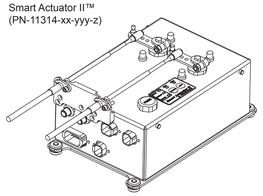
Complete Controls™ - Installation Instructions for Smart Actuator II™ Engine Controls

BASIC SYSTEM COMPONENTS

ACTUATOR: ***YOU WILL NEED (1) ACTUATOR FOR EACH ENGINE:***

Smart Actuator II™
(PN-11314-xx-yyy-z)



You will receive one actuator for each engine, boats equipped with trolling valves will require an additional Smart Actuator II™.

"xx" in part number of Smart Actuator II™ indicates 12 or 24 VDC system.

"yyy" in part number indicates Actuator type
TMG (Throttle Mechanical Gear) TEG (Throttle Electronic Gear) TROLL (if Troll equipped)
TMGB (Throttle Mechanical Gear Backup)

"z" in part number indicates PORT (P) STBD (S) CENTER (C) engine.

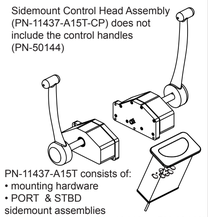
CP CONTROL HEAD(S): ***YOU MUST HAVE 1 CP HEAD FOR EACH SYSTEM:***

2-Button
Top Mount
Control Head
(PN-11415-C-CP)

4-Button
Top Mount
Control Head
(PN-11413-CT-CP)

6-Button
Top Mount
Control Head
with Trim control
(PN-11416-C-CP)

Sidemount Control Head Assembly
(PN-11437-A15T-CP) does not include the control handles
(PN-50144)



PN-11437-A15T consists of:
- mounting hardware
- PORT & STBD sidemount assemblies
- keypad assembly (PN-19412 or PN-19413)

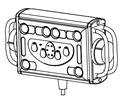
REMOTE STATION CONTROL HEAD(S): ***YOU CAN HAVE A MAXIMUM OF 5 REMOTE STATIONS FOR EACH SYSTEM:***

2-Button
2nd Station
(PN-11415-C2)

4-Button
2nd Station
(PN-11413-C15T2)

6-Button
2nd Station
(PN-11416-C2)

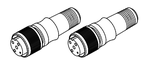
6-Button
Handheld Remote
Control Head
(PN-11470-6-35 hardwired)
(PN-11470-6-25-P pluggable)



Handheld
"Plug-in"
receptacle
(PN-11472-EEC3)

CABLES & HARNESSES:

Terminating Resistors ***(2 for each system)***
(PN-11600-TRF)



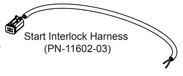
Station Communication Cable ***(1 for each control head)***
(PN-11600-02-xx) - available in 10 - 120 foot lengths

YOU SHOULD HAVE ONE (1) OF THESE HARNESSES FOR EACH ACTUATOR:

DC Power Harness
(PN-11601-01)

Actuator Enable Harness
(PN-11603)

Start Interlock Harness
(PN-11602-03)



Trim Control Harness
(PN-11611-xx-yy)
installer provides end connectors)

xx = type of cable (depends on engine)
yy = length of cable in feet

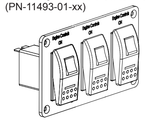
YOU SHOULD HAVE TWO (2) OF EACH OF THESE CABLES FOR EACH ACTUATOR:

PRO-X Type 33C Control Cables
(PN-A7100)

OPTIONAL ACCESSORIES

Remote Enable Switch
(PN-11490)

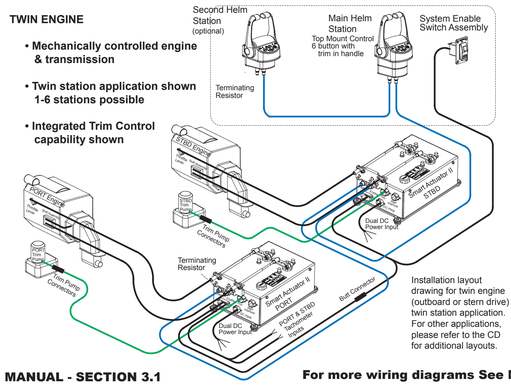
Triple Engine Enable Switch Panel
(PN-11493-01-xx)



PRE-INSTALLATION PLANNING

TWIN ENGINE

- **Mechanically controlled engine & transmission**
- **Twin station application shown 1-6 stations possible**
- **Integrated Trim Control capability shown**



Installation layout drawing for twin engine (outboard or stern drive) twin station application. For other applications, please refer to the CD for additional layouts.

