OPERATION MANUAL

(Including Guidelines for Safe Opereation)

HDX-121 HDX-121-BB

HONDEX™

by HONDA ELECTRONICS

INTRODUCTION

Thank you very much for purchasing our product.

- Please be sure to read this manual carefully and understand the contents before the actual operation in order to keep your safety.

- Please store this manual safely at the convenient place so that you can read it when needed.

- Please pass this manual to new owner when you resell or give this unit to someone else.

- We are not responsible for any physical injuries and property damages under product liability (PL) law by wrong usage or any other operations not described in this manual.

DEFINITION OF SYMBOL MARK [CAUTION FOR SAFETY]

DANGER : Incur the accident resulting in the death or serious injuries unless you keep the descriptions.

WARNING : Be in danger of incurring the accident resulting in the death or serious wound unless you keep the descriptions.

CAUTION : Be in danger or incurring the slight wound to human or damage to other physical property unless you keep the descriptions.

· Please understand that the unit may differ from the contents described in this manual due to the specification changes etc.

· Please inform us if you see any errors and/or unclear descriptions in this manual.

CONTENTS

OPERATION OF ECHO SOUNDER

REFERENCE DOCUMENT

CAUTION ON SAFETY (BE SURE TO READ THIS)

This explains the important cautions in order to prevent the users and surrounding people from physical injuries and property damages.

1. HANDLING OF MAIN UNIT

⚠ DANGER

●High voltage is used for the unit inside.
No one besides authorized personnel should disassemble or modify the unit.
If not followed, it may result in electric shock.
※Please be sure to consult with the local dealer for any repairs.

⚠ WARNING

●Install the unit firmly.
If not, it may cause the accidents such as human injuries.

●Do NOT use this unit for navigation purpose.
It may result in the accident.
※Use official paper chart for navigation usage.

●Do NOT navigate according to the depth information on the unit.
The depth info on unit may be shown differently compared to the actual depth.
Very shallow water such as 1-2m cannot be detected depending on the conditions.

●Do NOT operate the unit while navigating.
It may result in an accident.

●Do NOT put the power on in the presence of flammable materials.
It causes the fire.

●Do NOT use the power supply besides the specified one.
It causes the firing and heating.

●Do NOT disassemble and modify the unit.
It causes the firing, electronic shock, and injury.

●Do NOT operate the unit with wet hands.
It causes the electronic shock and damage.

●Disconnect the power cable in the case of problem, smoke, and fire.
It causes the firing and electronic shock.
Be sure to contact the local shop or customer support.

CAUTION

- •Do NOT install the unit where rain or spray dashes hit directly.
  It causes the firing and electric shock.
- •Do NOT install the unit at heated places.
  It causes the firing from the increase of internal temperature, injury, and electric shock.
- •Use the earthing.
  Noise influence can be prevented by firm earthing.
- •Away from direct sun light.
  It causes the difficulty of future vision and heat problem.

2. HANDLING OF CABLE

WARNING

- •Be sure to use the specified power supply cable.
  It causes firing and heating.
- •Do NOT leave the power plug after its removal.
  It causes firing and heating if the plug gets wet.
- •Be sure to wire the cables for safety pilot.
  The improper wiring causes the accident.
  ※Do NOT put the heavy object on cables or bend cables excessively.
- •Do NOT disassemble or modify the cables.
  It causes firing, heating, or electronic shock.
- •Do NOT use damaged cables.
  It causes firing or electric shock.

CAUTION

- •Do NOT pull out the cable when disconnecting the plug.
  The cable damage causes firing and electric shock.
  ※Be sure to hold and pull the plug itself for the removal.
- •Do NOT put any pressure on cables when installing the unit.
  It causes line cut and shortage.

3. HANDLING TRANSDUCER AND WATER TEMP SENSOR

⚠ DANGER

●Any works on the vessel are very unstable and risky.
Installation/Maintenance of transducer and water temp sensor should be handled after landing the vessel on ground or fixing the vessel at shipyard etc.

⚠ WARNING

●Be sure to ventilate well inside the vessel when installing the transducer at the bottom of vessel.
Volatile gas from solvent etc causes the toxic symptoms.

●Water proof treatment is required for Thru-Hull installation.
If not, it cause the marine accident.
※It is not allowed for aluminum vessels due to the risk of corrosion.

●Do NOT operate the electronic tools with wet hands.
It cause electric shock.

●Do NOT remove the transducer plug when the power is ON.
It causes electronic shock.

4. REMOTE

⚠ DANGER

●Do NOT use any leaked AA-batteries. (for IR usage)
It may cause human injuries if a person touches the leaked liquid.

⚠ CAUTION

●Place the remote for safe location when not being used.
Prevent from dropping and human accident.

5. HANDLING OF GPS

DANGER

●Do NOT work on GPS while piloting.
The work such as installation or maintenance should be carried out on ground.

CAUTION

●Place GPS antenna at highest location as possible for stable GPS signal.
Searching time for GPS signals take longer, and GPS accuracy becomes lower if any obstacles are located near by GPS antenna.

6. TFT LCD PANEL

●LCD panel is made with high precision technology. Therefore, the effective pixel is over 99%, and pixel loss and continuous lighting pixel exist 0.01% or more. Please understand this specifications.

7. OPERATION

Power OFF when starting engine.

Battery voltage varies when the engine starts. It may cause some damages onto the unit. Set the power OFF when starting the engine.

Power Supply 11-35V

Operate the unit within the range of DC11-35V.

Organic solution is prohibited.

Do NOT clean the unit with organic solution like thinner or alcohol etc because most parts are made with plastic. For heavy dirt, soak cloth in synthetic detergent and clean it after wring.

Take note of important data

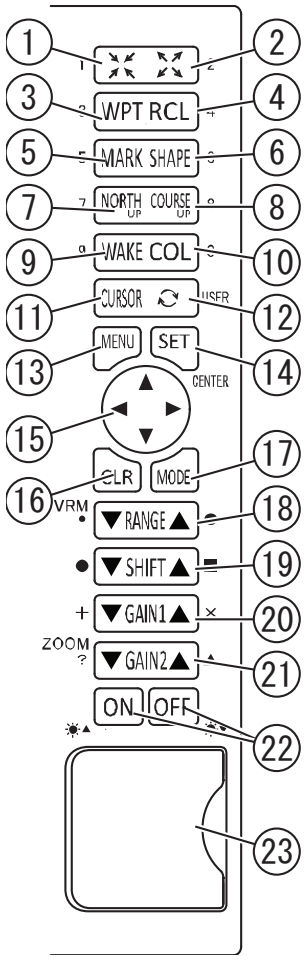
The unit is not designed for storing the data permanently. Important data should be recorded on the notebook etc.

8. GPS

Approx.±5m is considered for GPS variation normally under good conditions.
However, this may shift to appox.±10-30m under unfavorable conditions.

MEMO

1. FRONT PANEL



< HDX-121>

① Zoom out (→page25)
② Zoom in (→page25)
③ Waypoint (→page43)
④ Recall waypoint (→page49)
⑤ Mark (→page32)
⑥ Mark shape (→page32)
⑦ North up (→page26)
⑧ Course Up (→page26)
⑨ Wake On/Off (→page39)
⑩ Wake color (→page39)
⑪ Cursor On/Off (→page23)
⑫ User key
⑬ Menu (→page13)
⑭ Set
⑮ Direction key
⑯ Clear
⑰ Mode display switch (→page17)
⑱ Depth (→page83)
Variable marker
(distance marker) (→page63)
⑲ Shift
＊Mark input (→page63)
⑳ Gain1 (sensitivity)
(→page84,85)
＊Mark input (→page63)
㉑ Gain2 (sensitivity) (→page85)
＊Mark input (→page63)
・Zoom (only when activating manual-zoom) (→page86,87)
㉒ Power On/Off (→page15)
Brightness adjustment (→page18)
㉓ Card slot for SD and USB device

2. REAR VIEW

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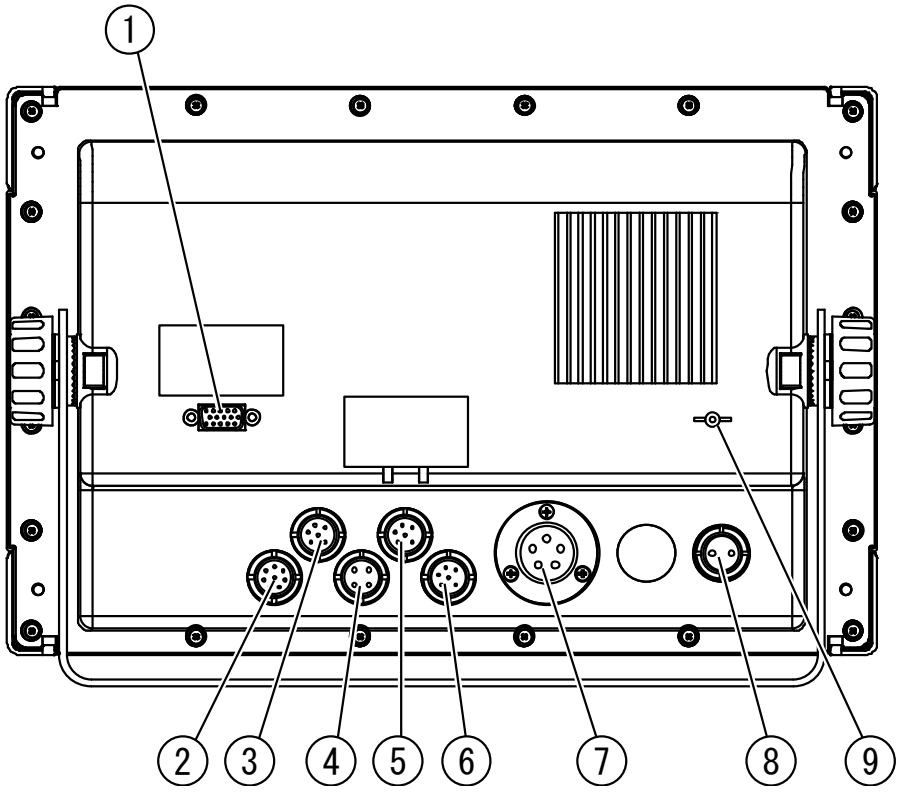
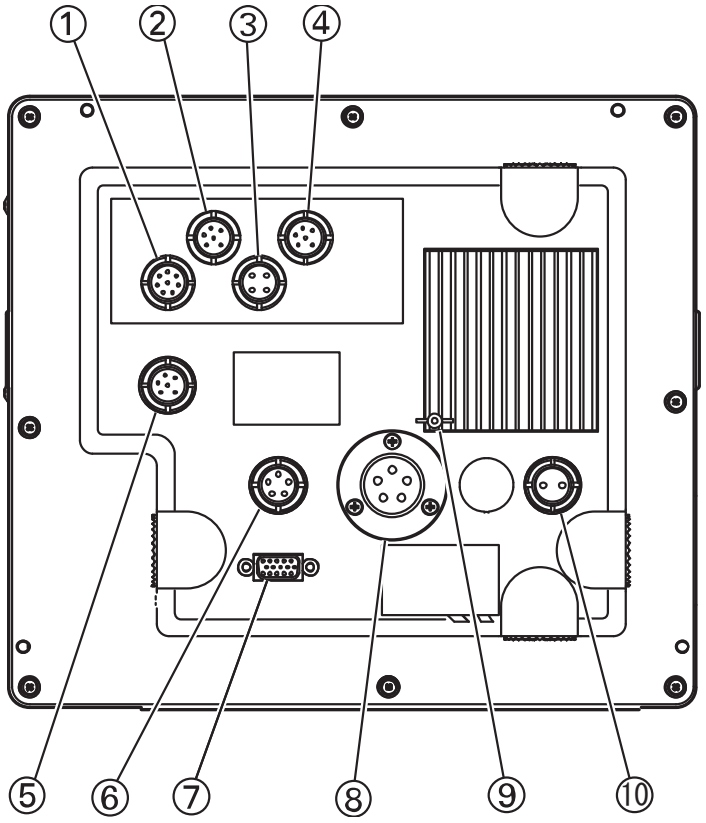


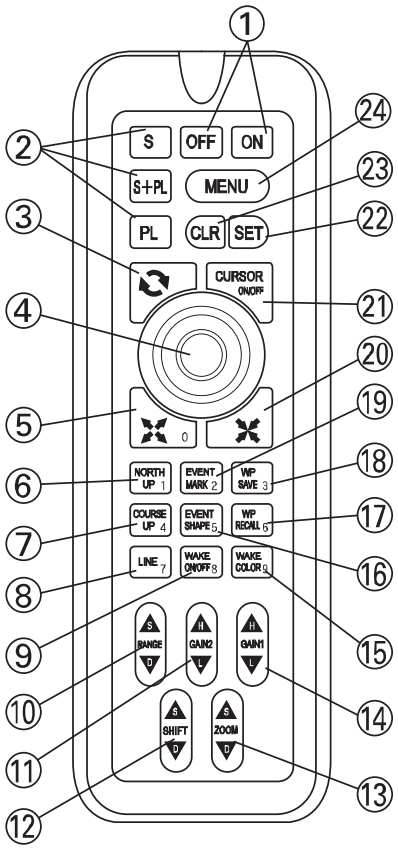
①RGB monitor output
②Water temp sensor (TEMP, 8P) *option
③External input/output (NMEA1, 6P)
④Remote (4P) *option
⑤External input/output (NMEA2, 6P)
⑥GPS (GPS, 6P)
⑦Transducer (5P) 1kW or 1.8kW
⑧DC Power (2P)
⑨Earth Terminal

< HDX-121-BB >



① Water temp sensor (TEMP, 8P)
② External input/output (NMEA1, 6P)
③ Remote (4P) *option
④ External input/output (NMEA2, 6P)
⑤ GPS (GPS, 6P)
⑥ Mark input terminal
⑦ RGB monitor output
⑧ Transducer
⑨ Earth Terminal
⑩ DC Power (2P)

3. REMOTE (OPTION)



① Power On/Off (→page15)
② Mode display switch (→page17)
③ User key
④ Direction key
⑤ Zoom in (→page25)
⑥ North Up (→page26)
⑦ Course Up (→page26)
⑧ Line (→page51)
⑨ Wake On/Off (→page39)
⑩ Depth (→page83)
＊Mark input (→page63)
⑪ Gain2 (sensitivity) (→page85)
Left-side sensitivity when showing dual-freq
＊Mark input (→page63)
⑫ Shift
＊Mark input (→page63)
⑬ Zoom (only when activating manual-zoom) (→page86,87)
＊VRM set-up (→page63)
⑭ Gain1 (sensitivity) (→page84,85)
Right-side sensitivity when showing dual-freq
＊Mark input (→page63)
⑮ Wake color (→page39)
⑯ Mark shape (→page32)
⑰ Recall waypoint (→page49)
⑱ Save waypoint (→page53)
⑲ Mark input (→page32)
⑳ Zoom out (→page25)
㉑ Cursor On/Off (→page23)
㉒ Set
㉓ Clear
㉔ Menu (→page13)

REMOTE（option）

⚠DANGER

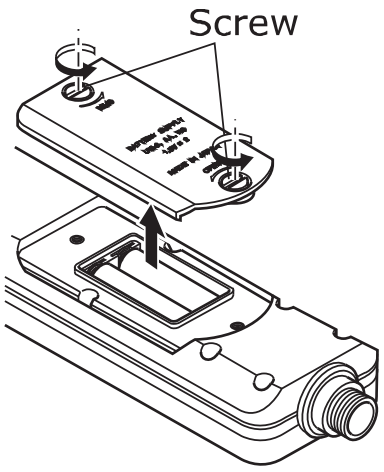
●Do NOT use any leaked AA-batteries. (for IR usage)
It may cause human injuries if a person touches the leaked liquid.

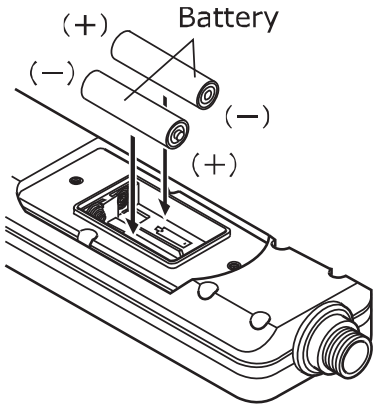
⚠CAUTION

●Place the remote for safe location when not being used.
Prevent from dropping and human accident.

・2pcs AA-batteries required for cordless usage.

HOW TO PUT BATTERIES





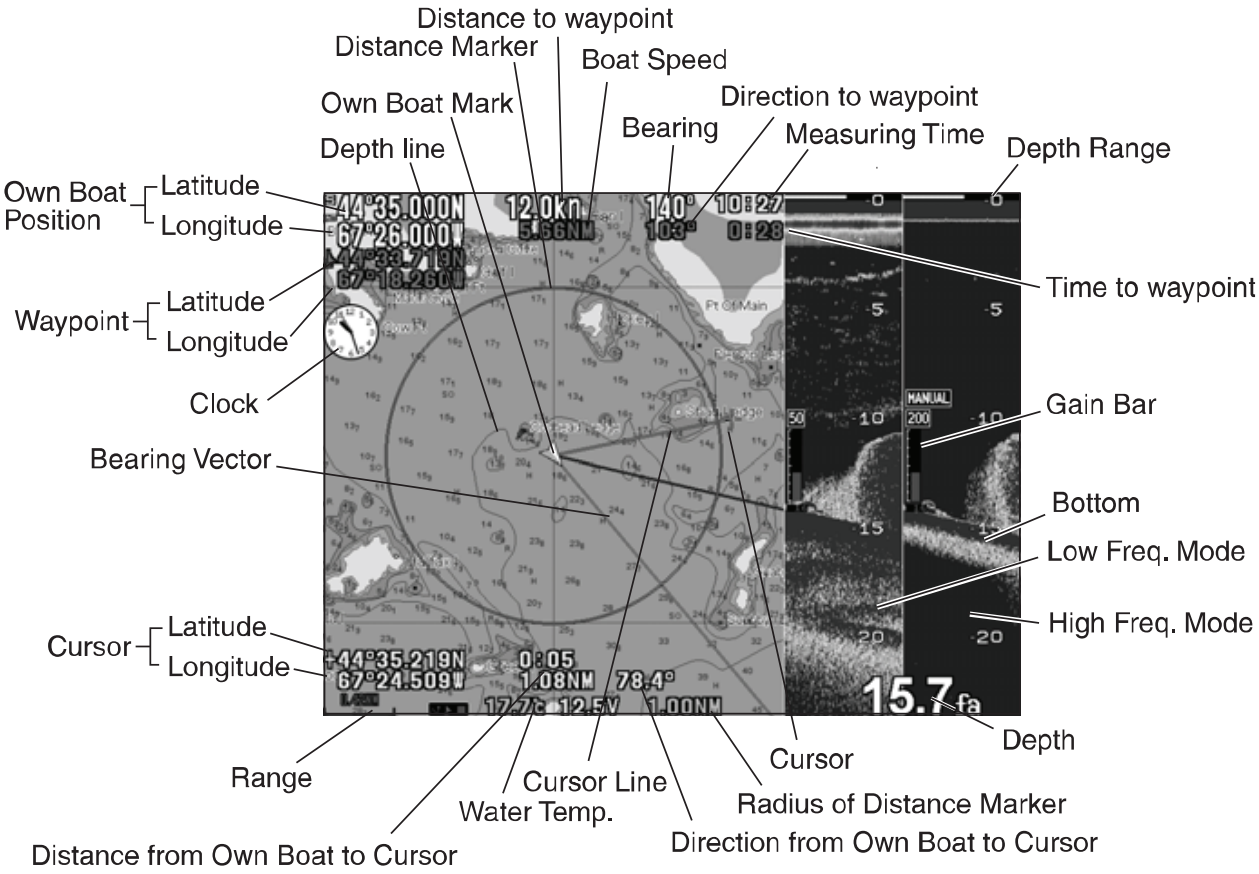
1 Loose 2pcs screws and remove the rear cover.

2 Place 2pcs batteries in correct direction.
※Do NOT tighten the screws too much.

【CAUTION ON BATTERIES】
Batteries cause the leakage of solution or explosion with misusage.
Please make sure to keep the followings.
- ・Place the batteries in correct polarity.
- ・No mix usage of 1pc used battery and 1pc new battery.
- ・Battery cannot be charged.
- ・Remove the batteries when not being used for long time.
- ・When the solution is leaked out of the batteries, wipe off the stained solution before putting new batteries.

【CAUTION ON REMOTE】
- ・Remote may not work when direct sunlight etc is hit on the infrared sensor of display unit.
- ・No obstacles between remote and display unit.
- ・Remote may be damaged by dropping and under direct sunlight.

HOW TO SEE THE DISPLAY

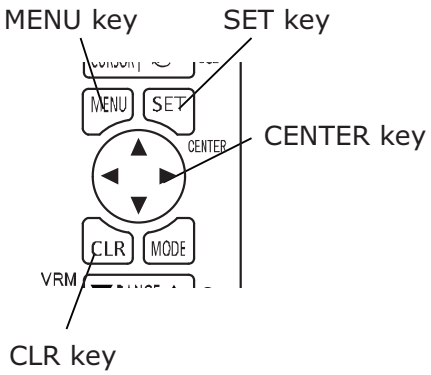


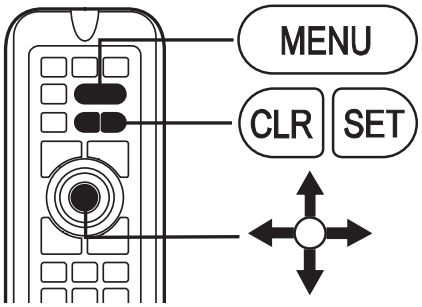
※Water temp sensor : Option

HOW TO OPERATE MENU

How to Operate Menu

Contents of items can be changed by using MENU/DIRECTION/SET/CLR keys.





1 Press MENU key.

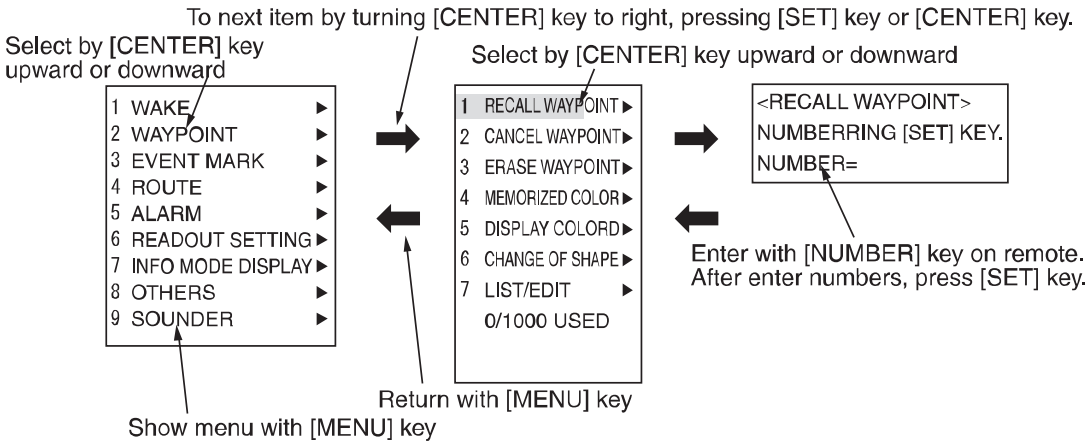
2 Use direction key (up/down) to select.
Also, input "assigned number" to do the same.

3 Use direction key (right) to display next menu page.
Press MENU key to return.
Repeat steps "2" and "3" to reach the selection of target function.

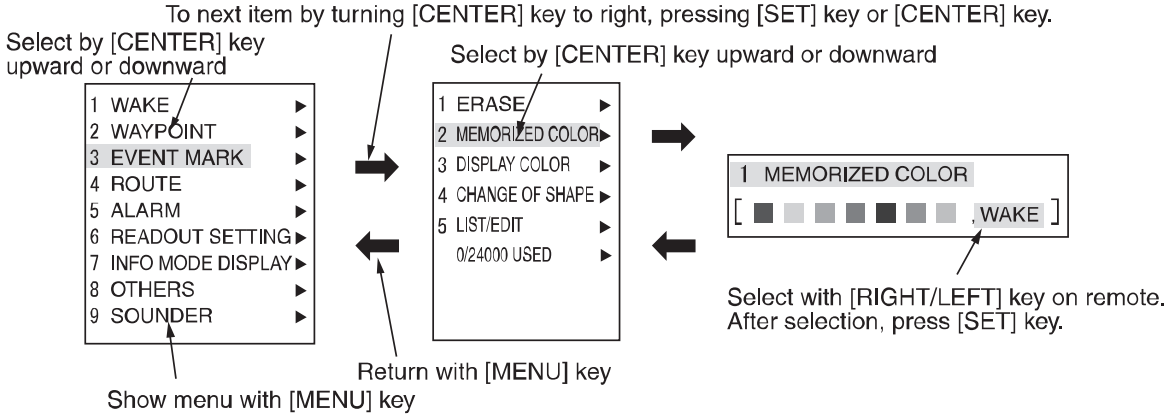
4 "Number input" or "Item selection" to change the set-up.

5 Press CLR key to close menu display.

<Enter of numbers>



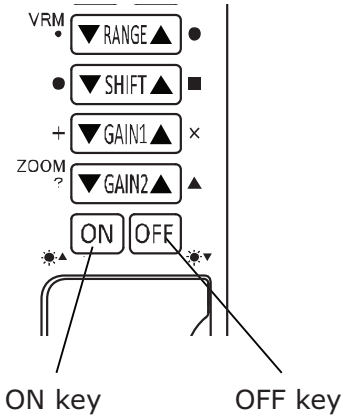
<Selection of menu items>



BASIC OPERATION

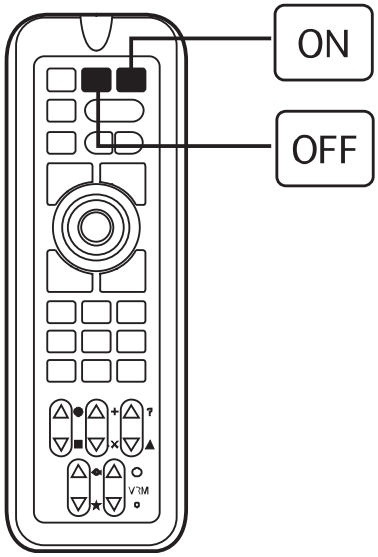
POWER ON/OFF

Power ON/OFF



1 Press ON key to turn on the power after beep sound followed by caution and chart display.

2 Press OFF key for 2sec or more to turn off the power.



《REMOTE》(option)

1 Press&Hold ON key to turn on the power after beep sound followed by caution and chart display.

2 Press&Hold OFF key to turn off the power.

Caution 1)

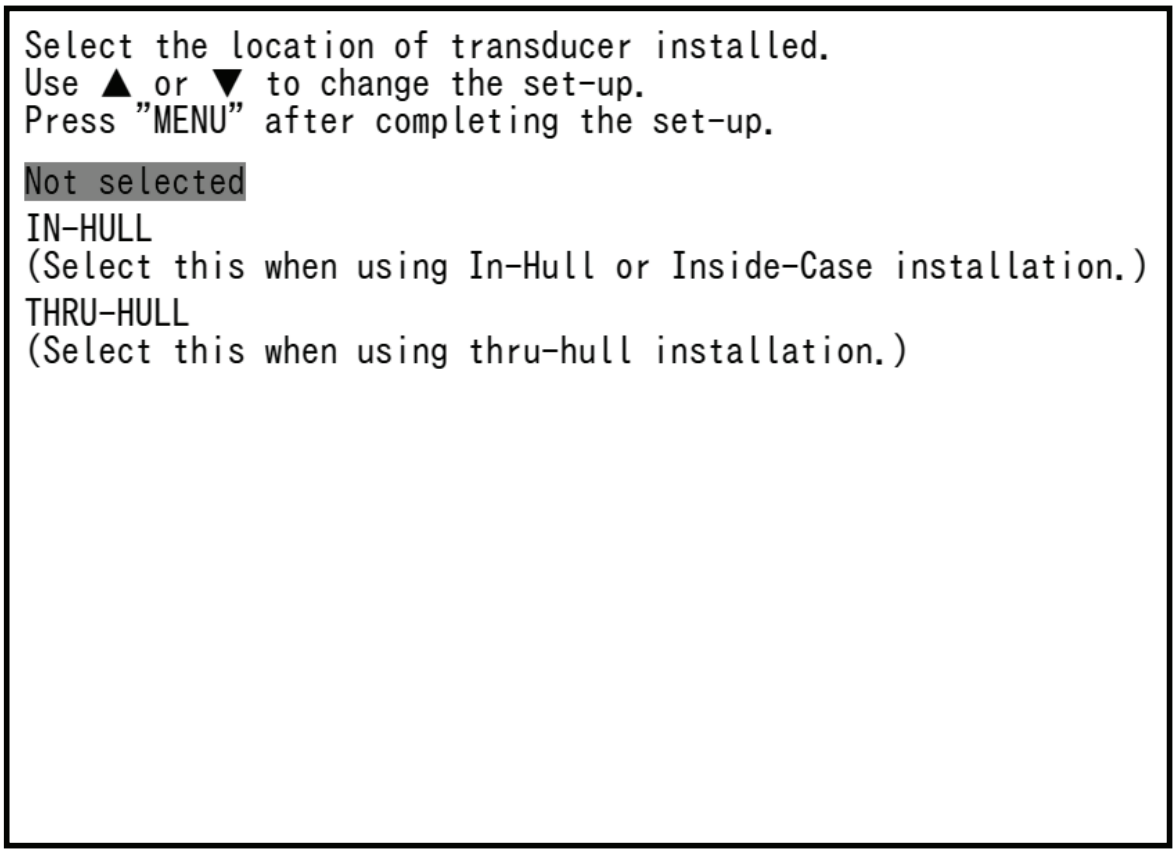
For 1st start-up, it may take 5-30min to grasp the GPS location.

Caution 2)

Start the engine before turning on the power of unit.

INITIAL SET-UP (TD LOCATION SET-UP)

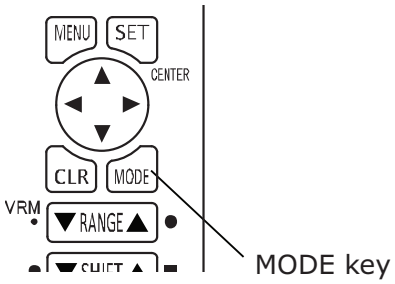
The following display appears after 1st time power on. Select the proper one.



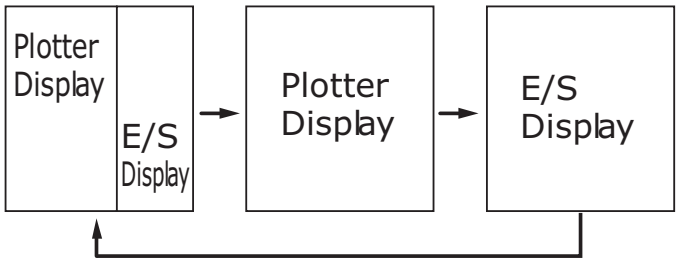
Also, this TD set-up can be changed from menu.
(Refer to "TRANSDUCER THRU-HULL / IN-HULL SET-UP" p103.)

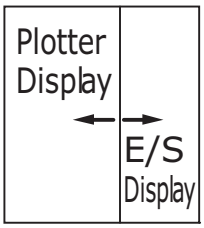
DISPLAY MODE SWITCH

Mode Change



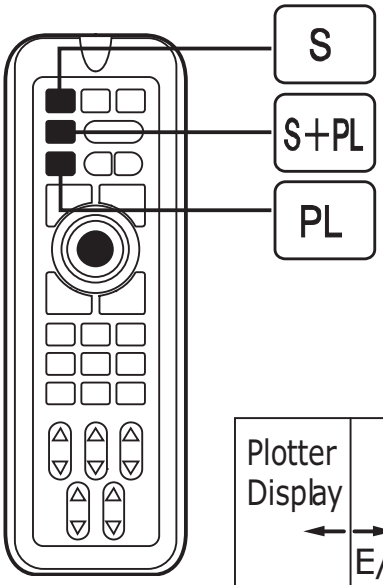
1 Press MODE key to change the display to Echosounder/Plotter – Plotter – Echosounder.





