For Electronically Controlled Engines and Transmissions

• EEC-3™
• EEC-4™

For Mechanically Controlled Engines and Transmissions

• Smart Actuator™
• Smart Actuator II™
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Control Head Operation

Neutral Transmission Position Indicated by Spring Detent.
With handle in this orientation, transmission will be positioned in neutral gear.

Gear Operating Range
- Handle controls gear position

Ahead Gear
- Idle engine speed

Reverse Gear
- Idle engine speed

Ahead Operating Range
- Engine speed is controlled from idle to full throttle

Reverse Operating Range
- Engine speed is controlled from idle to full throttle

Neutal Transmission Position Indicated by Spring Detent.

Keypad Operations

4-BUTTON KEYPAD

Gear Position Indicators
- Check Battery Indicator (pg. 13)
- Check System Indicator (pg. 13)

Light Dimming Feature — Press and HOLD the SYNC & WARM buttons together for approx. 4 seconds

Troll / Slow button — controls trolling valves (pg. 8), and used in conjunction with TAKE / SLOW button to change engine throttle response to approx. 1/2 of normal range (pg. 7).

WARM button — locks gear in neutral; throttle only (pg. 6).

Troll / Slow button — used to transfer station control (pg. 11) and in conjunction with TROLL / SLOW button to change engine throttle response to approx. 1/2 of normal range (pg. 7).

Take / Slow button — used to transfer station control (pg. 11) and in conjunction with TROLL / SLOW button to change engine throttle response to approx. 1/2 of normal range (pg. 7).

Sync button — allows both engines to be controlled from one control handle (pg. 8).

For the purpose of this guide, the 4-button keypad will be illustrated throughout.
Keypad Operations

**2-BUTTON KEYPAD**

**NEUTRAL Gear Position Indicators**

- **ACTIVE Indicator**
- **WARM / SYNC Indicator**

**ACTIVE button** — used to transfer station control from one control station to another (pg. 11).

**WARM / SYNC button** — will activate WARM mode (pg. 6) when control handles are both in NEUTRAL. Will activate SYNC mode (pg. 8) when control handles are in Ahead Gear (not Neutral).

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**6-BUTTON (Integrated Trim Control) KEYPAD**

**NEUTRAL Gear Position Indicators**

- **ACTIVE Indicator**
- **WARM / SYNC Indicator**

**ACTIVE button** — used to transfer station control from one control station to another (pg. 11).

**WARM / SYNC button** — will activate WARM mode (pg. 6) when control handles are both in NEUTRAL. Will activate SYNC mode (pg. 8) when control handles are in Ahead Gear (not Neutral).

**PORT & STBD Trim/Tilt buttons** operate trim of drive unit individually.

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**Light Dimming Feature** — Press and HOLD the ACTIVE & WARM/SYNC buttons together for approx. 4 seconds
System Startup

This procedure explains the process of starting up the complete controls electronic engine control system.

1. **CONTROL HANDLES** must be in the Neutral position prior to starting Control System.

   Position control handles to Neutral before starting the system.

2. **TURN ON SYSTEM** with the ignition keyswitch or enable switch. Do not move handles while system is starting up.

   Turn ON system by turning ON engine ignition keyswitch or enable switch.

3. **THE SYSTEM IS ON** when NEUTRAL indicator lights and TAKE & WARM lights are fully illuminated.

   If ACTIVE or TAKE light blinks slowly then control handles are NOT in Neutral. Move handles to Neutral and system will start.

   If all 4 keypad lights blink simultaneously, system is in ALARM Mode. Shutdown system and proceed to Alarm Recovery (pg. 13) before restarting.
Cruise Mode

**THIS MODE IS USED DURING NORMAL OPERATIONS AND PERMITS CONTROL OVER TRANSMISSION AND ENGINE SPEED USING THE CONTROL HEAD LEVERS.**

1. At system startup the engine’s gear will be immediately placed in WARM mode (pg 5). Press and Release WARM button one time to regain control of engine gear. **Press & Release WARM to regain control over engine gear**

2. **TAKE OR ACTIVE** light will be ON during normal “cruise” operation indicating station is “active” and in control of boat’s propulsion system.