Before installing the system, proper consideration should be given to the following:

1. **Actuator Location**

BE SURE TO:
- mount in dry and accessible location.
- allow a minimum of 6.0" of space for the connection of harnesses to the actuator.
- find a location that provides the shortest, most direct path from the engine and transmission control levers to the actuator(s).

2. **Dual Battery Input**

BE SURE TO:
- provide 2 independent and uninterrupted sources of DC power.

3. **Cable Routing**

BE SURE TO:
- check surfaces that come in contact with the cable, make sure they are free of sharp edges or burrs which could nick the cable.
- determine which method of routing station communication cables you will use (see step 3).
- identify engine harness hookup connections (see step 4).

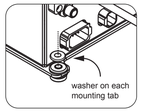
MANUAL - SECTION 3.1

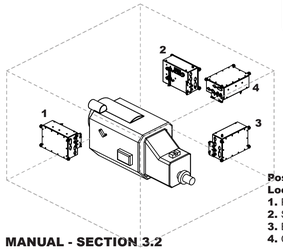
For more wiring diagrams See MANUAL - SECTION 7.1

1 Install the Smart Actuator(s)

BE SURE TO:
- mount in engine room in an accessible location that is free of water spray (propeller shaft) or high temperatures (engine exhaust).
- allow 6.0" space on connector side of actuator for the connection of harnesses to the Smart Actuator.
- mount with connectors facing sideways or in an downward position.

BE SURE NOT TO:
- mount actuator directly on the engine.





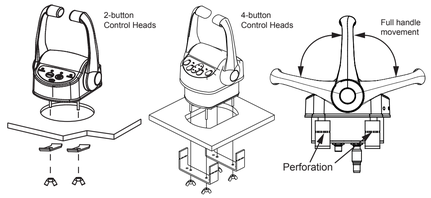
When mounting the Smart Actuator, it may be necessary to use washers on each mounting point to keep actuator securely fastened to wall

Possible Actuator Mounting Locations
1. PORT Side Wall
2. STBD Side Wall
3. Back Wall
4. Ceiling

MANUAL - SECTION 3.2

2 Install the Control Head(s)

BE SURE TO:
- mount in a location free of standing water.
- in a location that allows full movement of handles (full astern / full ahead)
- use templates provided with control head for cutout.



1. Mark location with template.
2. Cut hole in console.
3. Place control head in cutout.
4. Mount control head to surface by using the mounting clamps and wing nuts provided.

NOTE: **4-button control heads** - the control head clamps have a break off point indicated by a perforation. For consoles 0.25" to 1.00" thickness, use clamps as supplied. For consoles 0.75" to 1.625" thick, break off clamp at perforation.

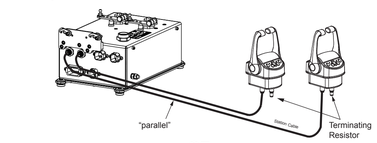
MANUAL - SECTION 3.2

3 Route Communication Cables

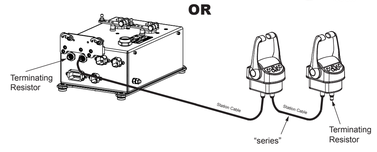
BE SURE TO:
- install a terminating resistor at both ends of the CANbus network.
- align notch in connector before insertion into receptacle **(see note below)**.

BE SURE NOT TO:
- splice or shorten cables in the field - cutting or nicking the cable WILL compromise the reliability of the system.

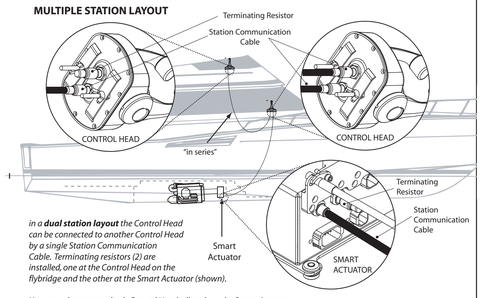
There are two methods for connecting Control Heads to the Control Processor:
1) PARALLEL -Both stations connect directly to Control Processor, or
2) SERIES - Stations can be joined "in series" together and connected to the Conrol Processor utilizing one station communication cable.



OR



MULTIPLE STATION LAYOUT



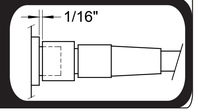
*in a **dual station layout** the Control Head can be connected to another Control Head by a single Station Communication Cable. Terminating resistors (2) are installed, one at the Control Head on the flybridge and the other at the Smart Actuator (shown).*

You may also connect both Control Heads directly to the Smart Actuator using (2) Station Communication Cables. In this arrangement the (2) terminating resistors would be installed, one at each Control Head.

