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1

ECHO SOUNDER



This chapter is described about overview of Echo Sounder.

1.1 Overview

The Echo sounder is an older instrumentation system for indirectly determining ocean floor depth. Echo sounding is based on the principle that water is an excellent medium for the transmission of sound waves and that a sound pulse will bounce off a reflecting layer, returning to its source as an echo. The time interval between the initiation of a sound pulse and echo returned from the bottom can be used to determine the depth of the bottom. An echo-sounding system consists of a transmitter, a receiver that picks up the reflected echo, electronic timing and amplification equipment, and an indicator or graphic recorder.

2

SPECIFICATION



This chapter is described about the specification of Echo Sounder.

- Resources
- Function
- Components

2.1 Resources

Transducer	
❑ Model	: TD-22/TD-24
❑ Type	: 50kHz/200kHz
❑ Power	: 600W
❑ Material	: Rubber
Main Unit	
❑ Display	: 10.4" COLOR TFT LCD 640x480dot
❑ Power	: 12V to 35V DC Consumption Power : 40VA
❑ Mark display	: Automatic Set(0~300sec(5min))
❑ Options	: Rectifier(10A) 100/110/115/220/230VAC
Optimum Surrounding	
❑ Temperature	: Main Unit = -15°C ~ +55°C
❑ Humidity	: 95% (+30°C ~ +60°C)
❑ Thermometer	: -10°C ~ +40°C

2.2 Performance

Main Unit Performance	
❑ Display Color	: 16color (13 colors Sorted by Echo power)
❑ Depth Range(m)	: 0~10, 0~20, 0~30, 0~40, 0~50, 0~60, 0~70, 0~80, 0~90, 0~100, 0~120, 0~150, 0~200, 0~250, 0~300, 0~400, 0~500, 0~600, 0~1,000m, 0~1,500m
❑ Depth Correction	: 0~99m
❑ Screen Speed(1page/min)	: Stop, 15min, 1/12, 1/8, 1/4, 1/2 (6steps)
❑ Function Display	: Gain, STC, Transmitting Power, Time Mark, Depth, Variable Rod, Color pattern being connected with external devices
❑ Displaying Screen	: General Report Screen, Memory Screen
❑ Alarm	: Depth, Low Voltage (Sound & Display)
❑ Data Output	: NMEA0183
❑ Transmitting Pulse Width	: Long/Short selectable
❑ External Input	: Position, Speed, Bearing
❑ Selecting Function	: Dual, Single(Low/High), Enlarge(Low/High), Replay(Min-91minute, Max-12hour)

2.3 Components

■ ECHO SOUNDER

No.	MODEL	SPECIFICATION	Q'ty	REMARK
1	SES-2000/(N)		1EA	
2	DC Cable	CVV-SB 2.0mm ² ×2C	5m	
3	Fuse	5A	2EA	
4	Installation Mat.		1set	
5	Transducer	50KHz or 200KHz,50/200Khz	1EA SET	TANK included.
6	Manual		1book	

3

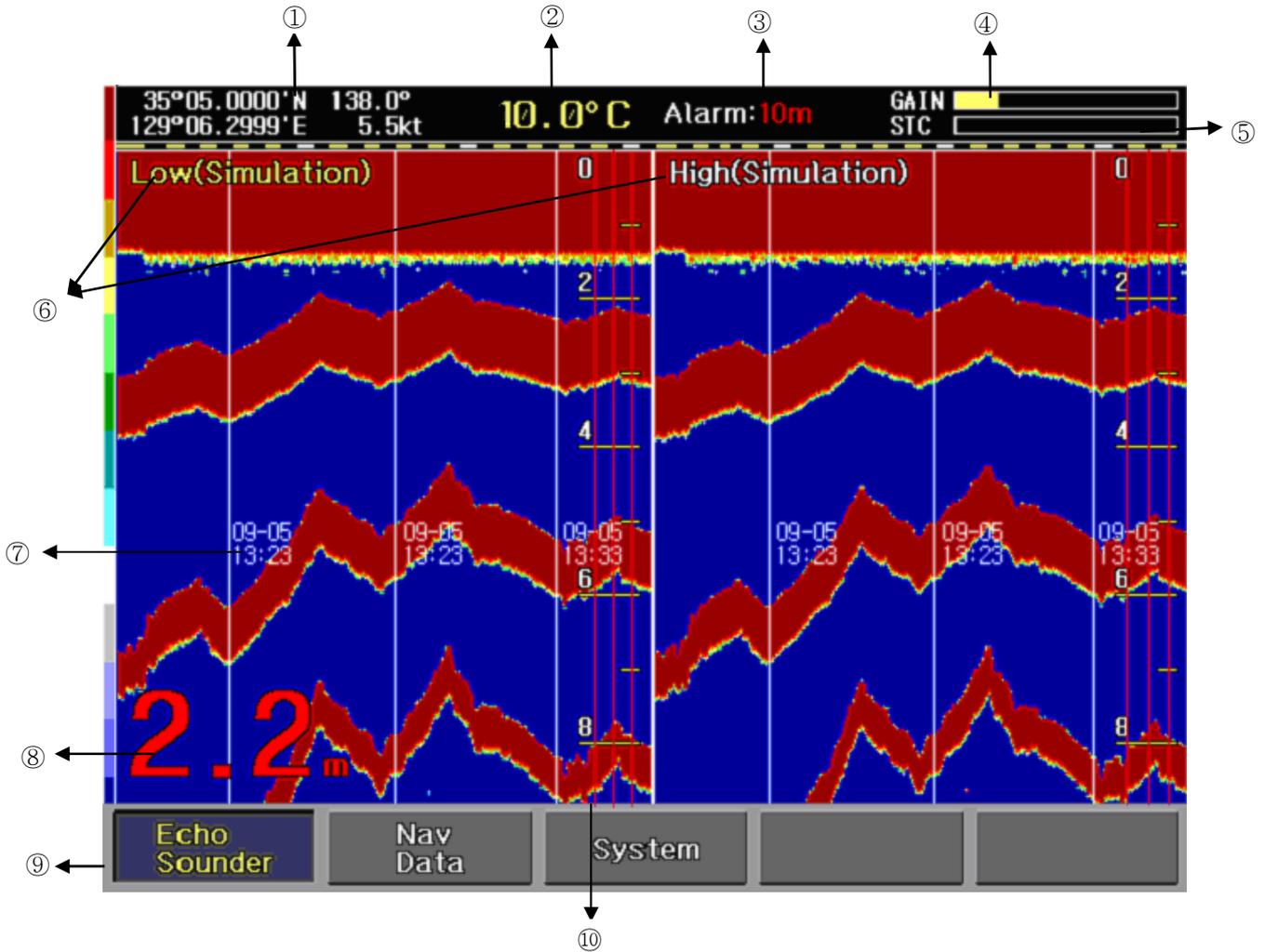
DESCRIPTION



This is described about general functions of Echo Sounder

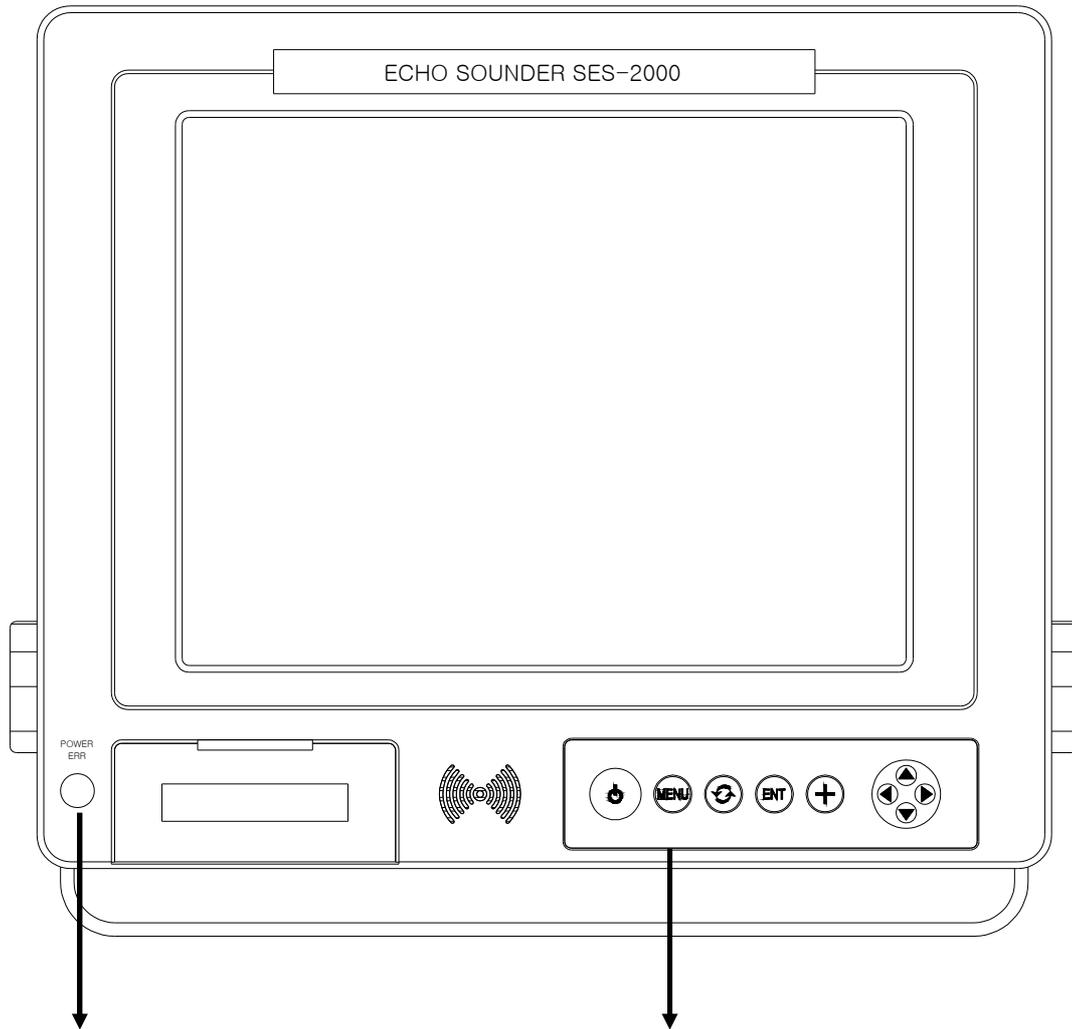
- Echo Sounder Screen
- Key and Operation
- Menu
- Screen Mode