【Change Display Ratio】
Only for "Echosounder/Plotter" mode, possible to change each display ratio. Press&Hold MODE key to show "DISPLAY CORRECTION" message. Use direction key(right/left) to change the divided ratio.

《Case of Remote》(option)



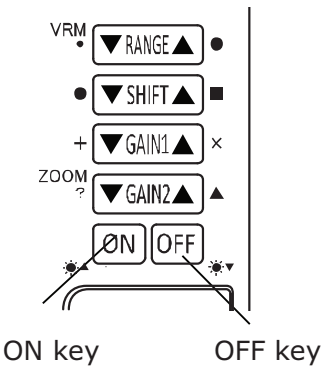
1 Press "S", "S+PL", or "P" to change the mode.

"S" : Echosounder mode
"S+PL" : Combo mode. Plotter on the left. Echosounder on the right.
"PL" : Plotter mode

【Change Display Ratio】
Only for "Echosounder/Plotter" mode, possible to change each display ratio. Press&Hold MODE key to show "DISPLAY CORRECTION" message. Use direction key(right/left) to change the divided ratio.

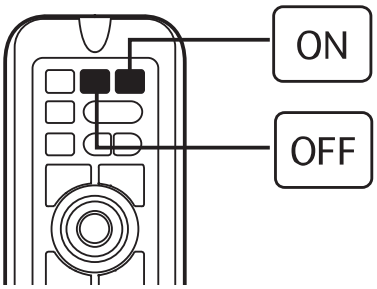
SCREEN BRIGHTNESS

Brightness Adjustment



1 Quick Press ON : Brighter
Quick Press OFF : Darker

2 Brightness indicator will disappear itself.
Otherwise, press any keys except
ON/OFF to close it.

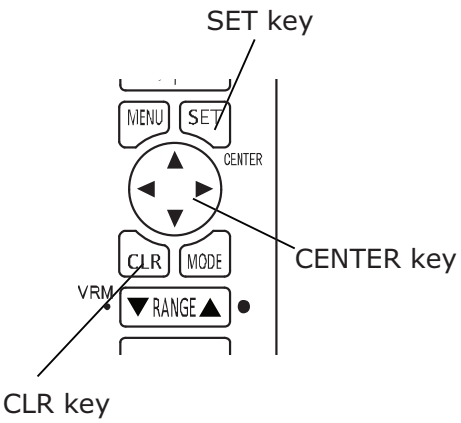


《Case of Remote》（option）

1 Quick Press ON : Brighter
Quick Press OFF : Darker

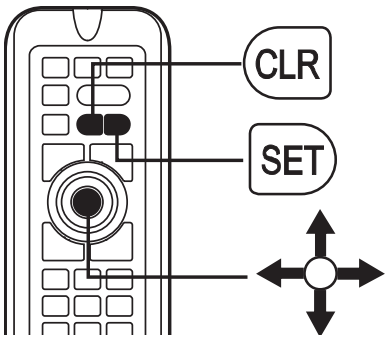
SIMULATION MODE

SIMULATION



1 Go to 8.OTHERS – 8.INITIAL – 5.SIMULATION. Use Direction key to select the different demo mode.

OFF : No simulation mode
FIX : Fixed location of own vessel
MOVE : Vessel keeps moving.
ROTATE : Vessel keeps rotating.
ONE WAY : Vessel moves to one direction.



※DEMO icon appears when activating simulation mode.
※Select OFF and press SET key to return to the normal mode.
※Use a cursor and choose the desired demo location before activating simulation mode.
Caution) Simulation mode is only for practice or exhibition usage.
Information shown on DEMO screen is not actual info such as depth etc.

NMEA0183 OUTPUT

On/Off NMEA Output

1 Go to 8.OTHER – 7.EXT TERMINAL – 3.NMEA1 OUTPUT or 4.NMEA2 OUTPUT.
ON : Output
OFF : No output

NMEA0183 Output Interval

1 Go to 8.OTHER – 7.EXT TERMINAL – 1.INTERVAL SETUP1 or 2.INTERVAL SETUP2.

2 Each interval can be selected.

※Interval set-up may be disabled when outputting too much data.
※Please refer to p.114 for NMEA0183 output sentence.

BAUD RATE Set-up for NMEA0183 and GPS

1 Go to 8.OTHER – 7.EXT TERMINAL – 5.NMEA1 PORT BAUD RATE, 6.NMEA2 PORT BAUD RATE, or 7.GPS PORT BAUD RATE. (4800, 9600, 38400)

※GP-16H: 4800, GP-17H(HD): 9600
※AIS: 38400
※Reboot the unit after change of this set-up.

SCREEN CAPTURE TO USB DEVICE

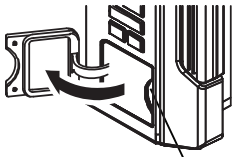
Possible to save the screen image to USB device. PNG format 800x600

Enable the Save Function

1 Go to 8.OTHERS – 3.USER KEY.

2 Select SAVE PICTURE

Instruction



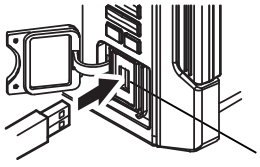
Pull the card slot cover.

1 Pull the card slot cover.

2 Insert USB device into the USB connector.

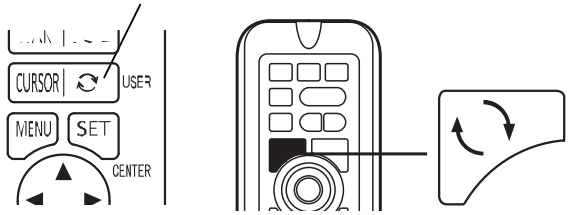
3 Press USER key to save the screen shot.

4 Use PC etc to see the image.



USB connector

USER key



Note)Refer to P.31 for the removal of USB device.

INITIALIZE

1 Go to 8.OTHERS- 8.INITIAL.

2 Select one from the followings. Press SET key to execute the initialization.

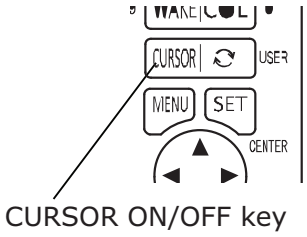
1. INITIALIZE MENU	: Initialize all the contents of MENU.
2. INITIAL CORRECION VALUE	: Initialize each calibration values.
3. INITIAL MEMORY DATA	: Initialize the recorded data such as mark and waypoint.
4. INITIAL ALL	: Initialize all items above 1-3. Return to factory set-up. Required to reboot the unit.

※Any erased data cannot be regenerated.

OPERATION OF PLOTTER

CURSOR

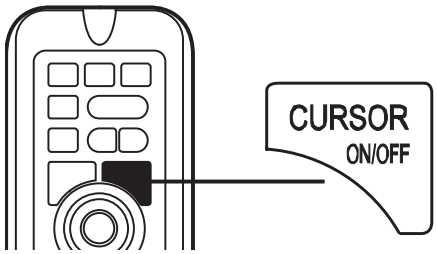
On/Off Cursor



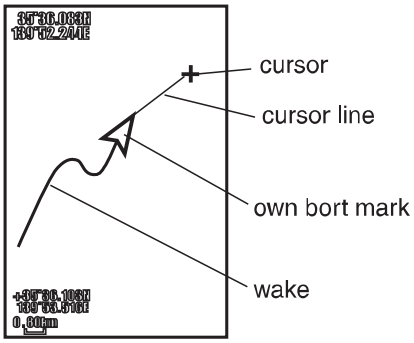
CURSOR ON/OFF key

Use of Cursor
- Display the selected Lat/Long.
- Display distance/bearing/time from own vessel to cursor.
- Input/Erase mark or waypoint.

1 Press CURSOR ON/OFF key to show the cursor. Press one more time to cancel.

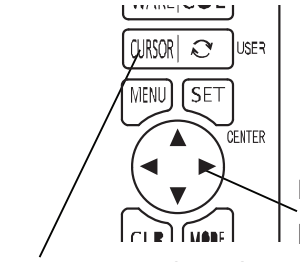


【Cursor Line】
"Cursor Line" is the line between own vessel to cursor.



※No indication of cursor line/bearing/time when the location of own vessel is not shown on the screen.

MOVE CURSOR

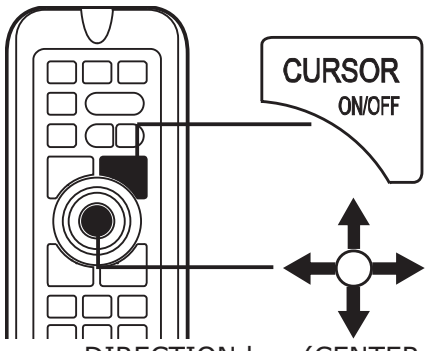


CURSOR ON/OFF key

1 Select CURSOR ON/OFF key to show the cursor.

2 Use DIRECTION key to move the cursor.

《Case of Remote》(option)
※Centering key is located at the center of DIRECTION key.



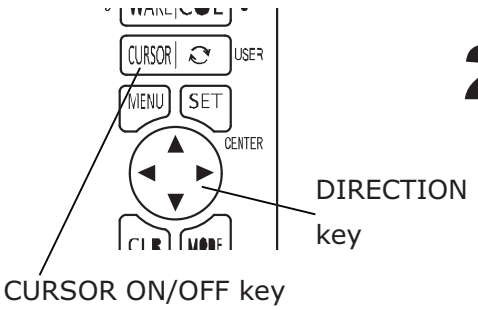
DIRECTION key (CENTER key)

When cursor is ON :
Cursor location becomes the center.
When no cursor is ON :
Own vessel location becomes the center.

Memo) DIRECTION key moves either the cursor (when the cursor is ON) or chart display (when there is no cursor on the screen).

SHIFT DISPLAY

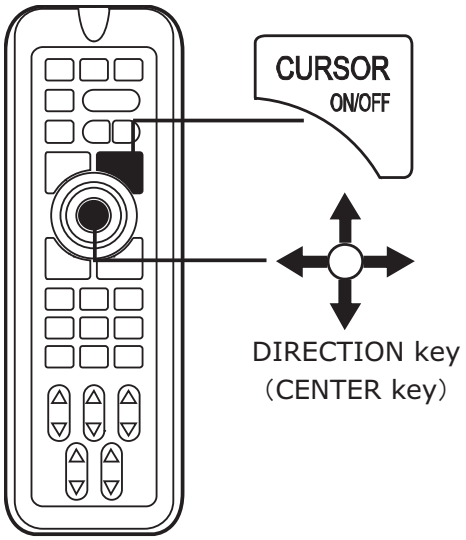
Move Chart Display



1 Press CURSOR ON/OFF to cancel cursor.

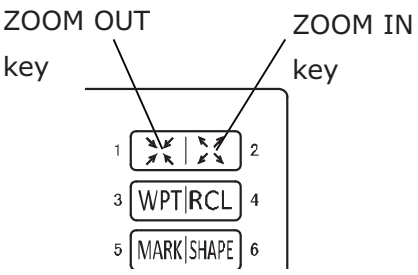
2 Use DIRECTION key to move the display.

【Shift Display】
When own vessel is out of the screen, you can always go back by pressing CENTER key (center of DIRECTION key).



ZOOM IN / ZOOM OUT

Zoom In/Out



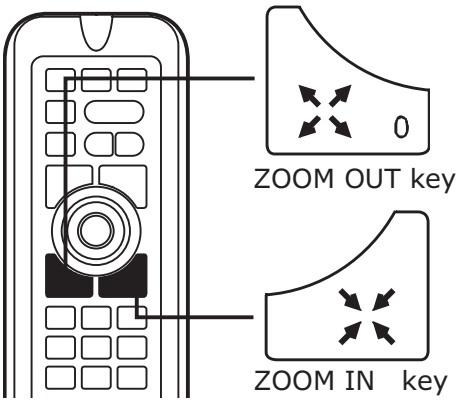
【Zoom In/Out】

Cursor ON

: Zoom In/Out at the center of cursor position.

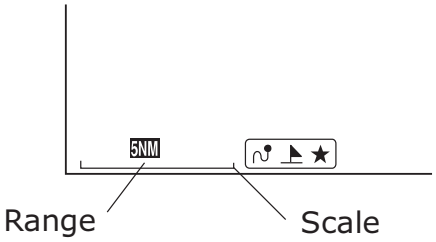
Cursor OFF

: Zoom In/Out at own vessel position.



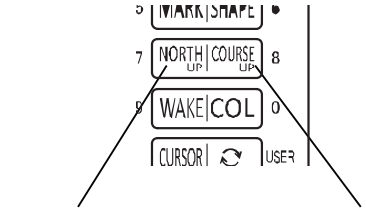
【Scale】

"Scale" helps you to understand the distance on the screen.



DISPLAY DIRECTION

Selection of Direction



NORTH UP key　　COURSE UP key

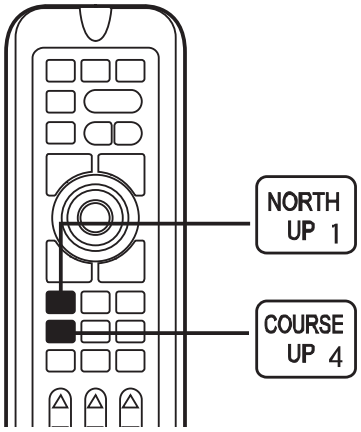
1 NORTH UP : North is up on the screen.

COURSE UP : Vessel bearing is up on the screen.

【Course Up】
"Manual/Auto" course-up can be selected in the menu. (→page75)

Auto course-up ON:
Bearing direction is always upper side of the screen.

Auto course-up OFF:
Press COURSE UP key to activate the function.



Note) Auto course-up can be only enabled after pressing COURSE UP key at first.

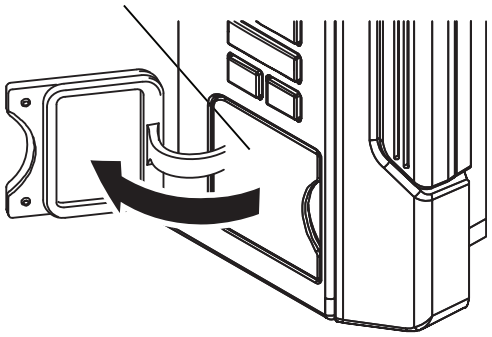
MAP CARD

Chart Data

【Insert Card】
Pull the card slot cover at lower right on the unit.

Insert the card into the slot.

Card slot cover



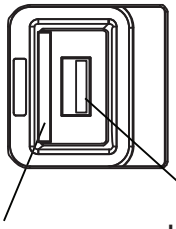
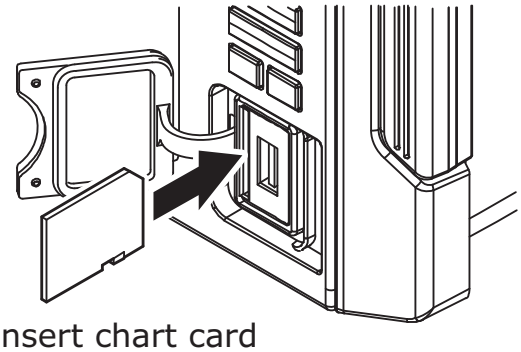


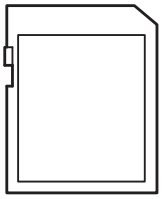
Chart
connector

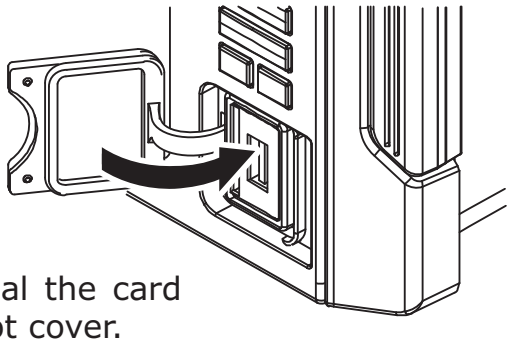
USB connector
(no use)



Insert chart card
(sticker side on the left)

Chart SD card





Seal the card
slot cover.

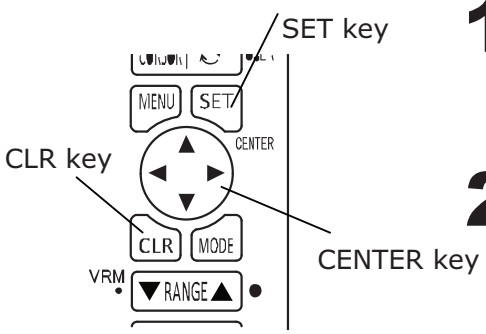
Note) Do NOT remove the SD card (chart card) while the power is ON.

USB DEVICE

Possible to copy the data between unit and USB device.

※Any USB devices up to 8GB specs
【Copy Data Contents】Wake, Mark, Waypoint, Line, Route
※It may take sometimes to recognize the connected USB device.
※Software may act slow when USB device is connected.

Save Data from Unit to USB Device



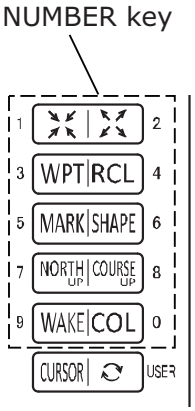
1 Go to 8.OTHERS – 2.MEMORY CARD – 2.STORE FROM UNIT TO USB-DRIVE.

2 Input the block number of USB device and press SET key.
※Red-colored block number means some data contained.

<THUMB DRIVE>
NUMBERING [SET] KEY
NUMBER=

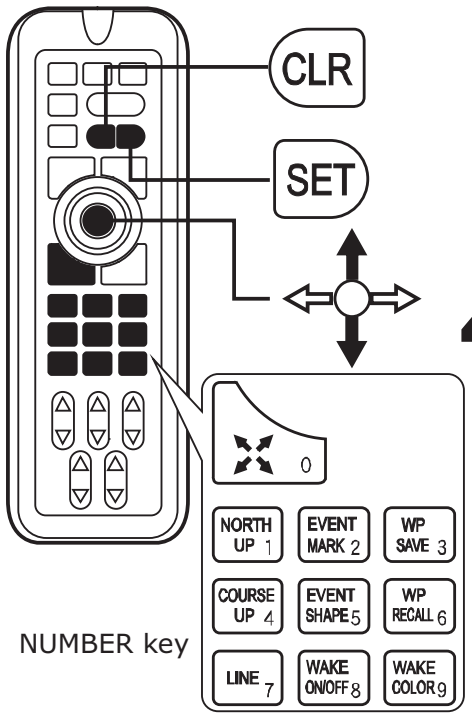
RED:USED WHITE:UNUSED

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29



3 Use DIRECTION key to select the item to be saved.
※Red-colored block number means some data contained inside USB device.

1 WAKE [SET]KEY
2 WAYPOINT
3 EVENT MARK
4 LINE
5 ROUTE

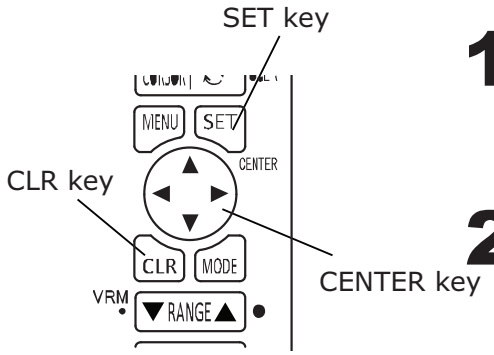


4 If USB device contains some data, select either overwrite or cancel.

※Overwriting erases the old data.

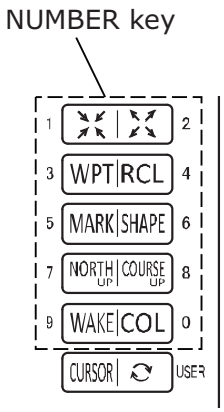
<STORE WAKE TO THUMB DRIVE>
0 / 370
DATA IS IN THUMB DRIVE
SET:OVERWRITE
CLR:COPY CANCEL

Load Data from USB Device



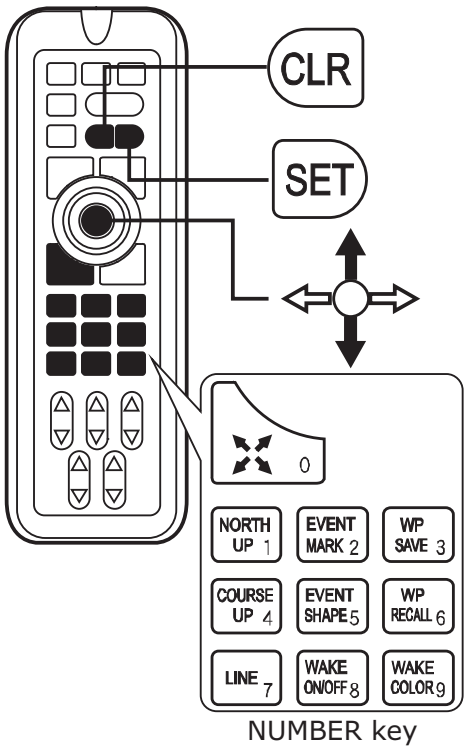
1 Go to 8.OTHERS – 2.MEMORY CARD – 3.STORE FROM USB-DRIVE TO UNIT.

2 Input the block number of USB device.
※Red-colored block number means some data contained.




```
<THUMB DRIVE>
NUMBERING [SET] KEY
NUMBER=
RED:USED    WHITE:UNUSED
 0  1  2  3  4  5  6  7  8  9
10 11 12 13 14 15 16 17 18 19
20 21 22 23 24 25 26 27 28 29
```

3 Use DIRECTION key to select the item.
※Red-colored block number means some data contained inside USB device.



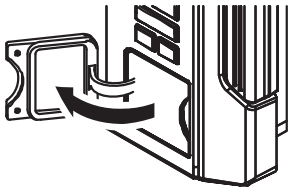

```
1 WAKE              [SET]KEY
2 WAYPOINT
3 EVENT MARK
4 LINE
5 ROUTE
```

4 If unit contains some data, select either overwrite, add or cancel.

```
<READ WAKE TO UNIT>
        0     /              2137
DATA IS IN UNIT
   1:AFTER DELETE UNIT DATA,
     READ FROM THUMB DRIVE.
   2:ADD THUMB DRIVE DATA TO
     .UNIT DATA
CLR:COPY CANCEL
```

ERASE USB DATA

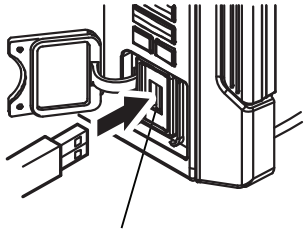
Erase all the saved data of USB device.



1 Pull the card slot cover.

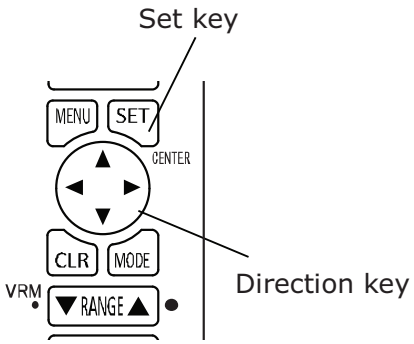
2 Insert USB device.

3 Go to 8.OTHERS – 2.MEMORY CARD – 1.ERASE USB-DRIVE DATA.



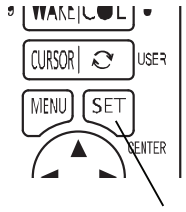
USB slot

4 Press SET key to erase all the data inside USB device.



REMOVE USB DEVICE

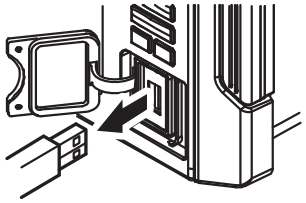
Be sure to execute the following when removing USB device from unit.
※If not, it may cause the damage onto the stored data.



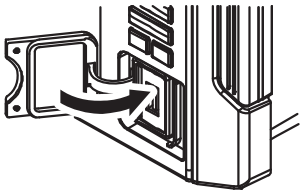
SET key

1 Go to 8.OTHERS – 2.MEMORY CARD – 4.REMOVE USB-DEVICE.

2 Press SET key to hear beep sound so that USB device can be removed.



3 Remove the USB device.

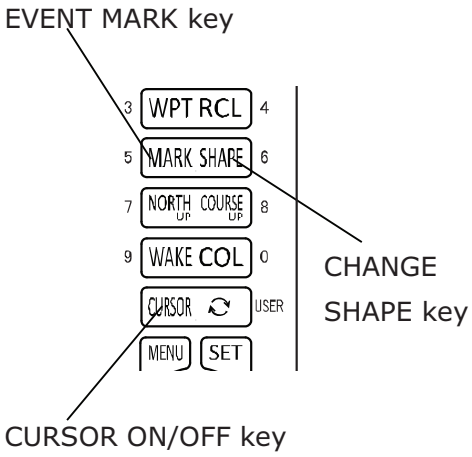


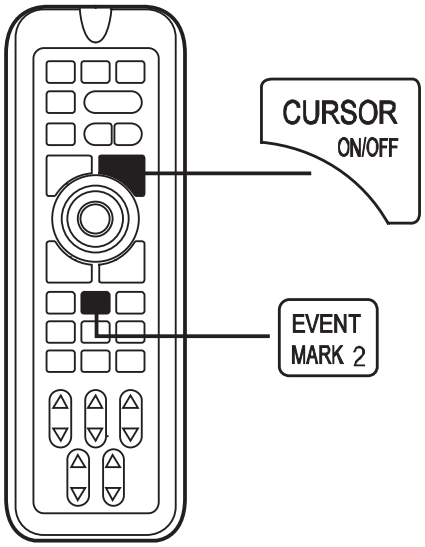
4 Seal the card slot cover onto the unit.

Put the slot cover firmly for water protection.

MARK INPUT

Input Mark at Own Vessel Position





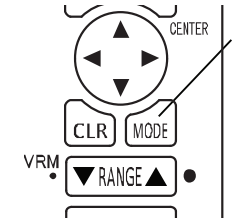
1 Press MARK key input mark at own vessel.

※When the cursor is ON, mark is input at cursor location.

※Mark shape can be changed by SHAPE key or from MENU 3.EVENT MARK – 4.CHANGE SHAPE.
(9 types →page74)

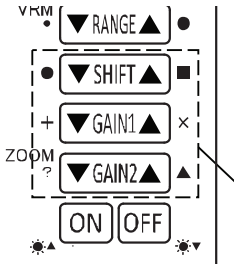
【MARK】
- Shape: 9 types (selected from Menu)
  (1● 2■ 3+ 4× 5? 6▲ 7◆ 8★ 9•)
- Color: Red, Yellow, Green, Magenta, White, Cyan, Blue, Color of wake
- Upper Limit: 48,000 points

MARK WITH SOUNDER KEY

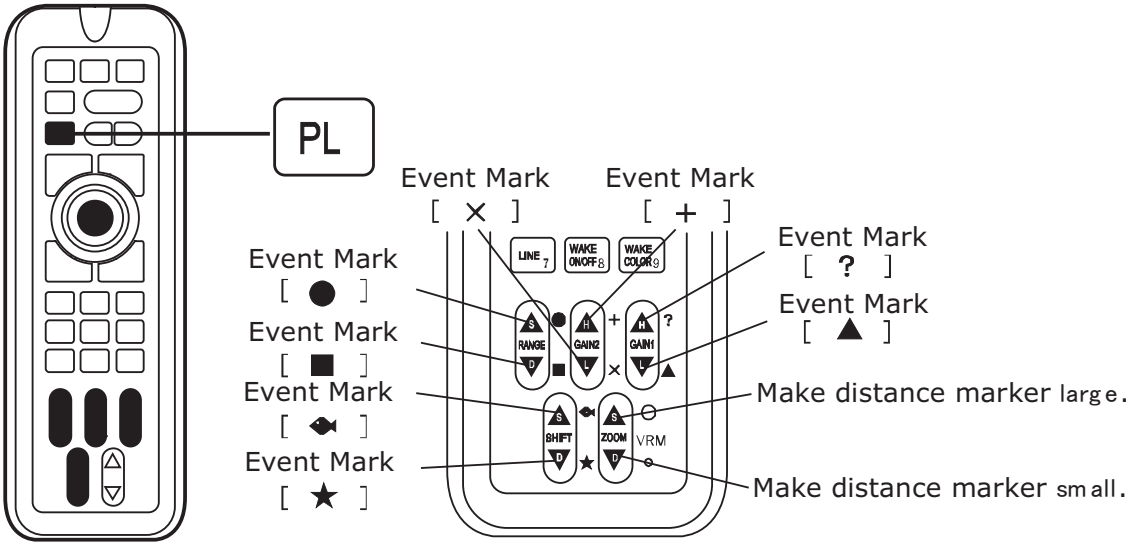


MODE key

1 ※Go to 8.OTHERS – 8.INITIAL – 6.SPEICAL MENU – 1.REMOTE MARK KEY and select. (→page63)



In case of HDX-121
Echo Sounder key (Event Mark key)



SPOT SOUNDING FUNCTION (DEPTH INFO DISPLAY)

Depth is indicated at the mark position.

Select "●" to show the location's depth. Or, assign "SPOT S" for user key.

【Mark Key】

1 Go to 3.EVENT MARK – 4.CHANGE SHAPE – 1.MEMORIZED SHAPE. Select "●".

2 Press MARK key to input an event mark.

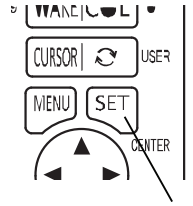
【User Key】

1 Go to 8.OTHERS – 3.USER KEY. Select "SPOT S.".

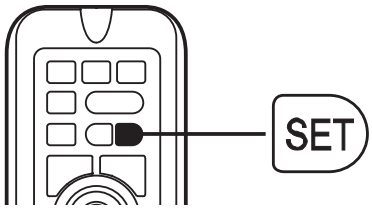
2 Press USER key to input an event mark.

ERASE MARK

Erase by Color



SET key



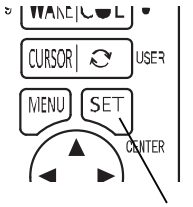
Erase marks by color.

1 Go to 3.EVENT MARK – 1.ERASE – 1.ERASE BY COLOR.

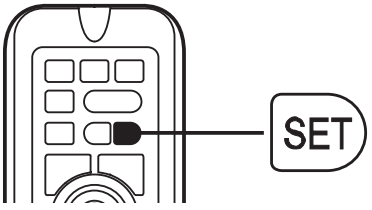
2 Select the color you want to erase.

3 Press SET key to erase all marks of selected color.

Erase by Shape



SET key



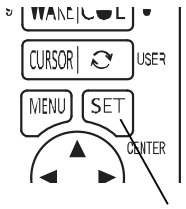
Erase marks by shape.

1 Go to 3.EVENT MARK – 1.ERASE – 2.ERASE BY SHAPE.

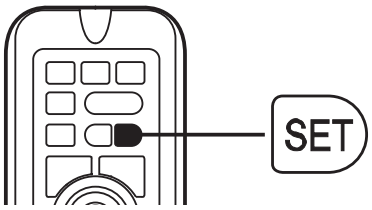
2 Select the shape you want to erase.

3 Press SET key to erase all marks of selected shape.

Erase All



SET key

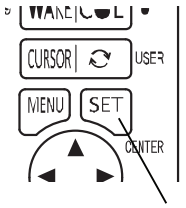


Erase all marks at once.

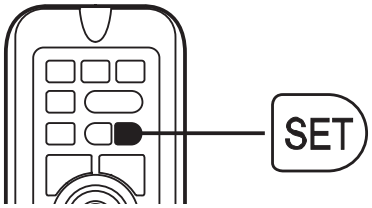
1 Go to 3.EVENT MARK – 1.ERASE – 3.ERASE ALL.

2 Press SET key to erase all marks.

Erase Marks by Date



SET key



Erase mark by selected date.

1 Go to 3.EVENT MARK – 1.ERASE – 4.ERASE BY DATE.

2 Select one from the followings.

3 [1.ERASE TODAY EVENT]
Erase Today's marks.
Press SET key to erase.

[2.ERASE YESTERDAY EVENT]
Erase Yesterday's marks.
Press SET key to erase.