MANUAL SECTION 3.4E

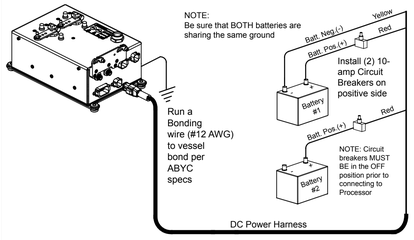
Δ IMPORTANT Δ

Align notch in connector with receptacle BEFORE insertion. Failure to align notch will bend the pins in the receptacle and will result in erratic system performance. Cable nut requires 6-7 turns while pushing in on connector for proper seating. There should be NO MORE THAN 1/16" [2mm] gap between the nut and the connector.



4 Connect DC Power Harness & Bonding Wire

BE SURE TO:
- follow ABYC standards for all electrical connections. If unfamiliar with ABYC standards, consult a marine electrician.
- know whether your system uses 12v or 24v DC. The Smart Actuator can use both - refer to specific wiring diagram for your engine type in Section 7.1 of manual.
- use 2 independent batteries for power for the system. Power voltage drops cause reliability issues, using 2 sources will help eliminate power problems.



NOTE: For each actuator you install you will need to supply battery power to each. Each actuator will require it's own DC Power Harness and it's own set of breakers.

MANUAL SECTION 3.4A

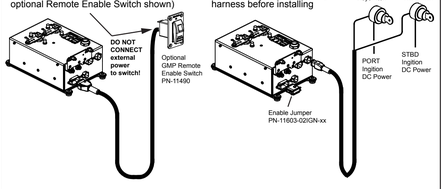
5 Connect Remote Enable Switch

BE SURE TO:
- follow ABYC standards for all electrical connections. If unfamiliar with ABYC standards, consult a marine electrician.
- turn OFF circuit breakers that control power to the Control Processor BEFORE installing Remote Enable Switch and Harness.
- if using a Single Pole, Single Throw (SPST) switch - locate the switch in an area where it will not be inadvertantly turned OFF during operation.

1. There are two methods for connecting Remote Enable:
   A. Switch Activated - which uses a Single Pole, Single Throw (SPST) switch
   B. Ignition Activated - which supplies DC power from the ignition switch(es)

A. SWITCH ACTIVATED
Standard Single Pole, Single Throw (SPST) switch may be used (GMP optional Remote Enable Switch shown)

B. IGNITION ACTIVATED
May be with or without output make sure your have the right harness before installing

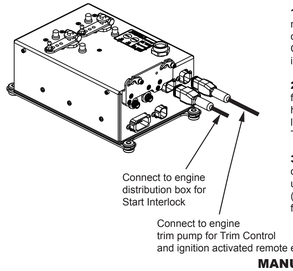


NOTE: PN 11603 - Enable Harness is different for "switch activation" than PN 11611 - Enable harness for "ignition activation." Be sure to use the correct enable harness for the specific type of start up arrangement.

MANUAL SECTION 3.4B

6 Connect Start Interlock & Trim Harness

BE SURE TO:
- locate the appropriately labeled receptacle on the Smart Actuator for Start Interlock.
- insert the cable connector fully into the receptacle until you hear a "click". This signifies that the locking tab has engaged the connector.
- follow the steps below for connecting the Start Interlock harness.



1. Verify that you have the right harness - if not STOP, call your dealer or consult the CD for more technical information.

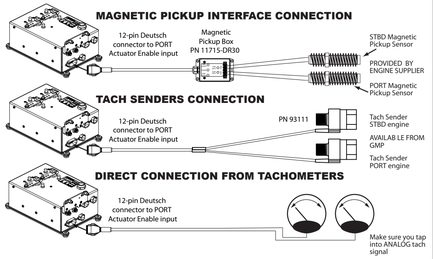
2. Insert Deutsch connectors for Start Interlock and Trim harnesses into receptacle labeled Start Interlock and Trim/Tilt on Smart Actuator.

3. Route harness to the engine distribution box and connect using appropriate connectors (see engine manufacturer for proper connection).

MANUAL - SECTION 3.4C

7 Install Tachometer Inputs

BE SURE TO:
- provide RPM information to the Smart Actuator II™ system by one of 4 methods:
1) Open Loop Sync - in the absence of a tach signal the Actuator will try to match the Slave engine RPM to the position of the Lead engine control handle. NO ACTION REQUIRED proceed to step 8.
2) Magnetic Pickup Interface (MPI) - provided by engine supplier
3) Tach Senders (or drive adapters where applicable)- must be supplied by GMP
4) Direct Connection from tachometer (outboard applications)

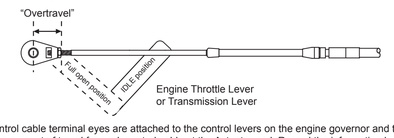


MANUAL - SECTION 3.4D

8 Install Control Cables at Engine

BE SURE TO:
- use premium grade Type 33C control cables - we recommend PRO-X A7100 by Glendinning.
- mount cables on engine and transmission but DO NOT connect to control levers at this time.
- remove terminal eye attached to actuator coupler plates and install on the end of each control cable making sure that you have a minimum of 3/16" thread engagement - DO NOT tighten jam nuts at this time.

