

Engine Control System KC-E102

Manual



KC-E102 Series Engine Control System

Chapter 0 – KC-E102 Model Classification

Chapter 1 – Operation

Chapter 2 – H102/ H102A Control Head

Chapter 3 – E102 Electronic Engine Control Driver unit

Chapter 4 – Single line cabling & Wire Termination

Chapter 5 – Power Up & Initial Checks.

Chapter 6 – Reset to Factory Default

Chapter 7 – How to calibration

Chapter 8 – KC-E102 Error Code

KC-E102 Series Engine Control System

Chapter 0

KC-E102

Model Classification

KC-E102 Series Engine Control System

(1) KC-E102 Model Classification

S: Single engine(E102 one unit)
T: Twin engine(E102 two unit)

KC-E102X –XS

1: One station(H102 one unit)
2: Two station(H102 two unit)
3: Three station(H102 three unit)
4: Four station(H102 four unit)

Model	Single engine	Twin engine	Part number
KC-E102S-1S	O		E102 x 1 unit H102 x 1 unit
KC-E102S-2S	O		E102 x 1 unit H102 x 2 unit
KC-E102S-3S	O		E102 x 1 unit H102 x 3 unit
KC-E102S-4S	O		E102 x 1 unit H102 x 4 unit
KC-E102T-1S		O	E102 x 2 unit H102 x 1 unit
KC-E102T-2S		O	E102 x 2 unit H102 x 2 unit
KC-E102T-3S		O	E102 x 2 unit H102 x 3 unit
KC-E102T-4S		O	E102 x 2 unit H102 x 4 unit

KC-E102 Series Engine Control System

Chapter 1

KC-E102

Operation

KC-E102 Series Engine Control System

(1) Operating the KC-E102 Control System

- 1) Upon power up,
Station 1 buzzer will sound
Station select light will be flashing
Station Lock light is steady.
- 2) Control handle **MUST** be place in Neutral position
Press Station Select to acknowledge and silence the buzzer

CAUTION!

**The Control system is now operational.
Operate with care by trained personnel only.**

- 3) Station 1 is now in command.
As Station Lock is still lighted, control is locked at station 1.
To transfer station, press Station Lock.
(This will unlock the lock function)
Station Lock light will be deactivated and station transfer is now possible.
- 4) Go to the station that you want control
Control handle **MUST** be place in Neutral position.
Press the Station Select button.
With a beep sound the station control is now transfer to the new station.
Operator can choose to Station Lock the control system.

KC-E102 Series Engine Control System

Chapter 2

H102 / H102A

CONTROL HEAD

KC-E102 Series Engine Control System

(1) H102 / H102A Control Head

1) SW2, to the correct position

0 – Station 1

1 – Station 2

2 – Station 3

3 – Station 4

2) F_Switch, S5, Setting

Switch	ON	OFF	Default
1	H102	H102A	ON
2	Dual Lever	Single Lever	ON
3	External Buzzer	External Buzzer	ON
4	Internal Memory	External Memory	OFF
5	Calibration & Test Enable	Calibration & Test Disable	OFF

3) For the last control station, Set SW3 to “ON”

KC-E102 Series Engine Control System

(2) H102 Series Control Head



H102 – Forward Console
H102A – AFT Console
H102S – Single Station

KC-E102 Series Engine Control System

(3) Control Head H102 / H102A Keypad

1) Station Select

This button is for setting the control station to be in command.

Power up default: Station 1

Station Lock **MUST** be deactivated & control handles **MUST** be place

In neutral before station control can be transfer

2) Station Lock

This feature will lock the station in command and will not allow transfer of control to any other station.

Power up default: Station 1

Press to deactivated, no light, and press again to activate, lighted.

3) Port Override

This feature will allow the port handle control of throttle **WITHOUT** activating the gear box.

Control handle **MUST** be place in neutral.

Press the button and the light is on.

Move the pot handle into the clutch detent, gear box should not activate.

Moving the leer further will start to increase the engine rpm.

Move control lever back to neutral and press button, light off.

“This feature is usefully for operating PTO off the engine”

4) Stbd Override

This feature will allow the starboard handle control of throttle **WITHOUT** Activating the gear box.

Control handle **MUST** be place in neutral.

Press the button and the light is on.

Move the port handle into the clutch detent, gear box should not activate.

Moving the lever further will start to increase the engine rpm.

Move control lever back to neutral and press button, light off.

5) Sync Mode

This allows control of a twin engine with one control handle.

Power up default: Starboard Handle.

6) Dim

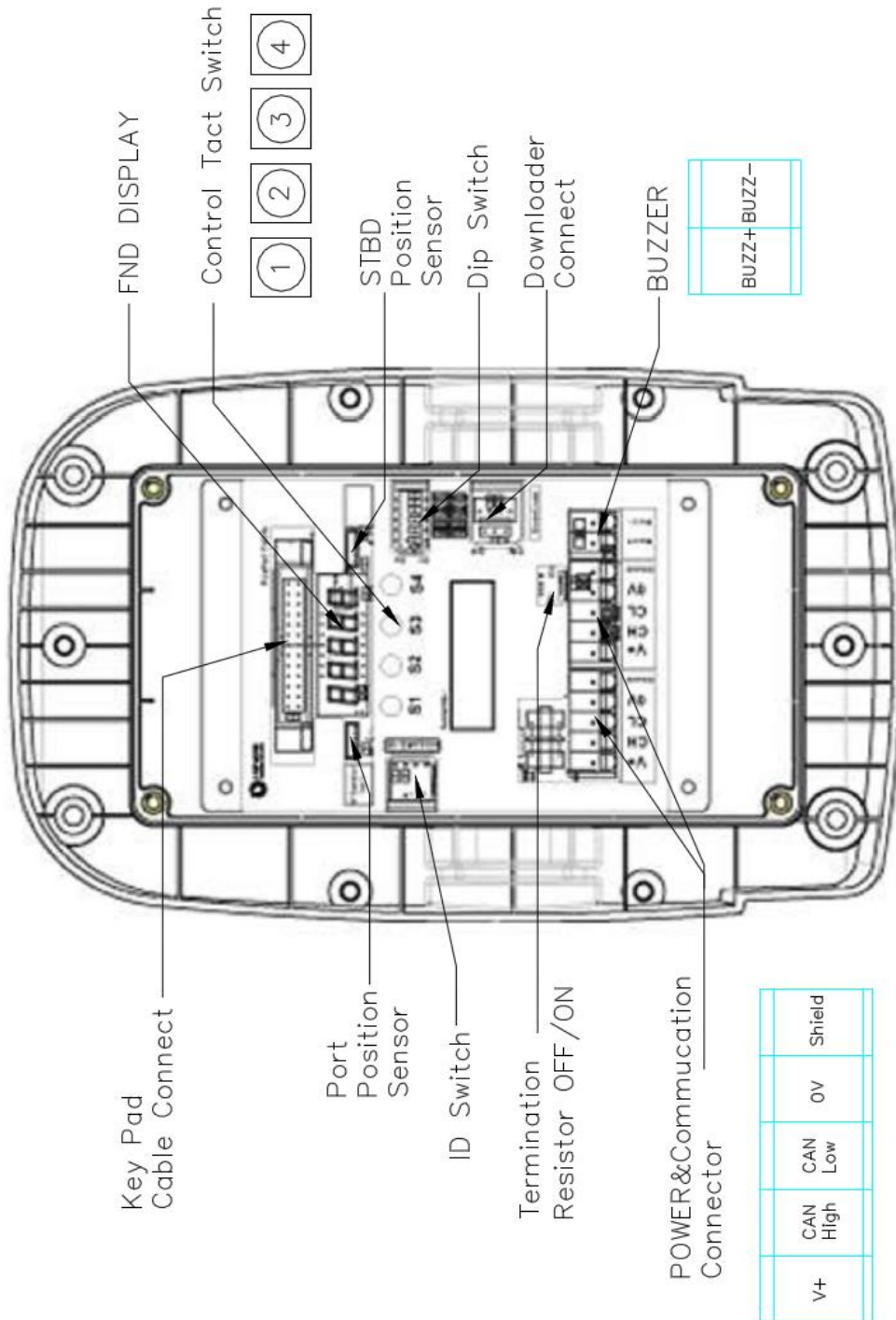
This allows the dimming of the LED lights on the keypad.