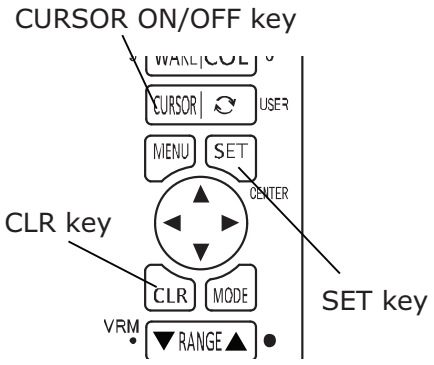
[3.ERASE BY DATE]
Select the dates to erase.

1～6 : Select the period of time from start to the end.
Select "7" followed by pressing SET key to erase the selected date's marks.

1	ERASE TODAY EVENT	
2	ERASE YESTERDAY EVENT	
3	ERASE BY DATE	▶
ERASE BY [SET] KEY		
[ERASE TODAY EVENT] AND [ERASE YESTERDAY EVENT]		
do NOT work when no GPS signal is received.		

1	FROM YEAR	[2014 Y]
2	MONTH	[9 M]
3	DAY	[14 D]
4	UNTIL YEAR	[2014 Y]
5	MONTH	[9 M]
6	DAY	[14 D]
7	START ERASING WITH THE PERIOD ABOVE.	

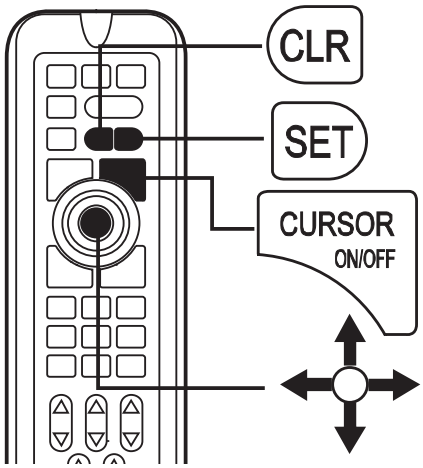
Erase by Cursor

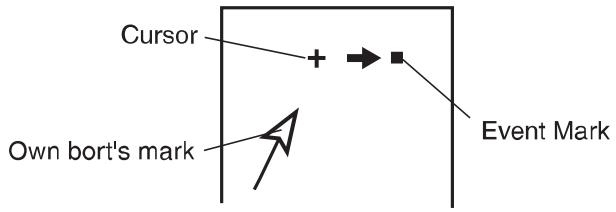


1 Go to 3.EVENT MARK – 1.ERASE – 5. ERASE BY CURSOR. Select ON.

2 Press CURSOR ON/OFF key to display a cursor.

3 Use DIRECTION key to overlap the cursor on the selected mark.



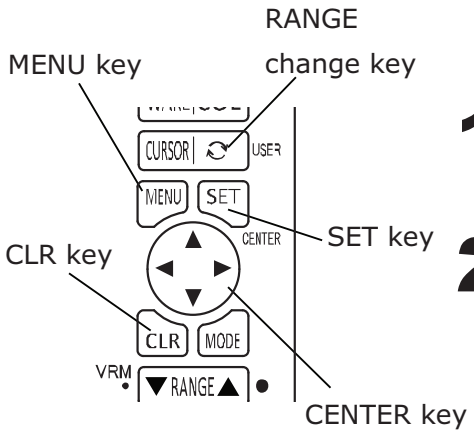


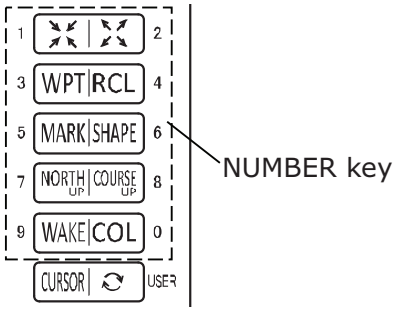
4 Press SET key to erase.

EDIT MARK

Mark Edition

Possible to edit shape, color, and lat/long manually. Comment can be added also.



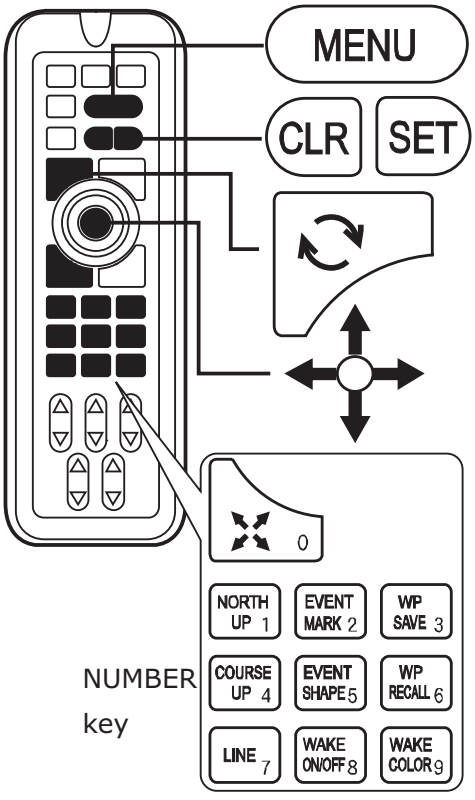


1. List

1 Go to 3.EVENT MARK – 5.LIST/EDIT.

2 Use DIRECTION key (left/right) to move the cursor and press SET key to execute.

NEXT	: Display next 10 items.
PREV	: Display previous 10 items.
100-NEXT	: Display 10 items after 100 items later.
100-PREV	: Display 10 items before 100 items earlier.
TOP	: Display 1st 10 items.
END	: Display last 10 items.



2. Input/Edit

1 Go to 3.EVENT MARK – 5.LIST/EDIT.

2 Use DIRECTION key (up/down) to move the cursor and press SET key or Right DIRECTION key for edit mode.

【Input Characters】
Symbol, Number, Alphabet (Capital/Small).
【Edit Mode】

Up/Down DIRECTION key	: Select character and mark.
Left/Right DIRECTION key	: Move the cursor.
SET key	: Save the edit data. (No save unless all the data is input except comment.)
CLR key	: Cancel the edit. (Comment is deleted when the cursor is located at comment section.)
Number key	: Input number to cursor.
USER key	: Change the mark color at mark shape position.

※Changing event number means the contents is saved to new event number. Old data stays at old number.

3. Erase Event Mark

1 Go to 3.EVENT MARK – 5. LIST/EDIT.

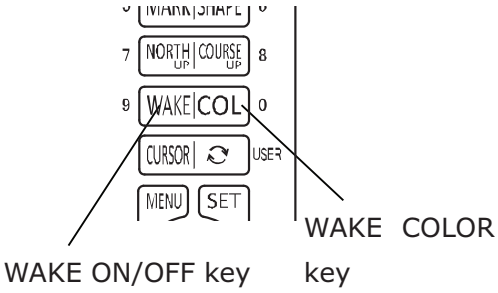
2 Use DIRECTION key (up/down) to move the cursor to select mark number. Press CLR key.
SET key to execute the erasing. CLR key to cancel.

4. End

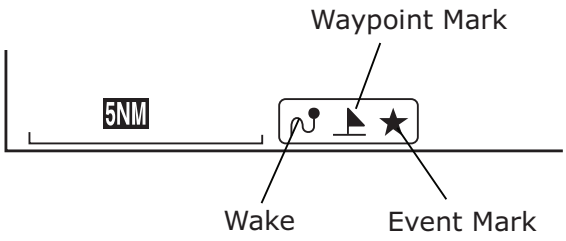
1 Press MENU key to end List/EDIT mode.

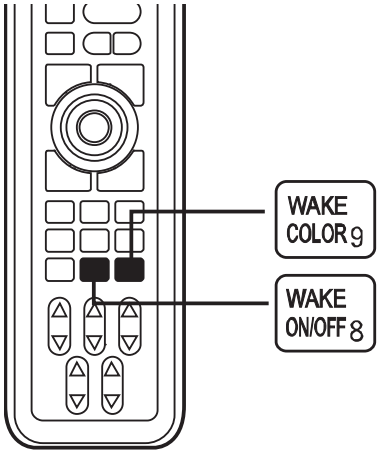
DISPLAY (RECORD) WAKE

WAKE



1 Press WAKE ON/OFF key to start recording the wake.
"∩•" appears when recording.





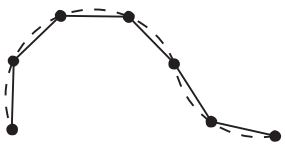
2 Press WAKE ON/OFF key to cancel recording the wake.
"∩•" disappears after the cancel.

3 Press WAKE COLOR key to change the wake color. (from 7 colors)

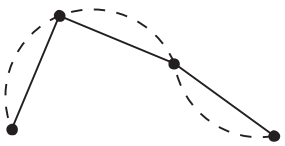
Memory Interval	Advantage	Disadvantage
Long	Longer wake time	Long recording hrs
Short	Precise wake	Short recording hrs

- - - - - - : Actual wake • : Storing of boat
——— : Indicated wake

※Memory interval affects the wake shape.

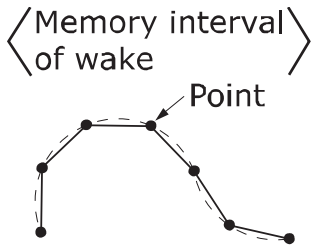


[Interval: Short]



[Interval: Long]

【Recording Limit】
Max.64,000 points. Old wake will be deleted after exceeding 64,000th point. Better to set to longer interval for long hrs (distance).



1sec: 1sec x 64000 / 60 / 60 = 17.7hrs Max.
5sec: 5sec x 64000 / 60 / 60 = 88.8hrs Max.

Go to 1.WAKE to see the current recording points shown at the bottom of MENU.
e.g.) ***/64000 USED
"***" means the current recording point number.

WAKE LINE WIDTH

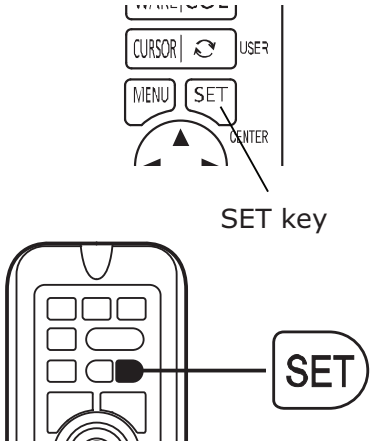
Possible to change the width of wake.

1 Go to 1.WAKE – 7.OTHER SETUP – 3.WAKE WIDTH.

2 Select NORM or WIDE.

ERASE WAKE

Erase by Color

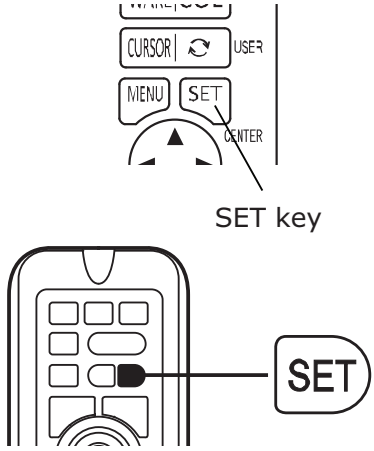


1 Go to 1.WAKE – 4.ERASE WAKE – 1.ERASE BY COLOR.

2 Select a color.

3 Press SET key to erase the selected color.

Erase All

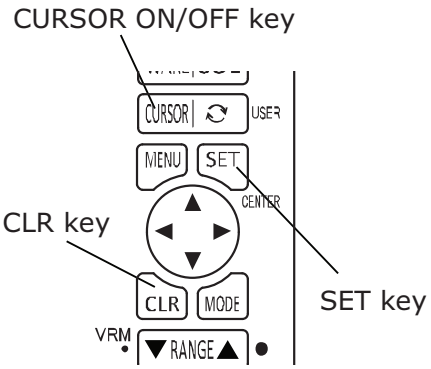


Erase all wakes.

1 Go to 1.WAKE – 4.ERASE WAKE – 2.ERASE ALL.

2 Press SET key to erase all wakes.

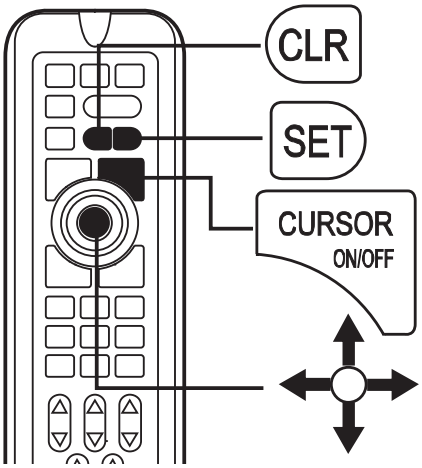
Erase by Cursor

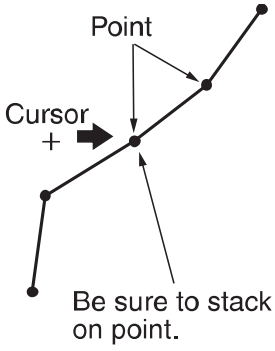


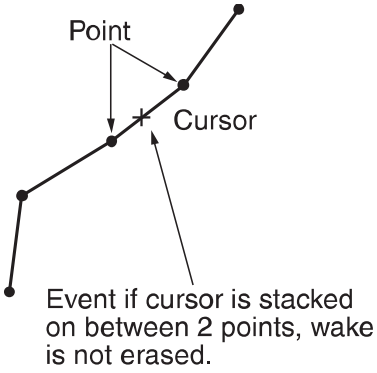
1 Go to 1.WAKE – 4.ERASE WAKE – 4.ERASE BY CURSOR.

2 Press CURSOR ON/OFF key to display a cursor.

Use DIRECTION key to overlap the cursor on the selected wake point.

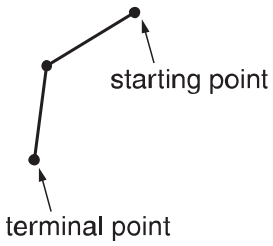


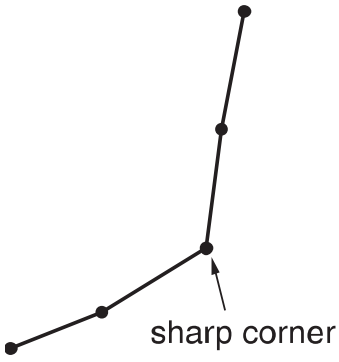




3 Press SET key to erase.

Note) Easier to erase by using the points at start/end or sharp curve.

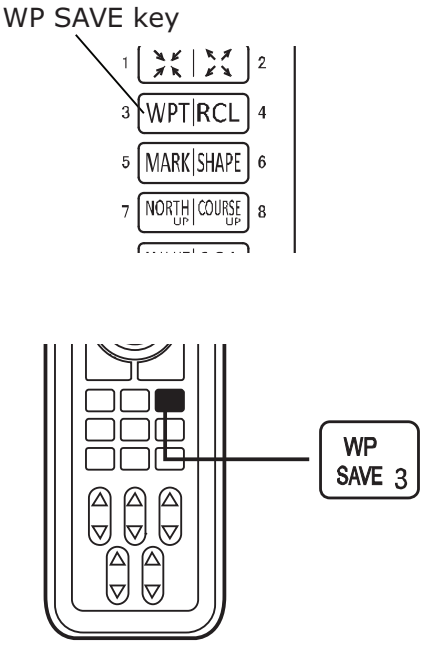




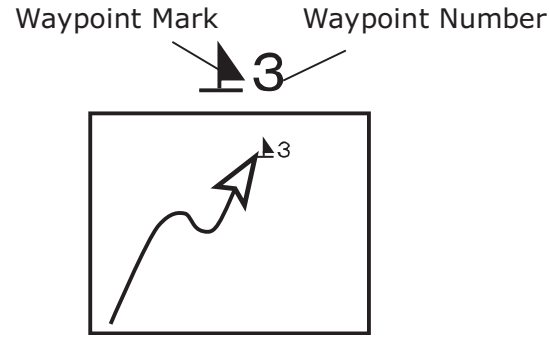
WAYPOINT MARK

Waypoint Mark

- Shape: 8 types (1 2 3 4 5 6 7 8)
- Color: Red, Yellow, Green, Magenta, White, Cyan, Blue, Color of wake
- Upper Limit: 2,000 points



1 Press WP SAVE key to set a waypoint mark and number.



※When the cursor is ON, a waypoint mark is saved at the cursor location. When the cursor is OFF, a waypoint mark is saved at own vessel.

Shape Change

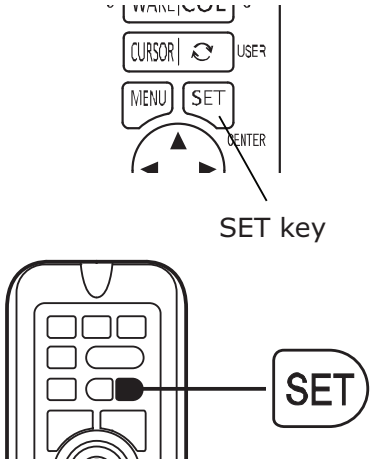
Change the shape of waypoint mark.

1 Go to 2.WAYPOINT – 6.CHANGE OF SHAPE.

2 Select the shape.

ERASE WAYPOINT MARK

Erase by Color

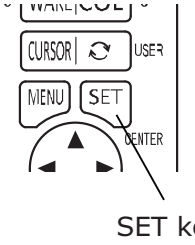


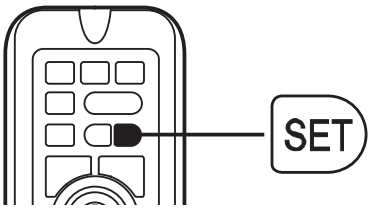
1 Go to 2.WAYPOINT – 3.ERASE WAYPOINT – 1.ERASE BY COLOR.

2 Select a color.

3 Press SET key to erase the selected waypoint marks.

Erase by Shape



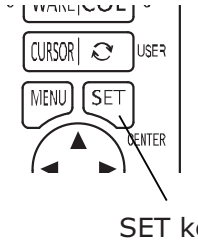


1 Go to 2.WAYPOINT – 3.ERASE WAYPOINT – 2.ERASE BY SHAPE.

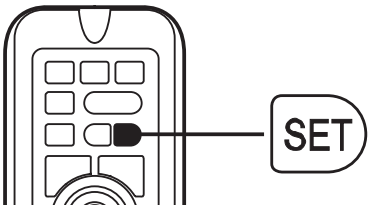
2 Select a shape.

3 Press SET key to erase the selected waypoint marks.

Erase All



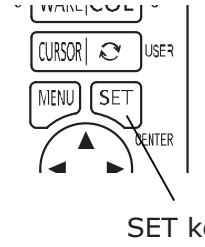
SET key



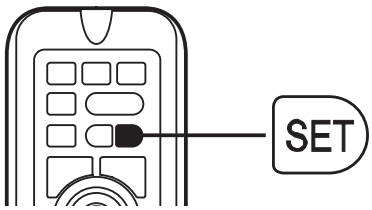
1 Go to 2.WAYPOINT – 3.ERASE WAYPOINT – 3.ERASE ALL.

2 Press SET key to erase all waypoint marks.

Erase by Date



SET key



1 Go to 2.WAYPOINT – 3.ERASE WAYPOINT – 4.ERASE BY DATE.

2 Select a waypoint to be erased.

3 [1.ERASE TODAY WAYPOINT]
Erase today's waypoints.
Press SET key to erase today's waypoints.

```
1  ERASE TODAY WAYPOINT
2  ERASE YESTERDAY WAYPOINT
3  ERASE BY DATE                ▶
ERASE BY [SET] KEY
[ERASE TODAY WAYPOINT] AND [ERASE YESTERDAY WAYPOINT]
do NOT work when no GPS signal is received.
```

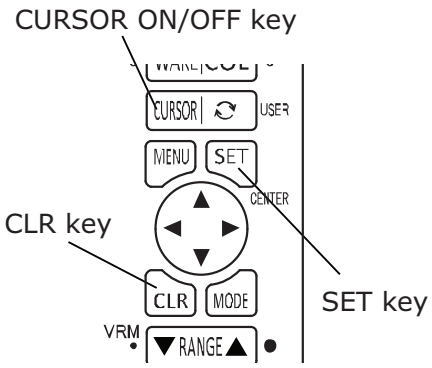
[2.ERASE YESTERDAY WAYPOINT]
Erase yesterday's waypoints.
Press SET key to erase yesterday's waypoints.

[3.ERASE BY DATE]
Select the dates to erase.

```
1  FROM  YEAR          [2014 Y]
2        MONTH         [ 9 M ]
3        DAY           [ 14 D ]
4  UNTIL YEAR          [2014 Y]
5        MONTH         [ 9 M ]
6        DAY           [ 14 D ]
7  START ERASING WITH THE PERIOD ABOVE.
```

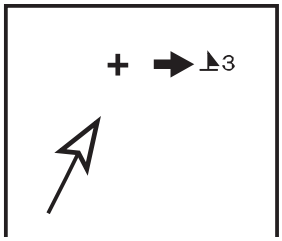
1~6: Select the period of time from start to the end.
Select "7" followed by pressing SET key to erase the selected date's marks.

ERASE BY CURSOR



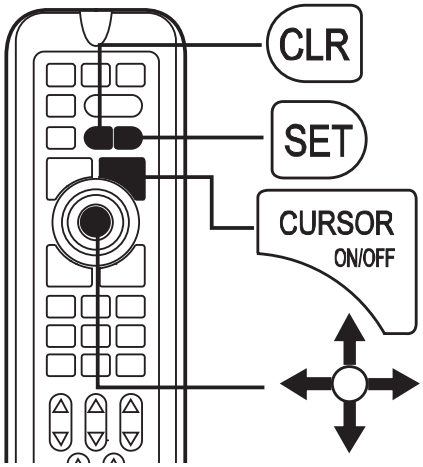
1 Go to 2.WAYPOINT – 3.ERASE WAYPOINT – 5.ERASE BY CURSOR. Select ON.

2 Press CURSOR ON/OFF key to display a cursor.



3 Use DIRECTION key to overlap the cursor to a waypoint mark to be erased.

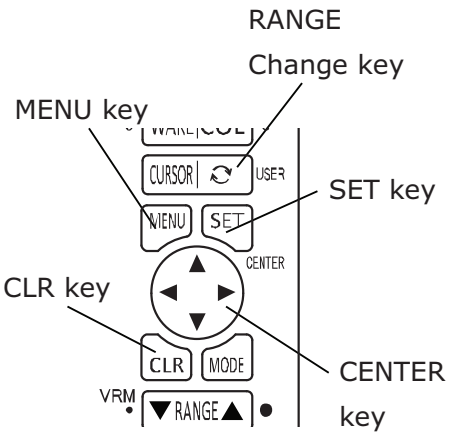
4 Press CLR key to erase.

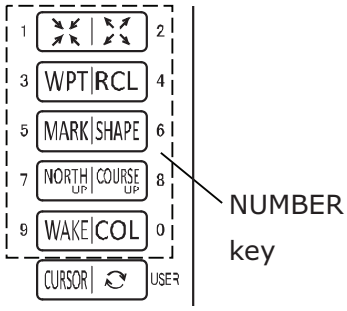


EDIT WAYPOINT MARK

Edit Waypoint Mark

Possible to edit shape, color, and lat/long manually. Comment can be added also.



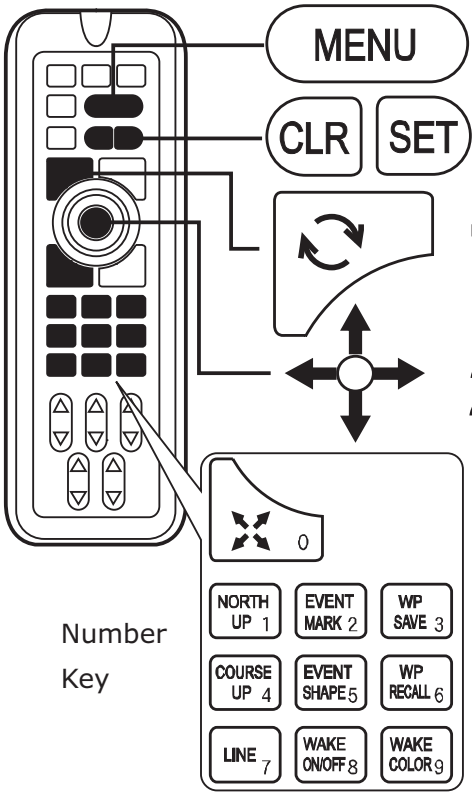


1. List

1 Go to 2.WAYPOINT – 7.LIST/EDIT.

2 Use DIRECTION key (left/right) to move the cursor and press SET key to execute.

NEXT	: Display next 10 items.
PREV	: Display previous 10 items.
100-NEXT	: Display 10 items after 100 items later.
100-PREV	: Display 10 items before 100 items earlier.
TOP	: Display 1st 10 items.
END	: Display last 10 items.



2. Input/Edit

1 Go to 2.WAYPOINT – 7.LIST/EDIT.

2 Use DIRECTION key (up/down) to move the cursor and press SET key or Right DIRECTION key for edit mode.

【Input Characters】
Symbol, Number, Alphabet (Capital/Small).
【Edit Mode】

Up/Down DIRECTION key	: Select character and mark.
Left/Right DIRECTION key	: Move the cursor.
SET key	: Save the edit data. (No save unless all the data is input except comment.)
CLR key	: Cancel the edit. (Comment is deleted when the cursor is located at comment section.)
Number key	: Input number to cursor.
USER key	: Change the mark color at mark shape position.

※Changing event number means the contents is saved to new event number. Old data stays at old number.

3. Erase Waypoint Mark

1 Go to 2.WAYPOINT – 5. LIST/EDIT.

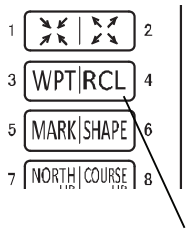
2 Use DIRECTION key (up/down) to move the cursor to select waypoint number. Press SET key to erase. Press CLR key to cancel.

4. End

1 Press MENU key to end Waypoint List/Edit mode.
Press MENU key to end List/EDIT mode.

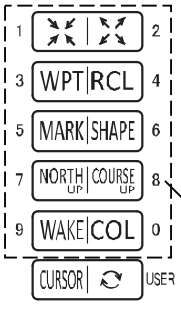
WAYPOINT NAVIGATION

Set-up Waypoint Navigation



WP RECALL key

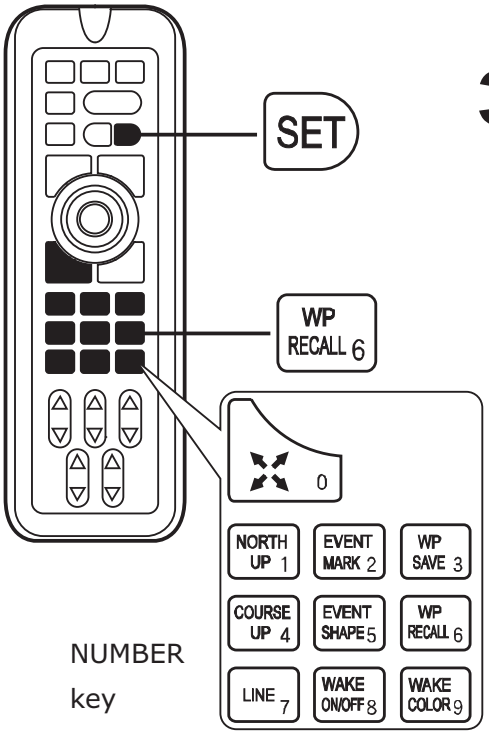
Waypoint navigation shows line from own vessel to the waypoint. On the upper left screen, you may see waypoint's lat/long and distance/time between waypoint and own vessel.



NUMBER key

1 Press WP RECALL key. Or, go to 2.WAYPOINT – 1.RECALL WAYPOINT.

2 Use NUMBER key to input the number.
※Possible to use a cursor instead of number input.



NUMBER key

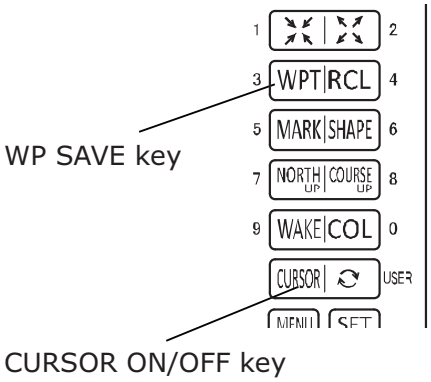
3 Press SET key to set.

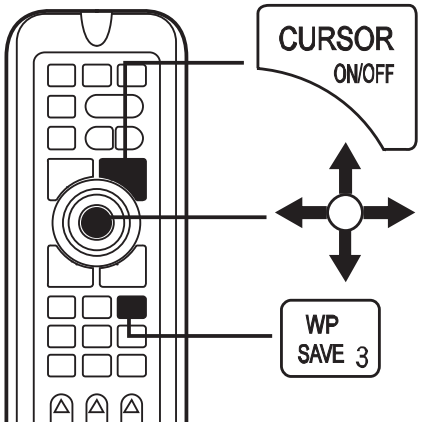
※Correct time may not appear when the time is 100hrs or over.

Note) The following conditions are required for setting waypoint navigation.

- Lat/Long of own vessel is shown on the screen.
- Waypoint is pre-set.

SIMPLE WAYPOINT NAVIGATION





1 Press CURSOR key to display a cursor on the screen.

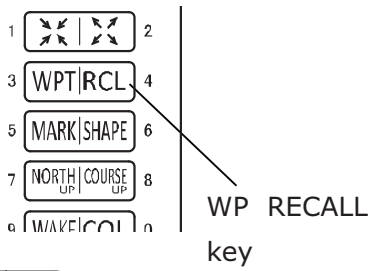
2 Use DIRECTION key to move to the desired location.

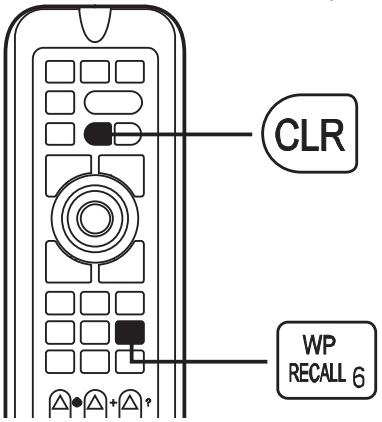
3 Press&Hold WPT key to activate a simply waypoint navigation.

※Simple waypoint navigation is only a temporary waypoint. No position data is stored.

CANCEL WAYPOINT NAVIGATION

Cancel Navigation





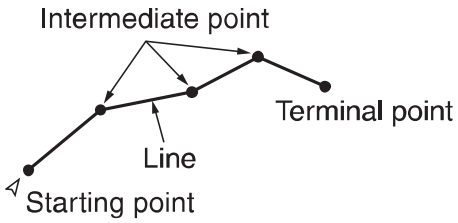
1 Press RCL key.

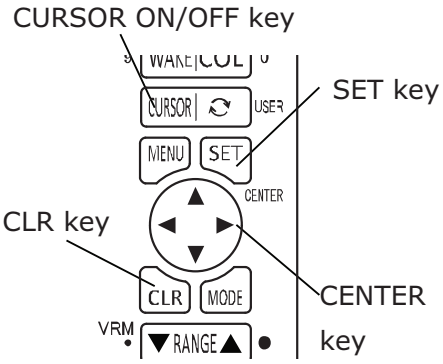
2 Press CLR key to cancel.

DRAW LINE

Draw Line

【Line】
Possible to draw desired lines.
Max.8,000 points





1 Press CURSOR key to display a cursor.

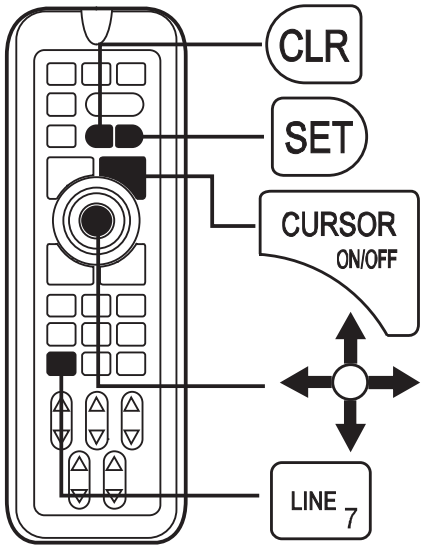
2 Go to 8.OTHERS – 1.DRAW LINE – 1.START DRAW. Press SET key.