1. Ensure that each control cable has "overtravel," that is the cable is able to travel farther than the lever that it will be attached to. Check this for both ends of travel. If the cable will NOT overtravel in both directions, make adjustments:
- **For 1/4" or less adjustment** - the terminal eye on the end of the cable may be screwed on or off the cable end. Terminal eye engagement on the control cable end must never be less than 3/16".
- **For more than 1/4" adjustment** - move the cable clamp position on the engine or transmission - check with engine or transmission manufacturer on how to do this.



2. After control cable terminal eyes are attached to the control levers on the engine governor and transmission. Measure the amount of travel for each control cable at the Actuator end. Record the information below:

PORT ENGINE		STBD ENGINE	
Control Cable	Length of Travel	Control Cable	Length of Travel
Throttle		Throttle	
Gear		Gear	
Troll Valve		Troll Valve	

MANUAL SECTION 3.3

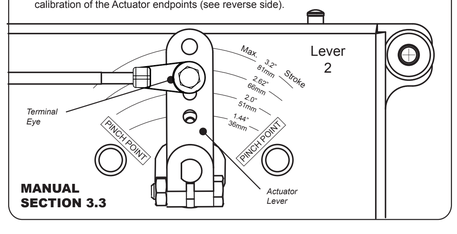
9 Cable Connection at Actuator

BE SURE TO:
- mount the engine / transmission control cables to the Actuator by backing off the screws holding the locking clamp in place. Make sure that the control cables are seated properly before replacing locking clamp.

1. Select the correct Actuator cable lever connection hole to be used, determined by the length of control cable travel recorded on the chart in step 8.

2. Move the terminal eye on the Actuator coupler plate to the correct stroke value listed on the Actuator beneath the coupler plate.

3. Adjust control cable terminal prior to attaching cable to the Actuator coupler plate. Leave the control cables **DISCONNECTED** until you are ready to proceed with calibration of the Actuator endpoints (see reverse side).



MANUAL SECTION 3.3

It is strongly recommended that the installer have a thorough understanding of the complete Manual prior to installation. To view the complete Manual, consult the CD supplied with the system or visit our website.

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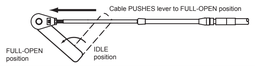
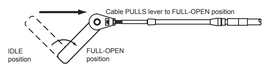
Installation IS NOT COMPLETE until endpoint calibration & verification is performed, see reverse side or consult the Manual - Section 4.0 For wiring diagrams, see Section 7.1

Complete Controls™ - System Test & Checkout / Troubleshooting Mode - Alarm Code Retrieval

SMART ACTUATOR II™ ENDPOINT CALIBRATION INSTRUCTIONS:

DETERMINE THE DIRECTION OF TRAVEL FOR THE ENGINE THROTTLE AND TRANSMISSION CONTROL LEVERS FOR EACH ENGINE AND RECORD ON THE TABLE BELOW:





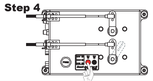
ENGINE THROTTLE LEVER MOVEMENT		TRANSMISSION GEAR LEVER MOVEMENT	
INCREASES Engine Speed		*ENGAGES AHEAD Gear*	
PORT Engine	***STBD Engine***	***PORT Transmission***	***STBD Transmission***
PUSH **OR** PULL	PUSH **OR** PULL	PUSH **OR** PULL	PUSH **OR** PULL

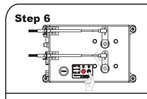
DO NOT CONNECT PUSH / PULL CABLES TO THE ACTUATOR LEVERS PRIOR TO CALIBRATING ACTUATOR ENDPOINTS AND CABLE DIRECTION

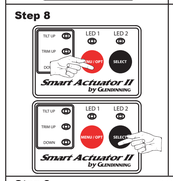
USE CAUTION: KEEP HANDS AWAY FROM MOVING COMPONENTS OF ACTUATORS WHEN CALIBRATING ACTUATOR ENDPOINTS!

Vessels equipped with mechanical gears (outboards and I/O) leave the control system in "WARM" mode until the engines are running. Attempting to shift gears with the engines OFF may result in damage.