3.1 Echo Sounder Screen



- ① Ownship Lat/Long : Lat/Long of Ownship position(Present) in case of being connected by ex. data
- ② Temperature : Present temperature measured by thermometer(in connected thermometer)
- ③ Depth Alarm Range : Sounding Alarm & flashing Depth within range of depth alarm.
- ④ GAIN : Displaying Gain value in receiver
- ⑤ STC : Displaying STC value to see the screen removed plankton, bubble etc under the water about 100m less
- ⑥ Frequency : The frequency to measure by transducer
(In dual frequency, Displayed by yellow letter)
- ⑦ 5Min Time Mark : In time mark 15min, Displayed automatic time mark per 5min. (GPS Lat/Long)
- ⑧ Depth : Measured depth (set by m(meter) or ft(feet))
- ⑨ Menu : Displaying main menu each function
- ⑩ Time Mark Line : Time Mark Line in red is displayed based on set time.

3.2 Key and Operation



	Power ON/OFF. ON : Holding press 1 sec OFF : same way about 2sec.
	Selecting menu.
	Changing display mode.
	Stop alarm or select/change items in menu.
	Press cursor to show changeable rod. Press one more time it is disappeared. Highlighted cursor. Adjustable by [▲][▼].
	Selecting work, Moving or input data, cursor and changing depth. [◀][▶] checking previous data & Setting position, Gain, STC. [▲][▼] Moving cursor or setting depth range, input data.
	Below 12V, It is flashing LED with alarm.

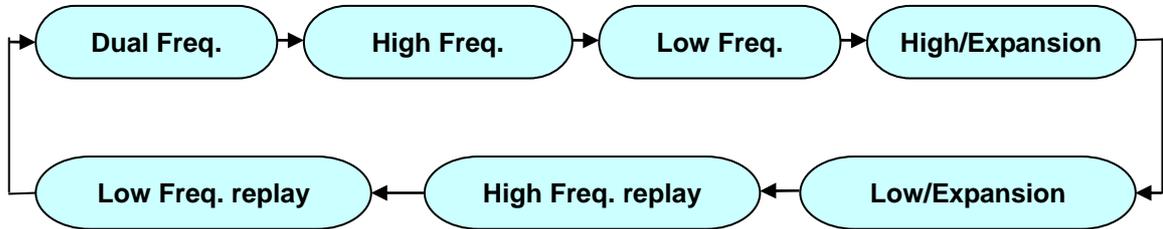
3.3 Menu



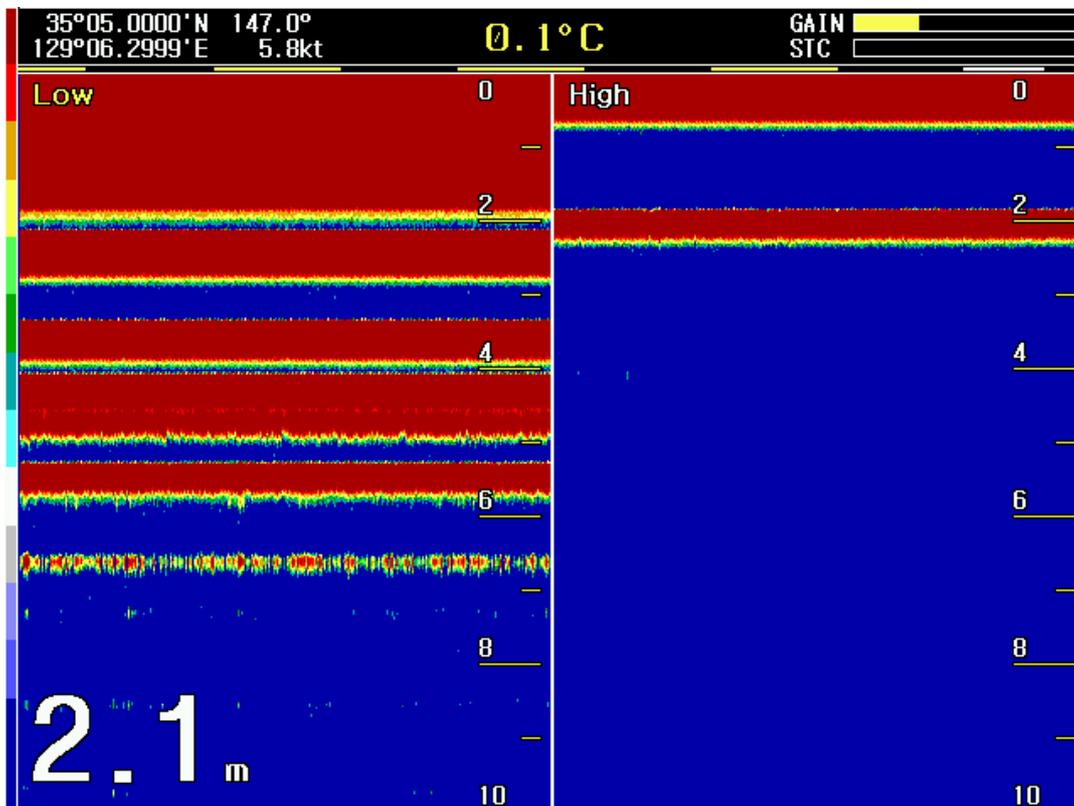
3.4 Screen Mode

The display provides a different screen each function, Press  to select a screen mode.

