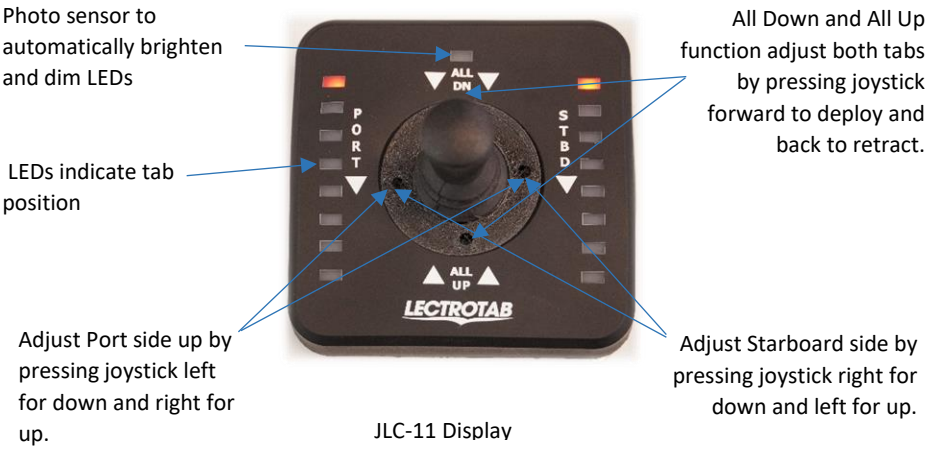


The JLC-11, with optional NMEA connectivity comes with a 12" - "JLC-NMEA" cable w/male end. Additional cables, fittings or tee's needed to connect to the existing NMEA backbone, purchased seperatly.

Note for JLC-11 w/NMEA Communications Wiring:

1) Switch all power off.
2) For new control installation, refer to the manual and wiring diagram, that came with your JLC-11 control.
3) Once the JLC-11 has been installed and secured to the helm, locate the 4-pin socket (communications port) on the back of the control pad, to install the JLC-NMEA cable.
4) For a upgrade to an existing JLC-11 (switch all power off) locate the 4-pin socket on the back of the JLC-11 control pad to install the JLC-NMEA cable.
5) To connect the JLC-NMEA cable, use the 4-pin end and align with the communications socket on the back of the control. The plug needs to be securly snapped into place before moving forward.
6) The final connection to the NMEA 2000 backbone will require an additional cable and possibly fittings (purchased seperatly).

Verify Display Settings and Operation JLC-11



JLC-11 Display

Set Actuator Deployment Time:

Follow the programming chart and instructions on page 10 and 11 to program keypad to match the actuator deployment time (first letter in actuator serial A or B = 8 seconds (factory default), C or D = 4 seconds and S = 6 seconds).

Verify Connection and Operation:

1. Press and hold the joystick forward "ALL DN" (All Down), and both actuators/tabs deploy simultaneously. Release joystick to stop.
2. Press and hold joystick backward to "ALL UP", and both actuators/tabs will retract simultaneously. Release joystick to stop.
3. If the tab or tabs are moving in the opposite direction as described, switch or reverse the two actuator wires on the back of the keypad for the tab that moves in the wrong direction (for example switch black and white wires at port terminals for port actuator).
4. With tabs fully retracted, press and hold joystick to right "STBD", and the port actuator/tab will deploy and release when fully deployed. Press and hold joystick to the left "PORT" to retract the port tab and release when fully retracted.
5. With tabs fully retracted, press and hold joystick to the left "PORT", and the starboard actuator/tab will deploy and release when fully deployed. Press and hold joystick to the right "STBD" to retract the starboard tab and release when fully retracted.
6. If the wrong tab is moving as described in step 4 and 5, exchange the port and starboard wires on the back of the keypad and repeat the testing process.
7. Press and hold the joystick forward until 4 LEDs on each side are lit. Press and hold joystick to right "STBD" and starboard tab will retract and right LEDs will reduce. At the same time, the port tab will deploy and left LEDs will increase.

LED Position Indicators:
When retracting actuators/tabs, the top LED indicators will flash and then remain lit to show tabs are fully retracted. The LED indicators show approximate tab position based on time. A standard "A" series actuator takes approximately 8 seconds to fully deploy or retract.

Automatic Tab Retraction:
There are a couple of options for automatically retracting the trim tabs. You may connect the accessory or run terminal of the ignition key switch to "AUX" terminal on keypad. When the ignition key switch is turned off, the tabs will retract automatically, and the display will turn off. Another option is to connect the "AUX" terminal to one side of an accessory switch and the other to +12vdc (see wiring diagram), so the tabs will only retract when this switch is turned off.

Programming JLC-11

Actuator Timing: Push and hold joystick to left for 4 or more seconds then turn the key switch on and release joystick to enter program mode for actuator timing.