TO CALIBRATE THE ACTUATOR ENDPOINTS AND SET CABLE DIRECTION (ABOVE), FOLLOW THE STEPS BELOW:

	ACTION	RESULT
Step 1	Turn ON power to Smart Actuator II™	No result.
Step 2	Press & Release both the RED & BLACK buttons on the Smart Actuator II™ simultaneously 3 times	Both LEDs above the RED and the BLACK buttons will flash to indicate you have entered Actuator Configuration Mode
IF calibration of the throttle actuator (LEVER 1) is desired, continue with the steps below. IF calibration of ONLY the gear actuator (LEVER 2) is desired and not LEVER 1, then PRESS & RELEASE the RED button 1 time BEFORE continuing with the steps below.		
Step 3	Press & Release both the RED & BLACK buttons on the Smart Actuator keypad simultaneously 1 time	Both LEDs above the RED and the BLACK buttons will out - this indicates you are ready to calibrate the Actuator endpoints
Step 4 	Press & Release the RED button repeatedly to EXTEND LEVER 1 to the desired position - if you go too far, press & release the BLACK button to RETRACT	You may also Press & Hold the RED button to EXTEND LEVER 1 in larger amounts until desired position is achieved - Release button when position is achieved!
Step 5	Press & Release both the RED & BLACK button simultaneously 1 time to confirm LEVER 1 extended position	The LED above the RED button will illuminate to indicate that extended position has been saved in memory

	ACTION	RESULT
Step 6 	Press & Release the BLK button repeatedly to RETRACT LEVER 1 to the desired position - if you go too far, press & release the RED button to RETRACT	You may also Press & Hold the BLK button to EXTEND LEVER 1 in larger amounts until desired position is achieved - Release button when position is achieved!
Step 7	Press & Release both the RED & BLACK buttons on the Smart Actuator II™ simultaneously 1 time to confirm LEVER 1 position	Both LEDs above the RED and the BLACK buttons will illuminate to indicate that retracted position has been saved in memory

Step 8 

IMPORTANT
Press the RED or the BLK button to confirm correct travel direction for LEVER 1

For PUSH to OPEN / AHEAD - press & release the RED button

For PULL to OPEN / AHEAD - press & release the BLK button

	LEDs ON	TRAVEL DIRECTION
1	LED 1 (above RED button)	PUSH to OPEN / AHEAD
2	LED 2 (above BLK button)	PULL to OPEN / AHEAD

If it becomes necessary to change travel direction after position is entered, see MANUAL Section 7.6.4 for detailed instructions.

Step 9 REPEAT steps 3-8 for LEVER 2 (gear actuator position).
NOTE: After completing endpoint calibration of LEVER 1 (throttle actuator), if endpoint calibration of LEVER 2 is not required, you may proceed to step 10.

	ACTION	RESULT
Step 10	Turn OFF power to Actuator and RESTART	You have successfully completed the calibration of the Smart Actuator. Proceed with calibration verification (see right).

ENDPOINT CALIBRATION VERIFICATION:

Leave the control cable ends DISCONNECTED from the levers on the actuator. The throttle and gear cables will be moved manually to confirm that the actuator lever and control cable travel achieve the same position. For I/O and Outboard applications, it may be necessary to rotate the propeller when moving the gear cable. This will allow proper gear engagement and will assure full cable travel.

Upon completion of the Endpoint Calibration procedure, it is advisable that the operation of the Smart Actuator II™ system be inspected to verify that each engine throttle and transmission lever is being properly moved in the correct direction and through the full range of travel.

The following points should be kept in mind when verifying actuator position and operation:
1) ***Direction of travel*** - the location of engine idle and full throttle, gear ahead and astern, and troll valve lockup / slip should be considered to ensure that the actuator is moving the engine and gear controls inthe appropriate direction.
2) ***Actuator endpoint*** - the actuator should move its associated control lever to the mechanical stop without placing undue strain on the control cable or control lever.
3) ***Control lever detent position*** - when positioning the gear lever or trolling valve lever, it may be helpful to disconnect the push-pull cable from the lever and move the control lever independently from the system.

Take control at any station that is convenient for good communication between the engine room and helm station.