Power up default: Full brightness

Press, press, press, press, press to get the required brightness.

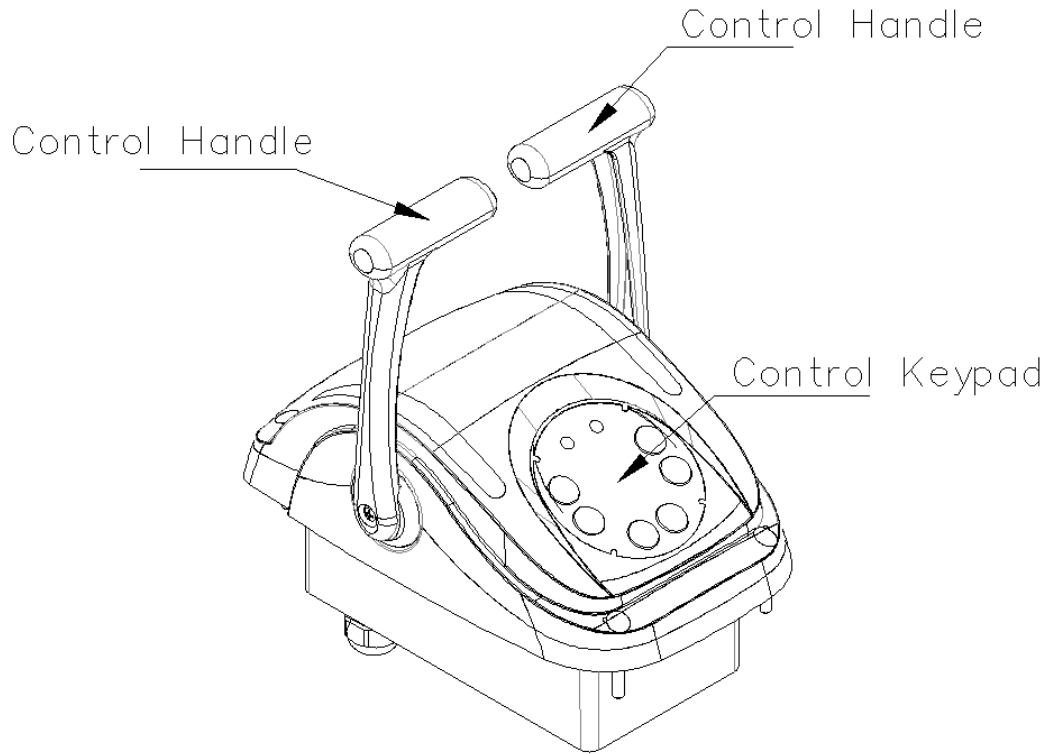
KC-E102 Series Engine Control System

(4) Main board on Control Head

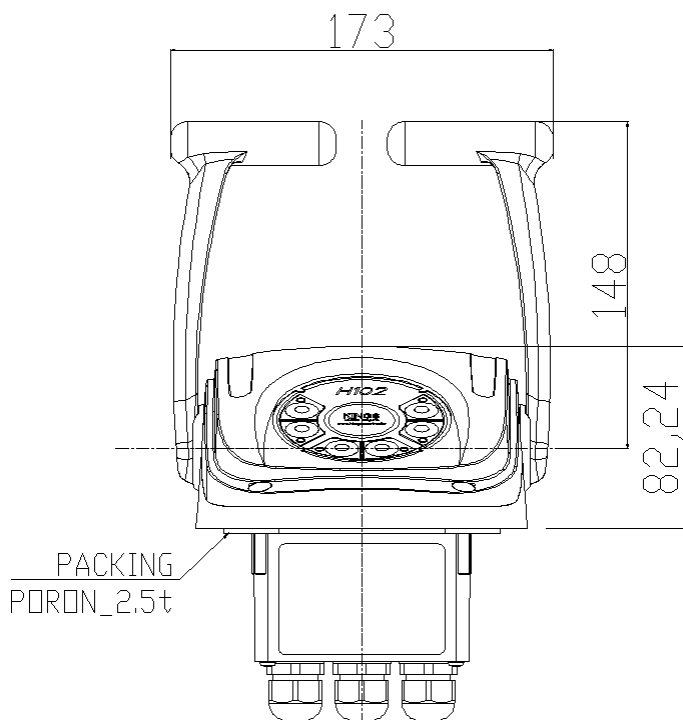


KC-E102 Series Engine Control System

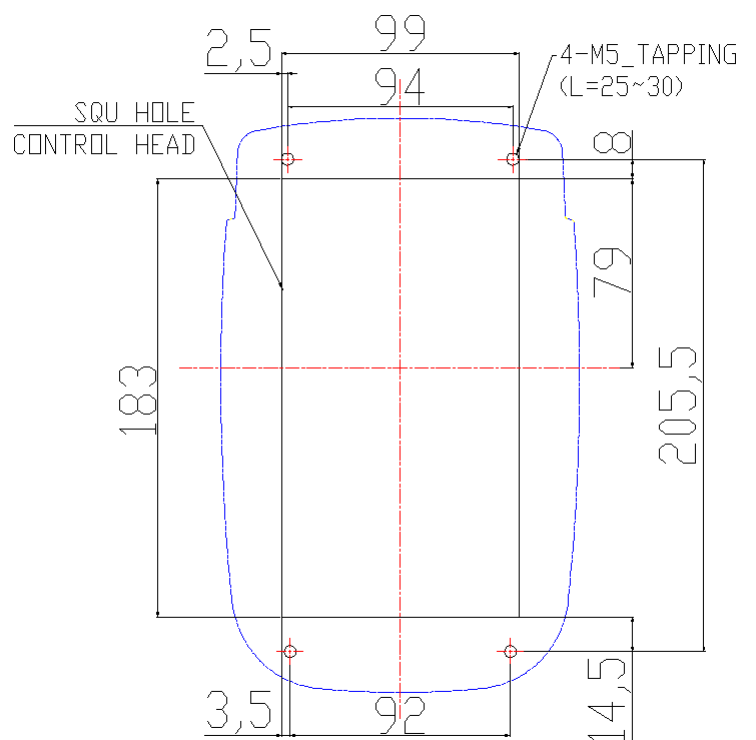
(5) Dimension the H102 Control Head



H102 Series Dimension