Independent Tab Control: Push and hold joystick 45° towards upper left corner for 4 or more seconds to enter program mode.

Push and hold joystick forward or backward to change Setting

Swap LEDs: Push and hold joystick to right for 4 or more seconds then turn the key switch on and release joystick to enter program mode for swapping LED movement to same side as joystick pressed.

Exit Program: Push and hold joystick to the right for 4 or more seconds to exit program mode and save new setting.

JLC-11 Display

Enter, Adjust and Exit Program Mode:

- Before entering program mode, 12vdc or 24vdc must be applied to JLC terminals +12vdc and battery negative (see wiring) and AUX 12vdc must be off (ignition key switch or accessory switch off).
- Push and hold joystick on keypad for 4 seconds or longer in "Enter" column on the programming chart, then switch the ignition key switch or accessory switch to on. Release the joystick.
- Follow the instructions under "Change Setting" in the program chart to change the current setting.
- Push and hold the joystick to the right for a few seconds to save setting and exit program mode.

Programming Chart

	Program Mode Sequence					
Setting	**Enter**	**Change Setting**	**Exit and Save**	**Range**	**Default**	**Program Details**
Auto Retract Previous Position	Push & hold joystick backward 4 sec. or longer	Push and hold joystick forward or backward	Push and hold joystick to right for 4 sec. or longer	Standard or Remember last position	Standard	8 LEDs = Standard Auto Retract 1 LED = Return to last tab position before key switch off
Actuator Time	Push & hold joystick left 4 sec. or longer	Push and hold joystick forward or backward	Push and hold joystick to right for 4 sec. or longer	4 to 12 seconds	8 seconds	8 LEDs = 8 seconds 6 LEDs = 6 seconds 4 LEDs = 4 seconds
Swap LED Tracking	Push & hold joystick right 4 sec. or longer	Push and hold joystick forward or backward	Push and hold joystick to right for 4 sec. or longer	LEDs track opposite side or same side as joystick press	Opposite	1 LED = LEDs track opposite of joystick press 8 LEDs = LEDs track same side as joystick press
Independent Tab Control	Push & hold joystick 45° towards upper left corner 4 sec. or longer	Push and hold joystick forward or backward	Push and hold joystick to right for 4 sec. or longer	Enable or Disable	Disable	1 LED = Disabled or tabs do not operate independently 8 LEDs = Tabs operate independently

Automatic Tab Retraction to Previous Position:
When the accessory switch or ignition key switch (connected to keypad "AUX" terminal) is turned off, the tabs will automatically retract. When the accessory switch or ignition key switch is turned back on, the tabs will adjust to the last known position before key switch was turned off. Follow the instructions on page 11 and 12 to program the keypad for this feature (Auto Retract Previous Position). Turning main battery power off will erase previous tab position and adjust to new position on next trip.

Actuator Time:
Follow the programming chart and instructions on page 11 and 12 to program keypad to match the actuator deployment/retract time (first letter in actuator serial A or B = 8 seconds (factory default), C or D = 4 seconds and S = 6 seconds).

Swap LED Tracking:
Refer to program instructions on page 11 and 12 for "Swap LED Tracking" to move the LED indicators to the same side as the joystick being pressed for Bow Up/Down. The default setting shows the "tab position" on the LED indicators (i.e. pressing STBD joystick shows port tab being deployed and LEDs lit on left side of keypad). Swapping the LED indicators to same side as joystick being pressed shows what side of the vessel is going down or up. Program this to customer preference.

Independent Tab Control:
Refer to program instructions on page 11 and 12 for "Independent Tab Control". The default is tabs can only be adjusted up, down, right and left. For independent tab control, follow the program chart above to enable. This will allow independent tab control by pushing the joystick at 45° angles to left for starboard tab and 45° angles to right for port tab.

JLC-11 Troubleshooting

LEDs do not light:

1) Test for +12vdc (or 24vdc) on back of JLC keypad at red "+" sticker terminal and middle terminal (battery negative).
2) Turn on ignition key switch or accessory switch (see Auto Tab Retraction p.11) which should show 12 or 24vdc on "AUX" terminal when switched on. The "AUX" terminal on the back of keypad must be connected to the ignition key switch or accessory switch. Turn key switch or accessory switch to ON and make sure battery selector switch is turned on to light LEDs on keypad.

Specifications

Model Number	**Display Color**	**Number of Stations/Actuators**	**Overall Width**	**Overall Height**	**Mounting Hole Cutout** (Diameter)	**DC Voltage**	**Fuse Size Power Input** (1 Actuator per Tab)	**Fuse Size AUX Terminal** (MUST CONNECT)
JLC-11	Black	1 or 2 Stations/ 1 or 2 Actuators/tab	3"X3"/ 77X77mm	3.5"(89mm)	2.625" (67mm)	12/24	12vdc = 15 or 20 amp 24vdc = 10amp	1 to 2 amp

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