3 Move a cursor to the starting point and press SET key.

4 Use DIRECTION key to move the cursor to the next point and press SET key.

5 Repeat step4 above to create more lines.

6 Press CLR key to end.



《Case of Remote》（option）

1 Press CURSOR key to display a cursor.

2 Move the cursor to the starting point and press LINE key.

3 Use DIRECTION key to move the cursor to the next point and press LINE key.

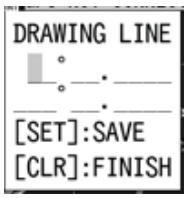
4 Repeat step3 above to create more lines.

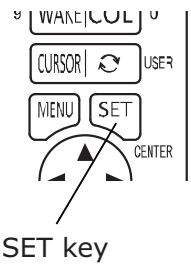
5 Press CLR key to end.

【Distance between 2 Points】
The distance between 2 points can be checked at the bottom when drawing the line.
【Line Color】
Go to 8.OTHERS – 1.DRAW LINE – 2.LINE COLOR.

DRAW LINE BY POSITION

Lat/Long Input Box





1 Go to 8.OTHERS – 1.DRAW LINE – 5.DRAW MODE. Select POSITION.

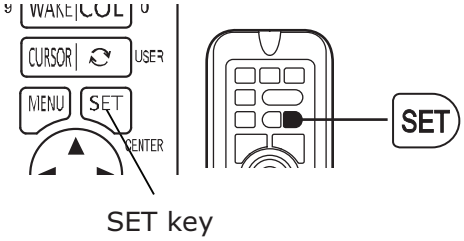
2 Press SET key to start drawing. Lat/Long input box appears on upper left of screen.

3 Use NUMBER key to input lat/long. Use DIRECTION key (left/right) to go back to the pre-set wrong value for correction if needed.
Press SET key to save the starting point. Input lat/long of the end point with same method. Repeat the steps above to add more lines.

Note) "min" format is used for below "decimal point".
Divide "sec" lat/long with "60" (sexagesimal system) to convert "sec" to "min".
e.g.) 10" (sec) = .167' (min)
30" (sec) = .500' (min)
135°35' 30" → .135°35.500'

ERASE LINE

Erase by Color

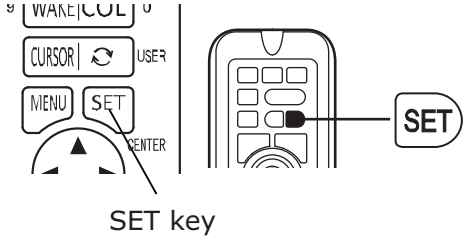


1 Go to 8.OTHERS – 1.DRAW LINE – 4.ERASE LINE – 1.ERASE BY COLOR.

2 Select a color.

3 Press SET key to erase the lines of selected colors.

Erase All

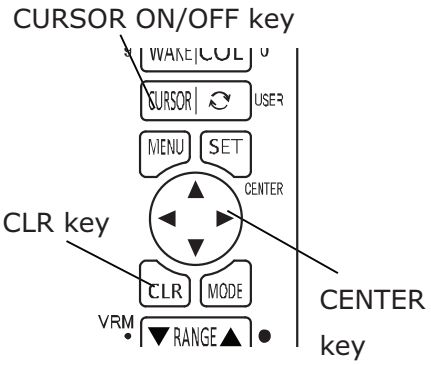


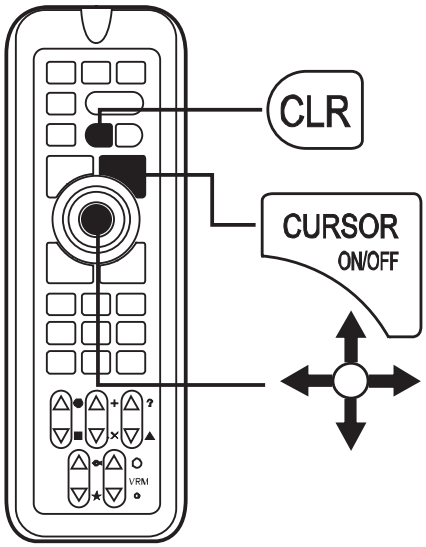
1 Go to 8.OTHERS – 1.DRAW LINE – 4.ERASE LINE – 2.ERASE ALL.

2 Press SET key to erase all lines.

ERASE by Cursor

Erase individual lines by using a cursor.





1 Go to 8.OTHERS – 1.DRAW LINE – 4.ERASE LINE – 3.ERASE BY CURSOR.

2 Select ON. (→page77)

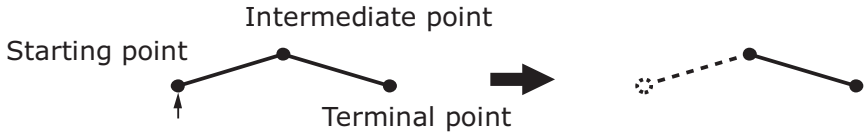
3 Press CURSOR ON/OFF key to display a cursor.

4 Use DIRECTION key to overlap the cursor on the selected line.

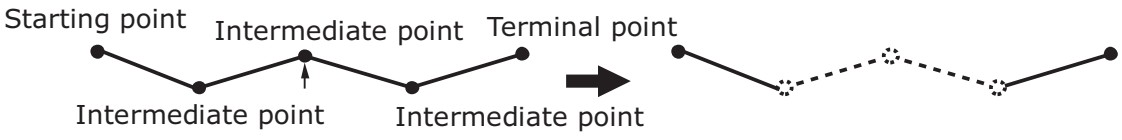
5 Press CLR key to show Line Erase Box.
SET key to erase.
CLR key to cancel.

Memo) Cursor position specifies the erasing line length.

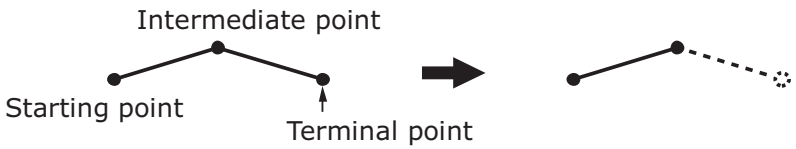
・Cursor at starting point: Erase the line until next point.



・Cursor at intermediate point: Erase the lines until next point and previous point.



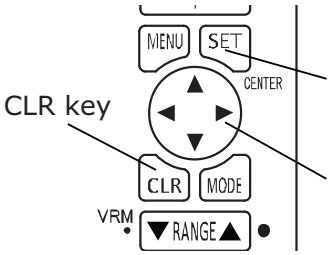
・Cursor at end point: Erase the line until previous point.



SAVE (ERASE) ROUTE

Save (Erase) Route

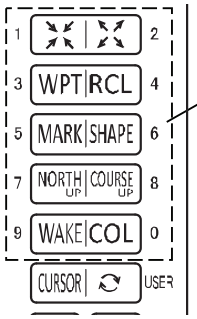
【Route】
Max. 40 routes (max.20 passing points)
The created route remains until it's erased.



SET key

CLR key

CENTER key



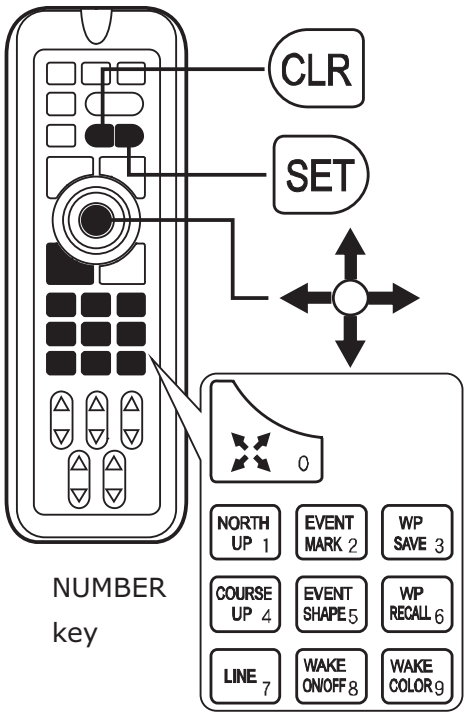
NUMBER key

1 Go to 4.ROUTE – 4.ENTER ROUTE.

```
<ENTER ROUTE>
NUMBERING [SET]KEY
NUMBER=


RED:USED WHITE:UNUSED
 0  1  2  3  4  5  6  7  8  9
10 11 12 13 14 15 16 17 18 19
20 21 22 23 24 25 26 27 28 29
30 31 32 33 34 35 36 37 38 39
```

2 Enter route number press SET key.
※Red-colored route number is already registered. Use other number (white) or erase unnecessary number first.



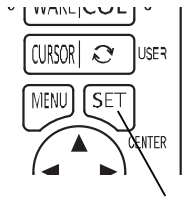
NUMBER key

3 Use DIRECTION key to move the cursor to the passing points. "●" mark is created for each passing point, and all the marks are connected with a line.

4 Press CLR key to end the route save.

RECALL SAVED ROUTE (ROUTE NAVIGATION)

Recall Route (Start Route Navigation)

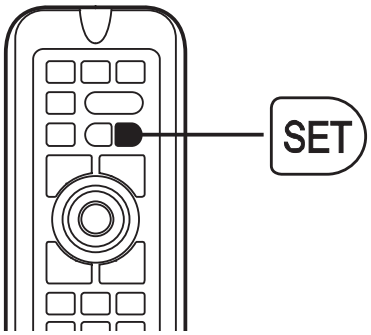


SET key

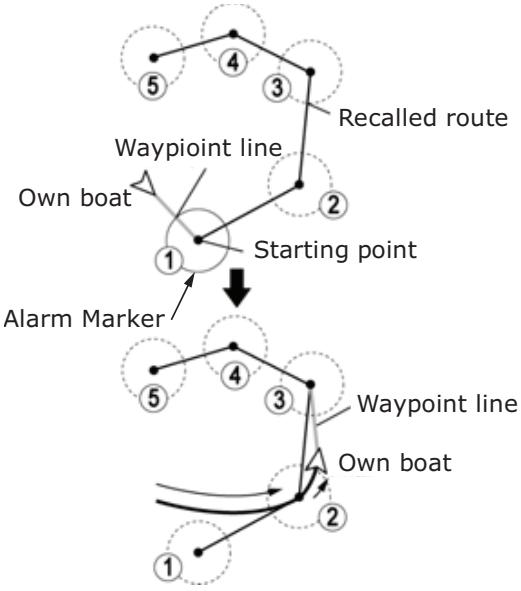
1 Go to 4.ROUTE – 1.RECALL ROUTE.

2 Input the route number.

3 Press set key to set the route navigation.



【Route Navigation】
It always sets to next passing point automatically every time the vessel reach a passing point.



【Route Navigation Display】

（1）When recalling a route, setting the closest passing point (either starting or end point) as the starting point #1 for this case. At the same time, put a line between own vessel and next passing point#1.

（2）When a vessel reaches inside alarm marker of #2, put a line between own vessel and passing point#3.

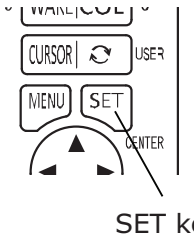
（3）This action is repeated until the vessel reaches to the end point.

Note) The following conditions need to be met for route navigation.
- Route is pre-set.
- Lat/Long of own vessel is shown on the screen.

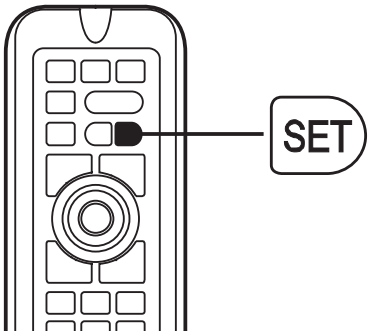
Route navigation is cancelled after power OFF.

ADVANCE WAYPOINT / RETURN WAYPOINT

Advance / Return Waypoint



SET key

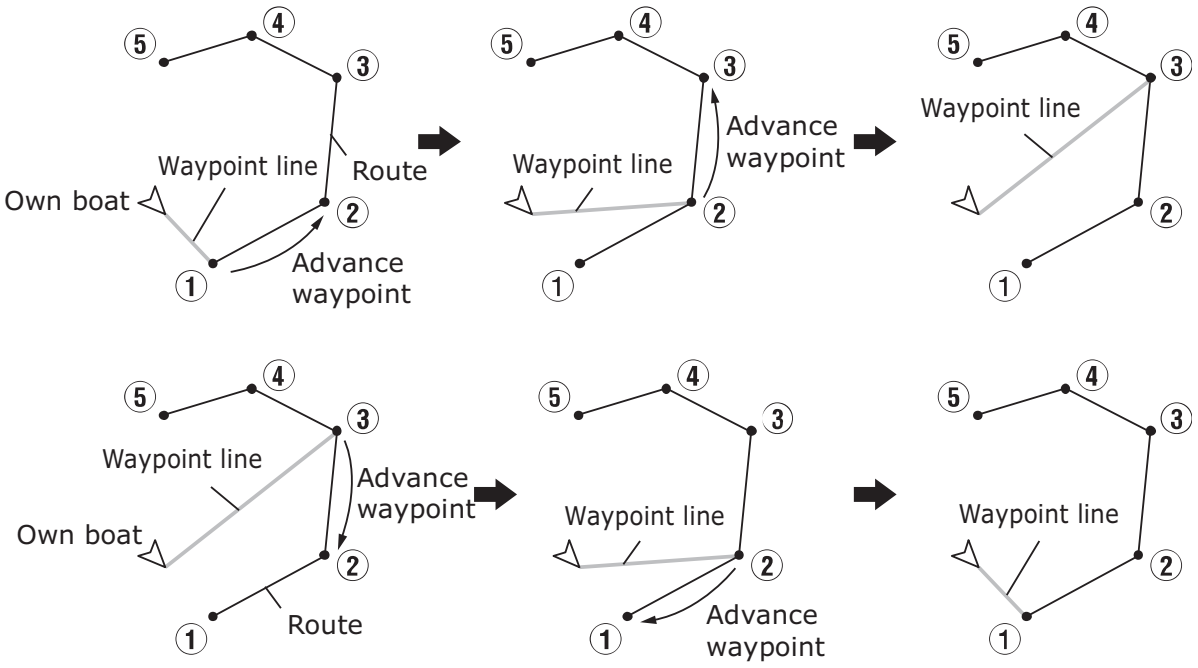


1 Set a route navigation. (→page54)

2 Go to 4.ROUTE – 5.ADVANCE WAYPOINT.

3 Each time pressing SET key skips to the following passing point.

※Go to 4.ROUTE – 6.RETURN WAYPOINT when setting the waypoint one earlier.



DISPLAY LAT/LON LINE

Lat/Lon

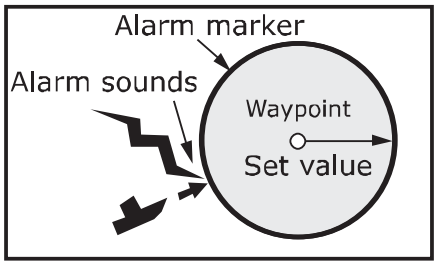
1 Go to 6.READOUT SETUP – 1.C-MAP SETUP – 2.LAT/LON GRID.

2 Use DIRECTION key (left/right) to set. OFF eliminates lat/long line.

SOUND ARRIVAL / ANCHOR WATCH / OFF-COURSE ALARM

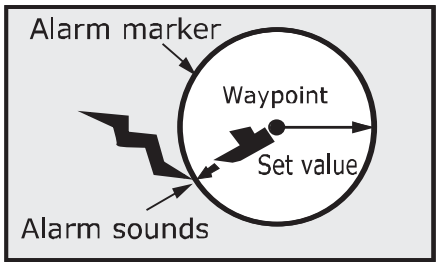
Sound Alarm

Following 3 different alarms can be set for waypoint navigation.



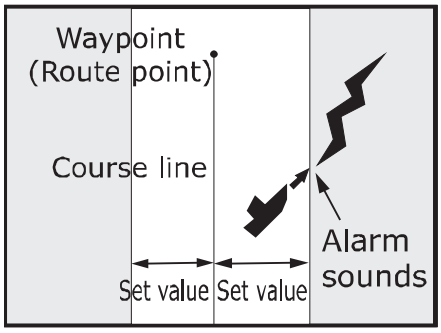
[Arrival alarm]

Arrival Alarm :
Alarm is ON when a vessel reaches within the selected range from the passing point.



[Anchor alarm]

Anchor Watch Alarm :
Alarm in ON when a vessel goes beyond the selected range from the passing point.

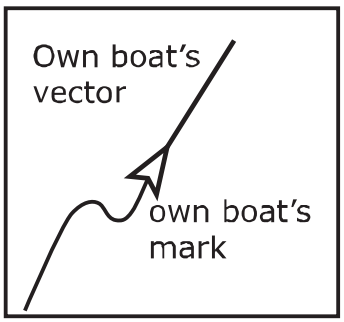


[Off course alarm]

Off-Course Alarm :
Alarm is ON when a vessel is away from the selected band of course line.

OWN VESSEL VECTOR AND OWN VESSEL MARK COLOR

Own Vessel Vector and Own Vessel Mark Color



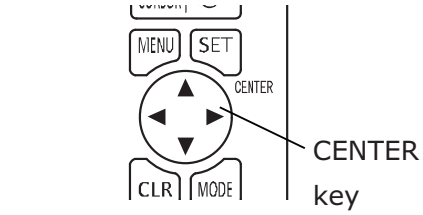
【Own Vessel Vector】
This vector points the course. Vector color is same as vessel color.

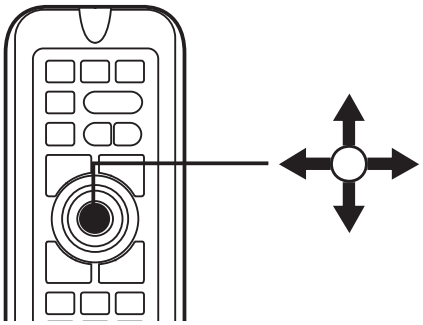
1 Go to 6.READOUT SETUP – 3.OWN BOAT READOUT – 2.OWN BOAT VECTOR.

2 Select one choice.

READOUT SET-UP FOR EACH INFO

Readout Set-up for Each Info





Info: Position, Speed, Distance, Bearing (→page76)

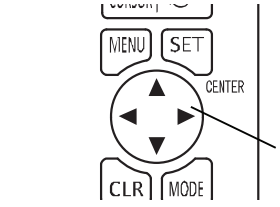
e.g.) Change bearing condition.

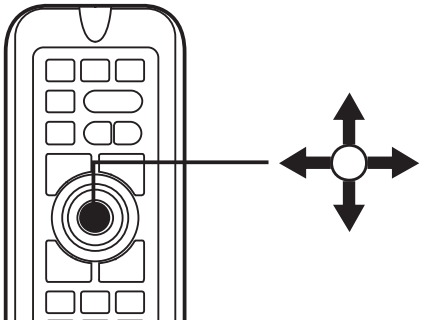
1 Go to 6.READOUT SETUP – 5.DISPLAY LETTERS – 4.BEARING UNIT.

2 Use DIRECTION key to select.

CHANGE FONT SIZE/COLOR FOR LETTERS

Change Font Size/Color





e.g.) Change font size related to own vessel.

1 Go to 6.READOUT SETUP – 5.DISPLAY LETTERS – 5.OWN BOAT LETTER – 1.LAT/LON LETTER.

2 Use DIRECTION key to select the font size.

※Select OFF to hide.

※Cursor character and Waypoint character can be changed as well. (→page76, 77)

LORAN C CHAIN

Display with Loran C

【Loran C】
Loran C (Long Range Navigation) is the hyperbolic navigation system using long wave band.
This unit enables you to set correction of Loran C chain, two slave stations and each slave station.

1 Go to 6.READOUT SETUP – 2.POSITION READOUT – 2.LORAN C SETUP.

2 Set-up each item inside 2.LORAN C SETUP. (→page76)

3 Go to 6.READOUT SETUP – 2.POSITION READOUT – 1.LAT/LON, LORAN C.

4 Select "LORAN C" to enable Loran C.

SMOOTHING

Smoothing Set-up

Apply the averaging to show the smooth wake information.

1 Go to 8.OTHERS – 5.GPS SETUP – 1.SMOOTHING.

2 Use DIRECTION key (left/right) to select the smoothing level.
Low, Mid, High

【2. Bearing LV (level)】※
Averaging for bearing variation.

【3. Speed Smoothing LV (level)】※
Averaging for vessel speed.

※ High: Stronger averaging. Smoother, but slower response/update.

SBAS

SBAS Set-up

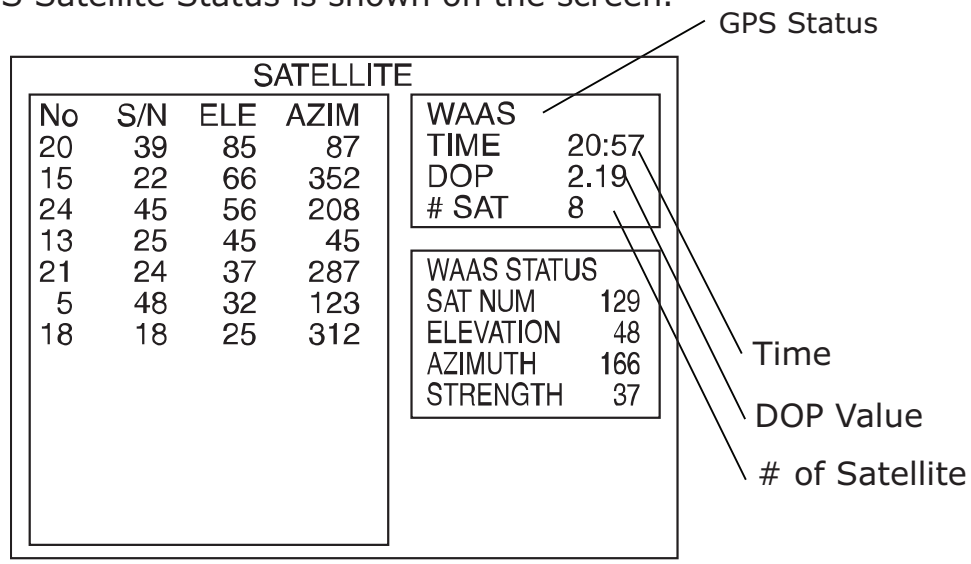
A satellite-based augmentation system (SBAS) is a system that supports wide-area or regional augmentation through the use of additional satellite-broadcast messages.
e.g.) US: WAAS, EU: EGNOS, JP: MSAS

1 Go to 8.OTHERS – 5.GPS SETUP – 4.WAAS.

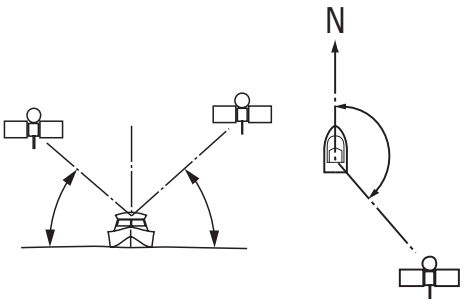
2 Select ON to enable SBAS.
"S" mark appears after receiving SBAS signal.

GPS STATUS INFO

GPS Satellite Status is shown on the screen.



1 Go to 7.FIND – 3.SATELLITE.



2 Press SET key to show the satellite status.

3 Press CLR key or MENU key to return.

DOP value : Smaller is better&accurate.
(Accuracy approx.10m for DOP4.0 or less)
SN value : Higher is better&accurate.

ASSIGN SOUNDER KEY TO PLOTTER KEY

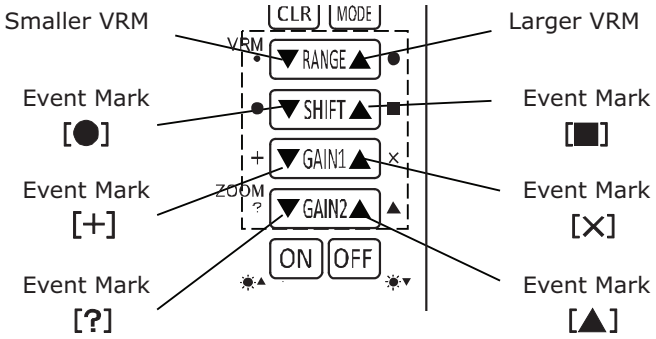
Change Sounder Key Function to Plotter

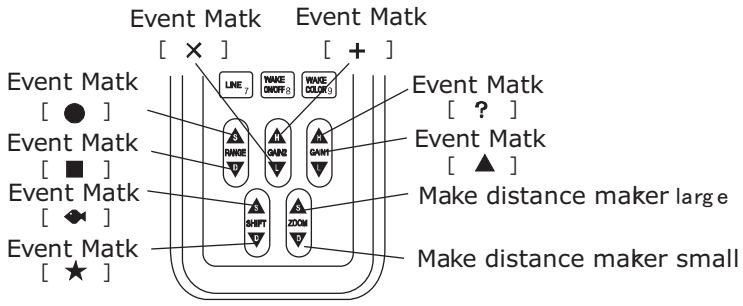
Possible to assign the sounder key to plotter key when showing plotter display only on the screen.

1 Go to 8.OTEHRS – 8.INITIAL – 6.SPECIAL MENU – 1.REMOTE MARK KEY.

2 Select one from the followings.

ALL ON	: Always plotter key function
ALL OFF	: Disabled
PL	: Plotter key function when only plotter display is ON.
PL+SP	: Plotter key function for PL or S/P display is ON.

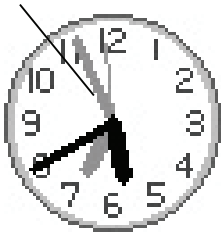




CLOCK

Clock Display

Pink-colored clock hand:
Expected arrival time



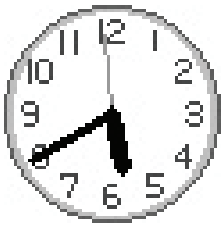
1 Go to 6.READOUT SETUP – 7.CLOCK.

2 Select ON to show clock.

※When using waypoint navigation, the expected arrival time is shown with pink clock hands.

CLOCK ALARM

Alarm



1 Go to 5.ALARM – 6.TIME ALARM.

2 Select ON to set the alarm time.

Alarm time is shown with orange clock hand.
Alarm goes on with the sign of red/white blinking.
Press CLR key to stop the alarm.

Note) No clock when receiving no GPS signal. Neither with alarm.

FRONT VIEW

Front Expansion View

Front view shows the expanded chart of bearing direction.

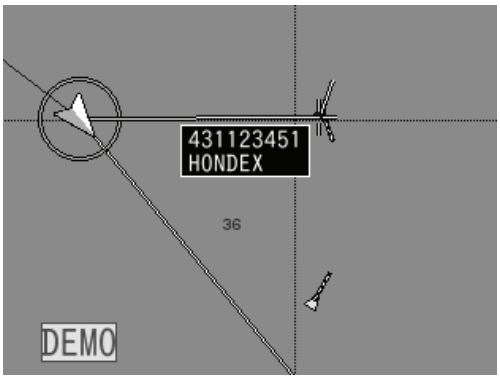
1 Go to 6.READOUT SETUP – 1.C-MAP SETUP – 7.OTHER SETUP – 8.FRONT VIEW.

2 Select ON.

AIS TARGET DISPLAY

Optional AIS cable is required. Baud rate: 38400. (→page20)

Place a cursor to the target vessel to display MMSI# and Vessel Name(when possible). (Fig.1)
Press SET key to show more detailed vessel info. (Fig.2)



(Fig.1)

NAME	:	HONDEX
MMSI	:	431123451
FLAG	:	Japan
STATUS	:	Under Way using engine
HEADING	:	20°
COG	:	160°
SOG	:	11.0kt
LAT	:	34° 30. 2500N
LON	:	137° 10. 7800E
DISTANCE	:	5.98NM
LENGTH	:	40m

(Fig.2)

※No guarantee of supporting all AIS receiver products available in the market.

AIS DISPLAY RANGE

Scale range applied for AIS display. (→page25)

1 Go to 8.OTHERS – 9.AIS SETUP – 1.AIS DISP RANGE.

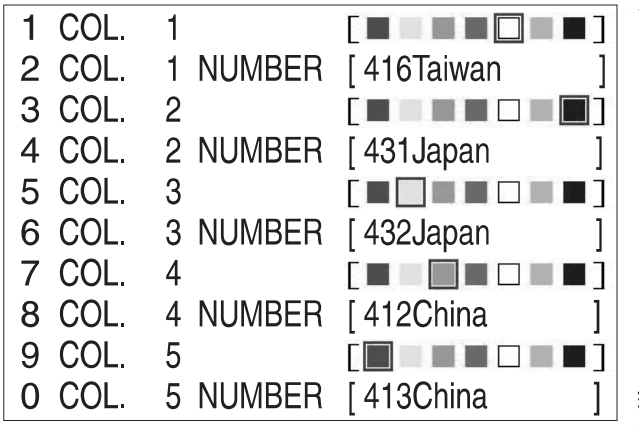
2 OFF : No display
1, 2, 5, 10 : Other vessels appear when the scale range is within the selected range.

AIS Target Color

Color set-up for each country vessel.

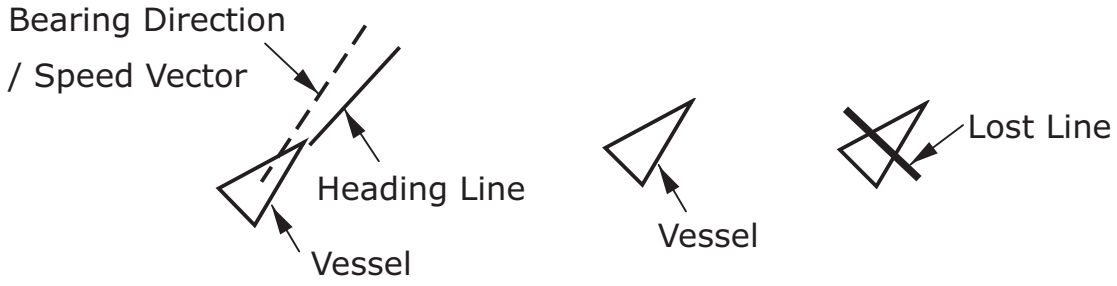
1 Go to 8.OTHERS – 9.AIS SETUP – 2.AIS COL SETUP.

2 Select color and country ID#. (up to 5 countries)



3 Color for other nations can be selected.

【AIS Icon】



※Max.50 vessels can be shown on the screen at once.
※Lost line appears when no AIS signal is received over 6min. Target vessels disappear after 10min of lost signal.

CHART SET-UP

1 Depth Unit: m, ft, fa

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 1. DPETH SETUP.

2 Depth Line

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 1.DEPTH SETUP – 2.DEPTH LINE.

3 Lat/Long Grid

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 2.LAT/LON GRID.

4 Tide, Current

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 6.OTHER OBJECTS – 2.TIDE CURRENT.

5 Navigational Aid

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 7.OTHER SETUP – 1.NAVE-AIDS.
This set-up effects on the display for light/signal/buoy/beacon.

US: Navigational aid using NOAA symbols.
US SMP: Simple version.
INT: Using international symbols.
INT SMP: Simple version.
OFF: No display of light/signal/buoy/beacon.

6 Mixing Level

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 7.OTHER SETUP – 2.MIXING LEVEL.
Use DIRECTION key to select ON or OFF.
Mixing level enables to show the charts with different scale set-up.
No chart data is shown when selecting “OFF” for this mixing level.

7 Declutter

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 7.OTEHR SETUP – 3.DECLUTTER.
Overlapped texts are to be deleted when selecting ON.

8 Map Boundaries

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 7.OTEHR SETUP – 4.MAP BOUNDARIES.
Chart with detailed map data is shown with surrounded dotted line, “TTTTTT”.

9 Auto Course-Up

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 7.OTEHR SETUP – 5.AUTO COURSE UP.
Press COURSE UP key on remote to execute the auto course-up. This is only effective when the vessel bearing is changed 15deg or over.

10 Centering

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 7.OTEHR SETUP – 6.CENTERING.
Own vessel keeps the center position always.
When it’s set to OFF, the chart does not shift. Own vessel goes out of the screen eventually.