Mounting Hole Dimension



KC-E102 Series Engine Control System

Chapter 3

E102

ELECTRONIC ENGINE

CONTROL Driver UNIT

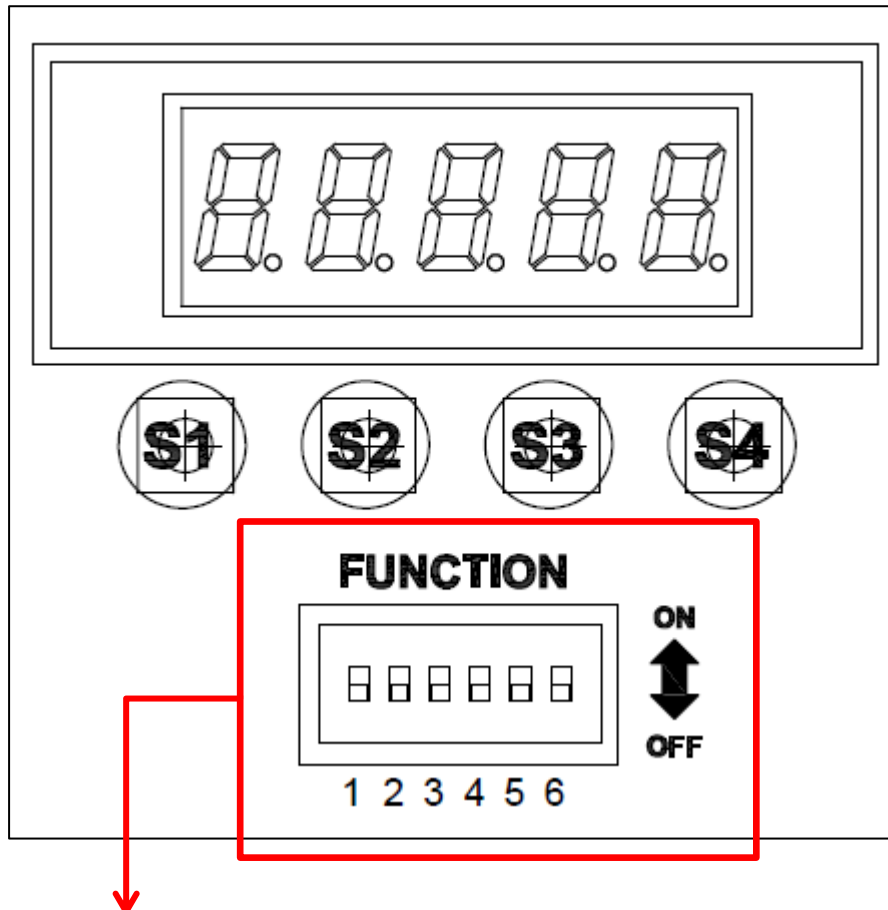
KC-E102 Series Engine Control System

(1) E102 Electronic Engine Control Driver main



KC-E102 Series Engine Control System

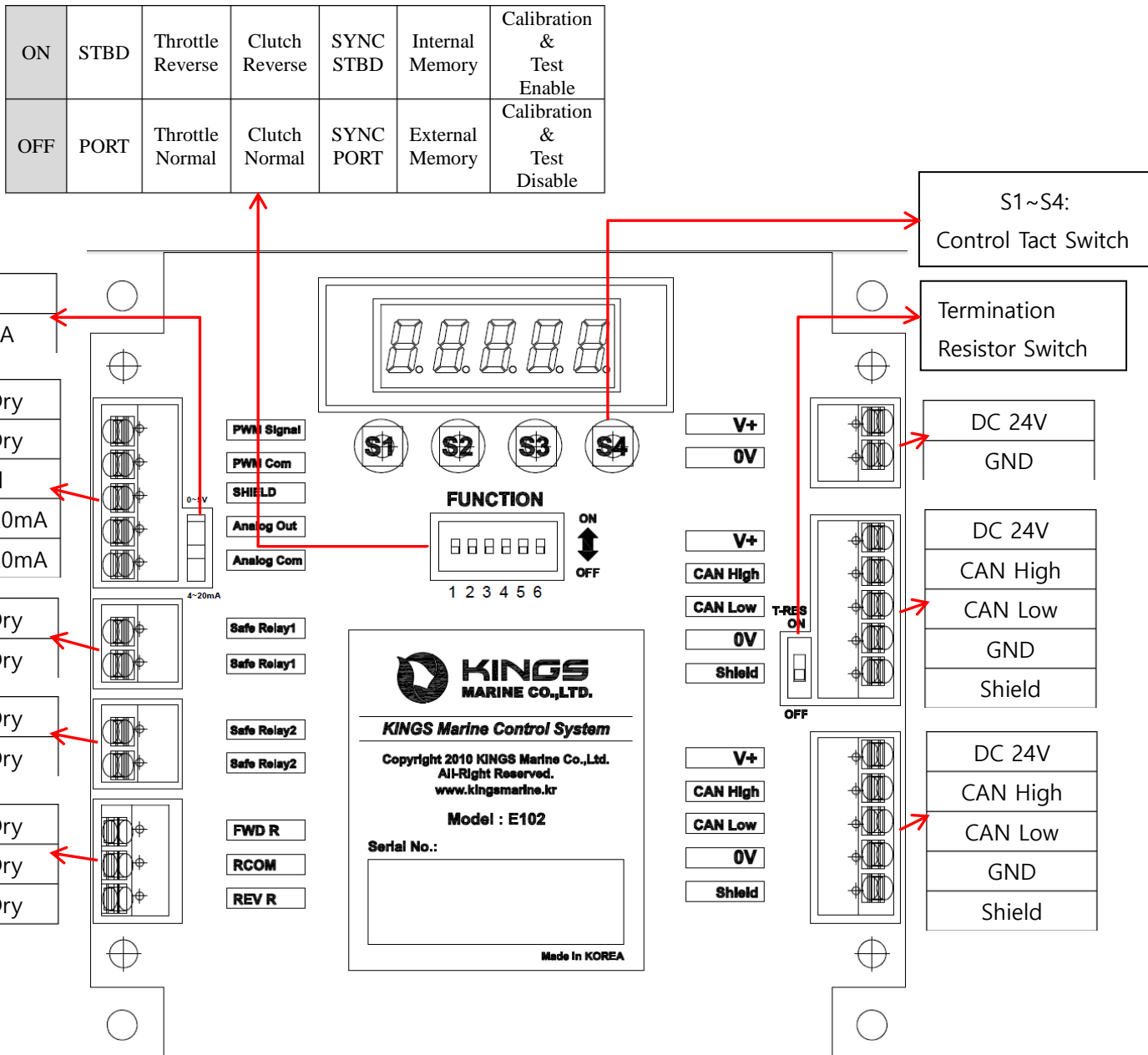
(2) E102 Electronic Engine Control Driver setting the dip switches