   - If TAKE light is fully illuminated (NOT blinking) station is “active” and in control of engine’s gear and throttle (Neutral lights will only be ON if gear is in neutral position).
   - If TAKE and GEAR lights are blinking every 2 seconds, station is INACTIVE and not in control of engine’s gear and throttle (for multi-station applications ONLY).
   - If all 4 keypad lights blink simultaneously, system is in ALARM Mode. Shutdown system and proceed to Alarm Recovery (pg. 13) before restarting.

3. If you wish to take control at a different control station, **PRESS & RELEASE** the TAKE button one time at the station where you want to take control. The TAKE (or ACTIVE) light will blink quickly and a beeping sound will be heard.

   **PRESS & RELEASE** the TAKE (or ACTIVE) button one more time to complete the transfer of control to the new control head station.

   **Station Lockout** is achieved when you **PRESS & HOLD** the TAKE (or ACTIVE) button for 5 seconds. This will prevent someone from taking control at all other stations.
Cruise Mode

**During normal CRUISE Mode** you can “bump” engine throttle settings in small increments while handles are in gear above IDLE.

1. **Press & Release WARM** to increase engine speed
2. **Press & Release TROLL** to decrease engine speed

To “bump” engine throttle settings in small increments from the 2-button keypad or 6-button (trim control) keypad follow the instructions below:

3. **Press & Release ACTIVE & WARM/SYNC simultaneously to decrease engine speed**
4. **Press & Release ACTIVE to increase engine speed**

**During normal CRUISE Mode** you can change the engine idle speed settings. Idle speed can only be changed while control handles are in the Neutral position (ONLY available with 4-button keypad).

1. **Press & Release TAKE** to reset to lowest idle engine speed
2. **Press & Release TAKE & SYNC to increase engine speed**

**THIS MODE IS USED DURING NORMAL OPERATIONS AND PERMITS CONTROL OVER TRANSMISSION AND ENGINE SPEED USING THE CONTROL HEAD LEVERS.**
**Warm Mode**

This mode locks the transmission in neutral while allowing engine throttle to be increased or decreased.

1. **To enter WARM Mode**
   - Control Handles MUST be in NEUTRAL. PRESS and RELEASE WARM button one time.
   - When Control Handles are in the NEUTRAL position then press WARM button once.
   - The Neutral Gear Indicators should be illuminated before pressing the WARM button.

2. **ADVANCE CONTROL LEVER** into engine throttle operating range. The engine gear will remain “locked” in neutral while engine speed is increased.

   - When WARM light is illuminated, control handles can be moved while gear shift remains “locked” in Neutral.
   - Engine Throttle Operating Range
   - Ahead Idle
   - Neutral
   - Full Forward

3. **To exit WARM Mode** and regain gear operation, bring handles back to neutral and PRESS AND RELEASE WARM button one time.

   - When Control Handles are in the NEUTRAL position and you press the WARM button once — the WARM keypad light should NOT be illuminated.

* Normal system configuration will automatically activate WARM Mode every time the control system is started.

It is STRONGLY RECOMMENDED that the system be placed in WARM Mode at all times when boat is docked!
Slow Mode changes engine throttle response. Full handle movement will only result in approximately half of normal full throttle engine speed (only available with 4-button keypad).

1. To engage Control Handles MUST be in NEUTRAL. PRESS and RELEASE TAKE & TROLL buttons simultaneously.

   SLOW Mode can only be engaged/disengaged when control handles are in the Neutral position.

   TAKE & TROLL lights will blink when EEC system is in SLOW Mode.

2. Once engaged, ADVANCING CONTROL LEVER into engine throttle operating range will ONLY result in approximately half of normal throttle output.

   Engine Throttle Operating Range

   Ahead Idle

   Neutral

   When TAKE & TROLL lights are blinking, response to control handle movement will result in half of normal output.

3. To disengage SLOW Mode, bring handles back to neutral and PRESS AND RELEASE TAKE & TROLL buttons simultaneously.

   When Control Handles are in the NEUTRAL position and you press the TAKE & TROLL buttons simultaneously — the system will return to normal CRUISE Mode.
**Sync Mode**

*While Sync Mode is engaged, system will automatically control slave engine speed to exactly match the lead engine speed.*

1. To engage, handles should be in or above IDLE — **PRESS & RELEASE** the Sync button one time (Sync light will illuminate).

   SYNC Mode can only be used when both engines are in the Ahead gear and handles are approximately the same speed — within 10% of total travel.

   **SYNC light will be ON when in Sync Mode**

2. When Sync function is energized, the boat operator controls both engines from one control handle. The system will automatically match one engine’s speed to the other.