Note) When a cursor is displayed, centering function is disabled.

11 Move Direction

Go to 6.READOUT SETUP – 1.C-MAP SETUP – 7.OTEHR SETUP – 7.MOVE DIRECTION.

12 Automatic Info

Object information appears automatically by a cursor.
Go to 6.READOUT SETUP – 1.C-MAP SETUP – 8.AUTO INFO.

ON POINT: Auto info of POINT appears when a cursor is located on items such as port
service/tide/light/wreck/rock/buoy/beacon/obstruction/land mark etc.

ON ALL: In addition to point data, area info appears
OFF: No display

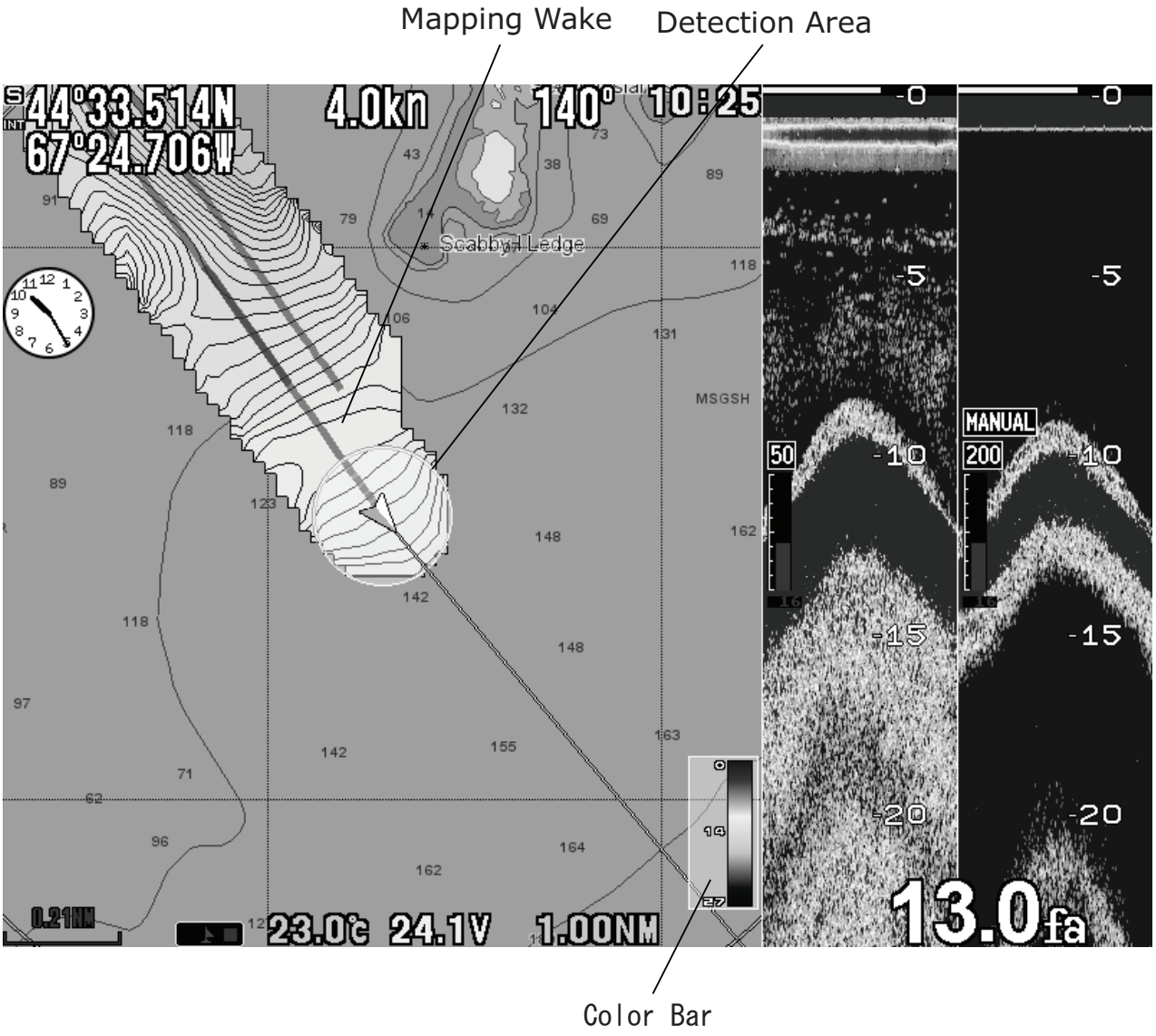
Press SET key to display all detailed information on the screen. Use DIRECTION key (up/down) to select each item.
Use ZOOM OUT or CURSOR ON/OFF key to scroll the bottom sheet when needed.
Press SET key to show Tide Graph when the object is TIDE.
Press CLR key to return.

BOTTOM MAPPING

2 mapping methods to choose from.

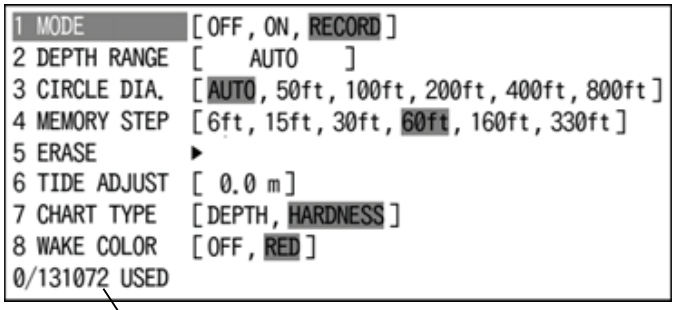
1) Depth Mapping
2) Bottom Hardness Mapping

Sea bottom condition can be stored into the unit. The captured data can be displayed on the screen as needed. Also, possible to copy the data to USB device.

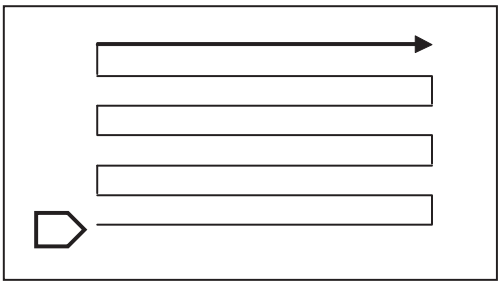


※ The collected mapping data may not match to the actual sea floor conditions.

Bottom Mapping Parameters



Current memory status



More paths with even interval gives stable data.

1 Select "1.MODE".
OFF: No show, ON: Display past captured image, RECORD: Record the current data.

2 "3. CIRCLE DIA.": Choose smaller value for narrow area with precise presentation. Choose larger value for wide area with rough presentation.

3 Manual tide adjustment with "6. TIDE ADJUST".

4 Target area(circle) is shown while recording the data. White color means normal status. Yellow color means data cannot be captured because of air-bubble etc caused by high speed. Red color means to reach max. memory of unit. Memory status is shown at the bottom of screen. No new data can be recorded unless old data is erased or moved to USB device.

5 After completing the recording, set the mode to "ON" and select the type of mapping data.

*Noise and air-bubble disable the stable data collection.

*Apply low speed for better data collection.

*Low tide or High tide time is suited for longer and stable data collection.

*Location accuracy depends on GPS signal conditions. Variation: approx.10m

Presentation Adjustment

1 Change "2. DEPTH RANGE" for target max depth. Color gradation change.
"AUTO" means to apply Sounder depth range set-up.

2 Change "CIRCLE DIA.". Smaller value for precise image. Larger value for simple image.

※ Black color is shown for the depth deeper than selected target max depth

Erase the collected data

1 Select "5. ERASE".

2 Select "ALL" for all data. Or, select the specific time of data by dates.

LIST OF PLOTTER MENU

Menu Item		※ Factory set-up
1. WAKE		
1. WAKE MEMORY(→page39)		OFF , ON
2. WAKE COLOR (→page39)		RED～BLUE
3. DISPLAY COLOR (→page39)	1. RED ～ 7. BLUE	OFF , ON
	8. ALL COLORS	
	9. NO EXC. WAKE	
4. ERASE WAKE (→page41～42)	1. ERASE RY COLOR	
	2. ERASE ALL	
	3. ERASE BY DATE	1. ERASE TODAY WAKE 2. ERASE YESTERDAY WAKE 3. ERASE BY DATA
	4. ERASE BY CURSOR	OFF , ON
5. MEM INTERVAL(→page39)		TIME , DISTANCE
6. MEM INTERVAL SET(→page39)	1. TIME	20sec (1sec～20min)
	2. DISTANCE	0.05NM(km) (0.01～2NM(km))
7. OTHER SETUP	1. COLOR MODE	MANUAL , BOTTOM HARDNESS
	2. COLOR SET BTM HARDNESS	
	3. WAKE WIDTH	NORM , WIDE
	4. WAKE ERASE AREA	N , - , - , - , - , W
	5. WAKE MEMORY POINT	OFF , ON
2. WAYPOINT		
1. RECALL WAYPOINT(→page49)		
2. CANCEL WAYPOINT(→page50)		
3. ERASE WAYPOINT (→page44～46)	1. ERASE BY COLOR	
	2. ERASE BY SHAPE	
	3. ERASE ALL	
	4. ERASE BY DATA	1. ERASE TODAY WAYPOINT 2. ERASE YESTERDAY WAYPOINT 3. ERASE BY DATE
	5. ERASE BY CURSOR	OFF , ON
	6. ERASE BY OWN BOAT	OFF , ON
4. MEMORIZED COLOR	1. MEMORIZED COLOR	PURPLE (RED～BLUE , WAKE)
5. DISPLAY COLOR (→page43)	1. RED ～ 7. BLUE	OFF , ON
	8. ALL COLORS	
	9. NO DISPLAY	

Menu Item			※ Factory set-up
	6. CHANGE OF SHAPE (→page43)	1. MEMORIZED SHAPE	
	7. LIST / EDIT(→page47,48)		
	8. OTHER SETUP	1. WAYPOINT RECALL MEMORY	OFF , ON
		2. WAYPOINT COMENT	OFF , ON
		3. WAYPOINT SAVE MODE	AUTO , NUMBERING
3. EVENT MARK (→page32)			
	1. ERASE (→page34)	1. ERASE BY COLOR	
		2. ERASE BY SHAPE	
		3. ERASE ALL	
		4. ERASE BY DATE	1. ERASE TODAY EVENT 2. ERASE YESTERDAY EVENT 3. ERASE BY DATE
		5. ERASE BY CURSOR	OFF , ON
		6. ERASE BY OWN BOAT	OFF , ON
	2. MEMORIZED COLOR	1. MEMORIZED COLOR	WAKE (RED～BLUE , WAKE)
	3. DISPLAY COLOR (→page32)	1. RED ⟆	OFF , ON
		7. BLUE	
		8. ALL COLORS	
		9. NO DISPLAY	
	4. CHANGE SHAPE (→page32)	1. MEMORIZED SHAPE	
	5. LIST / EDIT(→page37,38)		
	6. OTHER SETUP	1. EVENT MARK COMMENT	OFF , ON
4. ROUTE			
	1. RECALL ROUTE(→page55)		
	2. CANCEL ROUTE		
	3. ERASE ROUTE (→page54)	1. ERASE ROUTE ALL	
		2. ERASE BY NUMBER	
	4. ENTER ROUTE (→page54)		
	5. ADVANCE WAYPOINT(→page56)		
	6. RETURN WAYPOINT(→page56)		

Menu Item			※ Factory set-up
5. ALARM			
	1. ARR / ANCHOR ALARM (→page57)	1. ALARM SET	OFF , ARRIVAL , ANCHOR
		2. DISTANCE SET	0.50NM(km) （0.00～9.99NM(km)）
	2. OFF COURSE ALARM (→page57)	1. ALARM SET	OFF , ON
		2. COURSE WIDTH SET	0.50NM(km) （0.01～9.99NM(km)）
	3. TEMP ALARM (→page88)	1. ALARM SET	OFF , IN RANGE , OUT RANGE
		2. TEMP SET1	15.0℃(℉) （0.0～40℃(99.9℉)）
		3. TEMP SET2	20.0℃(℉) （0.0～40℃(99.9℉)）
	4. FISH ALARM (→page88)	1. ALARM SET	OFF , S , L
	5. DEPTH ALARM (→page89)	1. ALARM SET	OFF , IN RANGE , OUT RANGE
		2. DEPTH SET1	10fa（1～1000fa）
		3. DEPTH SET2	1000fa（1～1000fa）
	6. TIME ALARM (→page64)	1. TIME ALARM	OFF , ON
		2. HOUR	00H (00～11H)
		3. MINUTE	00M (00～59M)
6. READOUT SETUP			
1. C-MAP SETUP	1. DEPTH SETUP	1. DEPTH UNIT	m , Ft , Fa
		2. DEPTH LINE	OFF , ON
	2. LAT/LON GRID		OFF , ON
	3. LIGHT SECTOR		OFF , ON
	4. ATTENTION AREA		OFF , ON
	5. TRACKS,ROUTES		OFF , ON
	6. OTHER OBJECTS	1. NAME	OFF , ON
		2. TIDE,CURRENTS	OFF , ON
		3. SEABED TYPE	OFF , ON
		4. WRECKS,OBSTN	OFF , ON
		5. PORT,SERVICES	OFF , ON
		6. ROAD	OFF , ON
	7. OTHER SETUP	1. NAVE-AIDS	OFF , US , US SMP , INT , INT SMP
		2. MIXING LEVEL	OFF , ON
		3. DECLUTTER	OFF , ON
		4. MAP BOUNDARIES	OFF , ON
		5. AUTO COURSE UP	OFF , ON
		6. CENTERING	OFF , ON
		7. MOVE DIRECTION	NEG , POS
		8. FRONT VIEW	OFF , ON
		9. SEA COLOR	NORM , or others
		0. LAND COLOR	NORM , or others
	8. AUTO INFO		OFF , ON POINT , ON ALL

Menu Item			※ Factory set-up
2. POSITION READOUT (→page60)	1. LAT/LON, LORAN C		LAT/LON , LORAN C
	2 LORAN C SETUP	1. CHAIN	5930
		2. SLAVE STATION1	Y:25
		3. SLAVE STATION2	Z:38
		4. SLAVE STA1 CORECT	0.00 μs
		5. SLAVE STA2 CORRECT	0.00 μs
3. OWN BOAT READOUT	1. OWN BOAT MARK		◢ ● ◢
	2. OWN BOAT VECTOR(→page58)		OFF , S , L
	3. WAYPOINT LINE		OFF , ON
	4. COURSE LINE		OFF , ON
	5. DISTANCE MARKER		1.00NM(km) (0～99.99NM(km))
	6. COLOR SETUP	1. BOAT MARK COLOR	WHITE (Select from 7 colors)
		2. W/LINE COLOR	MAGENTA (Select from 7 colors)
		3. COURSE LINE COLOR	RED (Select from 7 colors)
		4. DIST MARKER COLOR	CYAN (Select from 7 colors)
	7. HEADING LINE SETUP	1. HEADING LINE	OFF , ON
		2. NO-DISPLAY OVER	2kn (n/a～10kn)
4. CURSOR READOUT	1. CURSOR STYLE		+ □
	2. CURSOR COLOR		YELLOW (Select from 7 colors)
	3. CURSOR LINE(→page23)		OFF , ON
5. DISPLAY LETTERS	1. LAT/LON UNIT		1/100 , 1/1000 , 1/10000
	2. SPEED UNIT		1/1 , 1/10
	3. DISTANCE UNIT		1/1 , 1/10
	4. BEARING UNIT(→page58)		1/1 , 1/10
	5. OWN BOAT LETTER	1. LAT/LON LETTER	OFF , S , M , L
		2. SPEED LETTER	OFF , S , M , L
		3. BEARING LETTER	OFF , S , M , L
		4. TIME LETTER	OFF , S , M , L
		5 LAT/LON COLOR	WHITE (Select from 7 colors)
		6 SPEED COLOR	WHITE (Select from 7 colors)
		7 BEARING COLOR	WHITE (Select from 7 colors)
		9. TIME COLOR	YELLOW (Select from 7 colors)
	6. CURSOR LETTER	1. LAT/LON LETTER	OFF , S , M , L
		2. DISTANCE LETTER	OFF , S , M , L
		3. BEARING LETTER	OFF , S , M , L
		4. TIME LETTER	OFF , S , M , L
		5. LAT/LON COLOR	YELLOW (Select from 7 colors)
		6. DISTANCE COLOR	YELLOW (Select from 7 colors)
		7. BEARNG COLOR	YELLOW (Select from 7 colors)
		8. TIME COLOR	YELLOW (Select from 7 colors)
	7. WAYPOINT LETTER	1. LAT/LON LETTER	OFF , S , M , L
		2. DISTANCE LETTER	OFF , S , M , L
		3. BEARING LETTER	OFF , S , M , L
		4. TIME LETTER	OFF , S , M , L
		5 LAT/LON COLOR	MAGENTA (Select from 7 colors)
		6 DISTANCE COLOR	MAGENTA (Select from 7 colors)

Menu Item			※ Factory set-up	
		7 BEARNG COLOR	MAGENTA (Select from 7 colors)	
		8 TIME COLOR	MAGENTA (Select from 7 colors)	
	6. COLOR TONE		NORM , NIGHT	
	7 CLOCK (→page64)		OFF , ON	
	8.BOTTOM MAPPING	1.MODE	OFF , ON , RECORD	
		2.DEPTH RANGE	AUTO , 2.7fa/0.3fa , 5fa/0.3fa , 10fa/0.3fa, 30fa/0.3fa , 50fa/0.5fa, 100fa/1fa, 300fa/3fa	
		3.CIRCLE DIA.	AUTO , 50ft , 100ft , 200ft, 400ft , 800ft	
		4.MEMORY SETP	6ft, 15ft , 30ft , 60ft, 160ft , 330ft	
		5.ERASE	1.ERASE ALL	
			2.ERASE BY DATE	1.ERASE TODAY DATE
				2.ERASE YESTERDAY DATE
				3.ERASE BY DATE
			3.ERASE BY CURSOR	OFF , ON
		6.TIDE ADJUST	0.0m （-9.9m～+9.9m）	
		7.CHART TYPE	DEPTH , HARDNESS	
		8.WAKE COLOR	OFF , RED	
7. FIND	1. PORT			
	2. TIDE STATION			
	3. SATELLITES			
	4.RECEVE SENTENCE MONITOR			
	5.TRANSMIT SENTENCE MONITOR			
8. OTHERS				
1. DRAW LINE (→page51)	1. START DRAW			
	2. LINE COLOR		WAKE (RED～BLUE , WAKE)	
	3. LINE READOUT		OFF , ON	
	4. ERASE LINE (→page52,53)	1. ERASE BY COLOR		
		2. ERASE ALL		
		3. ERASE BY CURSOR	OFF , ON	
	5. DRAW MODE	(→page52)	CURSOR , POSITION	
2. MEMORY CARD	1. ERASE USB-DRIVE DATA			
	2. STORE FROM UNIT TO USB-DRIVE			
	3. STORE FROM USB-DRIVE TO UNIT			
	4. REMOVE USB-DRIVE			
3. USER KEY	1. USER KEY		II-LC , CMAP-OFF , SPOT S. , COLOR TONE , TIDE STA. , SAVE PICTURE	
4. UNIT SWITCH	1. DISTANCE UNIT		NM , Km	
	2. TEMP UNIT		℃ , °F	
5. GPS SETUP	1. SMOOTHING(→page61)		LOW , MID , HIGH	
	2. BEARING LV.		L , ・ , ・ , ・ , H	
	3. SPEED SMOOTHING LV.		L , ・ , ・ , ・ , H	
	4. WAAS(→page61)		OFF , ON	
	5. BEACON SETUP			
	6. INITIALIZE GPS	1. INITIALIZE GPS		

Menu Item			※ Factory set-up
6. CORRECTION	1. LOCAL TIME CORRECT	1. LOCAL TIME CORRECT	-05:00 (-12:00～+12:00)
		2. SUMMER TIME	OFF , ON
	2. GPS AZIMUTH	1. GPS AZIMUTH	REAL , MAGNETIC
		2. MAG/AZIMUTH DEVIATION	W18.0
	3. BOAT POSI CORRECT	1. BOAT POSI CORRECT	OFF , ON
		2. LAT CORRECT	0.000’
		3. LON CORRECT	0.000’
		4. COURSE VAL TO 0	
		5. MOVE TO CURSOR POINT	
	4. TEMP CORRECT	1. TEMP CORRECT	0.0℃(℉) (-3.0～+3.0℃(℉))
7. EXT TERMINAL (→page20)	1. INTERVAL SETUP1	1. GGA	OFF , 1 , 2 , 4sec
		2. GLL	OFF , 1 , 2 , 4sec
		3. VTG	OFF , 1 , 2 , 4sec
		4. RMC	OFF , 1 , 2 , 4sec
		5. APB	OFF , 1 , 2 , 4sec
		6. HDG , HDT	OFF , 1 , 2 , 4sec
		7. XTE	OFF , 1 , 2 , 4sec
		8. BOD	OFF , 1 , 2 , 4sec
		9. BWC	OFF , 1 , 2 , 4sec
	2. INTERVAL SETUP2	1. DBT	OFF , 1 , 2 , 4sec
		2. MTW	OFF , 1 , 2 , 4sec
		3. BTM	OFF , 1 , 2 , 4sec
	3. NMEA1 OUTPUT		OFF , ON
	4. NMEA2 OUTPUT		OFF , ON
	5. NMEA1 PORT BAUD RATE		4800 , 9600 , 38400
	6. NMEA2 PORT BAUD RATE		4800 , 9600 , 38400
	7. GPS PORT BAUD RATE		4800 , 9600 , 38400
8. INITIAL	1. INITIALIZE MENU(→page21)		
	2. INITIAL CORRECTION VALUE(→page21)		
	3. INITIAL MEMORY DATA(→page21)		
	4. INITIAL ALL(→page21)		
	5. SIMULATION(→page19)		OFF , FIX , MOVE , ROTATE , ONE WAY
	6. SPECIAL MENU	1. REMOTE MARK KEY	PL , PL+S/P , ALL ON , ALL OFF
		2. TIDE GRAPTH UNIT	m , feet
	7. SPECIAL MENU 2	1. HEADING CALIB	
		2. HEADING LINE	S , L
		3. EVENT INFO. BOX	OFF , ON
	8. SPECIAL MENU 3	1. KEY BRIGHTNESS	DARK , BRIGHT
9. AIS DISP (→page66)	1. AIS SETUP	1. AIS DISP. RANGE	OFF , 1 , 2 , 5 , 10 NM(km)
		2. AIS COL. SETUP	1. NATION COL. 1 COL. 1 (Select from 7 colors)
			2 COL. 1 NUMBER [416]Taiwan
			3 COL. 2 (Select from 7 colors)

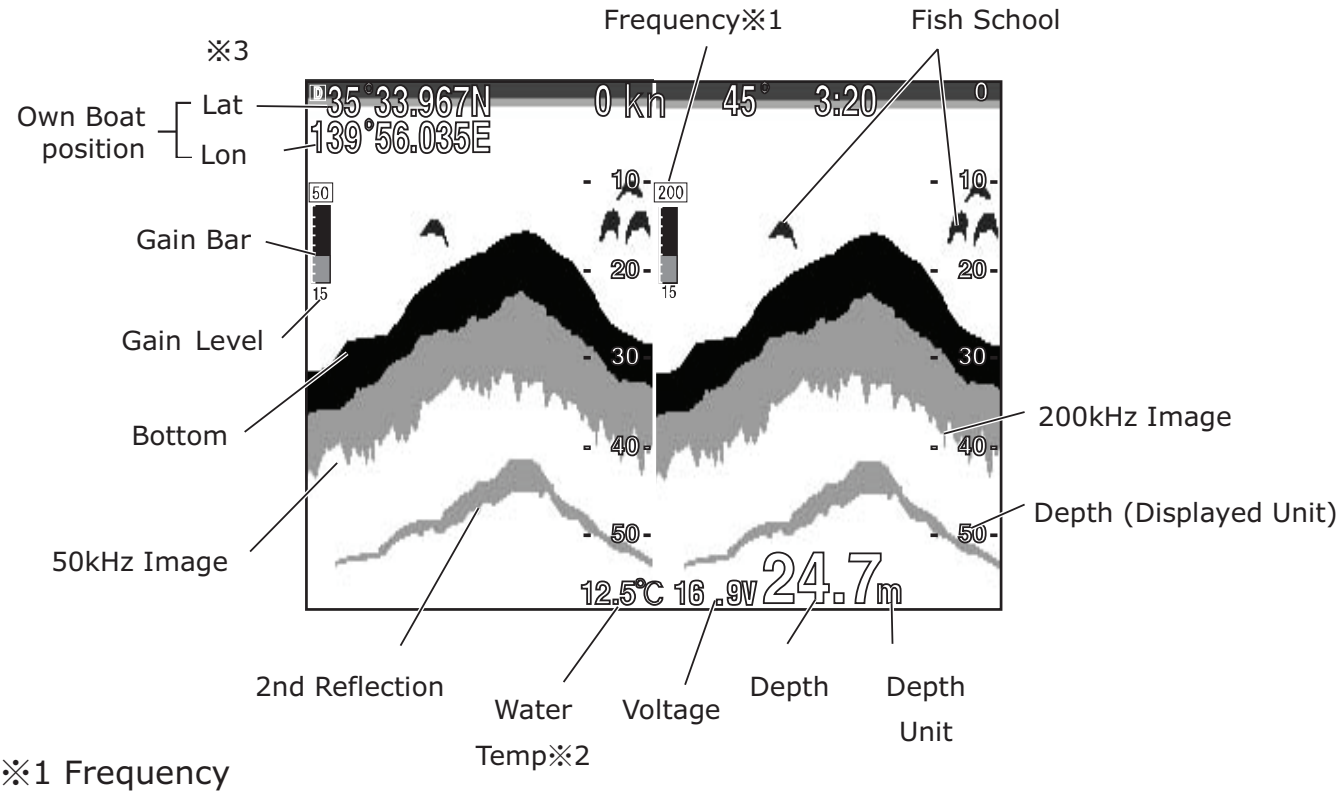
Menu Item	※ Factory set-up	
		4 COL. 2 NUMBER [431]Japan
		5 COL. 3 (Select from 7 colors)
		6 COL. 3 NUMBER [432]Japan
		7 COL. 4 (Select from 7 colors)
		8 COL. 4 NUMBER [412]China
		9 COL. 5 (Select from 7 colors)
		0 COL. 5 NUMBER [413]China
	2. OTHER NATION	Select from 7 colors.
0. C-MAP	OFF , ON	

MEMO

OPERATION OF ECHO SOUNDER

SOUNDER SCREEN

Example: Low-Freq – High Freq Display



※1 Frequency

Choose from 50-200, 200-50, 50-50, 200-200, 50, 200.

※2 Water temperature

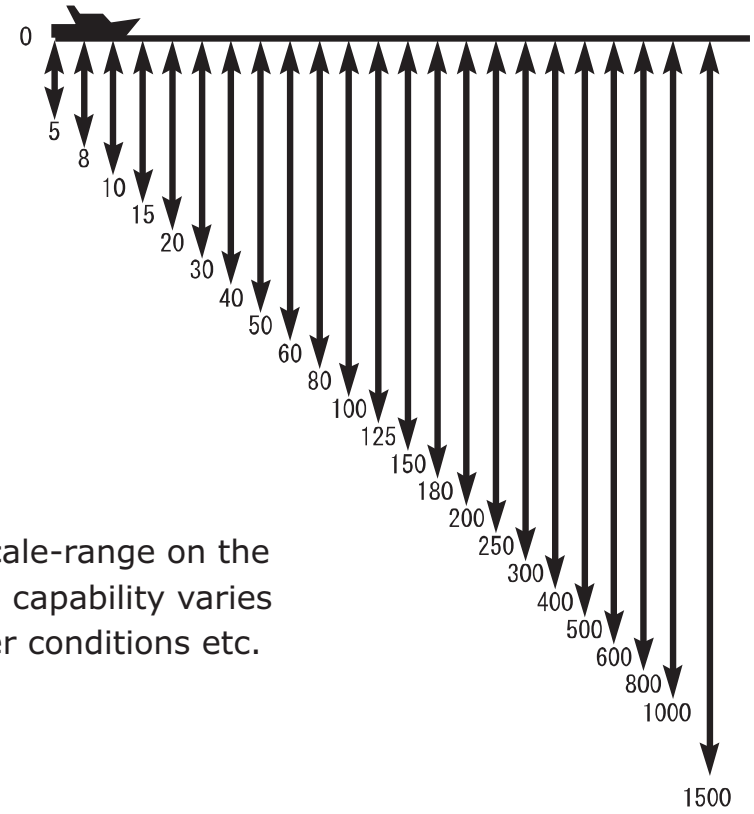
Optional water temp sensor is required to show water temp.

※3 GPS Info

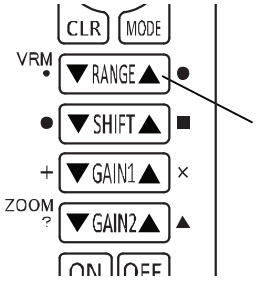
EXT appears when using an external GPS.

DEPTH SET-UP

Depth Range



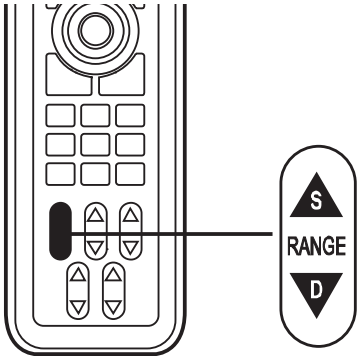
※This is only selected scale-range on the screen. The measuring capability varies depending on the water conditions etc.



Range Key

1 Press ▲key for shallower range.

Press ▼key for deeper range.



※The depth may not appear when detecting very shallow bottom with very deep range.

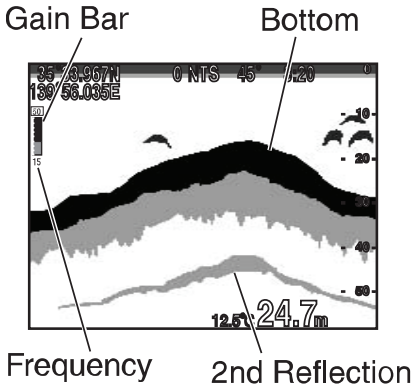
SENSITIVITY

Whole Display Gain Adjustment

Digital echo sounder is capable of changing the whole past image.
This function helps to find the optimized gain set-up for whole image (past recording data) with easy manual operation.

Single Frequency Display

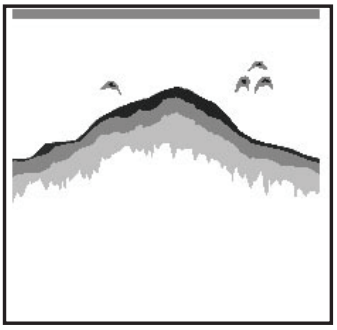
Operation for single frequency display.
※Both keys, [GAIN1] and [GAIN2], changes the sensitivity.
※Select single or dual frequency display from menu. (→page90)
※Dual frequency is selected for default set-up.



【Gain】
Adjust the gain to distinguish the sea bottom and fish school. (0~40: 40 steps of sensitivity level) Optimum sensitivity is to have 2nd reflection of sea bottom and red color bottom.

【2nd Reflection】
1st reflection is first reflected sound from sea bottom. 2nd reflection is the sound reflected from the sea surface and reflected again from the sea bottom. Usually, 2nd reflection is located twice deeper than sea bottom (1st reflection).

＜Low Gain＞

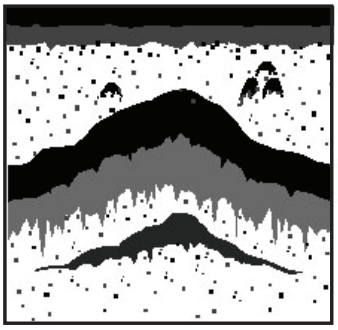


Bottom is green or white color.