Switch	ON	OFF	Default
1	STBD	PORT	OFF
2	Throttle Reverse	Throttle Normal	OFF
3	Clutch Reverse	Clutch Normal	OFF
4	SYNC STBD	SYNC PORT	OFF
5	Internal Memory	External Memory	OFF
6	Calibration & Test Enable	Calibration & Test Disable	OFF

KC-E102 Series Engine Control System

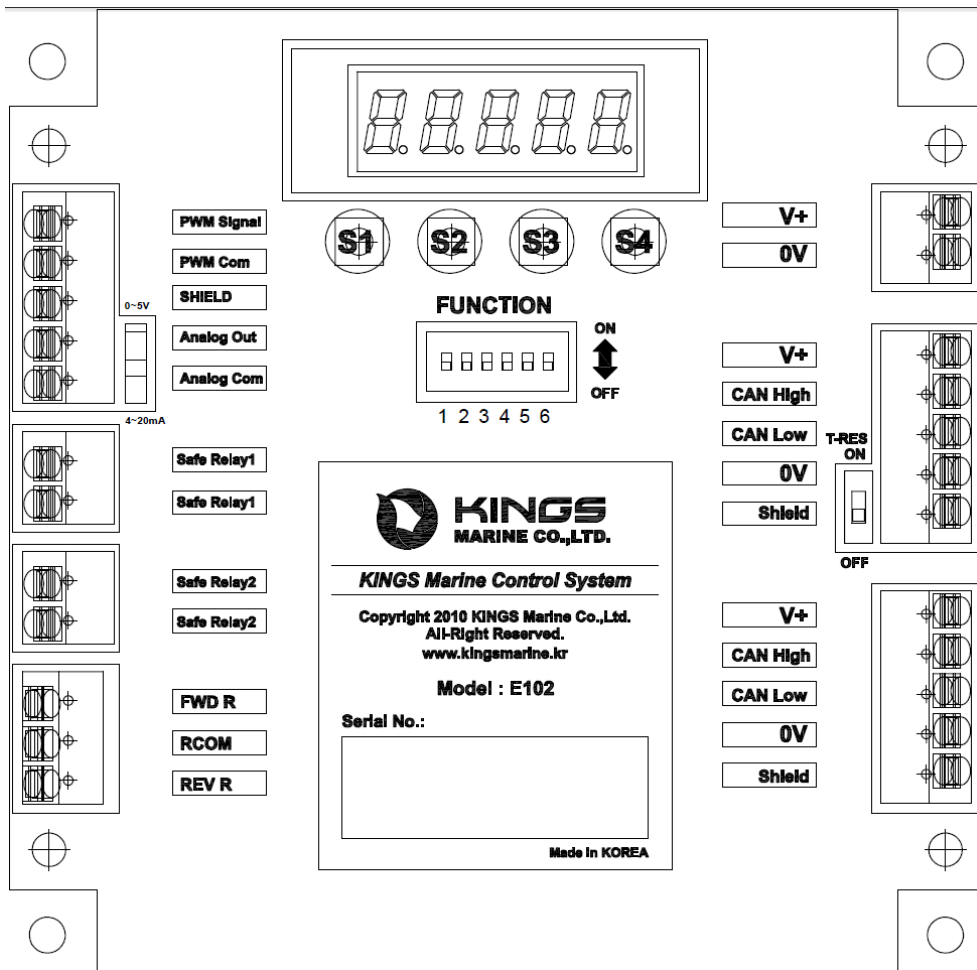
(3) Information the Electronic Engine Control Driver



- The Electronic Engine Control Driver is consist of one board.
- 4~20mA/0~5V switch is selected about analog output
- Fnd display is displayed current status and activation.
- Dip switch is for activation set
- S1~S4 switch is using for calibration, 4~20mA/0~5V analog output
- PWM is 8%~92%

KC-E102 Series Engine Control System

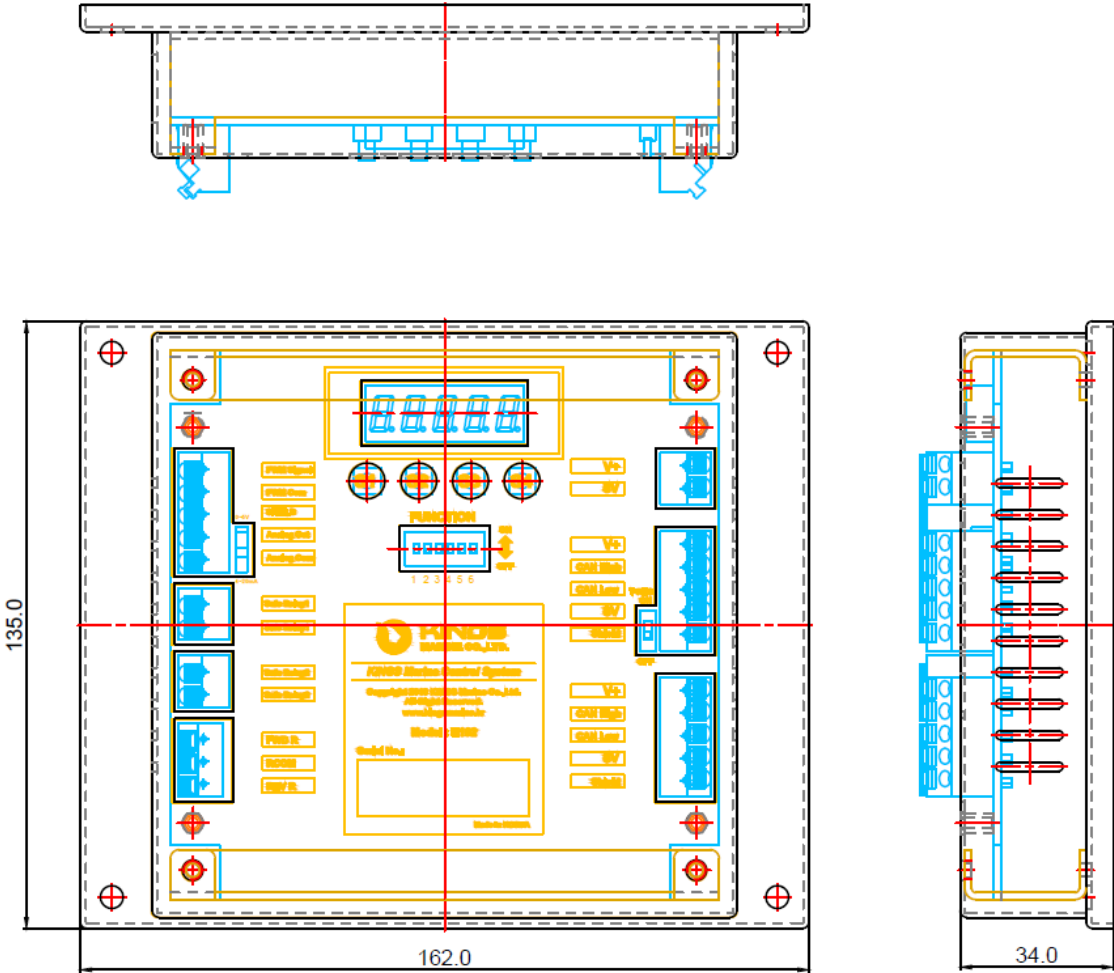
(3) Information the Electronic Engine Control Driver