ACTION	RESULT
With Actuator lever(s) in NEUTRAL position, check . . .	• Engine throttle lever should be in IDLE. • Gear control lever should be in NEUTRAL. • Troll valve (if equipped) should be at LOCKUP position.
Move control head handle(s) to AHEAD detent position . . .	Gear cable(s) can be moved to and matched with the AHEAD position of the Actuator lever(s). If not, recalibration is necessary.
Move control head handle(s) to ASTERN detent position . . .	Gear cable(s) can be moved to and matched with the ASTERN position of the Actuator lever(s). If not, recalibration is necessary.
Move control head handle(s) to FULL AHEAD and FULL ASTERN position . . .	Throttle cable(s) can be moved to and matched with the WIDE OPEN THROTTLE position of the Actuator lever(s). If not, recalibration is necessary.
Move control head handle(s) to NEUTRAL position . . .	Throttle cable(s) should be at IDLE position and transmission cable(s) should be at NEUTRAL position of the Actuator lever(s). Cable(s) SHOULD NOT be binding.
IF TROLL VALVE EQUIPPED, move control head handle(s) to NEUTRAL position(s) and PRESS & RELEASE Troll button on the keypad . . .	Troll LED will illuminate indicating that Troll Mode is ON. Verify that Troll Actuator lever(s) have moved to Troll Valve Open position. Cable(s) SHOULD NOT be binding.
IF TROLL VALVE EQUIPPED, move control head handle(s) to FULL THROTTLE position . . .	Verify that Troll Actuator lever(s) have moved toward LOCKUP position, but NOT into LOCKUP position. Cable(s) SHOULD NOT be binding.
IF TROLL VALVE EQUIPPED, move control head handle(s) to NEUTRAL position and PRESS & RELEASE Troll button on keypad . . .	Troll LED will go out indicating that Troll Mode is OFF. Verify that Troll Actuator lever(s) have moved to the LOCKUP position. Cable(s) SHOULD NOT be binding. Verify that NORMAL gear / throttle operation is now available from the helm station.

After performing the Endpoint Calibration Verification, if you find that one actuator position needs to be changed, refer to the beginning of the Endpoint Calibration instructions (left) and follow the instructions to re-calibrate the actuator endpoints. This completes the Calibration procedure. The system is now fully operational and ready for use.

SYSTEM TEST & CHECKOUT

COMPONENT INSTALLATION CHECKS

Smart Actuator:

- ☐ Verify Actuator(s) is securely fastened to the boat structure.
- ☐ Verify electrical power connections:
  - Battery Negatives - Negatives from both batteries should be connected (not at Control Processor). It is vital that there be zero voltage potential between battery negative terminals. Battery negative terminals should be connected to bonding system.
  - Negative Lead - Negative wire from EEC system is connected to single battery negative.
  - Positive Leads - Power should be connected from battery positive terminal or disconnect switch (battery side of switch) to CP via 15 amp fuse / circuit breaker.
  - Check that all battery connections are tight and verify that bonding wire is properly connected to bonding stud.
- ☐ Verify that all connectors are properly inserted into their receptacles (Station cables, Transmission harness, Throttle harness, and Trim harness (if applicable). DO NOT FORCE connectors into recepticles! All wires should be secured with tie-wraps along route.
- ☐ Verify that a terminating resistor is installed at each end of the CANbus network and that there is NO open station connector.

Control Head(s):

- ☐ Verify Control Head(s) are securely fastened to the boat structure.
- ☐ Verify that Control handles have an unobstructed freedom of movement (full ahead and full reverse).
- ☐ Return all handles to NEUTRAL.
- ☐ Verify that a terminating resistor is installed at each end of the CANbus network and that there is NO open connector.

OPERATIONAL CHECKS

General Functions:

NOTE: While performing system checks, verify that the "Check System" LED stays OFF. If it comes ON, the system is in Alarm Mode and alarm condition MUST be checked and corrected BEFORE proceeding.

- ☐ Turn system ON.
- ☐ Verify at MAIN station various functions: Warm Up, Slow, Troll, and Sync.
- ☐ Verify the operation of the trim buttons on the control head handle and keypad.
- ☐ Transfer control to other control stations and verify proper operation of functions at each station.

Start Interlock:

- ☐ Move STBD control handle out of NEUTRAL position. Attempt to start engine **(NOTE: Be prepared to immediately shutdown engine if start interlock has been wired incorrectly!)**.
- ☐ Engine should NOT start. If it does, start interlock has been wired incorrectly. Fix wiring and re-check.
- ☐ Move STBD control handle back to NEUTRAL position. After handle is moved to NEUTRAL position, then try to start engine. Engine should start.
- ☐ Perform same check for PORT engine.

Power Inputs:

- ☐ To verify separate power inputs, turn ON individual breakers one at a time and verify that DC power (12 or 24 VDC) is supplied to the Control Processor.

Engine Room Checks:

- ☐ Gear Operation - Verify that transmission levers are moving through their full range as you move control handles into and out of gear. Make sure that transmission shifts into appropriate direction (pushing handle forward causes forward boat motion, etc.).

Trolling Valve (if equipped):

- ☐ Enter Troll Mode and move handles to the forward detent - there should be little of NO propeller rotation. Rotation should increase as handle is pushed forward until Full-Lockup is achieved. Full-Lockup is verified by speed or transmission pressure.

