FURUNO

OPERATOR'S MANUAL

FISH SPECIES AND BIOMASS SOUNDER

Model **FSS-3BB**

(Product Name: FISH FINDER)

FURUNO ELECTRIC CO., LTD.

www.furuno.com

FURUNO ELECTRIC CO., LTD.

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・FURUNO Authorized Distributor/Dealer

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IMPORTANT NOTICES

General

- This manual has been authored with simplified grammar, to meet the needs of international users.
- The operator of this equipment must read and follow the instructions in this manual. Wrong operation or maintenance can void the warranty or cause injury.
- Do not copy any part of this manual without written permission from FURUNO.
- If this manual is lost or worn, contact your dealer about replacement.
- The contents of this manual and the equipment specifications can change without notice.
- The example screens (or illustrations) shown in this manual can be different from the screens you see on your display. The screens you see depend on your system configuration and equipment settings.
- Save this manual for future reference.
- Any modification of the equipment (including software) by persons not authorized by FURUNO will void the warranty.
- The following concern acts as our importer in Europe, as defined in DECISION No 768/2008/EC.
  - Name: FURUNO EUROPE B.V.
  - Address: Rotterdamseweg 30A, 2921 AP, Krimpen aan den IJssel, The Netherlands
- The following concern acts as our importer in UK, as defined in SI 2016/1025 as amended SI 2019/470.
  - Name: FURUNO (UK) LTD.
  - Address: West Building Penner Road Havant Hampshire PO9 1QY, U.K.
- Windows is a trademark of the Microsoft group of companies.
- All brand, product names, trademarks, registered trademarks, and service marks belong to their respective holders.

How to discard this product

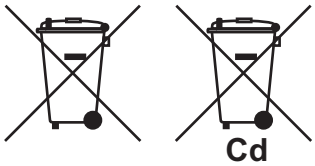
Discard this product according to local regulations for the disposal of industrial waste. For disposal in the USA, see the homepage of the Electronics Industries Alliance (http://www.eiae.org/) for the correct method of disposal.

How to discard a used battery

Some FURUNO products have a battery(ies). To see if your product has a battery, see the chapter on Maintenance. If a battery is used, tape the + and - terminals of the battery before disposal to prevent fire, heat generation caused by short circuit.

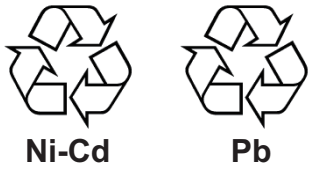
In the European Union

The crossed-out trash can symbol indicates that all types of batteries must not be discarded in standard trash, or at a trash site. Take the used batteries to a battery collection site according to your national legislation and the Batteries Directive 2006/66/EU.



In the USA

The Mobius loop symbol (three chasing arrows) indicates that Ni-Cd and lead-acid rechargeable batteries must be recycled. Take the used batteries to a battery collection site according to local laws.



In the other countries

There are no international standards for the battery recycle symbol. The number of symbols can increase when the other countries make their own recycle symbols in the future.

SAFETY INSTRUCTIONS

Follow the safety instructions listed below and throughout this manual to prevent damage to your equipment or vessel and to prevent harm to the operator or other personnel on-board. The results of failing to follow the instructions and guidelines outlined herein are listed below.

WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

Warning, Caution Prohibitive Action Mandatory Action

WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment.
Only a qualified technician is permitted to work inside the equipment.

Immediately turn off the power at the switchboard if something is dropped into the equipment.

Continued use of the equipment can cause fire or electrical shock.

Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent or dealer for service.

Immediately turn off the power at the switchboard if the equipment shows any abnormality.

If a unit exhibits any sign of abnormal heat or sound, turn the power off at the switchboard and consult a FURUNO agent or dealer.

Use only the specified power and signal cable.

Fire or damage to the equipment can result if a different cable is used.

WARNING

Use the proper fuse.

Use of an incorrect fuse can damage the equipment and can cause fire.

Do not put containers with liquids on the top of the equipment.

Fire, electrical shock or injury can result.

Keep the equipment away from rain and water splash.

Fire, electrical shock or injury can result if water leaks into the equipment.

Do not disassemble or modify the equipment.