- Switching Turn of Screen mode

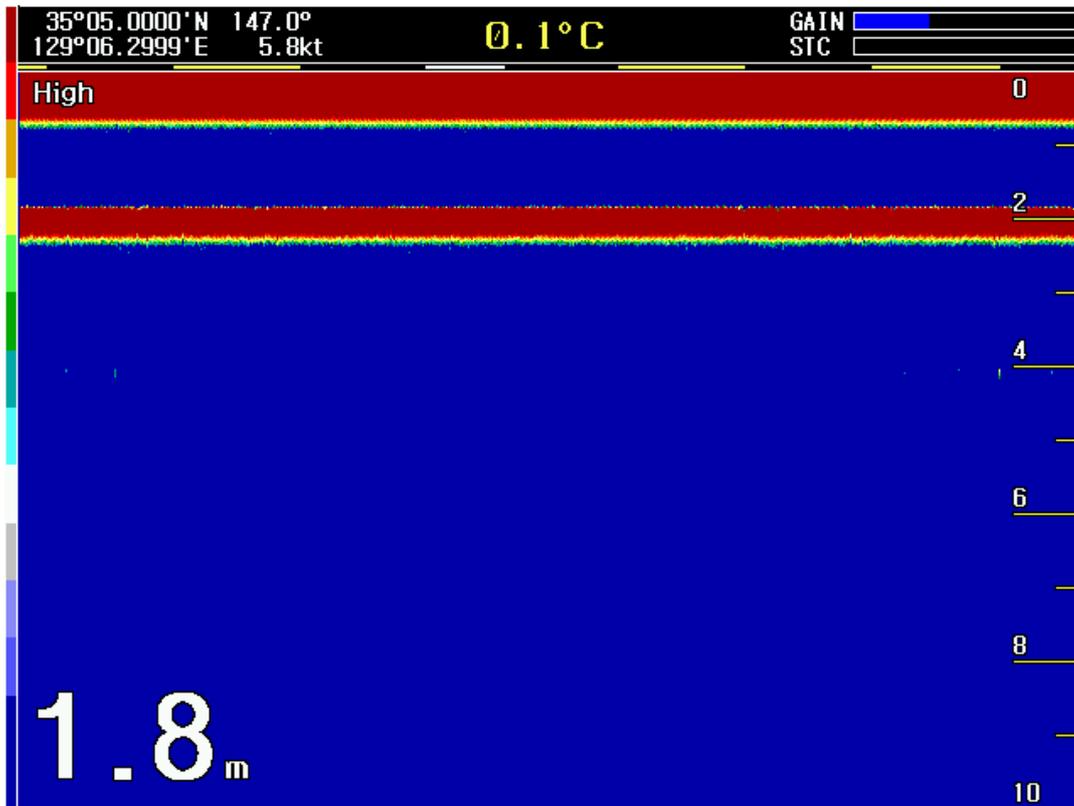


■ Dual Frequency

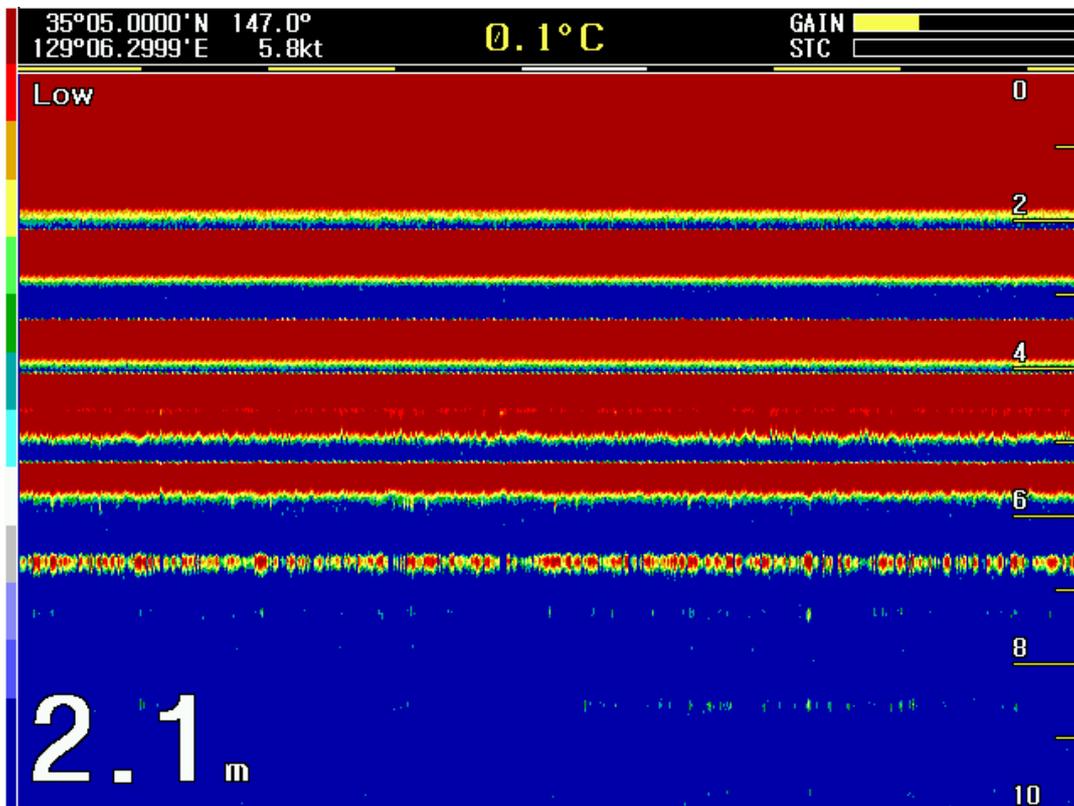


In the dual frequency mode, The frequency is displayed at the top of screen in yellow letter as low/high frequency. This screen shows measuring depth by low frequency in yellow letter.

