

# Complete Controls™ Operator's Quick Reference Guide



## For Electronically Controlled Engines and Transmissions

- EEC-3™
- EEC-4™

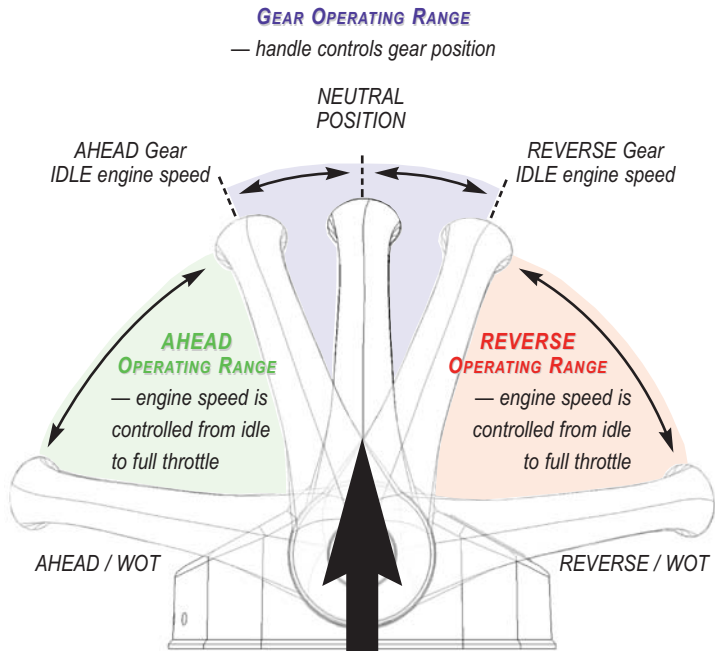
## For Mechanically Controlled Engines and Transmissions

- Smart Actuator™
- Smart Actuator II™

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# Control Head Operation



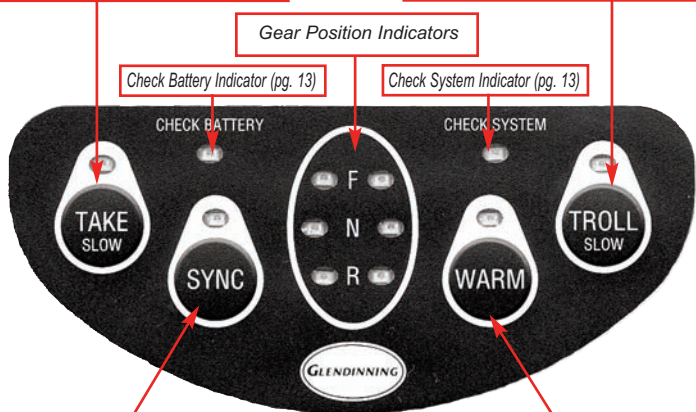
**NEUTRAL TRANSMISSION POSITION INDICATED BY SPRING DETENT.  
WITH HANDLE IN THIS ORIENTATION, TRANSMISSION WILL BE POSITIONED IN NEUTRAL GEAR.**

# Keypad Operations

4-BUTTON KEYPAD

**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).

**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).



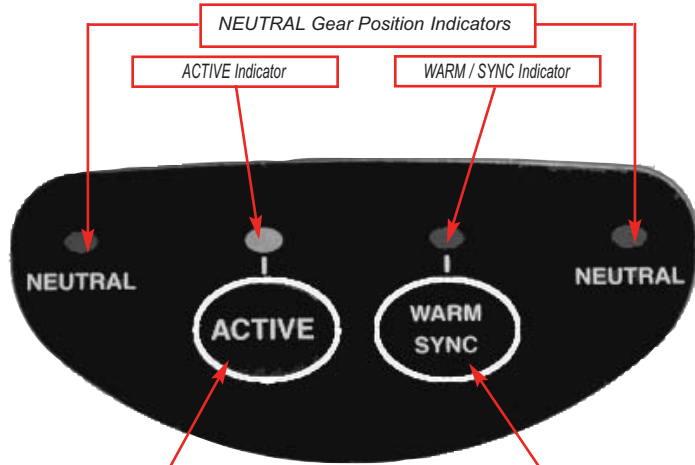
**SYNC button** — allows both engines to be controlled from one control handle (pg. 8).