3. To disengage, match the position of both engine control handles and **PRESS & RELEASE** Sync button one time.

   **SYNC Mode will be automatically disengaged when BOTH handles are moved to the NEUTRAL position**

   **SYNC light is OFF when Sync Mode disengaged - system now in Cruise mode**

Configuration options will allow the boat operator to change which engine is the LEAD engine. Once set the opposite engine will automatically follow.
Troll Mode

This mode allows the boat operator to control the position of the transmission trolling valves (if boat is equipped with Troll and only available with 4-button keypad).

1. To enter TROLL Mode
   Control Handles MUST be in NEUTRAL. PRESS and RELEASE TROLL button one time.

   When Control Handles are in the NEUTRAL position then press TROLL button once.

   The keypad should look like the illustration below.

   Engine IDLE speed settings may be adjusted during troll valve operation (see Cruise Mode, pg. 5 for more details). For throttle on top of Troll configuration, see Manual.

2. To exit TROLL Mode, bring handles back to neutral and PRESS AND RELEASE TROLL button one time.

   When Control Handles are in the NEUTRAL position and you press the TROLL button once — the keypad lights should look like the illustration below.
Trim Control

This allows the boat operator to control the trim / tilt of the engine drive unit from the control handle or keypad (only available with 6-button (TRIM) keypad).

1. To control both PORT & STBD trim simultaneously, press and release trim toggle switch located on the PORT control handle.

   Control Handles may be in any position to operate trim control

   Toggle UP to trim engine drive unit in an upward position

   Toggle DOWN to trim engine drive unit in a downward position

2. To control PORT & STBD trim / tilt separately, press and release PORT or STBD trim button located on the center of the keypad.

   With each press and release of the trim buttons, the engine drive units will respond incrementally. For large movements of engine drive unit, buttons will need to be pressed and held until desired position is reached.

   **TRIM IN (DOWN)**
   - Lowers the bow
   - Results in quicker planing
   - Improves ride in rough seas

   **TRIM OUT (UP)**
   - Lifts the bow
   - Increases top speed
   - Increases clearance in shallow waters
**Station Transfer**

*This procedure allows propulsion system to be transferred from one helm control station to the other.*

1. **Press and release** TAKE button one time, at the helm station where you want to take control (TAKE light will begin to flash).

2. **Control handles** must be in an appropriate handle position at station taking control in order for transfer to be completed (see chart below). When handles are in an appropriate handle position for transfer, the TAKE light will begin to flash quickly.

   - Control handles at ACTIVE station can be in any position prior to transferring control to another station.
   - Control handles at “station taking control” MUST be in an appropriate handle position to transfer control to it.

<table>
<thead>
<tr>
<th>Active Station Handle Position</th>
<th>Handle Position at Station taking Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>In NEUTRAL</td>
<td>In NEUTRAL</td>
</tr>
<tr>
<td>In GEAR / IDLE</td>
<td>In Neutral or same GEAR / IDLE</td>
</tr>
<tr>
<td>In GEAR / with speed</td>
<td>In Neutral or same GEAR / same or slower speed setting</td>
</tr>
</tbody>
</table>

3. **Press and release** TAKE button a second time at the station where you want to take control. The new Control station is now the Active station and has control of the engine and transmission.

   - **TAKE light & appropriate gear lights will flash when TAKE button is pressed at INACTIVE station**.

   - TAKE light & appropriate gear lights will be fully ON (not blinking) after TAKE button is pressed for the second time to indicate this station is in control.
Station Transfer

**LIGHT SEQUENCE AT STATION TAKING CONTROL DURING STATION TRANSFER PROCESS**

1. **PRIOR TO PRESSING TAKE BUTTON** at the station where you wish to take control, the **TAKE light & appropriate gear light will blink once every 2 seconds** (inactive station heartbeat).

   - **ACTIVE LIGHT & APPROPRIATE GEAR LIGHTS WILL FLASH ONE TIME EVERY 2 SECONDS**

2. After you **PRESS & RELEASE** the **TAKE button** once, the **TAKE light & appropriate gear lights will blink** — blink rate will depend on control handle setting at station taking control.

   - **SLOW BLINK — HANDLES NOT IN APPROPRIATE POSITION.**
   - **QUICK BLINK — HANDLES ARE IN THE APPROPRIATE POSITION, PROCEED TO STEP 3.**

3. Station transfer is completed after you **PRESS & RELEASE** the **TAKE button** a second time, while **TAKE & appropriate gear lights are quick flashing**.