External	Connector	Connector	External
Throttle	PWM signal	V+	Voltage input
	PWM com	0V	
	SHIELD	V+	H102/H102A
	ANALOG out	CAN High	
	ANALOG com	CAN Low	
Engine safe	Safe relay1	0V	H102/H102A
	Safe relay1	Shield	
Engine safe	Safe relay2	V+	H102/H102A
	Safe relay2	CAN High	
Clutch	FWD R	CAN Low	
	RCOM	0V	
	REV R	Shield	

KC-E102 Series Engine Control System

(4) Dimension



KC-E102 Series Engine Control System

Chapter 4

SINGLE LINE CABLING

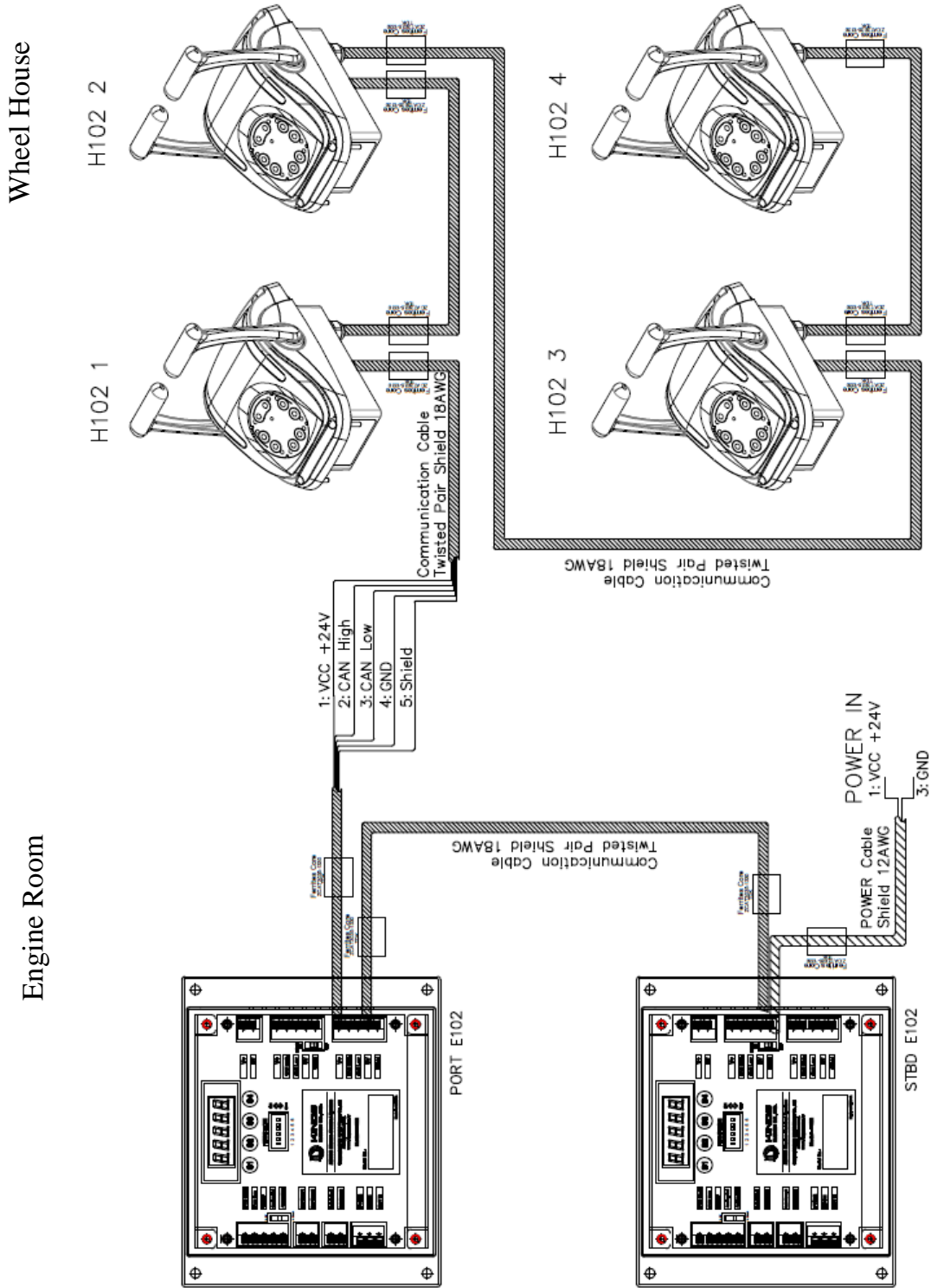
&

**WIRE
TERMINATION**

KC-E102 Series Engine Control System

(1) Cabling

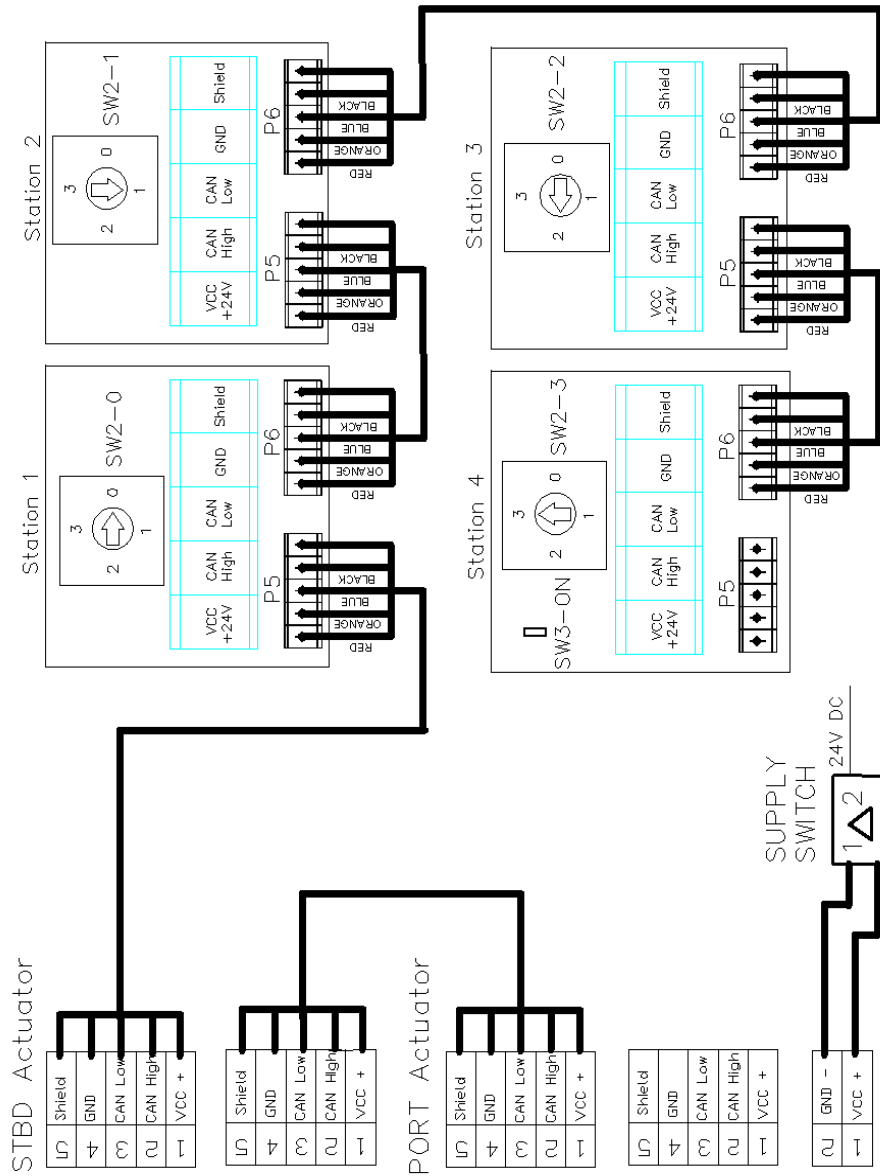
Example: KC-E102T-4S