Fire, electrical shock or injury can result.

Do not operate the equipment with wet hands.

Electrical shock can result.

Do not steer vessel using the depth data alone.

Grounding and serious injury may result.

⚠ CAUTION

Do not use depth information for navigation while the picture advance speed is set to "stop".

The depth indication is not refreshed while the picture is stopped. Use of depth data for navigation in this case could lead to grounding or other dangerous situation.

Do not transmit with the transducer out of water.

The transducer will be damaged.

Keep the following points in mind regarding cables.

- Keep the cables away from lubricants and fuels.
- Avoid areas where the cable may be damaged.
- Do not paint the cables.
  Solvents such as toluene, contained in paints, can damage the cable's protective covering.
- Do not cut the cables.
  The cables may be damaged or become corroded.
- Do not carry the equipment by its cables.
  The cables may be damaged or become disconnected.

⚠ CAUTION

Adjust the gain properly.

Too little gain may present no picture. Too much gain shows excessive noise on the picture.

Keep the bottom echo and depth indication shown stably.

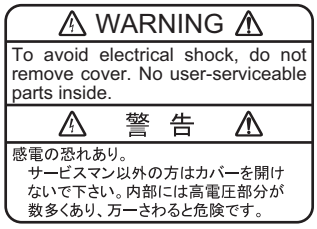
Unstable bottom echo and depth indication can result in grounding if the vessel is steered according to the depth information shown on the display. If unstable, adjust the setting of [Bottom Level] or [TX Power].

Do not connect/disconnect the cables from a unit while the unit is powered.

The unit may be damaged.

Warning Label

A warning label is attached to the Processor Unit and Transceiver Unit. Do not remove either label. If a label is missing or illegible, contact your local dealer about replacement.



Name: Warning Label (1)
Type: 86-003-1011-3

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FOREWORD

A Word to the Owner of the FSS-3BB

Congratulations on your choice of the FSS-3BB Fish Finder and Fish Species and Biomass Sounder. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

Since 1948, FURUNO Electric Company has enjoyed a high reputation for innovative and dependable marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

Your equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless properly installed and maintained. Please carefully read and follow the operation and maintenance procedures set forth in this manual.

We would appreciate feedback from you, the end-user, about whether we are achieving our goal.

Thank you for considering and purchasing FURUNO.

Features

The FSS-3BB is a dual frequency color fish finder, comprised of a Trackball Control Unit, Processor Unit, Transceiver Unit, and Transducer (optional or local supply). The FSS-3BB shows underwater conditions on a monitor (local supply).

- The IDENTI-FISH™ function distinguishes swim bladder and swim bladder-less fish. Requires IDENTI-FISH™ compatible transducer.
- Fish-size graph allows estimation of fish distribution at a glance.
- Data recording and screenshot function for easy review of past echoes and recordings.
- Scrollback mode allows the user to review past data.
- Gain changes made at the FSS-3BB are applied to all currently displayed screens (high and low frequencies echoes only).
- Recorded data can be saved to an external data storage device.
- Constant and stable display of echoes is achievable with the use of the heave offset function (requires a SATELLITE COMPASS™).
- Geographical location of schools of fish can be output to connected navigational equipment.

Interference reduction measures

If a nearby vessel requests you to reduce interference, do the measure shown below to the equipment in the order shown. (1) Broadband fish finder/sonar, (2) Fish finder/sonar using multiple frequencies, (3) Fish finder/sonar using single frequency.

- Reduce TX power. See page 4-10.

This equipment corresponds to (1) Broadband fish finder.

Cautionary notes regarding external memory devices

- External memory devices that support USB2.0 or USB3.0 can be used with this equipment. The maximum useable USB cable lengths are 5 m for USB2.0 and 3 m for USB3.0. When connecting an external memory device via the trackball control unit, keep the total cable length between the trackball control unit and the device within 5 m.
- Do not use password-locked memory devices.
- Do not remove or disconnect an external memory device while data is being saved or loaded. This can cause data corruption or loss.
- Do not connect or disconnect external memory devices while the FSS-3BB is powered. Turn off the power to the FSS-3BB before connecting or disconnecting an external memory device.
- For external hard drives, drives with a separate, external power supply are recommended.
- For recording echo data (see section 3.2), a device with 500 GB capacity or higher is recommended.
- When recording echo data and saving screenshots, connect the external memory device to the USB port of the Processor Unit. Do not connect external memory devices to the USB port on the Trackball Control Unit.
- Log output can require up to 2.4 GB capacity. Where the external memory device has insufficient capacity, the log is output until the capacity is full. Any log entries after that point are not saved.
- The following external memory devices are known to be compatible with this system:

External Memory Device	Maker	Model	Capacity
USB Flash Memory	Silicon Power	SP016GBUF3B02V1K	16 GB
	San Disk	SDCZ33-016G-J57	16 GB
	Kingston	DT100G3/16GB	16 GB
	Elecom	MF-HMU208GWH	8 GB
USB External Hard Drive	BUFFALO	HD-LD2.0U3-BKA	2 TB

Software used by the FSS-3BB

The FSS-3BB uses the following open source software.

The FreeType 2 library

Portions of this software are copyright© 1996-2016 The FreeType Project (www.freetype.org). All rights reserved.
Refer to the following URL for details on the terms of the software.
https://git.savannah.gnu.org/cgit/freetype/freetype2.git/tree/docs/FTL.TXT

Conventions used in this manual

For the sake of brevity, the procedures in this manual use the following conventions:

Phrase	Meaning
Left-click	Press the **Left button** once.
Double-click	Press the **Left button** two times, in quick succession.
Right-click	Press the **Right button** once.
Scroll	Scroll with the scrollwheel.
Drag and drop	Highlight the item with the cursor, then press and hold the **Left button**. Use the **Trackball** to move, or "drag", the item. Release the **Left button** to "drop" the item.

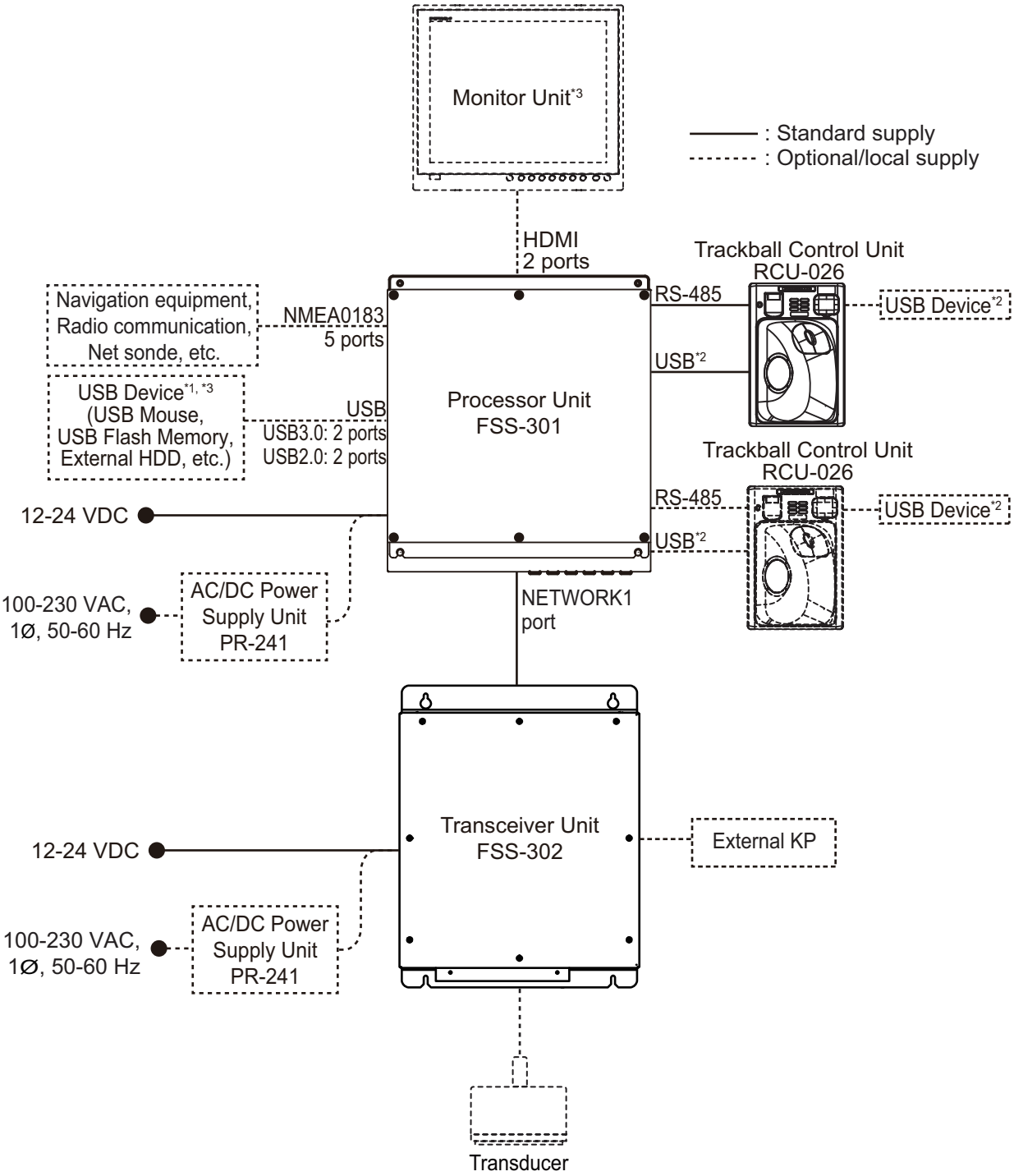
CE/UKCA declaration

With regards to CE/UKCA declarations, please refer to our website (www.furuno.com) for further information about RoHS conformity declarations.

Disclosure of Information about China RoHS

With regards to China RoHS information for our products, please refer to our website (www.furuno.com).

SYSTEM CONFIGURATION

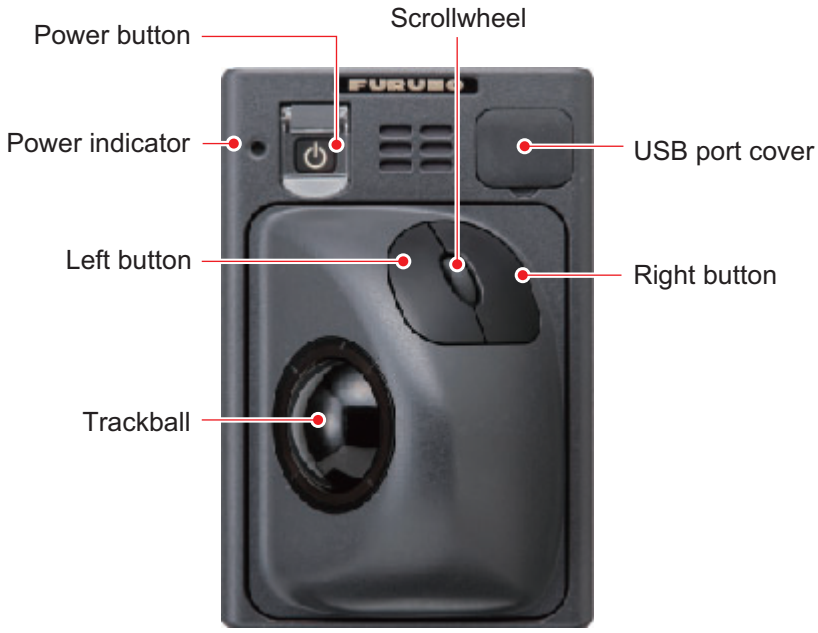


*1: A maximum of four USB devices including RCU-026 can be connected to the processor unit.
*2: To use the USB port on the RCU-026, connect the RCU-026 to the USB port on the processor unit, using the USB cable supplied with the RCU-026. If you do not use the USB port on the RCU-026, the USB connection between the RCU-026 and processor unit is not required.
*3: To extend the distance between the processor unit and the monitor unit/USB device, use the optional DVI/USB repeater.

Note: The sub monitor cannot display the same screen as the main monitor.