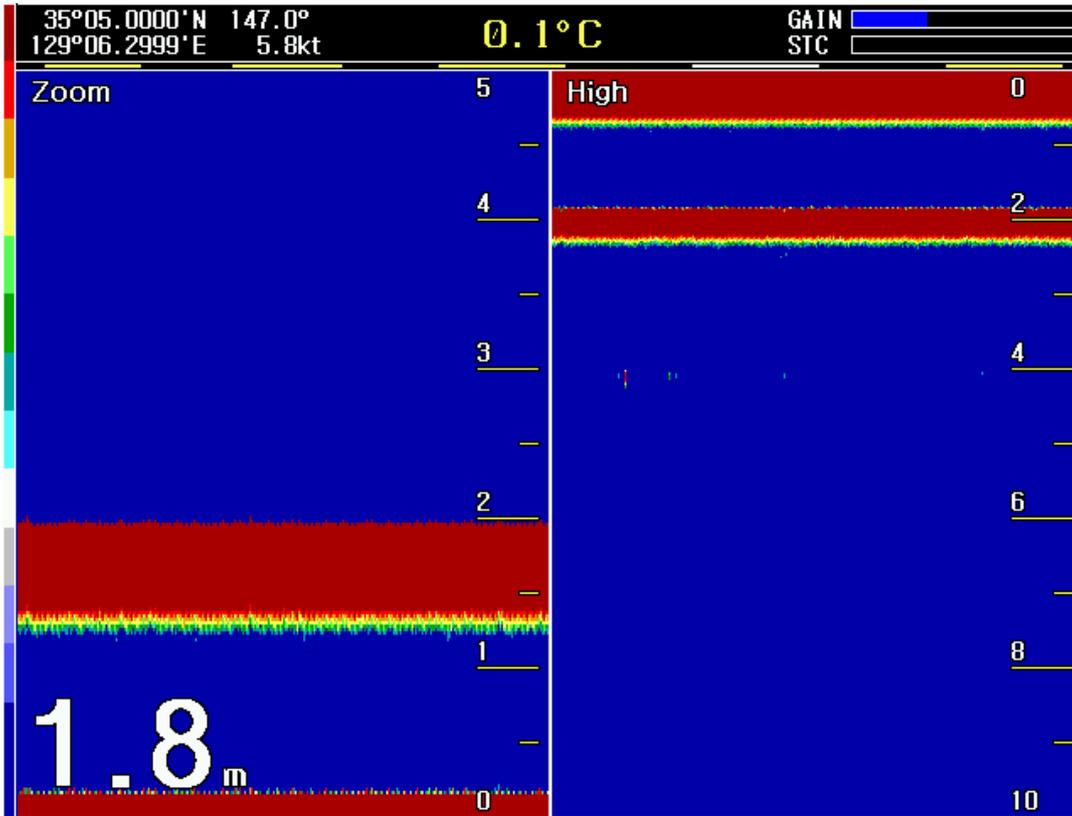
■ High Frequency



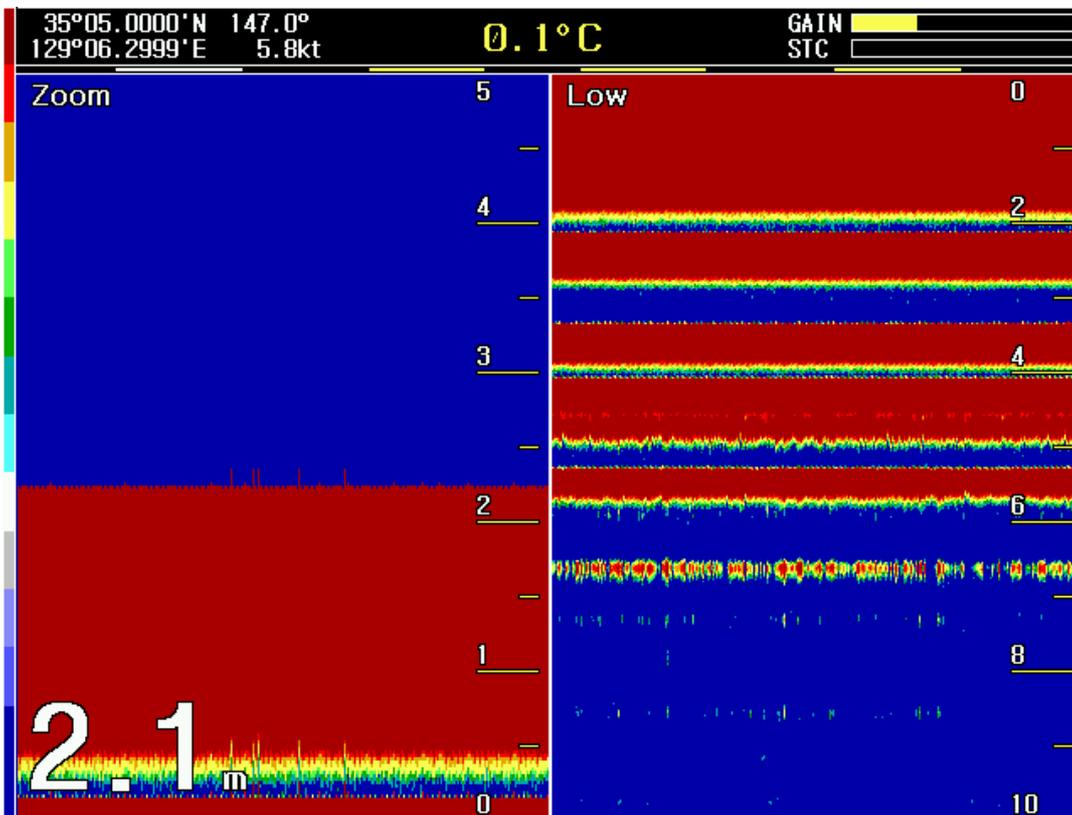
■ Low Frequency



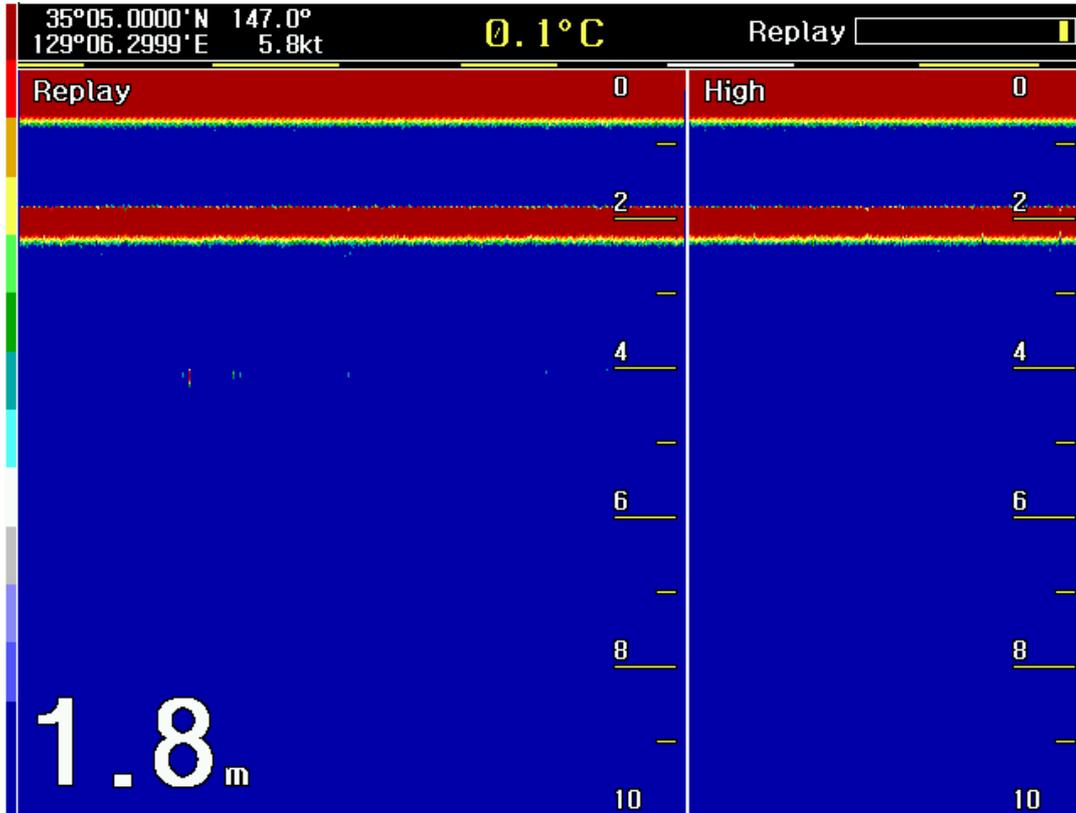
■ High Frequency - Expansion



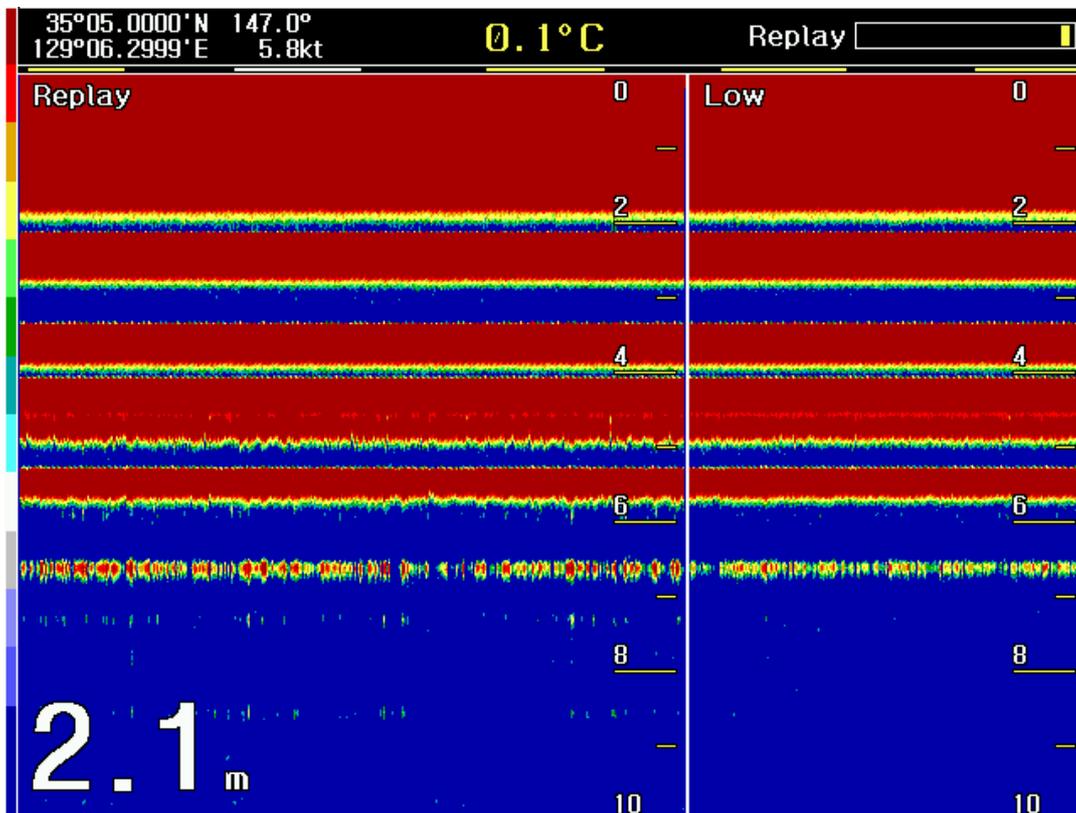
■ Low Frequency - Expansion



■ High Frequency Replay



■ Low Frequency Replay



4

HOW TO CONTROL FUNC.

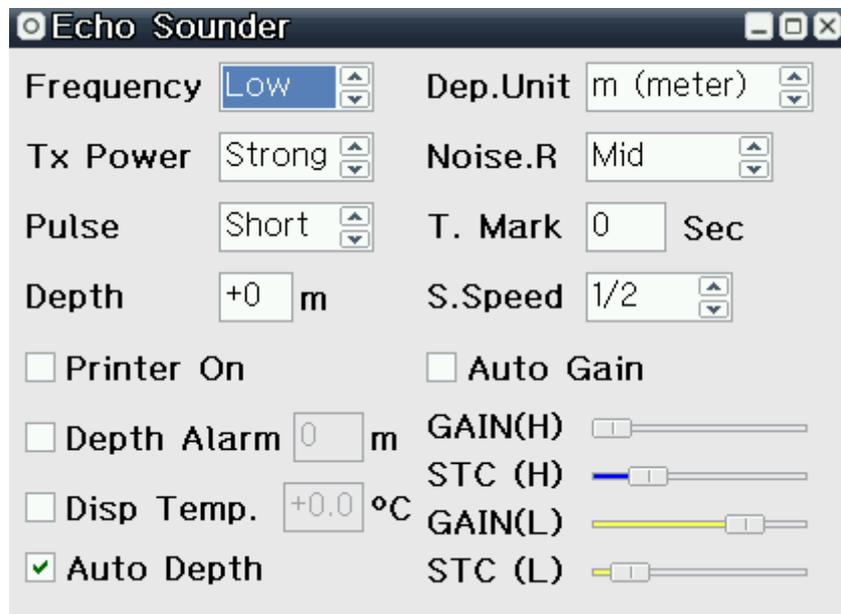
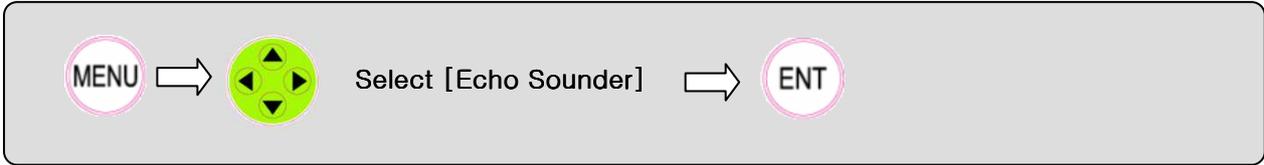


This chapter is described about how to control functions.

- Echo Sounder Set
- Navigation Data
- System

4.1 Echo Sounder Set

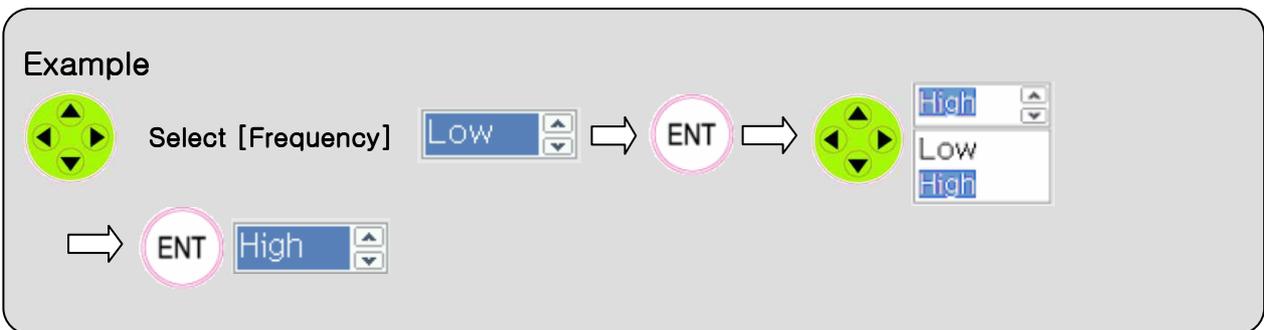
The echo sounder set menu is to use advanced performance and functions thru adjusting various set values as following instruction.



In order to return previous menu after set value, Press .

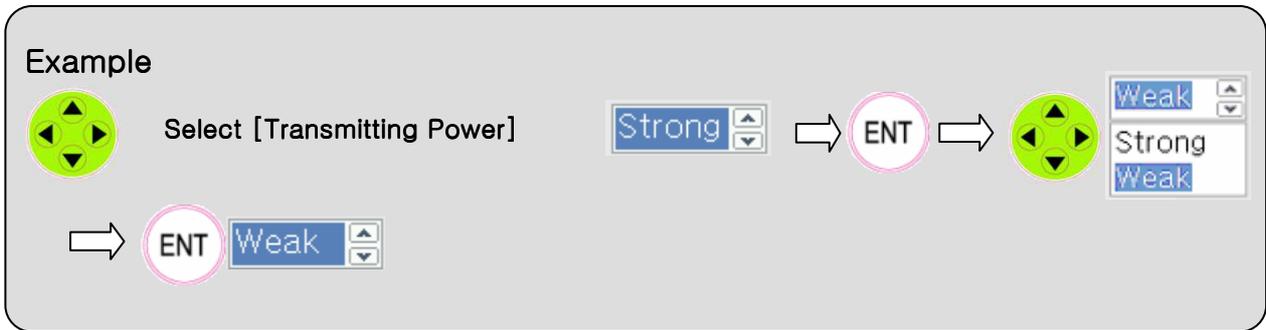
4.1.1 Frequency

The frequency set may provide you to select each high or low frequency to measure depth.