KC-E102 Series Engine Control System

(2) Wire Termination (Right side of E102)

Example: KC-E102T-4S

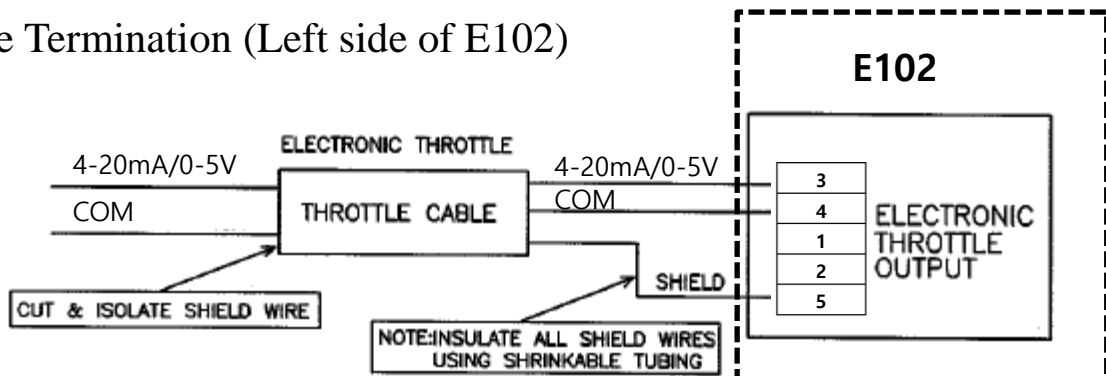


Set SW3 switch to “ON” position for last station Control Head
 Example) If station “2” is last Control Head, set SW3 switch to “ON” position.

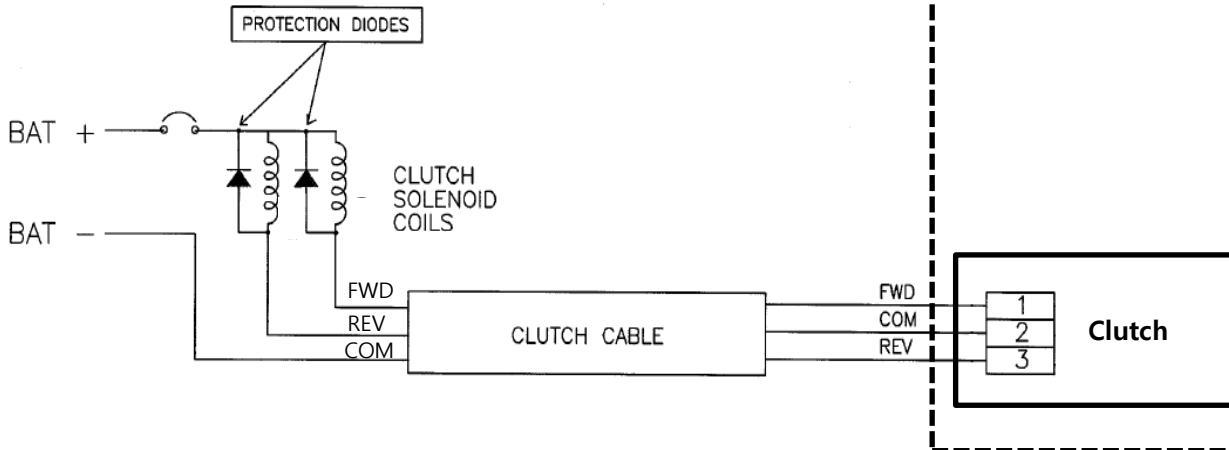
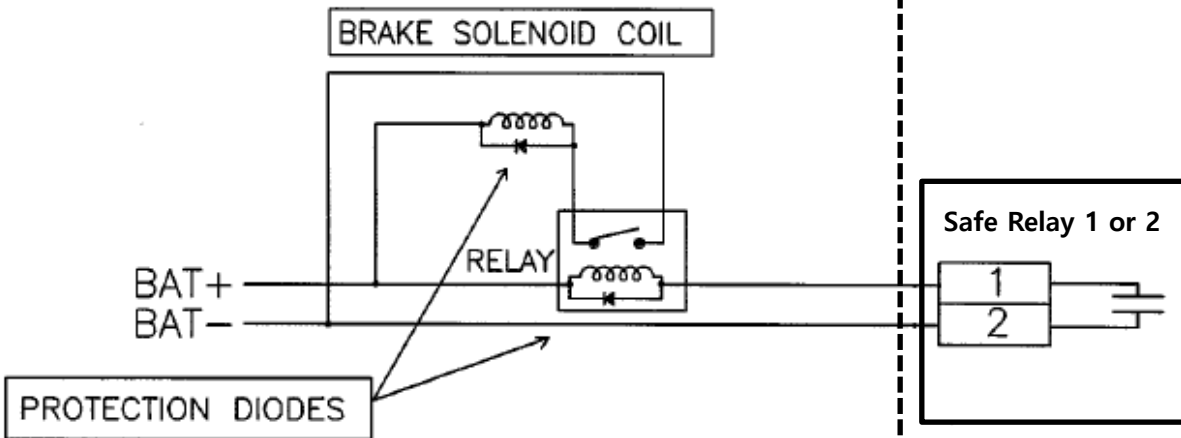
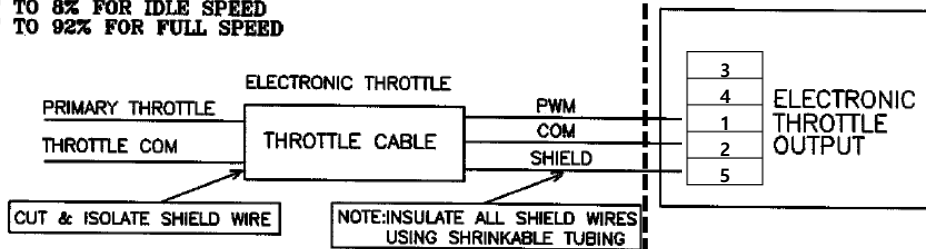
Install terminal link at terminal R “ON” position for last station Engine controller
 Example) If PORT Engine controller is last Engine controller install a terminal link at terminal R “ON” position.