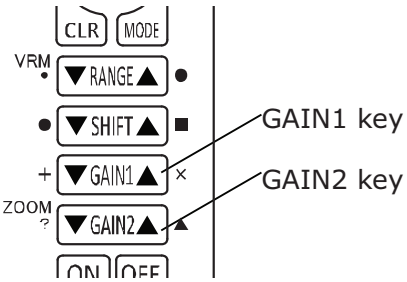
＜Good＞

2nd reflection appears ok. Easy to distinguish fish.

＜High Gain＞



Too much Plankton and noise element.

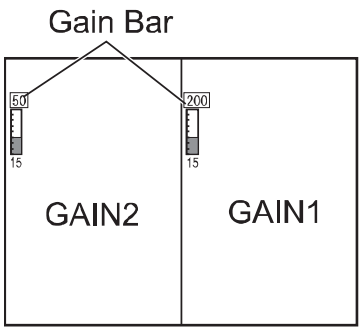


1 【Lower Sensitivity】
Press ▼key of GAIN1 or GAIN2 to lower the sensitivity and gain bar.

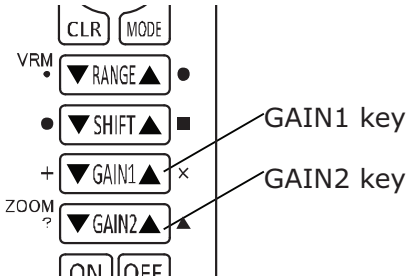
【Higher Sensitivity】
Press ▲key of GAIN1 or GAIN2 to increase the sensitivity and gain bar.

Dual Frequency Display

For dual frequency display, GAIN1 is for right display, and GAIN2 is for left display.



<In case of "50-200">



1 Adjust the sensitivity of left display with GAIN2 key.

【Lower Sensitivity】

Press GAIN2 ▼key to lower the sensitivity and gain bar.

【Higher Sensitivity】

Press GAIN2 ▲key to increase the sensitivity and gain bar.

2 Adjust the sensitivity of right display with GAIN1 key.

【Lower Sensitivity】

Press GAIN2 ▼key to lower the sensitivity and gain bar.

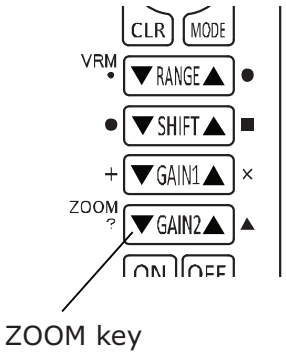
【Higher Sensitivity】

Press GAIN2 ▲key to increase the sensitivity and gain bar.

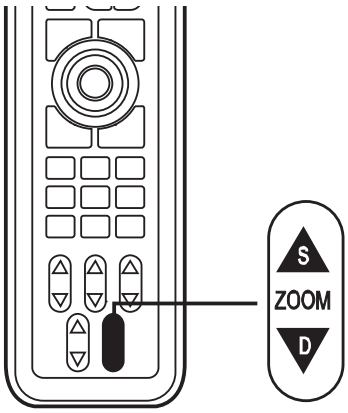
EXPANSION MODE

Expansion Mode

【Expansion Display】
Expanded display appears on the left side.
When selecting dual frequency mode, the right-side frequency is applied for expanded display.



ZOOM key



1 Press 9.SOUNDER – 4.EXPANSION – 1.EXP MODE.

2 OFF : Normal display appears.

BOTTOM LOCK
: Straight bottom contour and expanded area from the bottom.

Auto Zoom
: Set the bottom at center position and expand upper/lower area.

Manual Zoom
: Set the selected location at center and expand upper/lower area. Use Zoom key to move the expansion area.

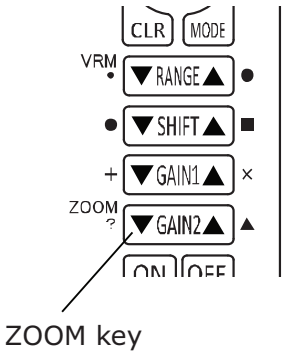
※Display range varies depending on the expansion ratio.

EXPANSION AREA

Expansion Area

Possible to move the expansion area to either sea surface or bottom side.

※[Zoom] key can be only used during manual expansion mode.
※Expansion ratio can be selected from x2, x4, x8.
※x4: factory set-up



ZOOM key

1 Go to 9.SOUNDER – 4.EXPANSION – 1.EXP MODE. (→page86, 104)

2 Select MANUAL ZOOM.

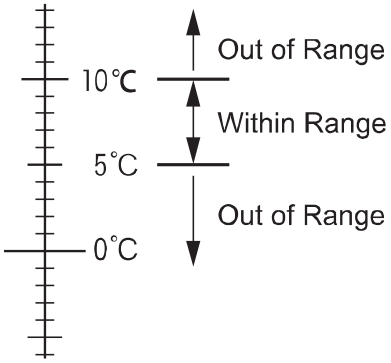
3 Use ZOOM key to move the expansion area.
Press ▲key to move to shallow area.
Press ▼key to move to deeper area.

WATER TEMP ALARM

Water Temp Alarm

Alarm is ON within or exceeding the range of 2 different water temps.
※Optional water temp sensor is required for water temp alarm.

e.g) Water temp1 : 5℃
Water temp2 : 10℃



1 Go to 5.ALARM – 3.TEMP ALARM – 1.ALARM SET.

2 Alarm set-up
Within Range
: Alarm is ON within the range of 2 selected temps. Temp display blinks.
Out of Range
: Alarm is ON outside the range of 2 selected temps. Temp display blinks.
OFF : Temp alarm is OFF.

3 Set-up the water temp1 and temp2.

※Press CLR key to cancel the alarm.

FISH ALARM

Fish Alarm

Alarm is ON when the fish is detected.

1 Go to 5.ALARM – 4.FISH ALARM – 1. ALARM SET.

2 Alarm set-up
S : High sensitivity mode to detect small/big fish schools.
L : Low sensitivity mode to detect only big fish schools.
OFF : Fish alarm is OFF.

Note) Fish alarm may react to the objects other than fish.

DEPTH ALARM

Depth Alarm

Alarm is ON within or exceeding the range of 2 different depths (Depth Set1, Depth Set2).

1 Go to 5.ALARM – 5.DEPTH ALARM – 1.ALARM SET.

2 Alarm set-up.

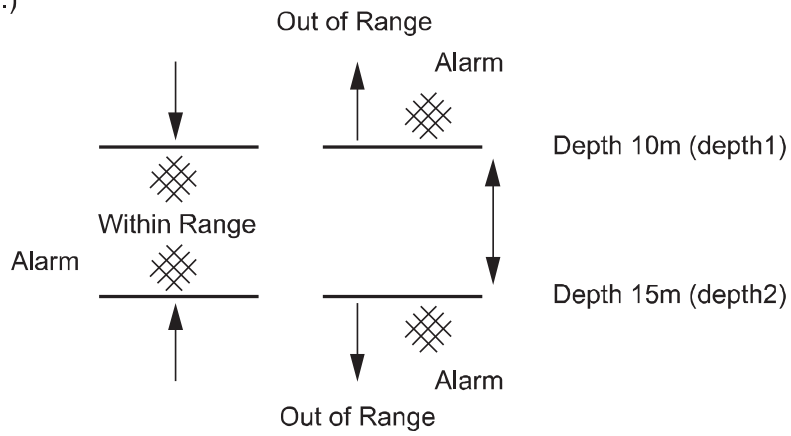
Within range
: Alarm is ON within the range of 2 selected depths.

Out of Range
: Alarm is ON outside the range of 2 selected depths.

OFF : Depth alarm is OFF.

3 Set-up Depth1 and Depth2.

e.g.)



WATER TEMP CORRECTION

Water Temp Correction

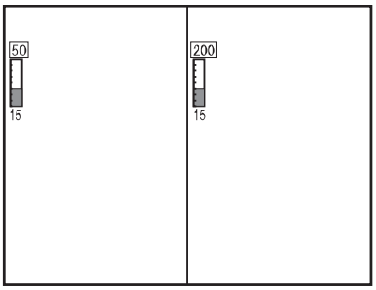
Correct the water temp.

1 Go to 8.OTEHRS – 6.CORRECTION – 4.TEMP CORRECT.

FREQUENCY DISPLAY

Frequency Display

Possible to select dual frequency display as follows.



<In case of "50-200">

※When using Auto-Gain (→page91) , right display is only applied for Auto-Gain function.

1 Go to 9.SOUNDER – 1.DISPLAY.

2 Set-up.

50	: 50kHz display
200	: 200kHz display
200-50	: 200kHz on the left, 50kHz on the right
50-200	: 50kHz on the left, 200kHz on the right
※ 50-50	: 50kHz for both screens.
200-200	: 200kHz for both screens.

SWEEP SPEED

Sweep Speed

【Sweeping Speed】

Sounder display consists of the consecutive latest image (image beneath the vessel) at the right edge and keep shifting the past image to the left side. Sweeping speed is the speed to shift the image. Whole screen appears differently with this set-up value.

【Relation between Sweeping Speed and Sounding Rate】

Sweeping speed can be selected from 8 different types. The following is the reference of sounding rate for each set-up.

Menu Set-up	Sweep Speed / Sounding Rate
× 3	3／1
× 2	2／1
4	1／1
3	1／2
2	1／4
1	1／8
Freeze	Freeze

Fast ↑

Slow ↓

1 Go to 9.SOUNDER – 2.SWEEP SPEED.

2 Select one.

SOUNDER SET-UP

Select AUTO or MANUAL set-up for the depth (range) & sensitivity (gain).

1 Go to 9.SOUNDER – 3.AUTO MODE.

2 AUTO enables the selected AUTO functions in the following detailed set-up.
AUTO or MANU indicator appears above gain bar.

DETAIL SET-UP

[Auto Gain] Automatic gain control

1 Go to 9.SOUNDER – 8.OTHERS – 3.SPECIAL SETUP – 7.AUTO MODE SERTUP.

2 Select AUTO GAIN.

OFF : Disable
LOW : Normal
HIGH : High gain

[Depth Range] Set-up Auto Range/Shift.

1 Go to 9.SOUNDER – 8.OTEHRS – 3.SPECIAL SETUP – 7.AUTO MODE SETUP.

2 Select 2.AUTO RANGE.

OFF : Disable
RANGE : Auto-range
SHIFT : Auto-shift

※Shift key does not work when AUTO RANGE is selected.

A MODE

A Mode

A mode appears between sounder image and depth indication.
The width changes depending on the strength of reflected echo signal.

1 Go to 9.SOUNDER – 7.OTHER – 6.DISPLAY SETUP – 1.A-MODE.

2 Select one.
ON
OFF

BACKGROUND COLOR

Background Color

Visual image of display looks differently by surrounding brightness. It is easier to see the image by selecting the background color from 4 different colors.

1 Go to 9.SOUNDER – 5.COLOR SETUP – 1.BACKGROUND.

2 Select one.

COLOR CONFIGURATION

Color Configuration

Reflected signal of sound wave is converted into 17 ranks of digital signal according to the strength of response. Color configuration is the color set-up for 16 ranks except background color.

Sounder image is shown by the color configuration. The displayed color shows the strength of reaction. Also, specific reaction can be emphasized by changing the color configuration.

1 Go to 9.SOUNDER – 5.COLOR SETUP – 2.COLOR CONFIG.

2 Select one.

COLOR ERASE

Color Erase

Set-up the erase level so that fish schools can be seen clearly.

1 Go to 9.SOUNDER – 5.COLOR SETUP – 3.COLOR ERASE.

2 Select one.

INTENSE LEVEL

Intense Level

This set-up shows more color of strong reflection (signal).

1 Go to 9.SOUNDER – 5.COLOR SETUP – 4.INTENSE COL.

2 Select one.

STD
HI
MAX ↓

CLUTTER

Clutter

Fish school and bottom are displayed with the set-up of reflected echo strength and color tone. “Clutter” easily distinguishes the fish school by erasing the color from weakest reflection such as plankton or dirt under the water.

1 Go to 9.SOUNDER – 5.COLOR SETUP – 5.CLUTTER.

2

STD
1
2
3 ↓

Less noise toward higher number.

DEPTH UNIT

Depth Unit

Select from “meter”, “feet”, “fathom”, or “Brazas”.

1 Go to 9.SOUNDER – 7.OTHER – 1.DEPTH UNIT.

2 Select one.

SCALE LINE

Scale Line

Horizontal line (scale line) appears on the screen.

1 Go to 9.SOUNDER – 6.DISPLAY SETUP – 2.SCALE LINE.

SUPER RANGE

Super Range

Whole past image changes automatically according to the current depth (displayed depth range on screen) if changed any.

1 Go to 9.SOUNDER – 6.DISPLAY SETUP – 3.SUPER RANGE.

WATER TEMP GRAPH

Water Temp Graph

Water temp graph appears. Easy to see the fishing points by knowing the variation of water temp and tide change.

1 Go to 9.SOUNDER – 6.DISPLAY SETUP – 4.TEMP GRAPH.

※Optional water temp sensor is required to show the graph.

AUTO RANGE MAX. DEPTH

Auto Range Max. Depth

Set-up the max. depth when using auto range.

1 Go to 9.SOUNDER – 8.OTHER – 3.SPECIAL SETUP – 1.AUTO RANGE MAX.

2 Select one.

CLEAN ECHO

Clean Echo

Reduce the desynchronized noise such as other sounder, electronics noise, air bubble, and mechanical noise.

1 Go to 9.SOUNDER – 7.OTHER – 3.SPECIAL SETUP – 2.CLEAN ECHO.

2 Select one.

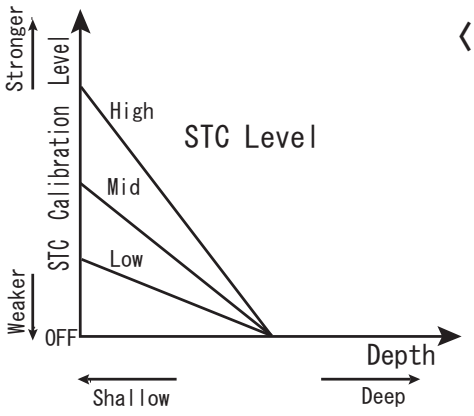
STC

STC Setup

Reduce the sensitivity of shallow water area by eliminating the noise signals such as plankton and air bubbles.

1 Go to 9.SOUNDER – 7.OTHER – 3.SPECIAL SETUP – 3.STC SETUP.

2 Set-up STC



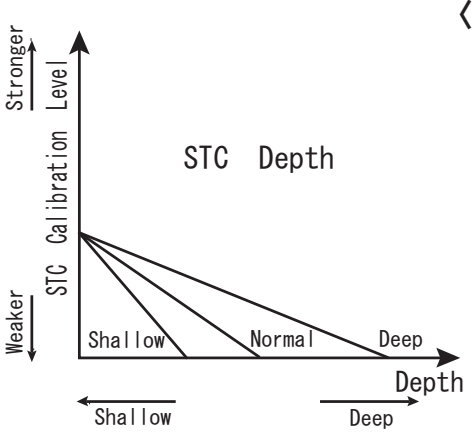
〈Low-Freq STC Level〉〈High-Freq STC Level〉

Set-up STC level for either low-freq or high-freq.

Low sensitivity at shallow area with stronger STC.

4 different STC level: OFF, Low, Mid, High

OFF: Weakest, H: Strongest



〈Low-Freq STC Depth〉〈High-Freq STC Depth〉

Set-up the target depth for STC adjustment (low-freq or high-freq)

Deeper the depth is selected, selected STC level is affected to deeper water.

3 different STC target depth: Shallow, Normal, Deep.

Shallow: 0~50m, Normal: 0~150m, Deep: 0~300m

OUTPUT POWER

Output Power

1 Go to 9.SOUNDER – 7.OTHER –
3.SPECIAL SETUP – 4.OUTPUT POWER.

2 OFF, LOW, or HIGH
（OFF: No transmit. Only active receiver.）

※Normal case: Set to HIGH.

PULSE LENGTH

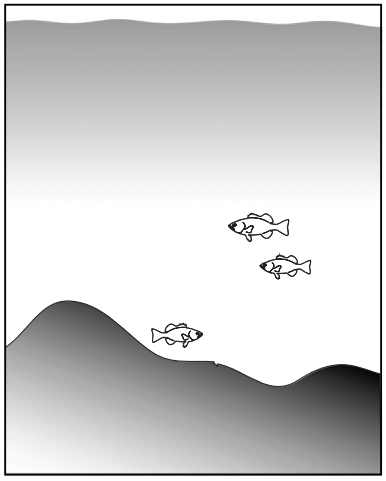
Pulse Length

The pulse length is the ultrasonic length transmitted each time. 3 selections to choose from. The resolution may vary for each option.

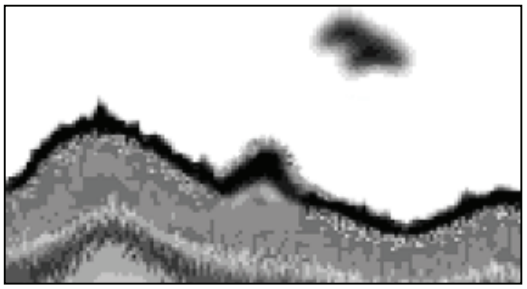
1 Go to 9.SOUNDER – 7.OTHER – 3.SPECIFAL SETUP – 5.PULSE LENGTH.

2 Short : High resolution but shallow depth penetration. Low power consumption.
STD : Standard (Normal) level
Long : Low resolution but deep depth penetration.

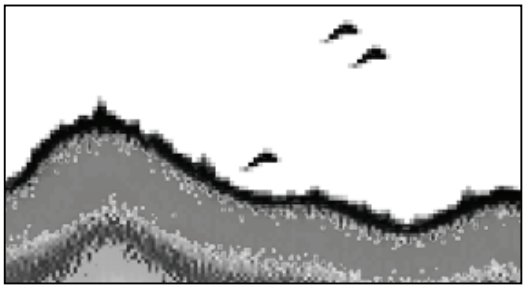
Example



[Long Pulse Length]
2 fish image combined together



[Short Pulse Length]
Better target separation.



SENSITIVITY MODE

Sensitivity

Set-up the sensitivity level of sounder.

1 Go to 9.SOUNDER – 7.OTHER – 3.SPECIAL SETUP – 6.SENSITIVITY.

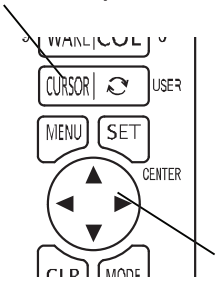
2 STD : Standard (Normal) level
HIGH : High sensitivity level

※Use GAIN1/GAIN2 key (→page84) for everyday's Gain (sensitivity) set-up.

SOUNDER CURSOR FUNCTION

Possible to locate the target point from sounder's past image. Easy to add Mark or Waypoint for the specific target area.

CURSOR ON/OFF key

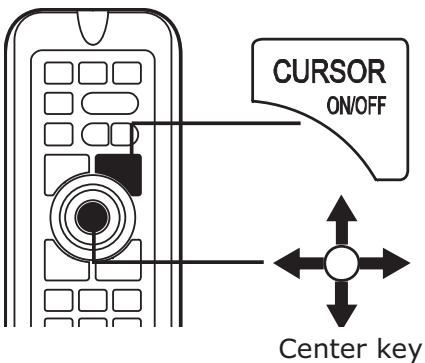


1 Press&Hold CURSOR key when using Sounder+Plotter or Sounder mode.

2 Sounder function is paused. Yellow line appears on the right edge of sounder screen.

DIRECTION key

3 Use DIRECTION key (left/right) to move the cursor to the target point.



Center key

4 Press WPT or MARK key to input mark. (You can use this feature even with Sounder mode. No need to display Plotter screen.)

5 Press CLR key or CURSOR key to return.

※This sounder cursor function pauses the echo-transmit. Normal sounder is not operating until the function is completed.

SOUNDER DISTANCE SCALE

Distance scale displayed on the sounder screen.
To give you an idea of how far away the target is located from an own vessel.

1 Go to 9.SOUNDER – 6.DISPLAY SETUP – 5.DIST SCALE.

2
OFF : No show
TOP : Scale display on the top
BOTTOM : Scale display at the bottom

※Distance scale number does not appear until echo image reaches to the left edge screen.
※No distance scale number when the distance is 20m or less.

SEARCHING AREA

The detection area (radius) by sounder(transducer) is shown below the depth scale number.

1 Go to 9.SOUNDER – 6.DISPLAY SETUP – 7.SEARCHING AREA.

SOUNDER FREEZE FUNCTION

Stop Sounder Transmit

Cancel the sounder function when showing only plotter mode on the screen.
It helps low power consumption.

1 Go to 9.SOUNDER – 7.OTHER – 2.FREEZE SOUNDER FOR PL.

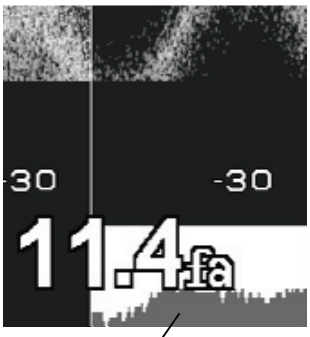
2 OFF : Sounder is in operation during PL mode.
ON : Sounder is stopped during PL mode.

BOTTOM HARDNESS FUNCTION

Bottom Hardness Function

Bottom Hardness Level : 0~20
Hard Bottom : Higher value
Soft Bottom : Lower value
The value appears on the upper left of screen.
Also, bottom hardness graph appears at the bottom.

1 Go to 9.SOUNDER – 6.DISPLAY SETUP –
6.BOTTOM HARDNESS SETTING –
4.BOTTOM HARDNESS GRAPH.



Note) Applicable for shallow water.
The value varies depending on the conditions of transducer installation etc.

TRANSDUCER THRU-HULL / IN-HULL SET-UP

TD Location

1 Go to 9.SOUNDER – 7.OTHER – 3.SPECIAL SETUP – 8.TD LOCATION.

2 Select one.

THRU-HULL-A :Custom. Not to be used normally.
THRU-HULL-B :Normal. Select this when using thru-hull installation.
IN-HULL-A :Select this when using in-hull or inside-case installation.
IN-HULL-B :Custom. Only for the case IN-HULL-A is not working properly.

LIST OF ECHO SOUNDER MENU

Menu Item			※ Factory set-up
9. SOUNDER			
1. DISPLAY (→page90)			50 , 200 , 200-50 , 50-200 , 50-50 , 200-200
2. SWEEP SPEED(→page90)			OFF 1 2 3 4 S x2 x3
3. AUTO MODE (→page91)			MANUAL , AUTO
4. EXPANSION	1. EXP. MODE	(→page86)	OFF , BOTTOM , AUTO ZOOM , MANUAL ZOOM
	2. EXP. RATE		x2 , x4 , x8
5. COLOR SETUP	1. BACKGROUND	(→page92)	BLACK , BLUE , WHITE , D.BLUE
	2. COLOR CONFIG	(→page93)	4 (0～4)
	3. COLOR ERASE	(→page93)	OFF (OFF～12)
	4. INTENSE COL	(→page94)	STD , HI , MAX
	5. CLUTTER	(→page94)	STD , 1 , 2 , 3
6. DISPLAY SETUP	1. A-MODE	(→page92)	OFF , ON
	2. SCALE LINE	(→page95)	OFF , ON
	3. SUPER RANGE	(→page95)	OFF , ON
	4. TEMP GRAPH	(→page96)	OFF , ON
	5. DIST SCALE	(→page101)	OFF , TOP , BOTTOM
	6. BTM HRADNESS SETTING (→page102)	1.BTM HARDNESS OFFSET	0 (-6～4)
		2.BTM HARDNESS AVE	1 , 2 , 3
		3.BTM HARDNESS SENS	H, ・ , ・ , ・ , ・ , L
		4.BOTTM HARDNESS GRAPH	OFF , ON
	7. SEARCHING AREA (→page101)	1. SEARCHING AREA	OFF , ON
		2. BEAM ANGLE SETUP	BY TD , OPTIONAL
		3. TD	TD48 , TD66 , TD47 , TD67
		4. OPTIONAL SET (L FREQ.)	20
		5. OPTIONAL SET (H FREQ.)	20
7. OTHER	1. DEPTH UNIT	(→page95)	m , ft , fa , br
	2. FREEZE SOUNDER FOR PL	(→page102)	OFF , ON
	3. SPECIAL SETUP	1. AUTO RANGE MAX (→page96)	30fa, 50fa, 100fa, 300fa, 500fa, 1000fa
		2. CLEAN ECHO (→page96)	OFF , L , M , H
		3. STC SETUP(→page97)	
		1. STC (LOW FREQ)	OFF , L , M , H
		2. STC (HIGH FREQ)	OFF , L , M , H
		3. STC DEPTH (LOW FREQ)	SHALLOW , NORMAL , DEEP
		4. STC DEPTH (LOW FREQ)	SHALLOW , NORMAL , DEEP
		4. OUTPUT POWER (→page98)	OFF , LOW , HIGH

5. PULSE LENGTH (→page99)	S , STD , L	
6. SENSITIVITY (→page100)	STD , HIGH	
7. AUTO MODE SETUP		
1. AUTO GAIN	OFF , LOW , HIGH	
2. AUTO RANGE	OFF , RANGE , SHIFT	
8. TD LOCATION (→page103)	IN-HULL-A , IN-HULL-B , THRU-HULL-A , THRU-HULL-B	
9. OTHER SPECIAL SETUP		
1. FINDEER DETAIL SETUP 1		
1. L FREQ. MIN DEPTH LV	0dB (−20～+12db)	
2. H FREQ. MIN DEPTH LV	0dB (−20～+12db)	
3. L FREQ. MIN DEPTH	0.37 m (0.25～6.11m)	
4. H FREQ. MIN DEPTH	0.37 m (0.25～6.11m)	
5. L FREQ. AUTO GAIN CORRECT.	±0 (−5～+5)	
6. H FREQ. AUTO GAIN CORRECT.	±0 (−5～+5)	
2. FINDEER DETAIL SETUP 2		
1. BANDWIDTH	WIDE , STD , NAR-1 , NAR-2	
2. TARGET DEPTH RANGE	X1 , x2 , AUTO	
3. DEPTH MEAS	AUTO , RIGHT-DISP	

MEMO

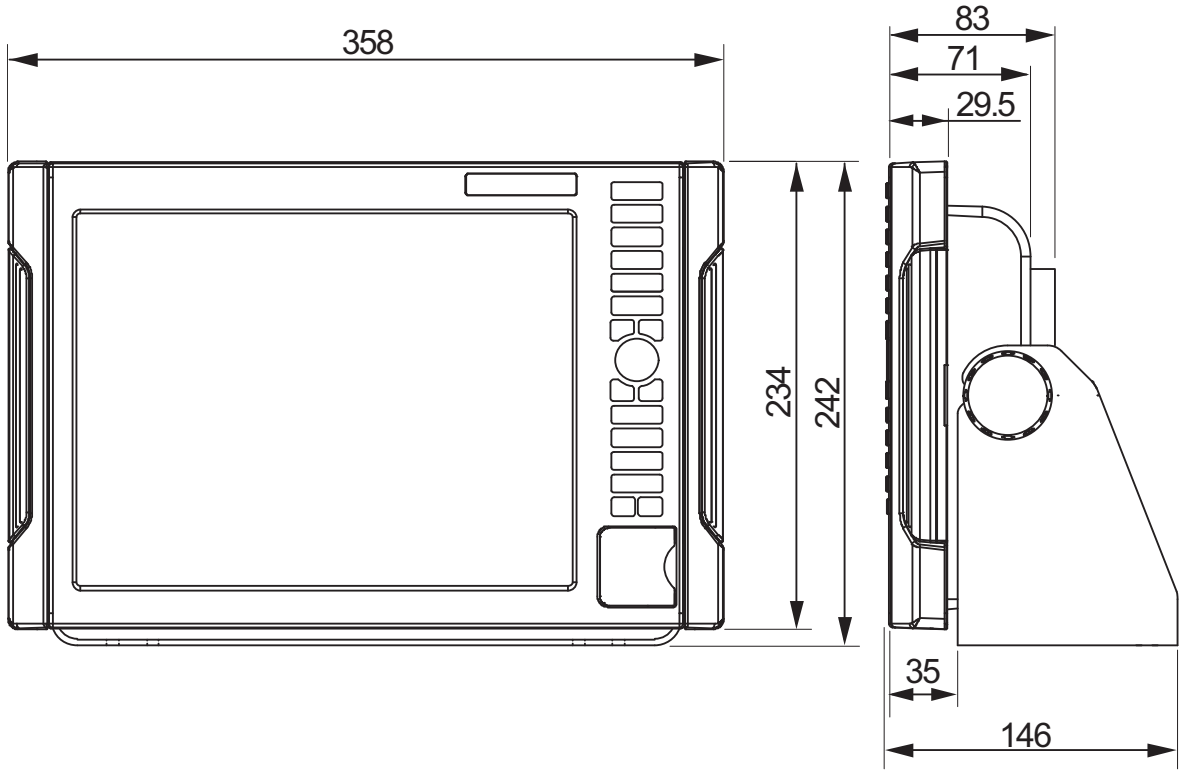
REFERENCE DOCUMENT

DIMENSIONAL DRAWING

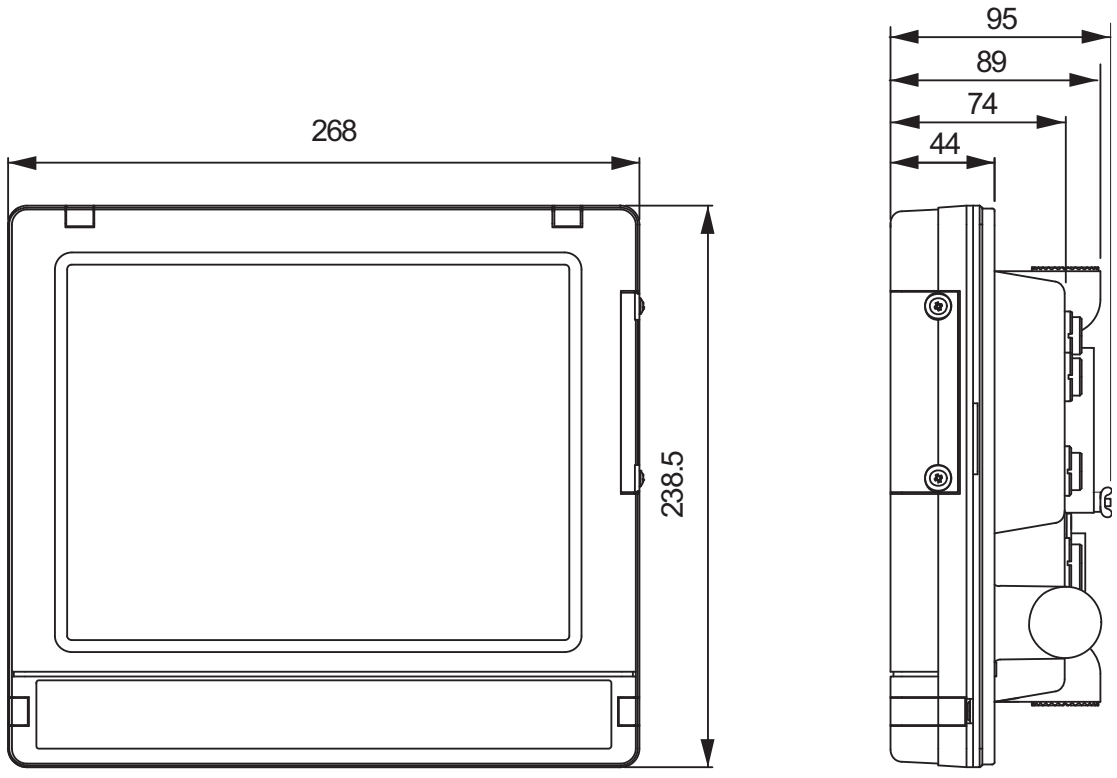
1.MAIN UNIT

Unit : mm

< HDX-121>



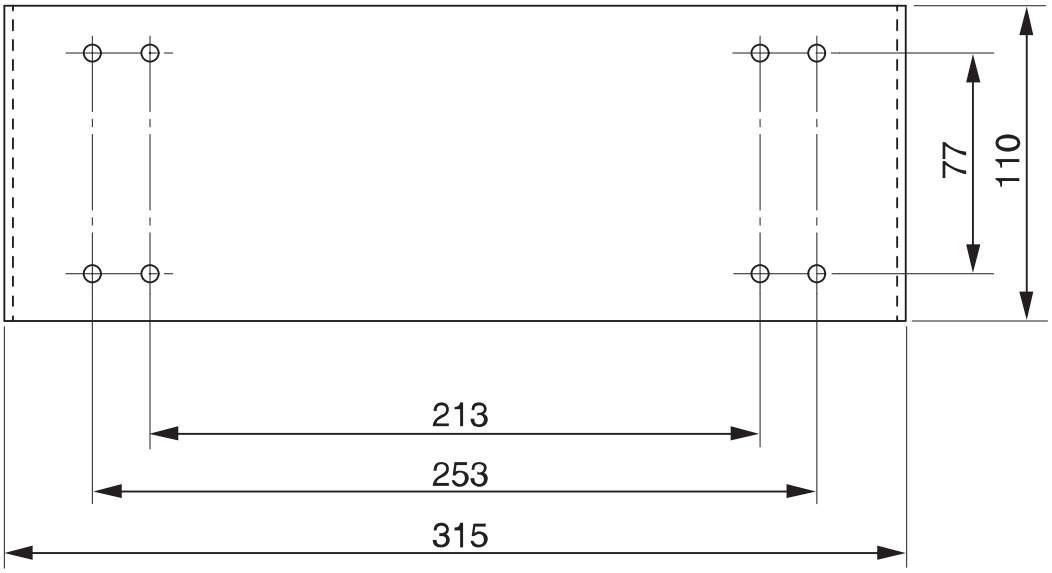
< HDX-121-BB >



2.BRACKET

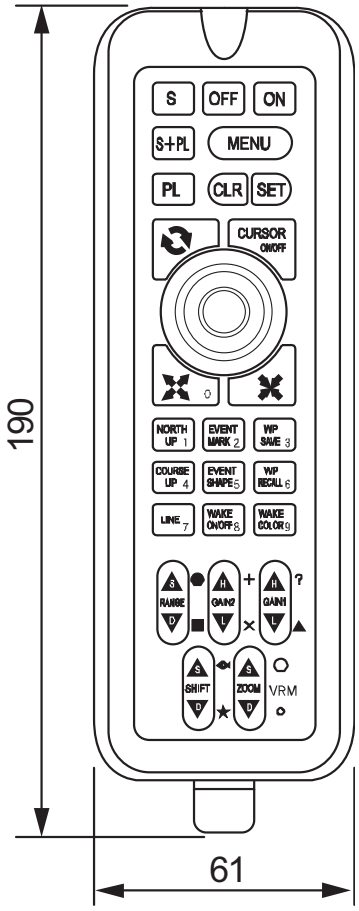
Unit : mm

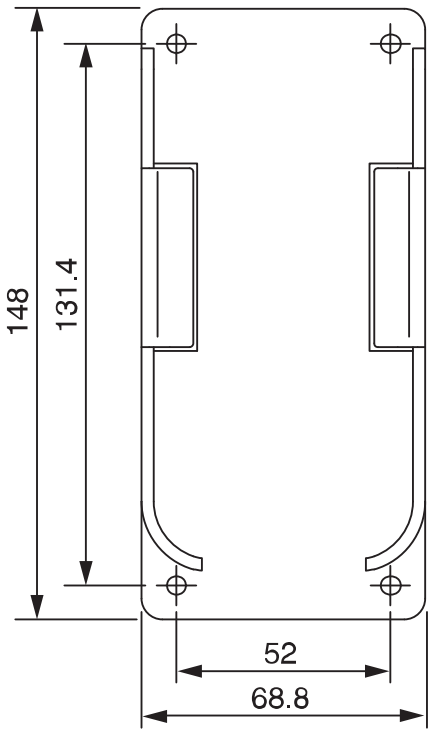
< HDX-121>

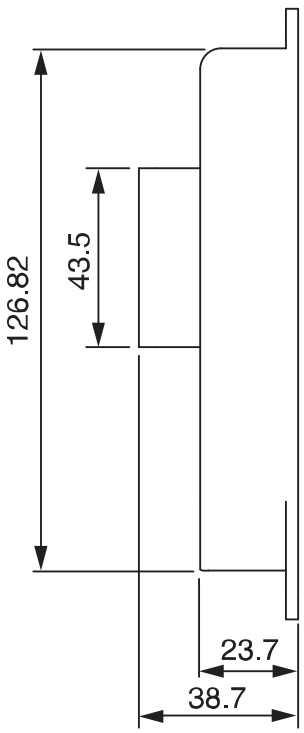


3.REMOTE & REMOTE HOLDER (OPTION)