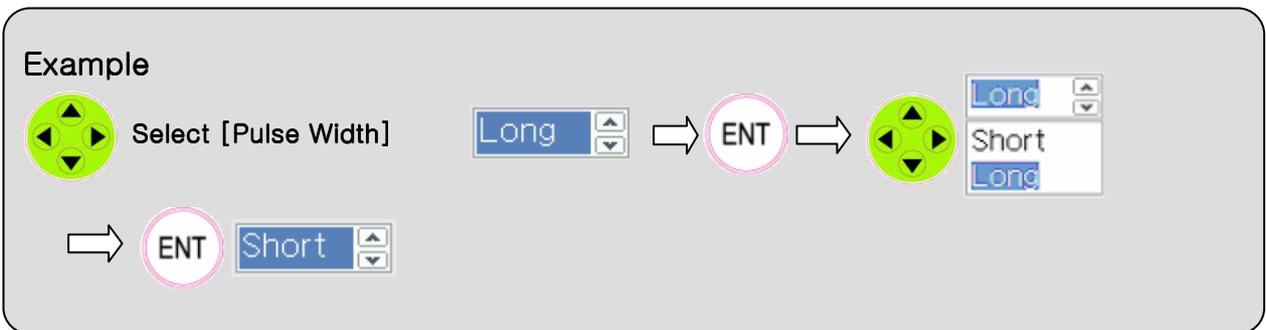
4.1.2 Transmitting Power

Transmitting power ser is to be used setting strong(600W) or weak(300W).



4.1.3 Pulse Width

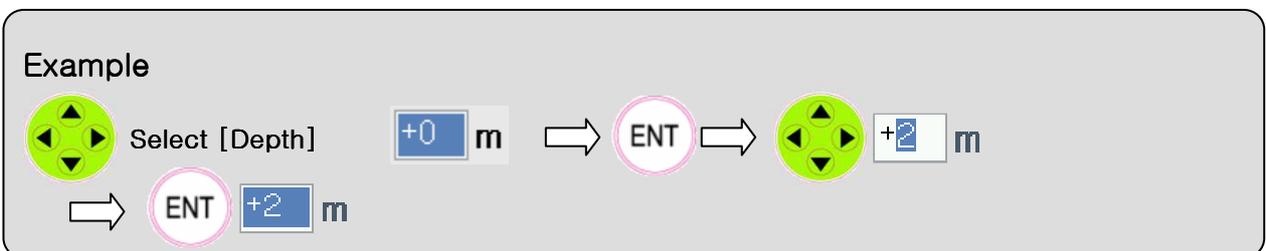
The pulse width set is to be used for setting its long or short.



4.1.4 Depth

This is to adjust an error occurred by transducer's installation position. Due to the transducer is installed at the bottom of vessel, It should be a little lever error between water surface and the transducer. Thus distance from water surface to transducer needs to be adjusted for measurement correctly.

The range of correction is 0~99m. When you adjust it then using direction key “[◀],[▶]” can change increasing/decreasing by 10, “[▼],[▲]” can change increasing/decreasing by 1.



4.1.5 Printer

This printer function can make its depth data to print out by connected printer.

Whenever pressing  , Setting USE() / CANCEL() one after the other.

Example



4.1.6 Depth Alarm

The depth alarm is to make alert for the vessel who is starting to go in less depth than setting depth previously.

Whenever pressing  , Setting USE() / CANCEL() one after the other.

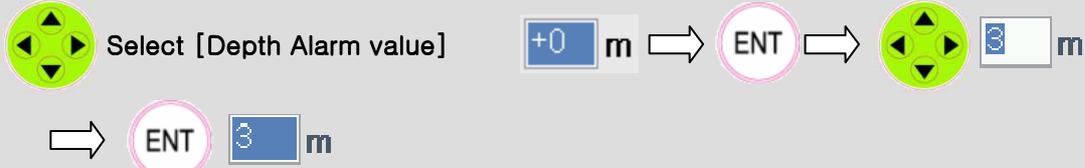
<Setting Depth Alarm>

Example



<Setting Depth Alarm range>

Example



4.1.7 Display Temp.

This function is to be used for displaying temperature when it is connected with thermometer.

Whenever pressing  selecting USE() / CANCEL() one after the other. It can be adjusted between -9.9°C and +9.9°C. [,] can adjust by 1°C step ,, can adjust by 0.1°C step.

Without temperature thermometer, It says "Error".

<Setting display temp.>

Example



<Setting temp. value >

Example



4.1.8 Auto Depth

The Auto Depth is a function to set the record of transducer automatically. Whenever press ,

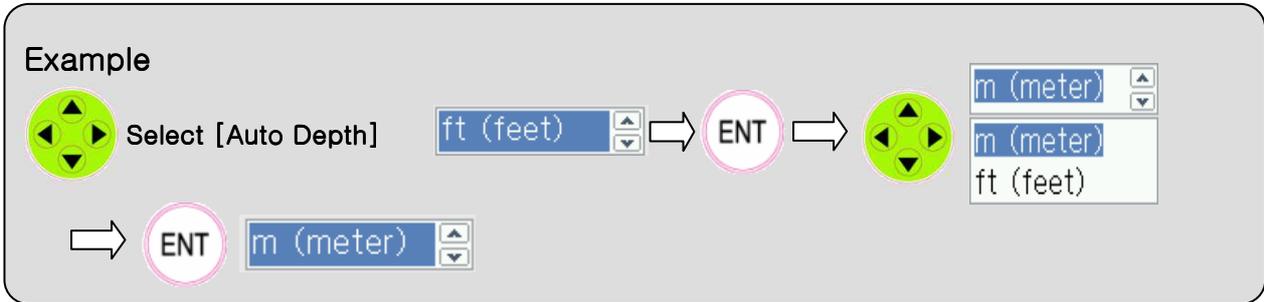
Then set USE () / CANCEL() one after the other.

Example



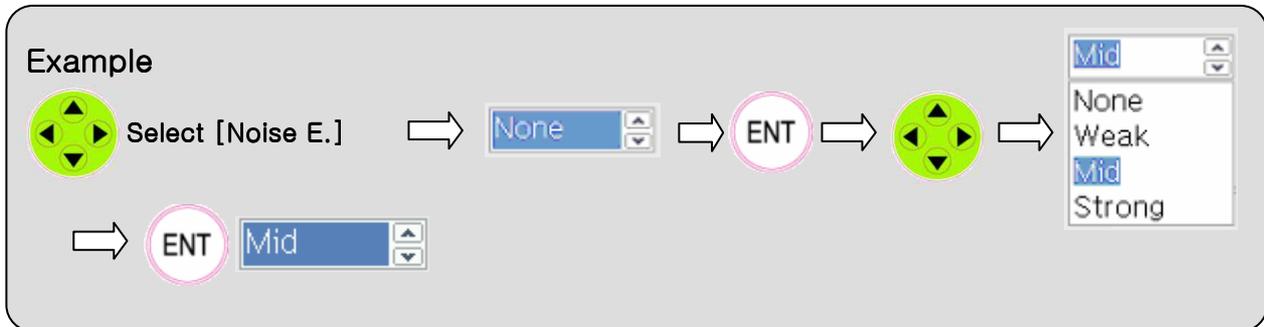
4.1.9 Depth Unit

The depth unit is a function to display meter or feet by depth unit in a screen.



4.1.10 Noise Erase

This function is to erase any noise out of input signal through transducer.

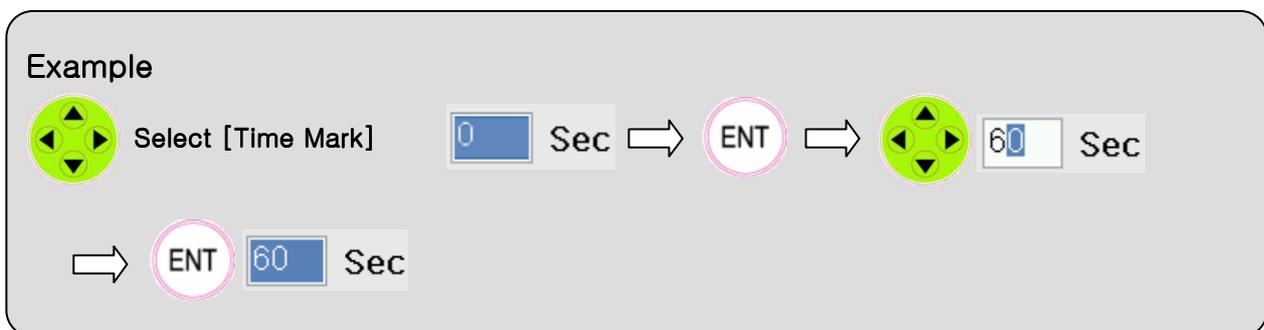


4.1.11 Time Mark

This is to be displayed a vertical line based on a certain time period in a screen.