KC-E102 Series Engine Control System

(3) Wire Termination (Left side of E102)



NOTE:
 DUTY CYCLE IS PRESET TO 8% FOR IDLE SPEED
 DUTY CYCLE IS PRESET TO 92% FOR FULL SPEED



KC-E102 Series Engine Control System

Chapter 5

POWER UP SYSTEM

&

INITIAL CHECKS

KC-E102 Engine Control System

(1) Power up system and Initial checks

- 1) Upon Power up, Station 1 control head will
 - a) Beep
 - b) Station Select light flashing
 - c) Station Lock light steady

- 2) Press Station select button on Station 1
 - a) Beeping stop
 - b) Station Select light steady
 - c) Station Lock light steady

- 3) Check that the Engine controller unit is displaying the correct Port / Stbd unit

- 4) Control system is now ready for final adjustment.

- 5) If error occurs refer to manual chapter 4 for trouble shooting.

KC-E102 Series Engine Control System

Chapter 6

How to Calibration.

KC-E102 Series Engine Control System






















(1) H102 Calibration

- 1) Turn off the power
- 2) Turn on the power while press S4 switch
- 3) After make buzzer sound, follow the process as below table

* **K=Keypad**

* **P=Process of calibration**

*  = LED flicker and press the right key *  = LED flicker

K P	Station Select	PORT Override	Sync Mode	Station Lock	STBD Override	Dim	Handle	Handle direction
1							“PORT”	Maximum “F”
2							“PORT”	Nuetral
3							“PORT”	Maximum “R”
4							“STBD”	Maximum “F”
5							“STBD”	Nuetral
6							“STBD”	Maximum “R”

KC-E102 Series Engine Control System

(2) A102 Calibration

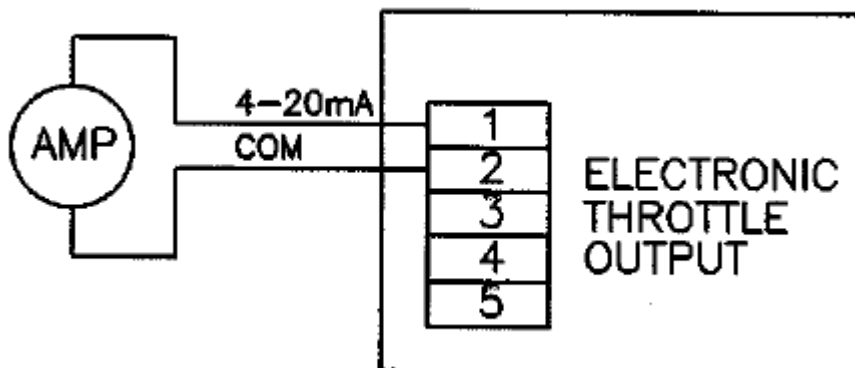
1) How to enter calibration

- a) Turn off the power
- b) Turn on the power while press S4 switch
- c) Then press S1 switch

d) below table is key in calibration

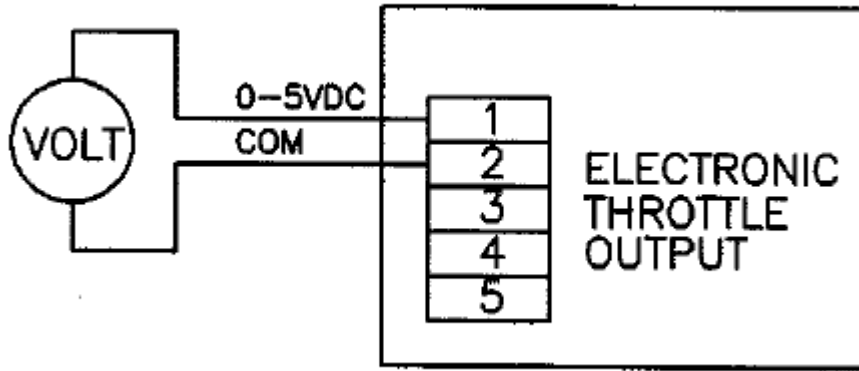
Key	Function
S1	Back/cancel
S2	Move the point
S3	Up the value
S4	Save and next step

2) 4-20mA Calibration



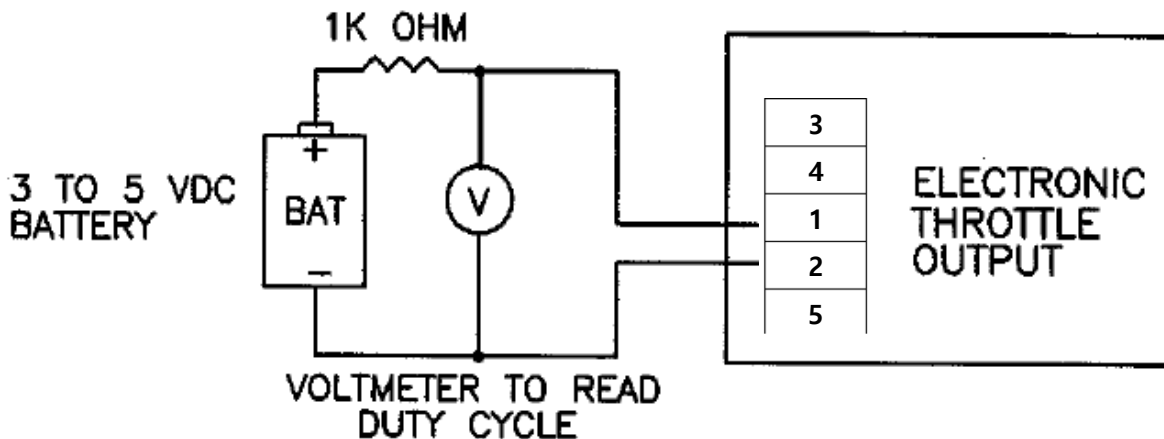
- Engine must not be running during signal calibration.
- Select switch must be selected to 4-20mA.
- Use an AMP METER as shown to measure the signal
- Enter the calibration mode and adjust value until 4mA is obtained, then save it.
- Adjust value until 20mA is obtained, then save it.