ALARM MODE:

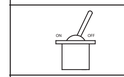
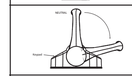
If your keypad looks like this - your system is in Alarm Mode

Alarm Mode is indicated by all 4 lights on the keypad flashing simultaneously.
During operation , 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.

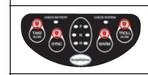
TO VIEW ALARM CODES:

Must be performed from MAIN STATION CONTROL HEAD

1 Enter Troubleshooting Mode:

	ACTION	RESULT
	Turn System OFF	Check to see that the control head keypad LEDs are NOT illuminated. This is a visual indication that the system has been turned OFF.
	Move control station handles to FULL throttle positions	The Main station control head handles MUST be in the full throttle positions in order to enter Troubleshooting Mode.
	Turn System ON	When the system has been turned ON the TAKE LED will blink slowly and a beeping sound will be emitted from the keypad.
	Press & Release the SYNC & WARM buttons in unison three (3) times	After pressing the two buttons, the keypad's 4 LEDs will now begin to alternate between **slow blinking** and **fast blinking** every 4 seconds.

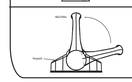
2 Retrieve Alarm Count & Codes:

	ACTION	RESULT
	Record the sequence of alternating slow and fast blinking LEDs on the Alarm Code chart (see right)	This first series of alternating blinking LEDs shows the alarm count - that is how many times the system went into Alarm Mode.
	Press & Release the SYNC button to cycle through the 16 most recent alarm codes	When the SYNC button is pressed & released the next series of alternating blinking LEDs will show the alarm code. Record the alarm codes on the Alarm Code chart (far right) and determine what the alarm codes are.

3 Delete Codes & Reset Count:

	ACTION	RESULT
	Press & Release the SYNC & WARM buttons simultaneously	This action deletes the alarm codes and resets the alarm count to zero. All LEDs will begin to flash to indicate alarm codes have been deleted. You may delete alarm counts and alarm codes anytime after entering "Troubleshooting Mode".

4 Exit Troubleshooting Mode:

	ACTION	RESULT
	Turn System OFF	You have now exited Troubleshooting Mode.
	Move control station handles to their NEUTRAL positions	You may now restart the system in Normal Run Mode.

ALARM COUNT CHART

The first series of alternating Slow and Fast blinking LEDs shows the alarm count - that is how many times the system went into Alarm Mode.

Place a mark in the boxes (right) to correspond with the alternating Slow and Fast blinking LEDs on the keypad at the Main station.

	LEDs SLOW BLINKING				LEDs FAST BLINKING				= ALARM COUNT
4-button	TAKE	SYNC	WARM	TROLL	TAKE	SYNC	WARM	TROLL	
2-button	PORT N	ACTIVE	WARM	STBD N	PORT N	ACTIVE	WARM	STBD N	

Match the blinking LEDs recorded above with the chart below to determine the Alarm Count.

COUNT	LEDs SLOW BLINKING				LEDs FAST BLINKING				COUNT	LEDs SLOW BLINKING				LEDs FAST BLINKING				COUNT	LEDs SLOW BLINKING				LEDs FAST BLINKING				COUNT	LEDs SLOW BLINKING				LEDs FAST BLINKING			
	TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N	TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N		TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N	TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N		TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N	TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N		TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N	TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N
1	●								17	●								33	●					●			49	●					●	●	
2		●							18		●			●				34		●				●			50		●			●	●		
3	●	●							19	●	●			●				35	●	●				●			51	●	●			●	●		
4			●						20			●		●				36			●			●			52			●		●	●		
5	●		●						21	●		●		●				37	●		●			●			53	●		●		●	●		
6		●	●						22		●	●		●				38		●	●			●			54		●	●		●	●		
7	●	●	●						23	●	●	●		●				39	●	●	●			●			55	●	●	●		●	●		
8				●					24				●	●				40				●		●			56				●	●	●		
9	●			●					25	●			●	●				41	●			●		●			57	●			●	●	●		
10		●		●					26		●		●	●				42		●		●		●			58		●		●	●	●		
11	●	●		●					27	●	●		●	●				43	●	●		●		●			59	●	●		●	●	●		
12			●	●					28			●	●	●				44			●	●		●			60			●	●	●	●		
13	●		●	●					29	●		●	●	●				45	●		●	●		●			61	●		●	●	●	●		
14		●	●	●					30		●	●	●	●				46		●	●	●		●			62		●	●	●	●	●		
15	●	●	●	●					31	●	●	●	●	●				47	●	●	●	●		●			63	●	●	●	●	●	●		
16					●				32						●			48					●	●											

For more detailed information on Troubleshooting / Alarm Codes, refer to MANUAL - SECTION 6.0 included on the CD that shipped with the unit, or visit our website www.glendinningprods.com

ALARM CODE CHART

Record the second set of alternating Slow and Fast blinking LEDs by placing an "X" in the column marked X. After recording each alarm code press SYNC button to advance to the next alarm code until all 16 codes are recorded. Once alarm codes are recorded, match each alarm to the description chart (below) and record this information next to each alarm code.