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

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

# Keypad Operations

2-BUTTON KEYPAD

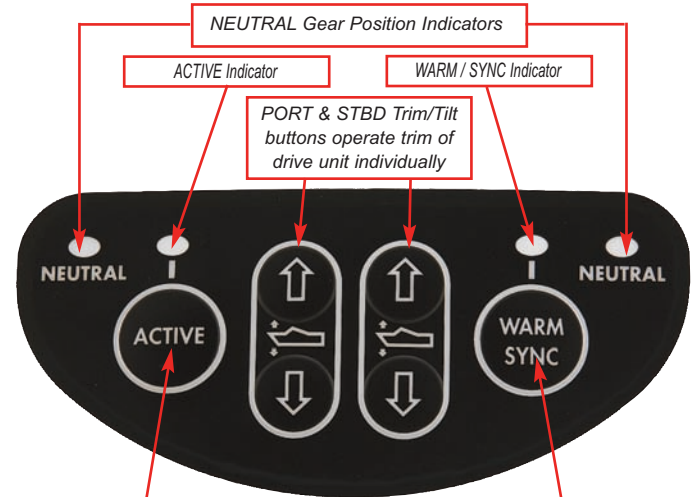


ACTIVE button — used to transfer station control from one control station to another (pg. 11).

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).

# Keypad Operations

6-BUTTON (Integrated Trim Control) KEYPAD



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).

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

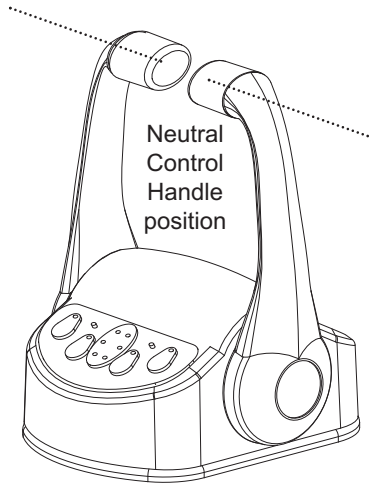
# System Startup

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.

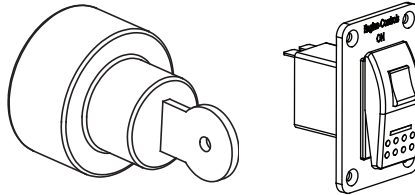
*Position control handles to Neutral before starting the system*



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*



*Ease control handles into throttle range - you are now in normal Cruise Mode*



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

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

1

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

*Press & Release WARM to increase engine speed*



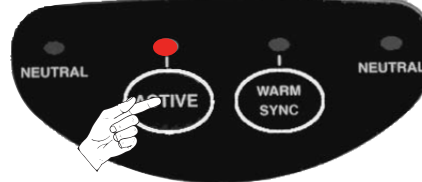
*Press & Release TROLL to decrease engine speed*



2

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

*Press & Release ACTIVE to increase engine speed*



*Press & Release ACTIVE & WARM/SYNC simultaneously to decrease engine speed*



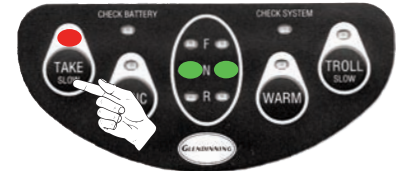
3

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**).

*Press & Release TAKE & SYNC to increase engine speed*



*Press & Release TAKE to reset to lowest idle engine speed*

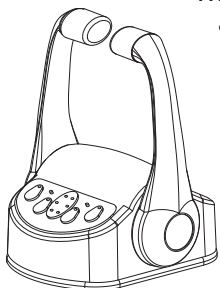


# Warm Mode

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.



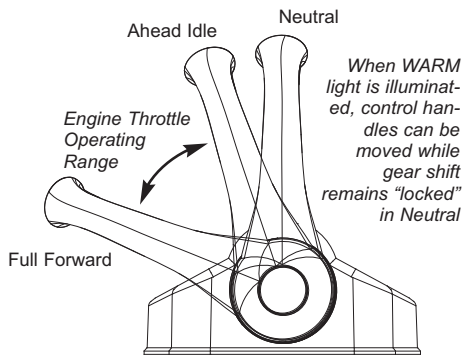
When Control Handles are in the **NEUTRAL** position then press **WARM** button once.