3) 0-5V Calibration



- Engine must not be running during signal calibration.
- Select switch must be selected to 0-5V.
- Use an VOLTAGE METER as shown to measure the signal
- Enter the calibration mode and adjust value until 0V is obtained, then save it.
- Adjust value until 5V is obtained, then save it.

4) PWM Calibration



- Engine must not be running during signal calibration.
- With the cable disconnected from the engine you must use a battery, and 1 k ohm resistor. As shown above to measure the duty cycle. E102 has an opto-isolated open collector output.
- Use a volt meter that can read duty cycle as shown to measure the PWM signal.
- Enter the calibration mode and adjust value until 8% duty cycle is obtained, then save it.
- Adjust value until 92% duty cycle is obtained, then save it.

KC-E102 Series Engine Control System

Chapter 7

RESET TO

FACTORY
DEFAULT

KC-E102 Series Engine Control System

(1) Reset to Factory Default

1) DIP switch 6 On

2) Press S1 until “Funct”

3) Press S4 to enter

4) Press S2 until A-SET

5) Press and hold S4 for 02s with beep sound and release.

6) Display shows END

7) The software is now reset to factory default.

KC-E102 Series Engine Control System

Chapter 7

Function

Setting

KC-E102 Series Engine Control System

(1) The way of entering Function mode


- 1) DIP switch 6 On
- 2) Press S1 until “Funct”
- 3) Press S4 to enter
- 4) below table is key function.

Key	Function
S1	Back/Cancel
S2	Up the Function number
S3	Up the Setting value
S4	Save/Next step

(2) E102 Engine controller Function List

“●” Factory default

Neutral delay time			
F01	●	10	Neutral delay time set
	30	~	Minimum : 10(1.0 sec)
		50	
Throttle delay time			
F02	●	10	Throttle delay time set
	20	~	Minimum : 10(1.0 sec)
		30	
Crash stop			
F03	●	00	Clutch delay can occur set a fixed time control
	10	~	Minimum : 00(0 sec)
		15	
Crash stop to travel time			
F04	●	03	On clutch delay ready, delay terminated time by movement
	20	~	Minimum : 03(0.3 sec)
		20	

Main board temperature			
F05	●	00	Electronic Engine Control driver board's temperature set
	60	~ 70	Minimum : 40(40 degree) Maximum. : 70(70 degree)
Single / Dual mode			
F06	●	0	Single Mode
	1	1	Dual Mode  During twin engine operation mode Make sure station STBD/PORT selection key ON or OFF on Dip switch "1" Make sure SYNC. PORT/STBD selection key ON or OFF on Dip switch "4"
Set the number of head			
F07	●	0	Automatic searching the number of head
	0	1	Set the number of head
		~ 4	Minimum: 1 (1pc) Maximum: 4 (4pcs)
Function setting value initialization			
A-SET	Initialize to factory default of all function value. - Pressing by "S4" key. - Show "SET" on FND Pressing by "S4" key 3 seconds with "BEEP" sound. - Initialization process done with show "END" on FND		

KC-E102 Series Engine Control System

Chapter 8

KC-E102

Error Code

KC-E102 Series Engine Control System






(1) E102 Engine controller error code display

1) Error list, buzzer sound, cause and solution

Error	Buzzer Sound	Cause		Activation	Solution
		Cause	Contents		
Err 2	2	Memory	Function setting is wrong	Stop activation and make buzzer sound	Check calibration, Dip S/W and function setting.
Err 4	4	CAN BUS	No respond communication for 3 second	Stop activation and make buzzer sound	Check communication connector or motor state.
Err 5	5	Temperature	MCU inner temperature is higher that function setting.	Stop activation and make buzzer sound	Check main board temperature.





* Electronic Engine Control DRIVE BOARD error is appeared on H102

2) H102 Control Head






Cause	Buzzer sound	Station Select	PORT Override	Sync Mode	Dim	STBD Override	Station Lock
Memory	"2"						
CAN BUS	"4"						
Temperature	"5"						

KC-E102 Series Engine Control System






3) H102A Control Head

Cause	Buzzer sound	Station Select	STBD Override	Sync Mode	Dim	PORT Override	Station Lock
Memory	"2"						
CAN BUS	"4"						
Temperature	"5"						


4) H102 keypad LED in error situation of E102

Cause	Buzzer sound	Station Select	PORT Override	Sync Mode	Dim	STBD Override	Station Lock
Potential meter	"1"						
Memory	"2"						
CAN Bus	"4"						
Temperature	"5"						

5) H102A keypad LED in error situation of E102

Cause	Buzzer sound	Station Select	STBD Override	Sync Mode	Dim	PORT Override	Station Lock
Potential meter	"1"						
Memory	"2"						
CAN Bus	"4"						
Temperature	"5"						

KC-E102 Series Engine Control System

WARRANTEE CERTIFICATION		
<p>This product is passed “KINGS MARINE CO., LTD”’s strict quality test.</p> <p>If there is defect of manufacturing or abnormal detection within warrantee period, please contact our Agent or Distributor with this Warrantee Certification.</p>		
WARRANTEE CLAUSE		
<p>1. The Warrantee period, we can guarantee, is one(1) year from your purchasing date</p> <p>2. Warrantee Exception Clause</p> <ul style="list-style-type: none"> - Warrantee period is expired. - Any kinds of Mal-function or defection caused by Modification or Repair without KINGS MARINE’s permission. - Any kinds of Mal-function, Defection, or External damage, caused by operator - Any kinds of Mal-function, Defection, caused by using spare part from Non-Authorized Distributor or Agent. - Any kinds of Mal-function, Defection, caused by not following Warnings or Cautions mentioned on this manual. - Any kinds of Mal-function, Defection caused by “Force Majeur”, like Fire, Flood. - Without presentation of this “Warrantee Certification”. <p>3. Other</p> <ul style="list-style-type: none"> - Any kinds of “Warrantee Certification” without authorized Signature is out of validity 		
<p style="text-align: center; font-size: 1.2em; font-weight: bold;">Manufacturer</p> <p>Room 302, Unit 102, Seokcheon-Ro397, Ojeong-Gu, Bucheon City, Gyeonggi-Do South Korea Tel: 82-32-624-0060 ~ 0064 Fax: 82-32-624-0065 E-mail: sales@sewhacnm.co.kr MADE IN KOREA</p>	<p>Product</p> <hr/> <p>Model</p> <hr/> <p>AUTHORIZED SIGNATURE</p>	<p>KC-E102 Series Engine Control System</p> <hr/> <p>E102 / H102 / H102A / H102S</p> <hr/> <div style="text-align: center;">  </div>