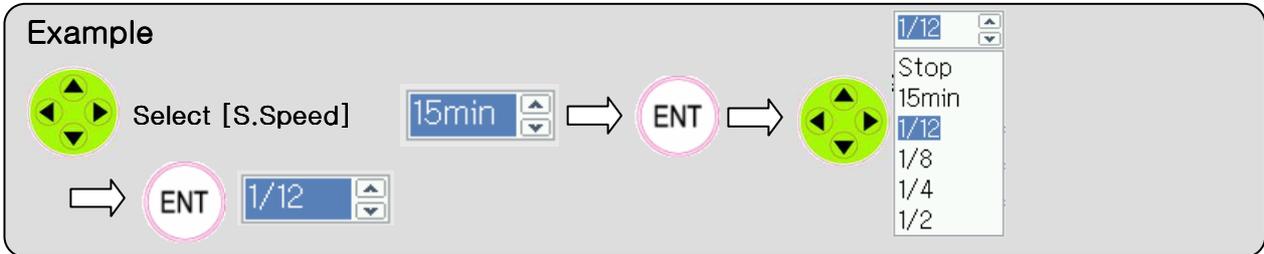
It can be set from 0 up to 300sec(5min).

[◀],[▶] can adjust up/down by 10sec step, [▼],[▲] can adjust up/down by 1sec step.



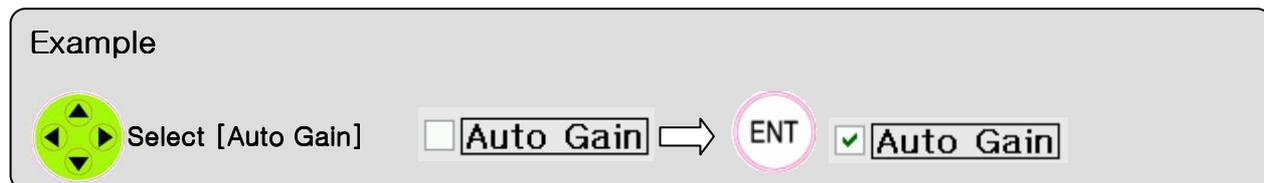
4.1.12 Screen Speed

This is a function to control updating depth data speed in a screen. As much as control bar goes to the right side, its updating speed is faster.



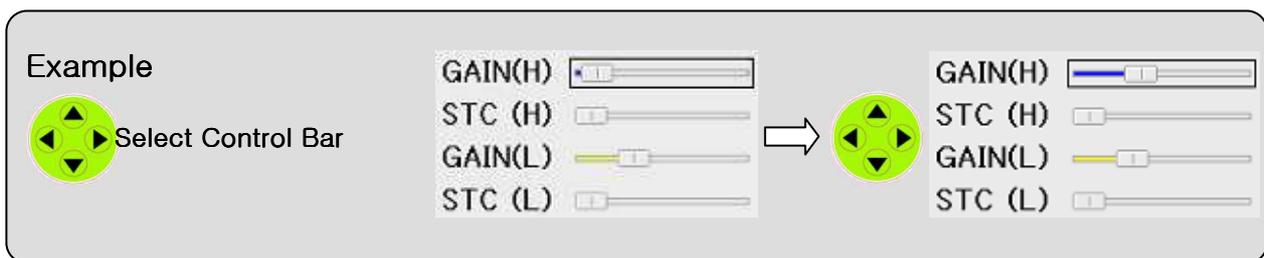
4.1.13 Auto GAIN

This is to set GAIN automatically. Whenever Press USE() / CANCEL() one after the other. In auto GAIN, It is not available to set manually.



4.1.14 GAIN/STC

GAIN/STC is a function to reduce unnecessary noise or detect data measured thru transducer. As control bar goes to the right end, which means higher value. [▼],[▲] can select control bar, [◀],[▶] can adjust setting value.

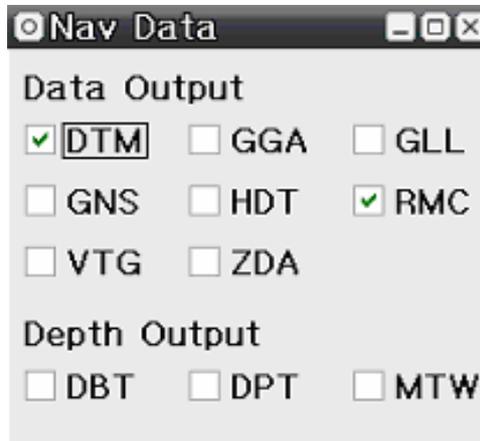
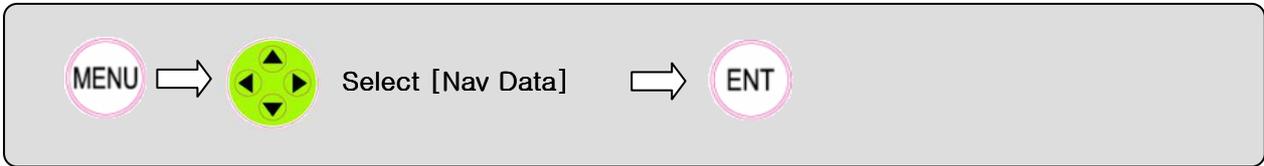


[NOTE] **Auto GAIN, GAIN/STC SOFT KEY**

Default screen without menu taskbar, Press then set auto GAIN & GAIN/STC.

4.2. Nav Data

This is a function to use for setting which signal(NMEA data) is out thru port to be interfaced with external devices.



To return previous menu after set, Press .

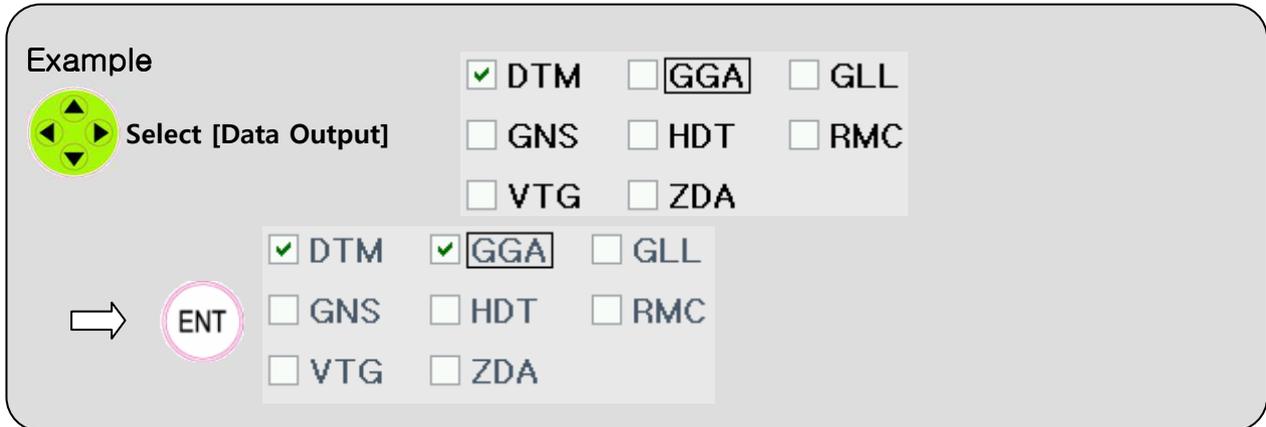
4.2.1 Data Output

Items in data output is generally to be used for transmitting data input by GPS receiver to external devices.

In this case, the items not received by external devices will not be out even being selected output.

After selecting item to be needed, Press **ENT**, USE() / CANCEL() one after the other.

Example



Select [Data Output]

<input checked="" type="checkbox"/> DTM	<input type="checkbox"/> GGA	<input type="checkbox"/> GLL
<input type="checkbox"/> GNS	<input type="checkbox"/> HDT	<input type="checkbox"/> RMC
<input type="checkbox"/> VTG	<input type="checkbox"/> ZDA	

→ **ENT**

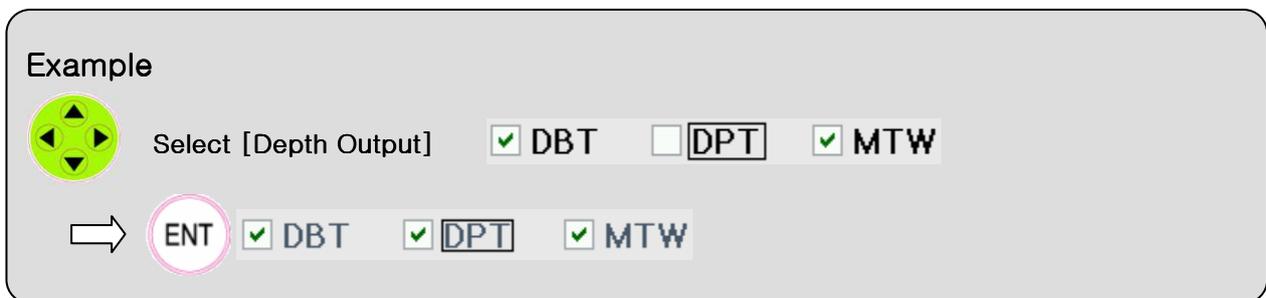
<input checked="" type="checkbox"/> DTM	<input checked="" type="checkbox"/> GGA	<input type="checkbox"/> GLL
<input type="checkbox"/> GNS	<input type="checkbox"/> HDT	<input type="checkbox"/> RMC
<input type="checkbox"/> VTG	<input type="checkbox"/> ZDA	

4.2.2 Depth Output

Items in data output is generally to be used for transmitting measured depth data(NMEA) receiver to external devices.