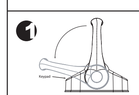
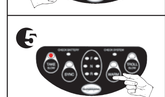
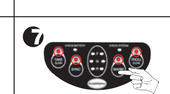
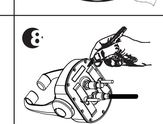
X	LEDs SLOW BLINKING TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N	LEDs FAST BLINKING TAKE PORT N	SYNC ACTIVE	WARM WARM	TROLL STBD N	ALARM CODE DESCRIPTION
	●								Detected multiple handles with the same handle ID at startup.
	●	●							No handle connected at startup.
	●	●	●	●	●				** Control Processor lost communication with Handle #1.
						●			** Control Processor lost communication with Handle #2.
	●					●			** Control Processor lost communication with Handle #3.
		●				●			** Control Processor lost communication with Handle #4.
				●		●			Detected multiple actuators with the same actuator ID at startup.
		●		●		●			Control Processor lost communication with actuator #1 (port throttle / gear).
	●	●		●		●			Control Processor lost communication with actuator #2 (stbd throttle / gear).
			●	●		●			Control Processor lost communication with actuator #3 (port / stbd troll).
	●		●	●		●			Control Processor lost communication with actuator #4 (port/stbd throttle / elec gear
	●	●	●	●		●			Control Processor lost communication with actuator #6 (center throttle / gear).
	●	●					●		Actuator #1 battery input below 10V / 19V.
			●				●		Actuator #1 battery input above 17V / 32V.
		●	●				●		Actuator #1 - Port throttle exceeded 5A for more than 6 seconds.
				●			●		Actuator #1 - Port throttle can not reach commanded position.
		●		●			●		Actuator #1 - Port gear exceeded 5A for more than 6 seconds.
			●	●			●		Actuator #1 - Port gear can not reach commanded position.
	●	●			●		●		Actuator #2 battery input below 10V / 19V.
			●		●		●		Actuator #2 battery input above 17V / 32V.
		●	●		●		●		Actuator #2 - Stbd throttle exceeded 5A for more than 6 seconds.
				●	●		●		Actuator #2 - Stbd throttle can not reach commanded position.
		●		●	●		●		Actuator #2 - Stbd gear exceeded 5A for more than 6 seconds.
			●	●	●		●		Actuator #2 - Stbd gear can not reach commanded position.
	●	●			●			●	Actuator #6 battery input below 10V / 19V.
			●		●			●	Actuator #6 battery input above 17V / 32V.
		●	●		●			●	Actuator #6 - Center throttle exceeded 5A for more than 6 seconds.
				●	●			●	Actuator #6 - Center throttle can not reach commanded position.
		●		●	●			●	Actuator #6 - Center gear exceeded 5A for more than 6 seconds.
			●	●	●			●	Actuator #6 - Center gear can not reach commanded position.

** = Handle losing communication will cause an alarm condition if handle is the ACTIVE handle at time of fault.

For a more detailed listing of Alarm Codes, refer to MANUAL - SECTION 6.0 included on the CD that shipped with the unit, or visit our website www.glendinningprods.com

TO CHANGE HANDLE ID:

Follow these instructions if you get the "Detected multiple handles with the SAME handle ID at startup" alarm code.

	ACTION	RESULT
1 	Move control handles to FULL ASTERN positions.	No result.
2	Turn power ON to the system.	The TAKE LED will begin to flash.
3	Press & Hold the two center buttons (SYNC & WARM) for approximately 2 seconds.	All four LEDs will begin to flash.
4	Press & Release the SYNC button one time to select Handle Identifier Mode.	The TAKE LED will begin to flash.
5 	Press & Release the WARM button one time to enter Handle ID Configuration.	The TAKE LED will be illuminated (fully on - no flashing).
6	Press & Release the SYNC button until the desired handle ID is achieved - see the chart at the right for ID# and corresponding LED that will be illuminated.	
7 	Press & Release the WARM button one time.	This action stores your handle ID in memory. All four (4) LEDs will begin to flash after ID is stored in memory.
8 	Record the handle ID# on the label located on the bottom of the control head.	To exit control handle configuration mode, turn system OFF and return control handles to their NEUTRAL positions.

ID#	LEDs that are illuminated
1	TAKE
2	SYNC
3	TAKE & SYNC
4	WARM
5	TAKE & WARM
6	SYNC & WARM

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