UNIT : mm

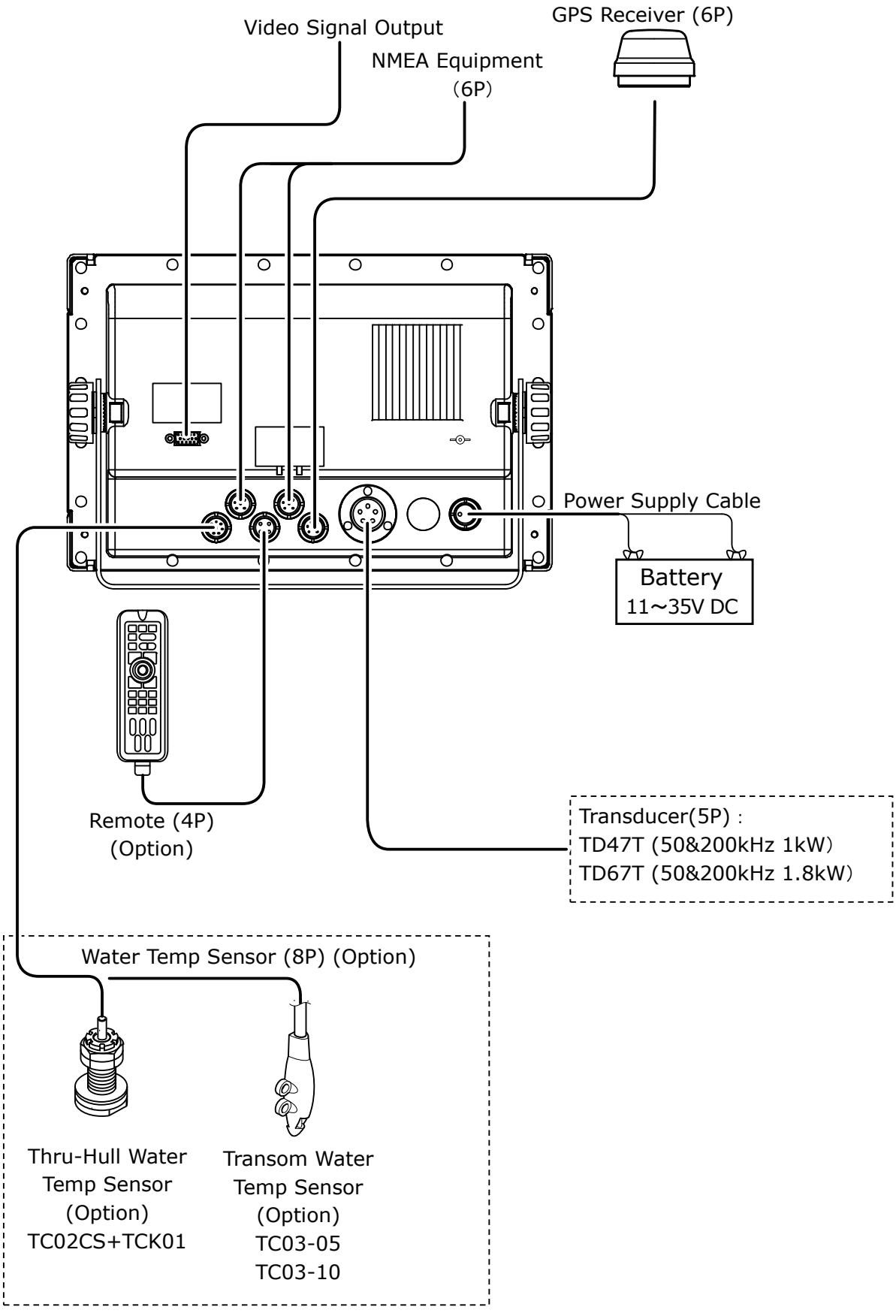




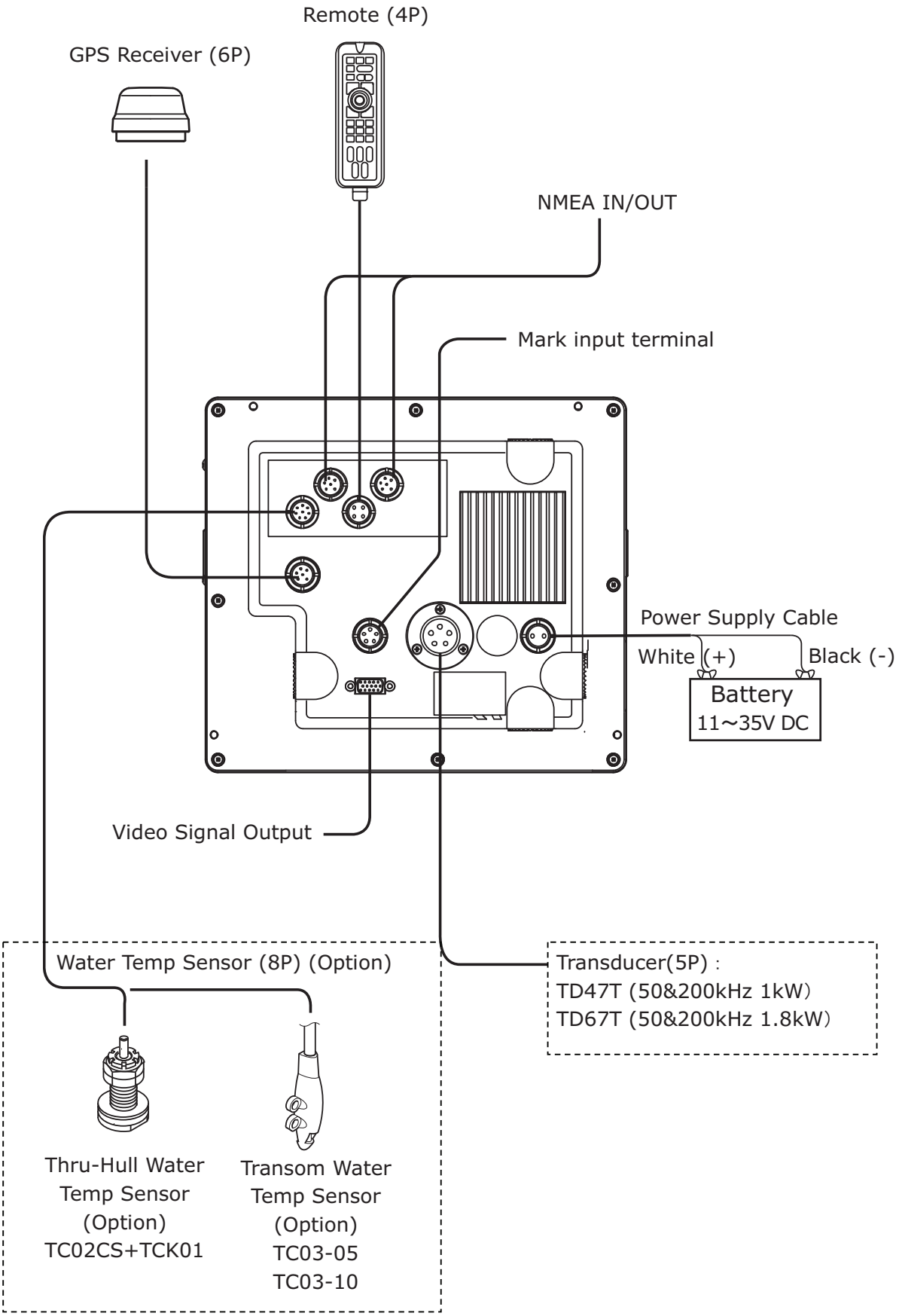


CONNECTION WITH MAIN UNIT

< HDX-121>

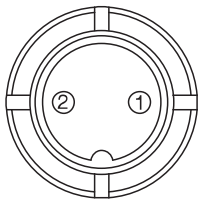


< HDX-121-BB >

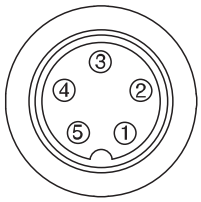

Remote (4P)
GPS Receiver (6P)
NMEA IN/OUT
Mark input terminal
Power Supply Cable
White (+)
Black (-)
Battery
11~35V DC
Video Signal Output
Water Temp Sensor (8P) (Option)
Transducer(5P) :
TD47T (50&200kHz 1kW)
TD67T (50&200kHz 1.8kW)
Thru-Hull Water
Temp Sensor
(Option)
TC02CS+TCK01
Transom Water
Temp Sensor
(Option)
TC03-05
TC03-10

CONNECTOR DIAGRAM

Caution: Connectors on display unit.



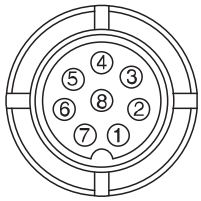
1. Connector for Power Supply
   1. Power Supply (+) 11～35V
   2. Power Supply (-)



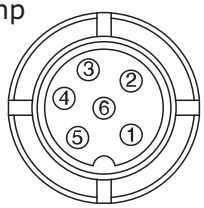
2. Connector 5P for Transducer
   1. TD 50kHz
   2. TD 200kHz
   3. Shield
   4. TD 200kHz
   5. TD 50kHz

(Example) TD Line Info

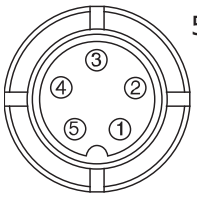
5P Spec	① -(Black) 50kHz
	② -(Green)200kHz
	③ Shield
	④ +(Red) 200kHz
	⑤ +(White) 50kHz



3. Connector for Water Temp Sensor
   1. N/A
   2. N/A
   3. N/A
   4. N/A
   5. N/A
   6. Water Temp Sensor(+)
   7. Water Temp Sensor(−)
   8. N/A



4. Connector for External Input/Output
   1. GND
   2. Data Input(−)
   3. Data Input(+)
   4. N/A
   5. Data Output
   6. DC10.5V (200mA)Output



5. Connector 5P for Mark input (HDX-121-BB Only)
   1. WAKE
   2. WAKE
   3. MARK
   4. MARK
   5. GND

GPS ANTENNA MADE BY OTHER COMPANY

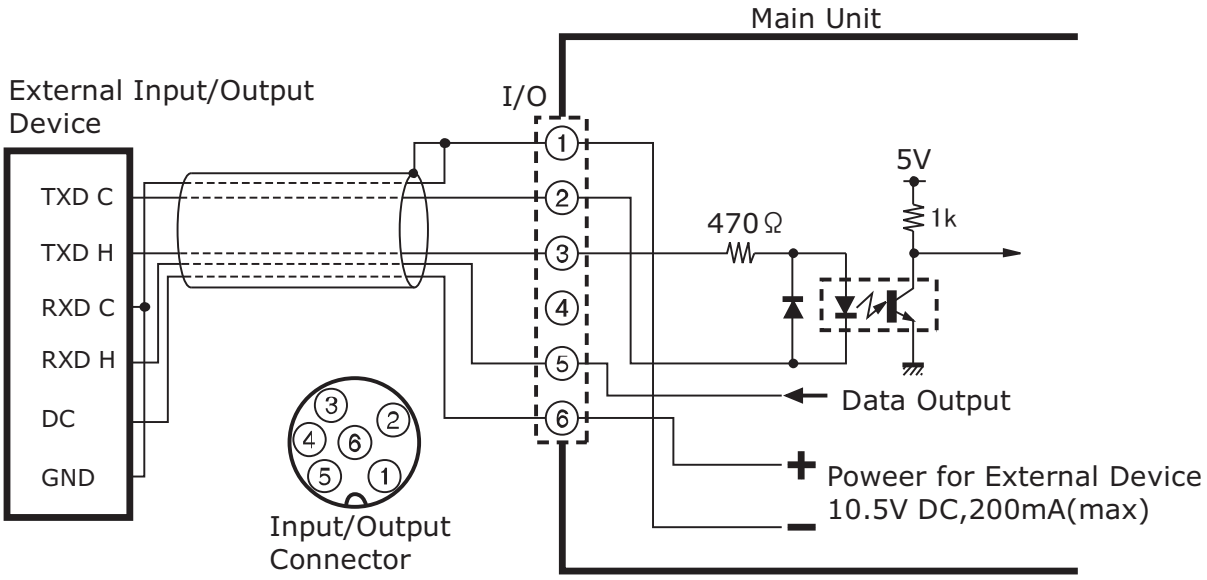
※ The performance&accuracy is not covered by the warranty when using GPS antenna of different brand.

NMEA CONNECTOR

Input/Output Connector

To be used when connecting to other device.

Data Format	Baud Rate	Format
NMEA0183 GGA,GLL,VTG,RMC,APB, XTE,BOD,DBT/MTW,HDG/HDT	4800, 9600, 38400bps	Start bit=1, Data bit=8 Parity bit=none, Stop bit=1



NMEA0183 OUTPUT SENTENCE

The following sentence is output.

The output interval can be set from OFF, 1sec, 2sec, 4sec.

※GGA,GLL,VTG,RMC: Available only when receiving the data from GPS receiver.

※Same output interval is used for HDG and HDT.

※The output interval might be longer when selecting many items.

※Factory set-up

1sec: GGA,VTG,RMC,APB,XTE,HDG,HDT OFF: Other items

Example for output sentence

$GPGGA,110147,3443.160,N,13726.746,E,1,09,001,00070,M,0025,M,,*55
$GPGLL,3443.16,N,137.26,E*55
$GPVTG,118.9,T,,,000.0,N,000.0,K*2C
$GPRMC,110146,A,3443.160,N,13726.746,E,000.0,118.5,270707,,*15
$GPAPB,A,A,00.001,R,N,V,V,001.4,T,000,001.4,T,,*77
$HCHDG,000.0,,,,*5C
$GPXTE,A,A,00.001,R,N*71
$GPBOD,001.4,T,,,000,1000*10
$GPBWC,110100,3508.785,N,13727.496,E,001.4,T,,,025.63,N,000*69
$SDDBT,209.6,f,63.9,M,34.9,F*28
$SDMTW,27.6,C*1A

MAIN UNIT INSTALLATION

WARNING

●Install the unit firmly.
If not, it may cause the human injuries.
※Install the unit correctly according to the following instruction.

CAUTION

●Do NOT install the unit where rain or spray dashes hit directly.
It causes the firing and electric shock.

【Procedure of Installation】(HDX-121)

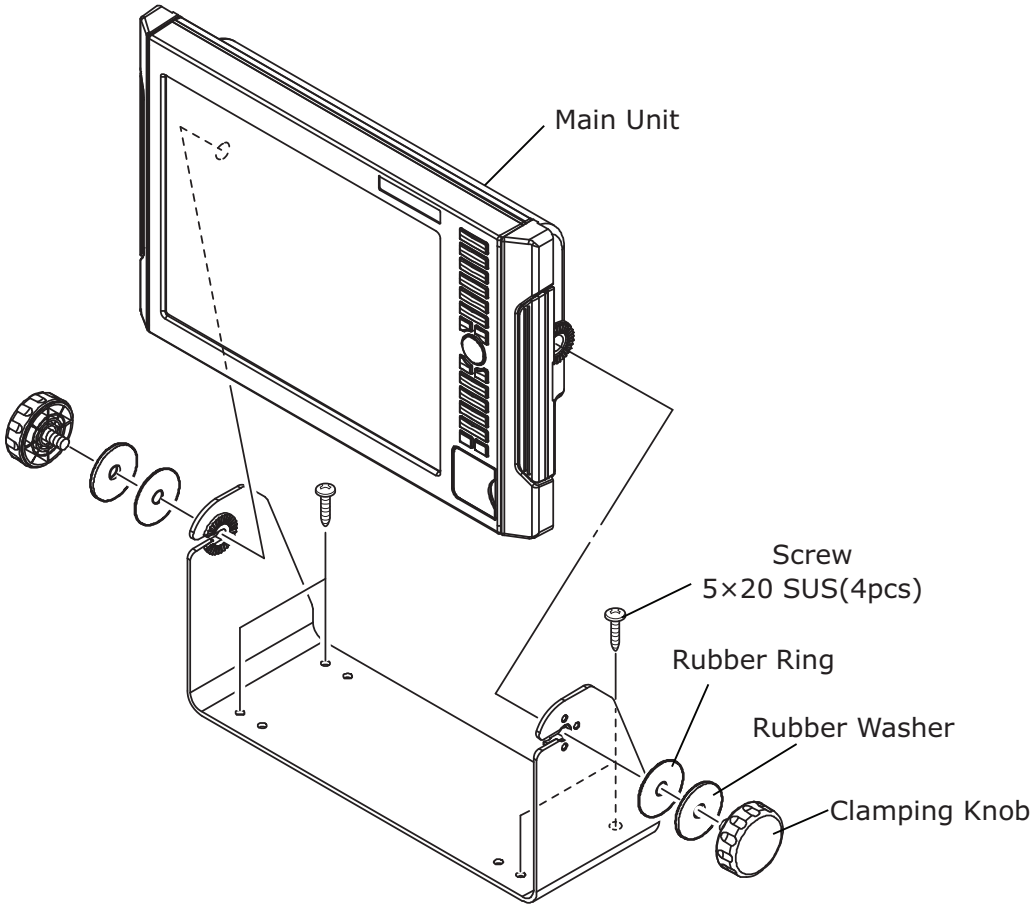
＜Installation of Unit＞

Fix the unit with enclosed screws by using bracket holes (4 locations).
Refer to the picture below.

1. ＜Positioning＞
Fix the unit with mounting bracket and fixation spot. Put the mark.
※Leave some room in the backside of unit for cable connections.

2. ＜Installation of Bracket＞
Fix it with enclosed screws by using 4 holes on the bracket.

3. ＜Installation of Unit＞
Refer to the picture below and fix the unit.

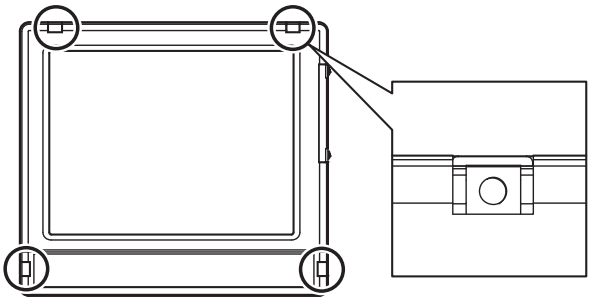


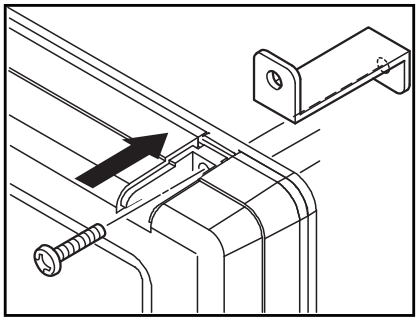
【Procedure of Installation】(HDX-121-BB)

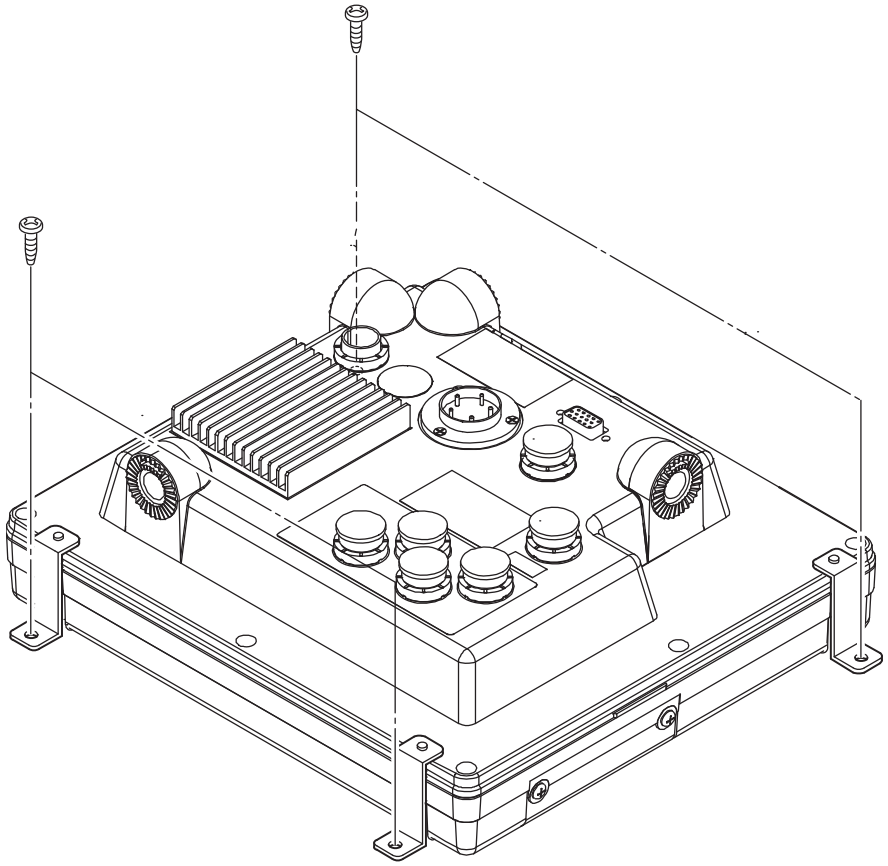
<Installation of Unit>

Fix the unit with enclosed screws by using bracket holes (4 locations).
Refer to the picture below.

1. Put brackets with pan-head screws with spring washer M4x20 on above four holes.
2. Please fix main unit with four mash-room head tapping screws 5x20.





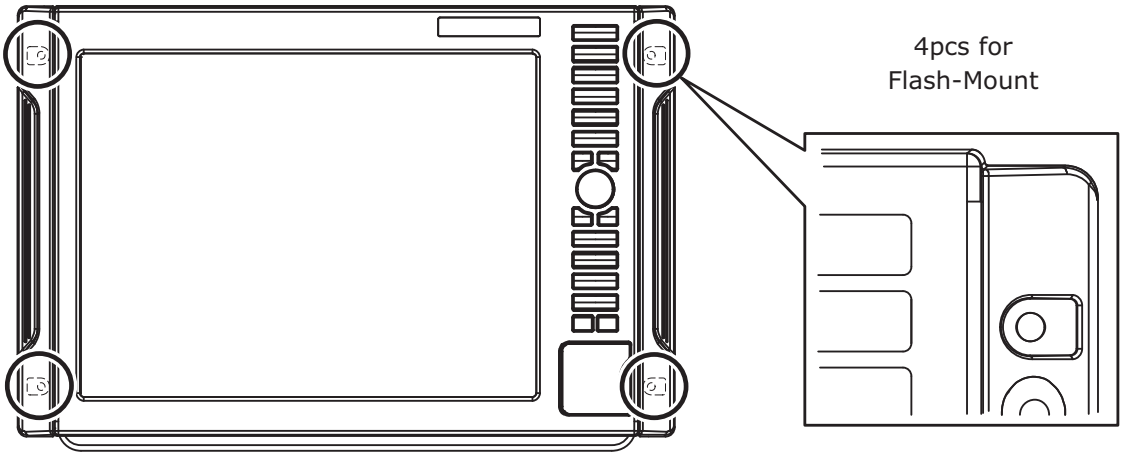


BUILT-IN INSTALLATION

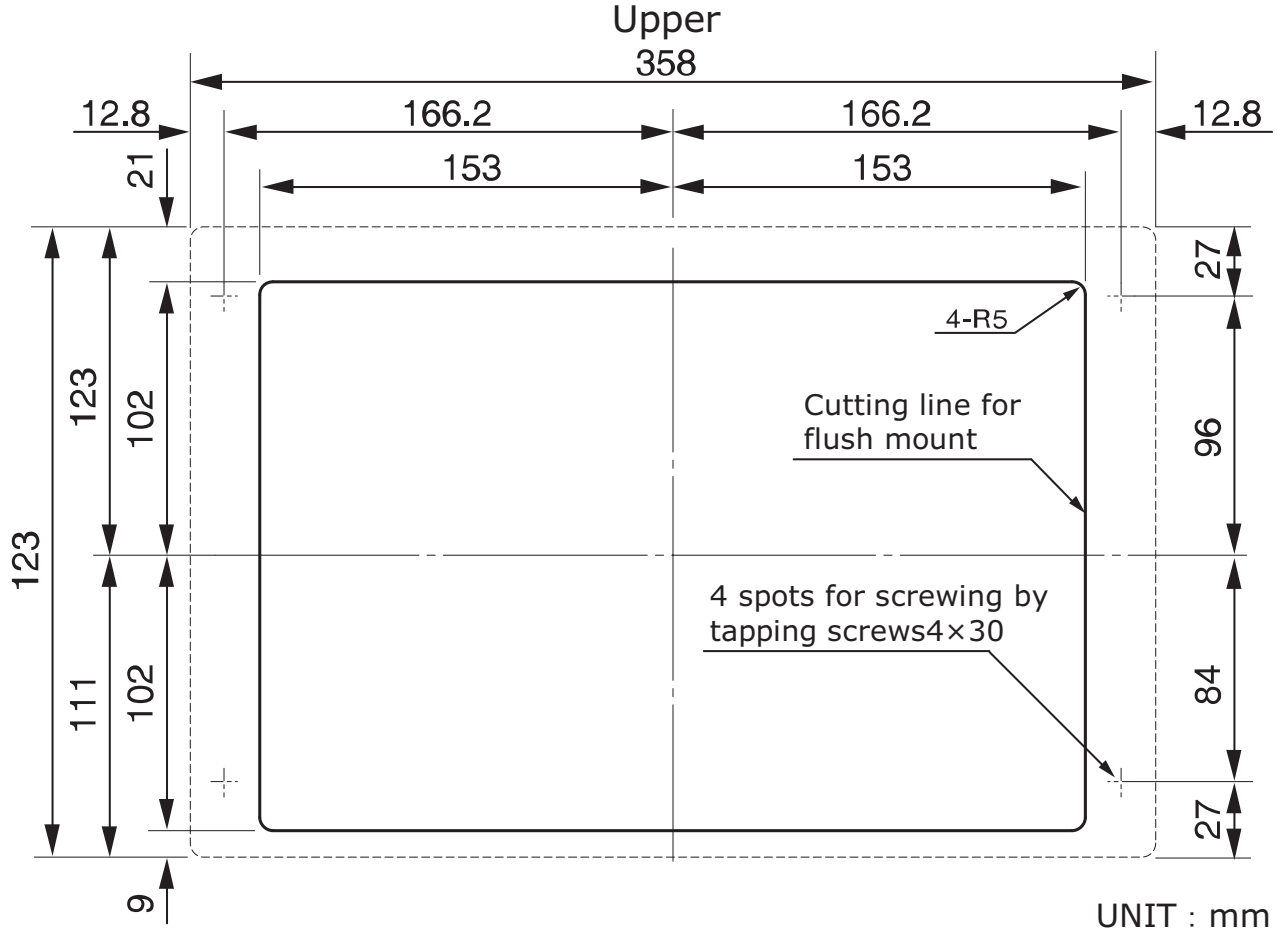
⚠ WARNING

●Install the unit firmly.
If not, it may cause the human injuries.
※Be sure to follow the instruction below and official installation method.

(HDX-121)
Fix the unit by using 4 holes on the front panel.