Selecting item, Press **ENT** repeatedly then USE () / CANCEL () .

Example



Select [Depth Output]

<input checked="" type="checkbox"/> DBT	<input type="checkbox"/> DPT	<input checked="" type="checkbox"/> MTW
---	------------------------------	---

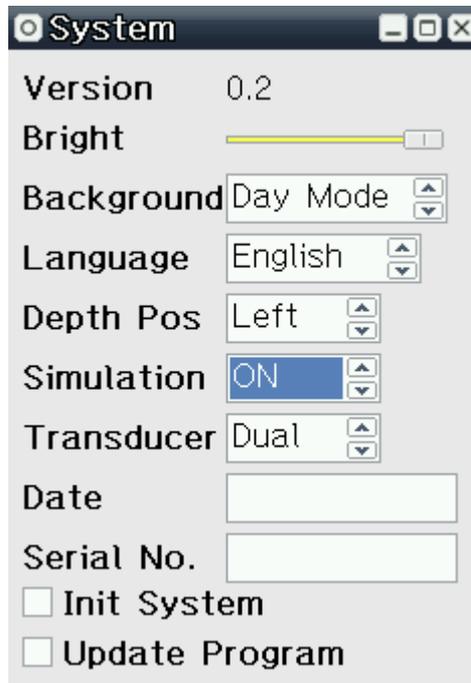
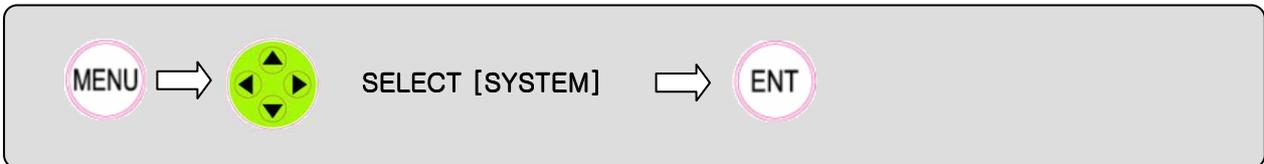
→ **ENT**

<input checked="" type="checkbox"/> DBT	<input checked="" type="checkbox"/> DPT	<input checked="" type="checkbox"/> MTW
---	---	---

4.3. SYSTEM

SYSTEM menu is used to display version, set-up brightness, and language. Eventhough this menu is not used frequently, it is used to set up functions which may affect the overall system.

Users can set brightness, language, and depth display only. Other values can not be changed after Input when the equipment is manufactured or installed. It can be changed only for better performance.



To come back to previous menu, press 

4.3.1 BRIGHTNESS

This menu is to adjust brightness. Brightness menu is the function to adjust screen brightness.

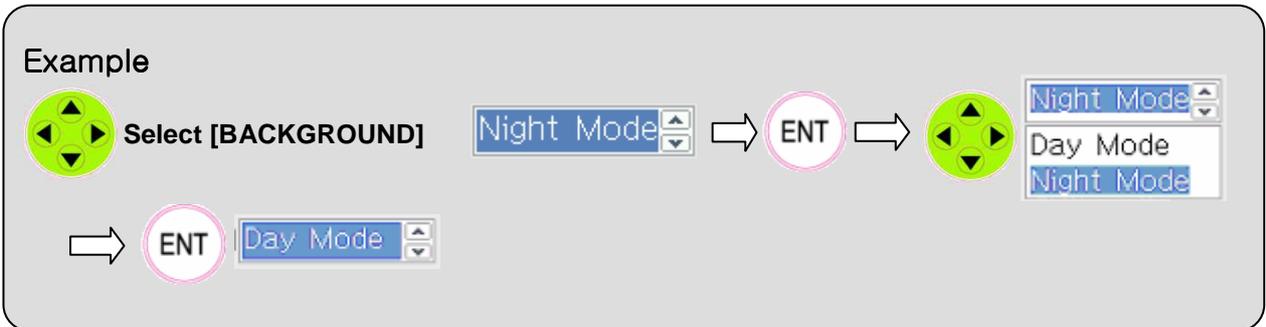
Adjust proper brightness during navigation for safety. Press [▼],[▲] to select adjustment bar and press [◀],[▶] to change brightness..



4.3.2 Background Mode

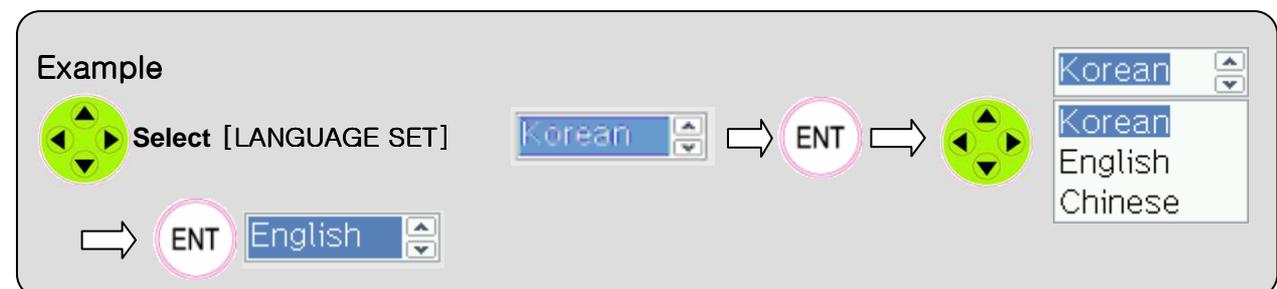
Background mode is to change background color. It consists of Day & Night mode.

Please refer to the example below to understand how to shift background mode.



4.3.3 LANGUAGE SET UP

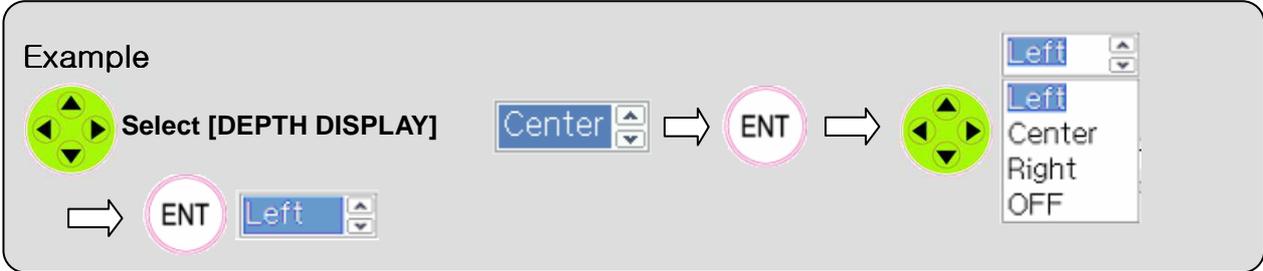
Language set-up is used to change the language on the display. Korean, English and Chinese language are available. Refer to the below to understand how to change the language.



4.3.4 DEPTH DISPLAY

DEPTH DISPLAY is the function to set up the depth display position on the screen.

Depth can be displayed on the left, center, right, and hide on the screen. Refer to the below example to understand how to change the display position..



<Display on the left>



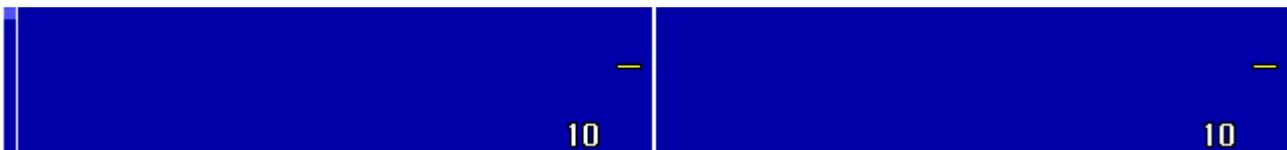
<Display in the center>



<Display on the right>

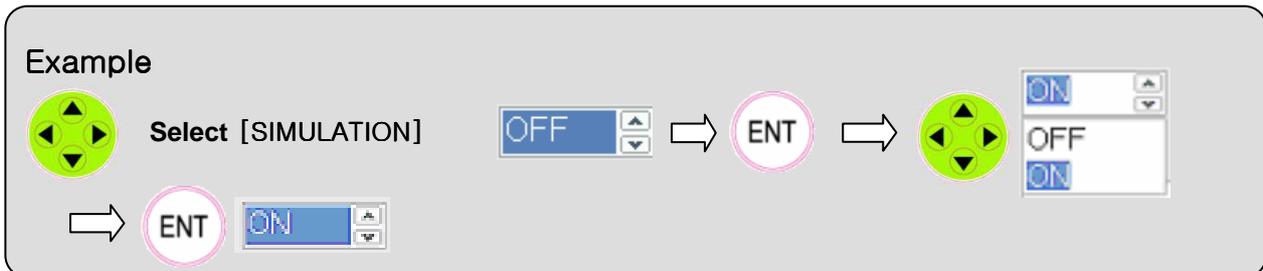


<HIDE>



4.3.5 SIMULATION

Simulation is the function to display virtual navigation on the Echo Sounder. Refer to the below example to understand how to turn on/off simulation mode.



5

INSTALLATION & MAINTENANCE



This chapter explains installation and maintenance.