The Neutral Gear Indicators should be illuminated before pressing the **WARM** button



2

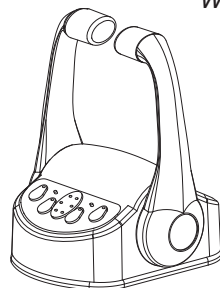
**ADVANCE CONTROL LEVER** into engine throttle operating range. The engine gear will remain "locked" in neutral while engine speed is increased.



It is **STRONGLY RECOMMENDED** that the system be placed in **WARM Mode** at all times when boat is docked!

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.

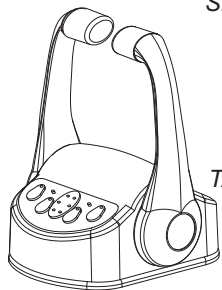


# Slow Mode

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.



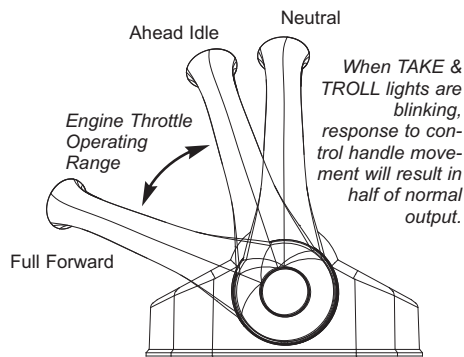
*SLOW Mode can only be engaged / disengaged when control handles are in the Neutral position.*

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



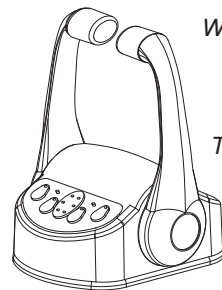
2

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



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.*

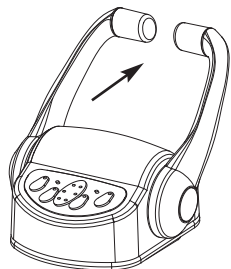


# Sync Mode

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.

SLAVE ENGINE



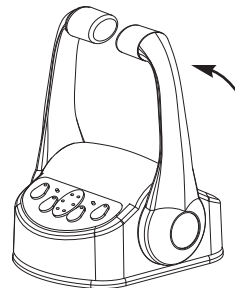
LEAD ENGINE



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

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*



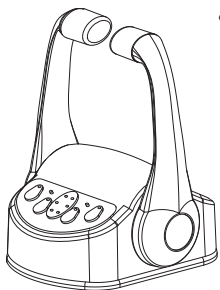
# Troll Mode

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).



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

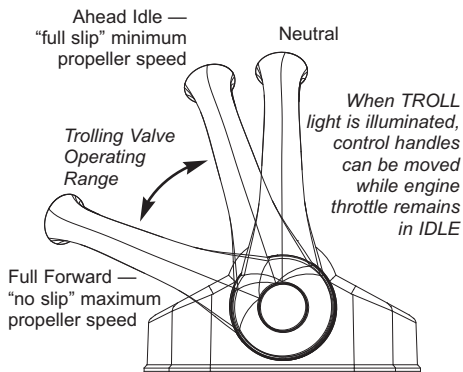
*When Control Handles are in the NEUTRAL position then press TROLL button once.*



*The keypad should look like the illustration below.*



Trolling valve position is controlled by the movement of the control handles. Engine throttle speed is maintained at IDLE while system is in TROLL Mode (normal configuration).

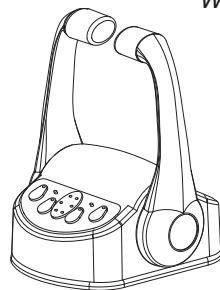


Engine IDLE speed settings may be adjusted during troll valve operation (see Cruise Mode, pg. 5 for more details). For throttle on top of Troll configuration, see Manual.



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.*

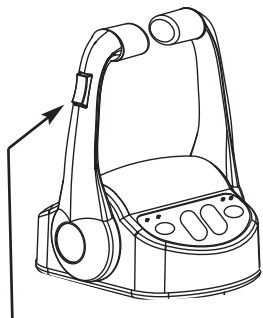


# Trim Control

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*

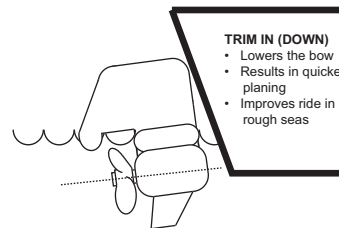
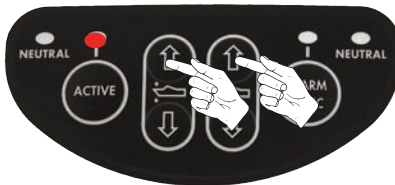
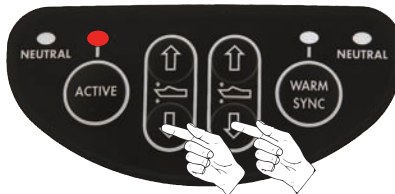
*Toggle UP to trim engine drive unit in an upward position*