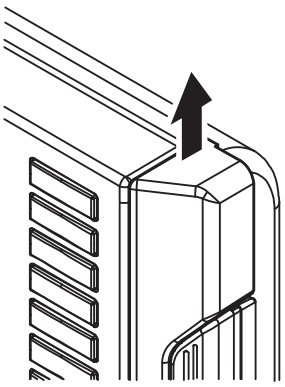


1. Refer to the following figure for fixation holes.

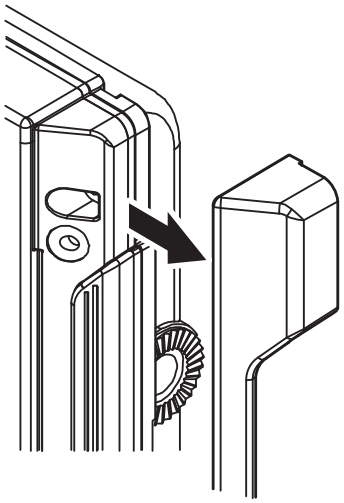


UNIT : mm

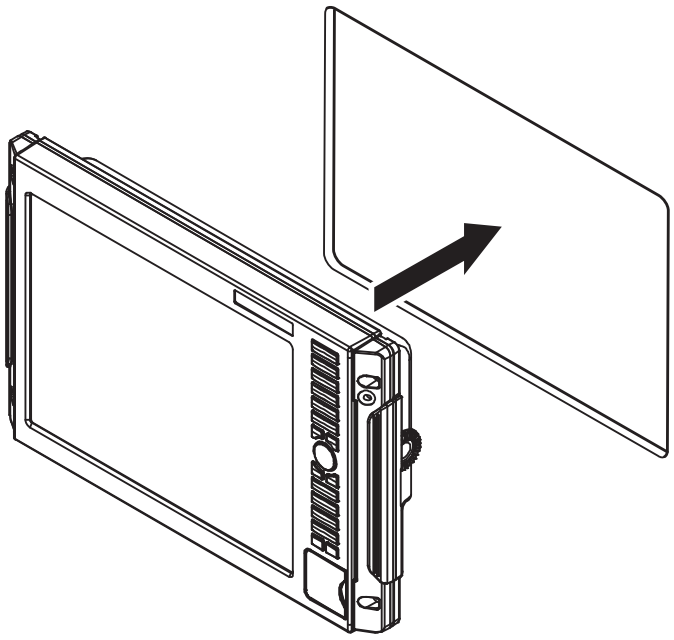
2. Raise 2pcs side covers.



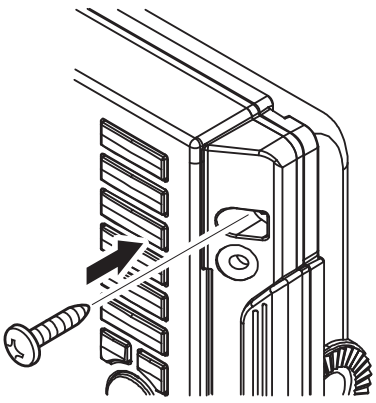
3. Remove the covers.



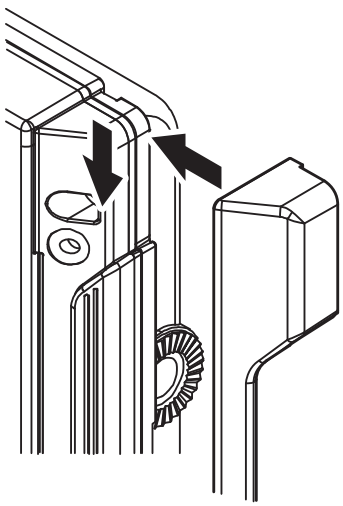
4. Flash-mount it.



5. Fix with 4pcs 4×30 screws.



6. Put the side covers back.



TRANSDUCER INSTALLATION

DANGER

●Any works on the vessel are very unstable and risky.
Installation/maintenance of transducer should be handled after landing the vessel on ground or fixing the vessel at shipyard etc.
If not, it may cause serious injuries.

WARNING

●Be sure to ventilate well inside the vessel when installing the transducer at the bottom of vessel.
Volatile gas from solvent etc causes the toxic symptoms.

●Water proof treatment is required for Thru-Hull installation.
If not, it causes the marine accident.

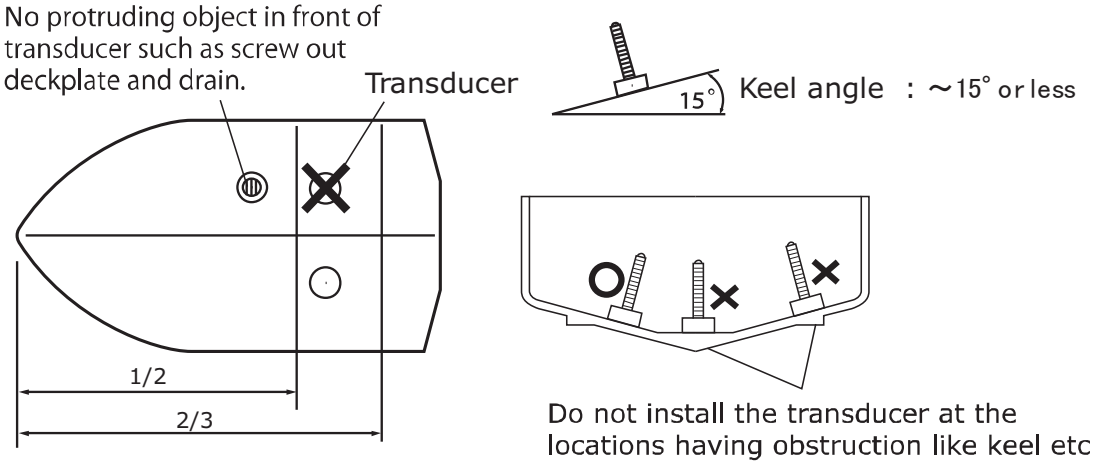
●Do not operate the electronic tools with wet hands.
It causes electronic shock.

【Installation Method】

The following installations can be applied. Please refer to each instruction.

1. Inside-Hull
2. Thru-Hull

※These methods prohibit the use of aluminum vessels for the risk of corrosion.
※Be careful about the following points when using the method 1 .



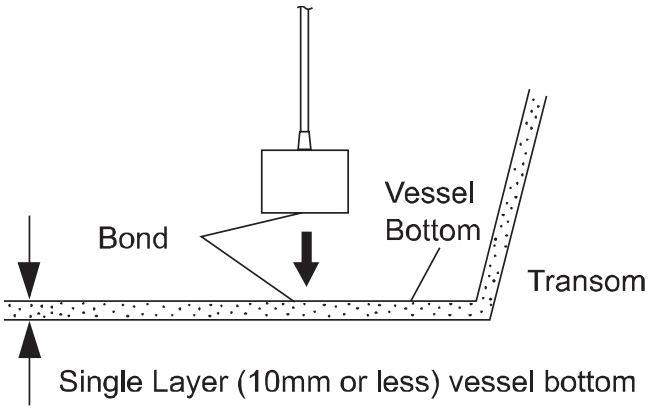
1. INSIDE-HULL

※Effective for FRP vessels with single hull layer of 10mm or less.
※Size and shape vary for each transducer.

Look for the best picture location before the fixation by putting adequate water on the transducer surface and vessel bottom followed by pressing the transducer onto the vessel bottom.

（1）Polish the adhesive surface (transducer bottom surface and vessel bottom) well with sandpaper (#240 or around) and alcohol in order to remove oil, water, and dirt on the surface.

（2）Put silicon bond on the adhesive surface (transducer bottom surface and vessel bottom) and press firmly for the bonding so that no air bubble is contained inside.

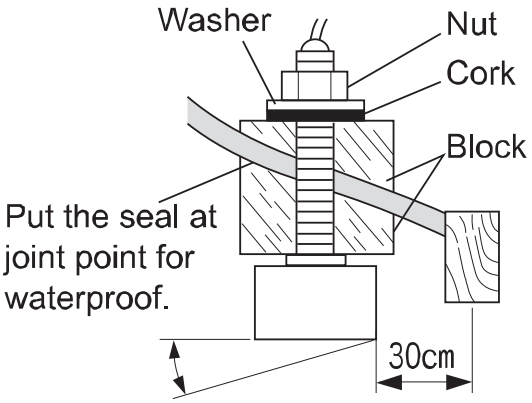


2. THRU-HULL

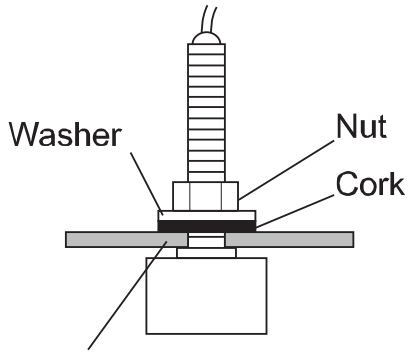
(1) Make hole of φ25 at the vessel bottom. (Aluminum vessels are not subject to the installation for the risk of corrosion.)

(2) Insert the screw part of transducer into the hole and fix it with 1pc cork washer, 1pc washer, and 1pc nut. (Extra cork washer is for spare.)

※Execute the waterproof care for the junction part.
For tilted hull, use a block etc to face directly to the vessel bottom.
※Size and shape vary for each transducer.



Keep the inclination of transducer surface below 10° or less.



Put the seal at joint point for waterproof.

WATER TEMP. SENSOR INSTALLATION

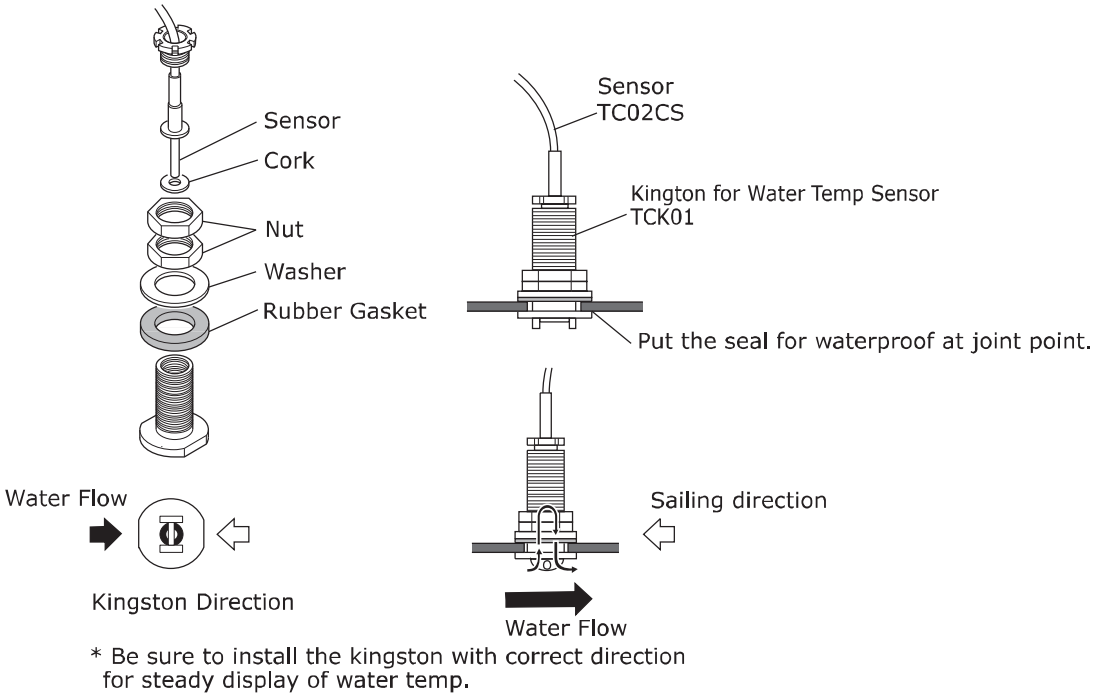
※Water temp sensor: Option

DANGER

- Any works on the vessel are very unstable and risky. Installation/maintenance of water temp sensor should be handled after landing the vessel on ground or fixing the vessel at shipyard etc. If not, it may cause serious injuries.
- Do not operate the electronic tools with wet hands. It causes electronic shock.

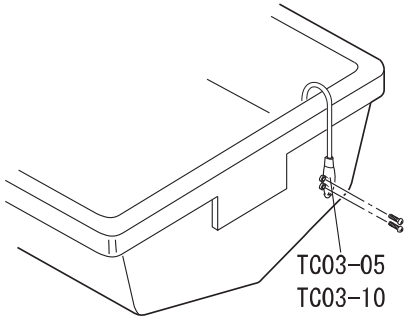
【Installation of Thru-Hull Water Temp Sensor (15m)】

※For FRP vessel only.
(The use of this sensor is prohibited for aluminum vessels due to the risk of corrosion.)



* Be sure to install the kingston with correct direction for steady display of water temp.

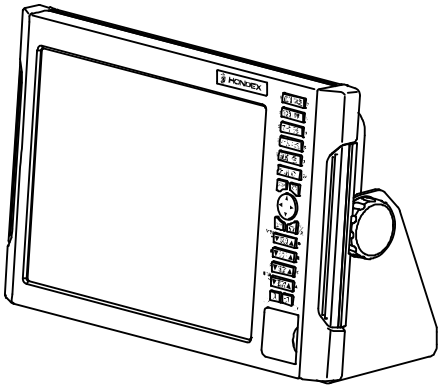
【Installation of Transom Water Temp Sensor】



STANDARD CONFIGURATION

< HDX-121 >

Main Unit 12.1”



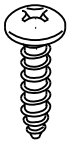
Bracket 1pc
Clamping Knob 2pcs
Rubber Washer 2pcs
Bracket Washer 2pcs

Screws for Main Unit and Bracket

5×20 SUS×4pcs

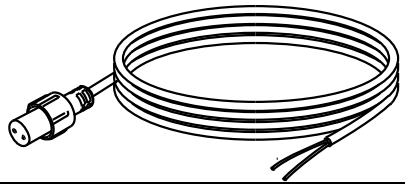
Screw for Buit-in Installation

4×30 SUS×4pcs

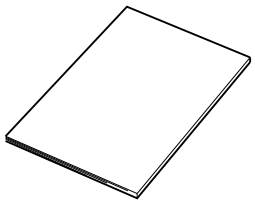


Power Supply Cable

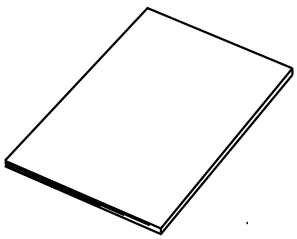
（DC07）2P 2m



Paper Temperate for Built-in Fixation

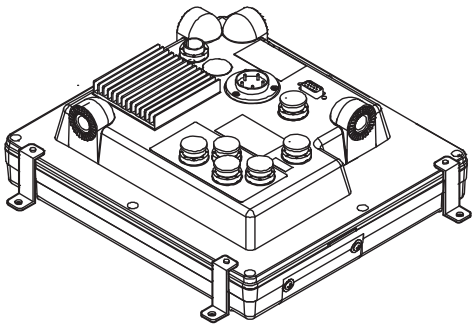


Operation Manual



< HDX-121-BB >

Main Unit



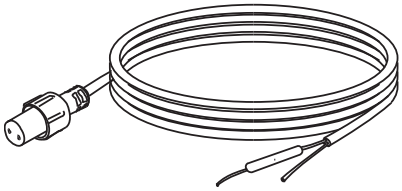
Fixing plate 4pcs
Screws with spring washer
M4×20 4pcs

Screws for Main Unit

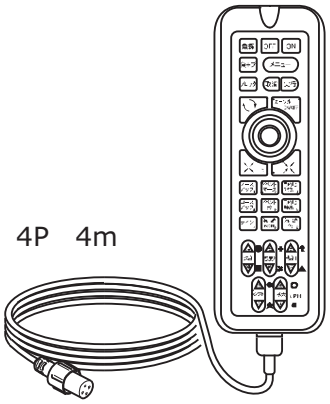
5×20 SUS×4pcs

Power Supply Cable

（DC06）2P 2m

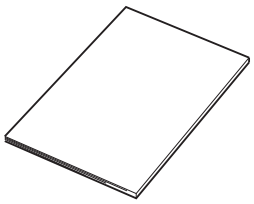


Remote (CR04)

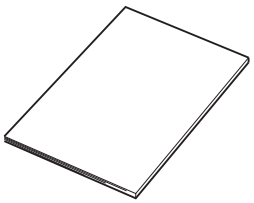


4P 4m

Paper Temperate for Built-in Fixation

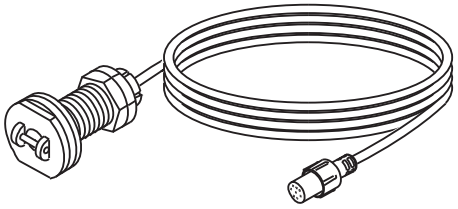


Operation Manual

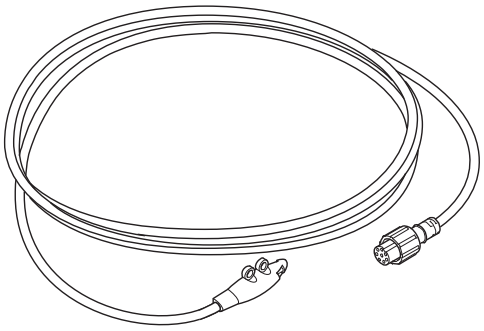


OPTIONS

Thru-Hull Water Temp Sensor
(TC02C + TCK01)
(8P 15m)

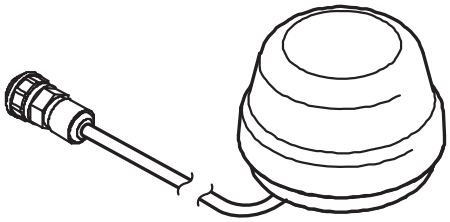


Transom Water Temp Sensor
TC03-05 (8P 5m)
TC03-10 (8P 10m)

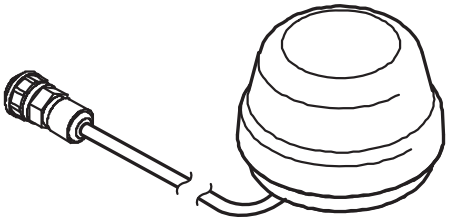


GPS Receiver

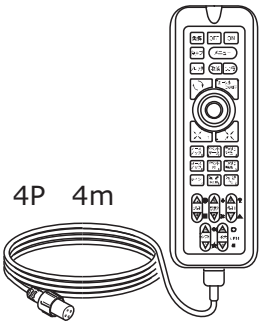
GP-16H



GP-17H/17HD
*GP-17HD(heading sensor included)

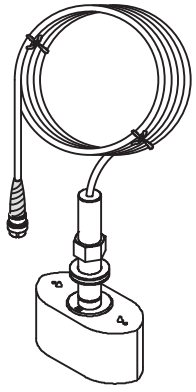


Remote (CR04)
for HDX-121

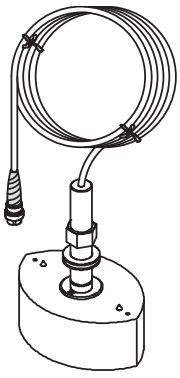


Transducer

TD47T (5P 12m)
50&200kHz 1kW



TD67T (5P 12m)
50&200kHz 1.8kW

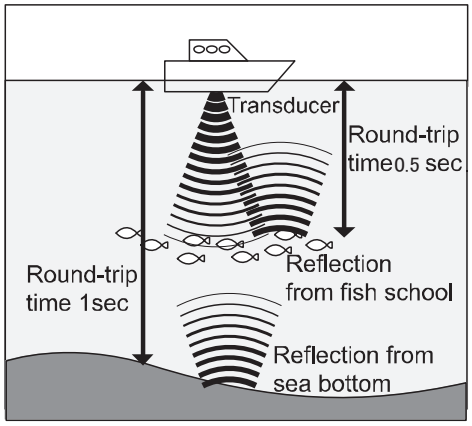


THEORY OF ECHO SOUNDER

1. Theory of Echo Sounder

●Theory of echo sounder is same as echo among hills.

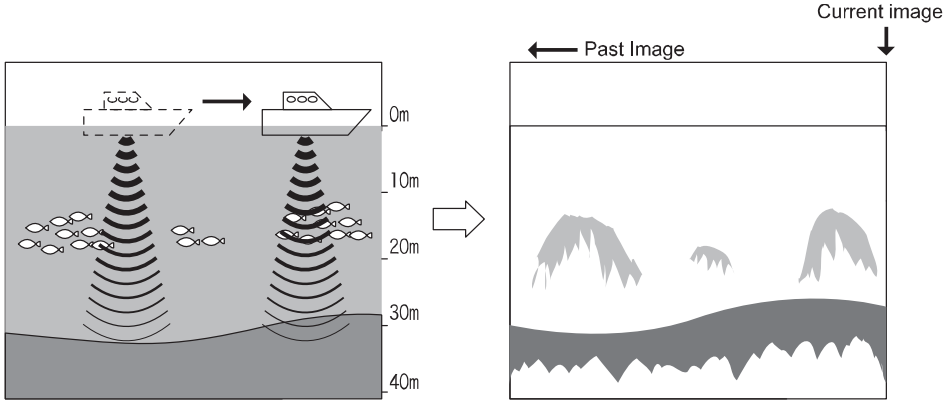
Ultrasonic wave transmitted from the transducer directly beneath the vessel is reflected at the sea bottom and received by transducer.
Echo sounder indicates the depth by calculating the round-trip time to distance.
Also, the unit shows the color image of fish school size/density or sea floor condition according to the strength of reflected wave.
Ultrasonic wave runs at 1500m/sec inside the water. Therefore, the depth to fish school and sea bottom can be captured by calculating the round-trip time.



e.g.) 1sec is round-trip time from sea bottom.
Round-trip distance = 1500m/sec x 1sec
= 1500m
The depth is half the size, so
Depth = 1500m÷2
= 750m
0.5sec is round-trip time from fish school
Round-trip distance = 1500m/sec x 0.5sec
= 750m
The depth is half the size, so
Depth = 750m÷2
= 375m

●Display Method

Current image is shown at 1st line of right edge after processing the reflected wave of transmitted ultrasonic. The line image previously located at the right edge moves to one line to the left.
Keep executing this operation to create the cross section view.
Therefore, the latest image beneath the vessel is located at the right edge. More left side the image moves, more past image the screen shows.
You can assume that echo sounder screen shows the image from the side view.
The sea floor shape can be only captured when sailing the vessel. No matter how the bottom is shaped, the image shows the flat bottom if the vessel is stopped.



Caution : There is no relationship between vessel speed and image line speed.

2. Distinguish of Fish School

●Important tip is comparison between fish school image and actual fish.

Possible to judge the fish type to some extent from the image of fish school. The shape of fish school changes even for same fish group by time (day/night, season, current change).

The important tip is to distinguish the fish type image and actual catch and look for the point.

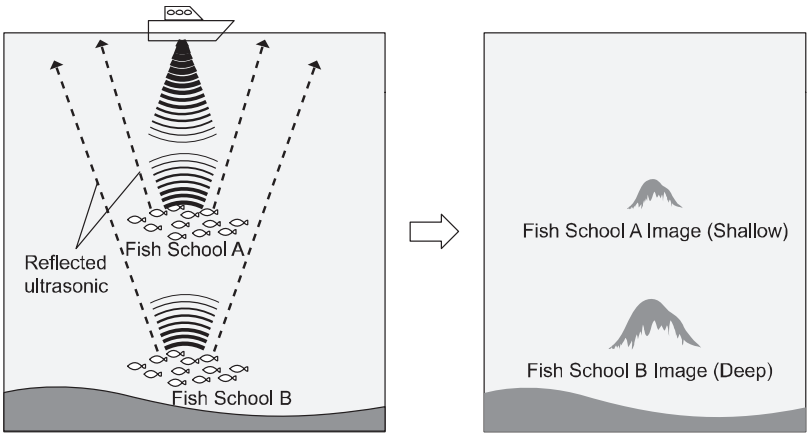
3. Distinguish of Fish Quantity

●Distinguish fish quantity from density/size of fish school.

Higher density of fish school has stronger reflected wave. Therefore, the fish density can be seen from the color strength of image.

It is wrong that fish quantity is large for large image on the screen. Fish school located deeper area tends to appear bigger compared to the one at shallow water. This is because the width of transmitted wave becomes wider as it go deeper. The reflected ultrasonic wave becomes bigger as the distance (depth) gets further. The important tip to distinguish the fish quantity is to know fish school located at deeper water appears bigger.

Judge from size of fish school and color strength.



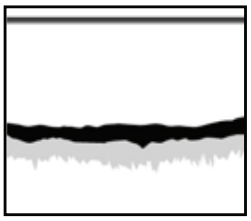
4. Distinguish of Sea Floor Condition

●There are many types of sea floor conditions such as rocky, sandy, or muddy.

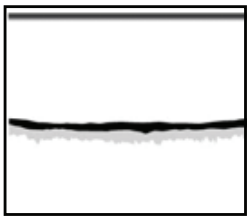
The condition can be judged by the upper/lower width of sea floor image and 2nd echo. The reflection is stronger for hard bottom such as rocky area. The image width is thicker, and 2nd echo tends to appear.

On the other hand, the reflection is weaker for soft bottom such as sandy and muddy area. The image width is thinner, and it's harder to have 2nd echo.

<Rocky Area>



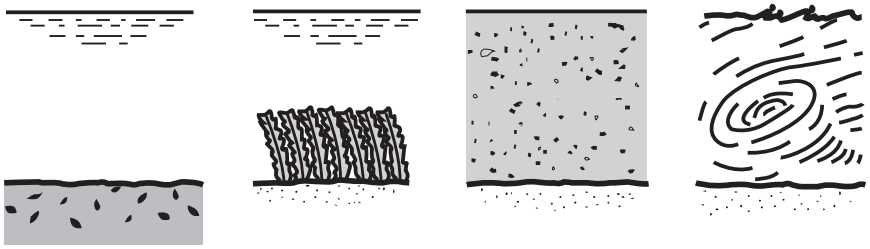
<Sandy or Muddy Area>



TROUBLE SHOOTING

●When the unit has any problems, please check the following points before returning the unit for repair.

Symptom	Cause	Remedy
Power cannot be turned ON.	Voltage of battery is lower than standard value (11V).	Recharge the battery.
	Contact of power connector is poor.	Retighten it. Remove and clean the rust/dust. Replace it in the case of corrosion. ・ Replace the power cable. ・ Replace the connector on the unit.
	Wrong connection of power. Opposite polarity + - .	Check the polarity and connect it properly.
	Cut the wire inside power cable.	Exchange to new power cable.
	Blown fuse.	Send it for repair.
No display on screen.	Brightness is set to minimum level.	Adjust the brightness. (Refer to [SCREEN BRIGHTNESS] → page18.)
Latitude/longitude of own vessel are not indicated.	Data from satellite cannot be received well.	Check GPS antenna and cable.
	Data is not sent from GPS receiver. (In case of using external GPS receiver)	Check setting of data output (GGA) from GPS receiver.
	Numbers of received satellite is less (0〜3)	Wait for a while. (Approx. 5〜30 minutes)
Display cannot be moved.	Cursor is shown on the screen.	Erase the cursor. (Refer to [CURSOR]→page 23)
Just above on display and north of map are swerved.	Course-up function is set.	In case you want to set just above on display to north, set North-Up function. (Refer to [DISPLAY DIRECTION]→page 26)
Automatic Course Up function is not available.	Setting method is wrong.	After setting Automatic Course Up function is set, press [COURSE UP] key.(Refer to [DISPLAY DIRECTION]→page 23)
Waypoint navigation cannot be set.	Latitude/longitude of own boat are not indicated.	Set after latitude/longitude are indicated.
	Waypoint is not set.	Set the waypoint.(Refer to [ADVANCE WAYPOINT / RETURN WAYPOINT]→page56)
Route navigation cannot be set.	Latitude/longitude of own boat are not indicated.	Set after latitude/longitude are indicated.
	Route is not set.	Set the route. (Refer to [SAVE (ERASE) ROUTE]→page54)

<table>
<tr><th>Symptom</th><th>Cause</th><th>Remedy</th></tr>
<tr><td rowspan="5">Bottom or fish cannot be displayed at all.</td><td>Contact problem with transducer connector.</td><td>Retighten the connection.
Remove/clean the rust/dust.
Replace it in the case of corrosion.
・ Exchange transducer.
・ Send it for repair.</td></tr>
<tr><td colspan="2">＜Problem with Transducer＞
Check followings and replace it in the case of actual problems.
1. It's normal if you hear the sound like "Bo Bo" from the surface of transducer.
2. It's normal if rain like dots appears on the transducer surface after setting the sensitivity and depth to the max and rubbing the transducer surface.</td></tr>
<tr><td>Transducer is not immersed enough into the water.</td><td>Adjust the transducer installation so that it is always beneath water surface.</td></tr>
<tr><td>Internal liquid is not enough inside the case.</td><td>Add enough liquid to immerse the transducer.</td></tr>
<tr><td rowspan="3">Image does not appear sometimes.</td><td>Transducer is not immersed enough into the water.</td><td>Adjust the transducer installation so that it is always beneath water surface.</td></tr>
<tr><td>Problem with the transducer installation causes the image problem due to air bubbles at speeding the vessel.</td><td>Check the installation of transducer.</td></tr>
<tr><td>Influence from other vessel causing air bubbles.</td><td>Move to other location or wait until air bubble disappears.</td></tr>
<tr><td rowspan="4">Bottom or fish school is not displayed well.</td><td>Too low sensitivity.</td><td>Increase the sensitivity.
Or, set to auto gain (auto sensitivity control).</td></tr>
<tr><td>Rubbish and weed attached on the transducer surface.
Dirty bottom or liquid.</td><td>Remove the excrescence.
Remove the dirt from bottom and exchange the liquid.</td></tr>
<tr><td colspan="2">Water and environmental conditions may cause the problem with image which is not problem at all.
 
Too much sludge　Lots of weeds　Muddy and dirty locations　Rapid current</td></tr>
<tr><td>Too high clutter.</td><td>Activate low reflection color.
Refer to [CLUTTER]→page 94.</td></tr>
</table>

Symptom	Cause	Remedy
Too much noise.	Too high sensitivity.	Lower the sensitivity. Set to auto gain (auto gain control)
	Interference with other vessel's echo sounder.	Noise disappears after other vessel moves far away.
	Noise from engine.	Change the routing of cables such as transducer and power cables. (keep distance from the engine as far as possible.)

SPECIFICATIONS

Display		HDX-121	HDX-121-BB
	Display	12.1" TFT Color LCD	N / A
	Display Style	Portrait	
	Number of Pixel	800 × 600	N / A
	Operating Voltage	DC11V～35V	
	Dimension of Main Unit(mm)	242(H)×358(W)×146(D)	89(H)×268(W)×238.5(D)
	Weight of Main Unit	Approx. 3.5kg	Approx. 1.65kg
Plotter	Chart Presentation	Mercator Projection	
	Track Display Memory Interval (Time)	1sec , 5sec , 10sec , 20sec , 30sec , 1min , 2min , 5min , 10min , 20min	
	Track Display Memory Interval (Distance)	0.01 , 0.02 , 0.05 , 0.1 , 0.2 , 0.5 , 1 , 2NM（km）	
	Color of Track Line	7 colors（Red, Yellow, Green, Magenta, White, Light Blue, Blue）	
	Track Display Memory Capacity	64,000 points	
	Waypoint Memory	2,000 points	
	Event Mark Memory	48,000 points	
	Route Memory	40 routes	
	Land Full Paint	○	
	Map Turning	○	
	L/L Present Position	○	
	L/L Cursor	○	
	Boat Speed & Direction	○	
	Distance & Bearing to Waypoint.	○	
	Distance & Bearing to Cursor	○	
	Map Data	C-Map SD Card NT+, MAX	

Echo Sounder	Frequency （KHz）	50&200
	Output Power （W）	1kW / 1.8kW
	Depth Range	0~1500m
	Auto Range	OFF / Range / Shift
	Auto Gain	OFF / Low / High
	A-Mode	OFF / ON
	Fish Alarm	OFF / S / L
	Water Temp Alarm	OFF / In Range / Out of Range
	Depth Alarm	OFF / In Range / Out of Range
	Expansion Mode	OFF / Bottom Lock / Automatic Expansion / Manual
	Expansion Rate	x 2 / x 4 / x 8
	Sweep Speed	8 levels（OFF , 1 , 2 , 3 , 4 , S , x2 , x3）
	Background Color	4 Colors (Black, Blue, White, Dark Blue)
	Color Configuration	5 Patterns
	Depth Unit	Meter / Feet / Fathom / Brazas
	Scale Line	OFF/ON
	Super Range	OFF/ON
	STC	OFF / L / M / H
	Output Power	OFF / LOW / HIGH
	Pulse Length	S / STD / L

HONDEX™

by HONDA ELECTRONICS

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