- INSTALLATION
- EQUIPMENT INSPECTION & MAINTENANCE
- TROUBLE SHOOTING

5.1 INSTALLATION

Installation

Please be cautious in unpacking the product to check if the contents are same as ordered. In particular, pay sufficient attention to the external look to see if there has been any damage in the course of transportation. If found, take some necessary actions for appropriate installation. In case that any on-scene action is not available, please contact us a.s.a.p for the right remedies. As this equipment is originally designed based on the characteristics of vessels, it is easy to install without any technical difficulties but at the same time it is recommendable that users follow the basic installation instructions for the optimal use as described in the below.

5.1.1 MAIN UNIT INSTALLATION

- Please select such a place that allows for easy operation, daily check and good ventilation.
- Please avoid places vulnerable to contact from rain or sea water.
Dry places are advisable for perfect installation.
- Please avoid places vulnerable to exposure from direct sunlight and heating elements.
- Please install where mechanical vibration is relatively less.
- Please avoid where any intervention of other electrical and magnetic elements is far away.

5.1.2 POWER CONNECTION

Connect DC-dedicated cable provided as a basic component according to the external wiring diagram and remember a sole power cable should be connected to the power distributor. As the consumption power is 40W(1.7A), the battery should be always kept in good conditions.

Please use DC 24V 15V for AC-DC power and for the purpose of safety, use our AC-DC 15A rectifier which is on separate sale.

- 2P(CN4) connector that is located at the back is for power supply and No.1 is (+) while No.2 is (-) and connect directly the DC power between 11V - 36V.
- After connecting 2P plug that is suitable for power supply to 2P cable, work on the connection with sufficient attention to (+) and (-).

5.2 INSPECTION AND MAINTENANCE/TROUBLE SHOOTING

5.2.1 GENERAL

To maintain the originally designed functions and the life cycle, regular check and maintenance are required. As inappropriate inspection and maintenance rather deteriorate the equipment and shorten the life cycle, the following instructions should be kept in user's mind.

5.2.2 TOOLS & TEST APPARATUS

For the purpose of the correct inspection, the below measuring tools should be prepared and used.

(1) Necessary measuring tools for each test item

Test item	Measuring tools	Others
General voltage, currency, resistance for which do not require any precision such as for power feature.	Multi-Tester	

5.2.3 DAILY CHECK AND MAINTENANCE

- Inspection of input power voltage(12V - 35V): 24V recommendable.
In order for the voltage to be available, work on maintaining the batter of the power supply.
In case of 12V, there are possibilities of the power failure and malfunction occurrence when in operation and in case of 35V, there are possibilities of fuse brokage and circuit damage.
- Tightened status of back connectors
In case of poorly tightened power connector, there are possibilities of power down and malfuncion occurrence and in case of poorly tightened antenna, it is impossible to receive the satellite signal.
- Get rid of LCD dust

5.2.4 6 months check up(Adjusting period by position)

- * When checking the inside of the equipment, separate the power input connector (SCN-16-2P) and check.
 - Get rid of dust inside the equipment
Brush off dust with compressed air - Wet dust may be the cause of circuit damage or malfunction.

5.2.5 2 years check up(Adjusting period by position)

- Wash circuit board and contact points of connectors.
Wash the surroundings of contact point wiring with activators (LPS cleaner).
- * Only skilled personnel are allowed to do the work.

5.2.6 Break Down & First Aid

Symptoms	Details	Defectives
power turns on(Front LED light) but screen is not displayed	If a buzz sound is heard	LCD module or back-light module is defective
	If a buzz sound is not heard	CPU board is defective
power does not turn on (Front LED light)	Check the fuse and in case of fuse breakage	Check if it is over DC 35V or changed pole, if it is ok, Repair power PCB.
	Check the fuse but no damaged	Check if it is less 12V, if ok, Repair power PCB

5.2.7 Dismantling

SES-2000, SES-2000N

- Loosen 7 pcs of $\varnothing 4$ mm fixed bolts at the back.
- Separate the back case from frontal mold frame. (If necessary, separate 40P connector)
- Loosen 4 bolts at the middle/frontal mold frame.
- Separate the middle mold frame from frontal mold frame.
- If the disassembly is done, separate them into 3 assembly sections(Frontal frame, middle panel, back case)

5.3 Checkpoints and Actions to be taken for Irregularities

Symptoms	Checkpoints	Actions
<ul style="list-style-type: none"> √ Shaky screen √ White stripes on the screen √ Screen color changes 	Check the LCD connectors' contact	Wash connector and boards with volatile cleaner
<ul style="list-style-type: none"> √ Screen is not displayed at power/on √ Screen mode disappears while operating 	Check the contact status of main board.	Wash connector and board with volatile cleaner
	Check if the wiring insertion between the mother board and the power supply is in a poor condition.	Check the wiring insertion.
<ul style="list-style-type: none"> √ Picture is dark √ Picture is lazy √ Picture is bright 	Check if acryl and LCD are heavily covered ?	Wash out the dirts
	Check if the brightness control is set up too dark ?	Adjust [Bright] /[System] in men
	Check if the brightness control is set up too bright ?	Adjust [Bright] /[System] in men
<ul style="list-style-type: none"> √ External interface is not working. 	Check if the data form input is properly set up ?	Connect the data form input to external unit properly.
	Signal is not made from external interface terminal. (Multi Tester)	Check the condition of the data connector line is in a good condition.
<ul style="list-style-type: none"> √ Power is not turned on. √ Power turns off while operating 	Check if it blinks temporarily when the power LED ON is pressed.	In case of current device problem - Troubleshooting
	Check if there is any dust or erosion on the contact of FUSE and FUSE holder.	Replace FUSE and wash out the FUSE holder contact
	Check if the wiring insertion between the mother board and the power supply is in a poor condition	Work on the wiring insertion
	Check if power voltage maintains above 12V~35V while operating	Troubleshoot the battery and AVR
<ul style="list-style-type: none"> √ Taking so long until display on 	Check each devices and connectors to CPU pcb	Check all devices & connectors to CPU pcb
<ul style="list-style-type: none"> √ Hardly measuring by low GAIN 	What if GAIN too low, STC too high set ?	Up GAIN, down STC
<ul style="list-style-type: none"> √ more bottom sea than one 	What if it is too low depth ? Or too high GAIN set ?	Adjust GAIN
<ul style="list-style-type: none"> √ Interference Noise 	Does it ground ? Is it high GAIN ?	Ground it Adjust GAIN

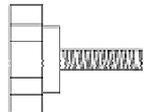
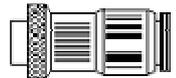
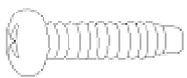
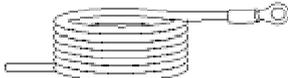
APPENDIX

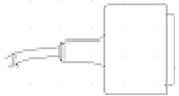
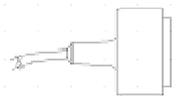
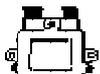
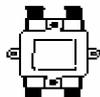
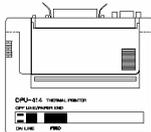


- APPENDIX 1. PACKING LIST
- APPENDIX 2. INSTALLATION DRAWING

APPENDIX 1. PACKING LIST

■ SES-2000/SES-2000N

SES-2000/SES-2000N (1/2)							
NO.	ITEM	DESCRIPTION	MODEL		Q'TY	CH	REMARK
1	MAIN UNIT		SES-2000 SES-2000N		1		
			CODE NO.	SES-2000 SES-2000N			
2	BRACKT				1		
			CODE NO.	ACC-PCOT-015			
3	BOLT		Ø6mm x 20		2		
			CODE NO.	SPR-1402			
4	DC POWER CABLE		CVV-SB 2.0 mm ² x 2C		1		SCN-20-2P
			CODE NO.				
5	DATA CABLE CONNECTOR		SCN-16-4P		1		
			CODE NO.	ACC-CNT-001			
6	SCREW		Ø4 x 16		10		
			CODE NO.	SPR-1407			
7	GROUND CABLE		KIV 5.5 mm ²		1		
			CODE NO.	SPR-1408			
8	FUSE		5A		2		
			CODE NO.	ACC-FUSE-001			
9	CABLE TIE		DACT-300		10		
			CODE NO.				
10	INSTRUCTION MANUAL				1		
			CODE NO.	SES2000-MK			

SES-2000/SES-2000N (2/2)							
NO.	ITEM	DESCRIPTION	MODEL		Q'ty	CHK	REMARK
11	Remote Depth Indicator cable		6P.SHIELD CABLE/10M		1		Option SCN-16-6P
			CODE NO.	ACC-CAB-003			
12			50KHz Rubber		1		SCN-20-6P
			CODE NO.	TD-22			
13	Transducer (SES-2000 Option / SES-2000N Standard)		50KHz Book		1		Option
			CODE NO.	TE-2000-5			
14			200KHz Rubber		1		SCN-20-6P
			CODE NO.	TD-24			
15			200KHz Book		1		Option
			CODE NO.	TE-2000-2			
16	REMOTE DEPTH INDICATOR		SD-3000		1		Option
			CODE NO.	SD-3000			
17	DIMMER CONTROLLER		DM-3001		1		Option (Cable 1m)
			CODE NO.	DM-3001			
18	JUNCTION BOX		SJ-2000		1		Option
			CODE NO.	SJ-2000			
19	JUNCTION BOX		SJ-4000		1		Option
			CODE NO.	SJ-4000			
20	PRINTER		DPU-414		1		Option (Printer Cable)
			CODE NO.	DPU-414			
21	Water Temp. Sensor		100ohm Metal vessel		1		Option Connecting Cable
			CODE NO.	PT-100-IRON			
22			100ohm Wooden vessel		1		Option Connecting Cable
			CODE NO	PT-100- WOODEN			

APPENDIX 2. INSTALLATION DRAWING