*Toggle DOWN to trim engine drive unit in a downward position*

2

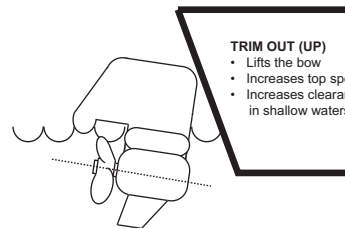
To control **PORT & STBD** trim / tilt separately, **PRESS and RELEASE** PORT or STBD trim button located on the center of the keypad.

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).

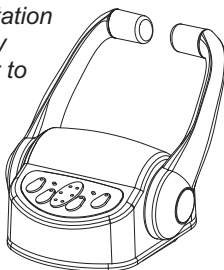


**TAKE LIGHT & APPROPRIATE GEAR LIGHTS WILL FLASH WHEN TAKE BUTTON IS PRESSED AT INACTIVE STATION**

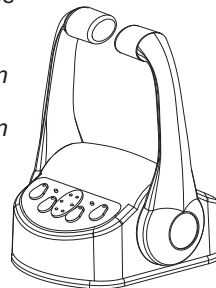
**2**

**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*



Active Station Handle Position	Handle Position at Station taking Control
In NEUTRAL	In NEUTRAL
In GEAR / IDLE	In Neutral or same GEAR / IDLE
In GEAR / with speed	In Neutral or same GEAR / same or slower speed setting

**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 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

	<b>1</b> <b>SYMPTOM</b>	<b>2</b> <b>ACTION</b>
<p><i>CHECK BATTERY light blinks</i></p>  <p><b>CHECK BATTERY INDICATOR WILL BLINK WHEN BATTERY VOLTAGE CONDITIONS EXIST THAT ARE QUESTIONABLE.</b></p>	<p>1) <b>SLOW BLINK</b> — combined battery input is too low.</p> <p>2) <b>QUICK BLINK</b> — combined battery input is too high.</p> <p><i>2-button &amp; 6-button keypads will indicate battery warning by 2 flashes of the LED that is currently illuminated at time of fault.</i></p>	<p>1) Determine cause of input power problem.</p> <p>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).</p>
<p><i>CHECK SYSTEM light blinks</i></p>  <p><b>CHECK SYSTEM INDICATOR WILL BLINK WHEN A POSSIBLE PROBLEM HAS BEEN DETECTED WITHIN THE SYSTEM.</b></p>	<p>1) Diagnostic tests have detected that part of the control system is not functioning normally.</p> <p><i>2-button &amp; 6-button keypads will indicate check system warning by 3 flashes of the LED that is currently illuminated at time of fault.</i></p>	<p>1) Restart control system (turn OFF/ON). Move handles to Neutral or Idle detent.</p> <p>2) Determine part of system not operating properly (ie. gear, throttle, troll, etc.).</p> <p>3) Utilize alarm code recovery procedure to discover source of problem (see troubleshooting section of manual).</p>

# Alarm Mode

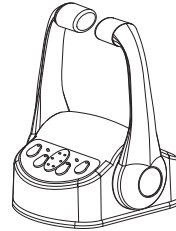
WHEN ACTIVATED THE CONTROL SYSTEM WILL NOT CONTINUE TO OPERATE. THE TRANSMISSION WILL GO TO NEUTRAL AND ENGINE SPEED WILL GO TO IDLE.



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.

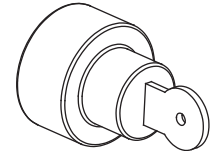


AN **ALARM** IS INDICATED WHEN ALL 4 KEYPAD LIGHTS “BLINK” SIMULTANEOUSLY



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

Return 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.

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

TYPE	KEYPAD LIGHTS	ENGINE THROTTLE	ENGINE TRANSMISSION
Warning	only light that is ON “blinks”	stays in commanded position	stays in commanded position
Alarm	all keypad lights “blink” in unison	goes to IDLE	goes to NEUTRAL



## **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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