   - **SOLID TAKE LIGHT INDICATES TRANSFER IS COMPLETE. NEW STATION IS NOW IN CONTROL.**

* 4-button keypad shown - function is similar for 2-button & 6-button keypads except “ACTIVE” button will be used instead of “TAKE” button.
Warning Mode

*During diagnostic check, the system will try to warn boat operator when a problem is detected while still operating in unaffected functions.*

<table>
<thead>
<tr>
<th>CHECK BATTERY light blinks</th>
<th>SYMPTOM</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) SLOW BLINK — combined battery input is too low.</td>
<td>1) Determine cause of input power problem.</td>
<td></td>
</tr>
<tr>
<td>2) QUICK BLINK — combined battery input is too high.</td>
<td>2) System will continue to operate normally, unless battery exceeds system parameters. If this occurs system will be switched into ALARM Mode (see pg. 12).</td>
<td></td>
</tr>
<tr>
<td>2-button &amp; 6-button keypads will indicate battery warning by 2 flashes of the LED that is currently illuminated at time of fault.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHECK SYSTEM light blinks</th>
<th>SYMPTOM</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Diagnostic tests have detected that part of the control system is not functioning normally.</td>
<td>1) Restart control system (turn OFF/ON). Move handles to Neutral or Idle detent.</td>
<td></td>
</tr>
<tr>
<td>2) Determine part of system not operating properly (ie. gear, throttle, troll, etc.).</td>
<td>2) Determine part of system not operating properly (ie. gear, throttle, troll, etc.).</td>
<td></td>
</tr>
<tr>
<td>3) Utilize alarm code recovery procedure to discover source of problem (see troubleshooting section of manual).</td>
<td>3) Utilize alarm code recovery procedure to discover source of problem (see troubleshooting section of manual).</td>
<td></td>
</tr>
</tbody>
</table>

CHECK BATTERY INDICATOR WILL BLINK WHEN BATTERY VOLTAGE CONDITIONS EXIST THAT ARE QUESTIONABLE.

CHECK SYSTEM INDICATOR WILL BLINK WHEN A POSSIBLE PROBLEM HAS BEEN DETECTED WITHIN THE SYSTEM.
**Alarm Mode**

**WHEN ACTIVATED THE CONTROL SYSTEM WILL NOT CONTINUE TO OPERATE. THE TRANSMISSION WILL GO TO NEUTRAL AND ENGINE SPEED WILL GO TO IDLE.**

During operation of the EEC, the system will continuously monitor system functions and will alert the operator if a system problem has been detected. When ALARM Mode is activated, the control system will STOP functioning. In the case of most alarm conditions, the control system will return to engine idle and Neutral gear on the transmission.

**AN ALARM IS INDICATED WHEN ALL 4 KEYPAD LIGHTS “BLINK” SIMULTANEOUSLY**

When the system is in ALARM Mode, return the MAIN STATION control handles to Neutral position.

Reset ignition switch to OFF

Restart control system

**NOTE: If your control system is equipped with a backup control system, this should be ACTIVATED IMMEDIATELY after the control system enters Alarm Mode in order to regain propulsion control.**

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**DIFFERENCES BETWEEN A “WARNING” AND AN “ALARM”**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>KEYPAD LIGHTS</th>
<th>ENGINE THROTTLE</th>
<th>ENGINE TRANSMISSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning</td>
<td>only light that is ON “blinks”</td>
<td>stays in commanded position</td>
<td>stays in commanded position</td>
</tr>
<tr>
<td>Alarm</td>
<td>all keypad lights “blink” in unison</td>
<td>goes to IDLE</td>
<td>goes to NEUTRAL</td>
</tr>
</tbody>
</table>
If an alarm occurs . . .

the cause of the alarm must be determined as soon as possible after returning to the dock. The alarm codes may be recovered to assist in troubleshooting. Contact Glendinning Marine Products for assistance.

Call (843) 399-6146

The above number is Glendinning’s main switchboard which is manned during normal business hours (Monday through Friday / 8:00am to 5:00pm EST).

When calling the main switchboard at night, weekends, or holidays follow the prompts that will enable the phone system to contact the service technician that is on duty. Service personnel will return your call.
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