1. OPERATION

1.1 Trackball Control Unit



Item	Function, description
Power button (⏻)	Press to turn the power on or off.
Power indicator	Lights green when the power is on.
Trackball	Moves the cursor.
Left button	**Click**: Selects the item highlighted with the cursor. **Double-click:** Inscribes a vertical line (TLL). **Drag & drop:** Moves the selected window, marker line, etc.
Right button	Short press: • Shows/hides the InstantAccess bar™. Long press: • Activates the scrollback mode. • Confirms picture when the scrollback mode is active.
Scrollwheel	**Scroll:** Changes the setting for the selected item. **Short press:** Takes a screenshot (still image). **Long press:** Replays screenshots.
USB port cover	Open to access the USB port, where a USB flash memory can be inserted. When the USB port is not in use, cover the USB port with the port cover. **Note:** Do not use this port to connect external memory devices for data recording or saving screenshots.

1.2 How to Turn the Power On/Off

Open the power button cover on the Trackball Control Unit, then push the power button (⏻). An audible "beep" indicates that the power is now on, then the start-up screen appears. The brilliance of the power indicator on the Trackball Control Unit can be adjusted with [Brightness] in the [Control Unit] menu. See section 4.7.3.

To turn the power off, open the power button cover, then push the power button.

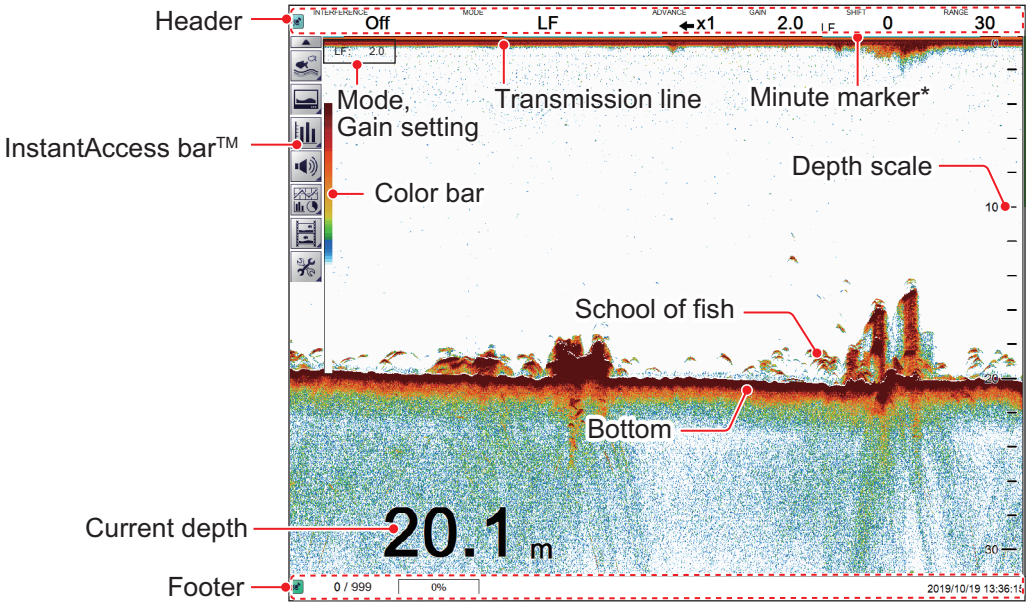
Note 1: Always use the Trackball Control Unit to turn the system on or off. If the system is turned off from a switchboard or by other means, changes made to settings are not saved.

Note 2: The Transceiver Unit uses a small amount of power when it is off. When the system will not be used for a long period of time, turn the system off from the switchboard.

1.3 Fish Finder Display

1.3.1 Display overview

The figure below shows an example of a typical fish finder display. Some indications are not shown in this example, however all functions and indications are covered later in this manual.

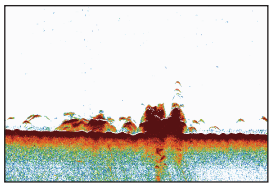


*: Each minute marker “bar ” denotes 30 seconds of time.

Operation with two monitors

The setting of [External IDENTI-FISH Echo Window], which is set at installation, determines what appears on the sub monitor.

- [Off]: The sub monitor shows the FSS-3BB logo. Windows such as graphs can be dragged from the main monitor to the sub monitor, as shown in the figure below.


Main monitor

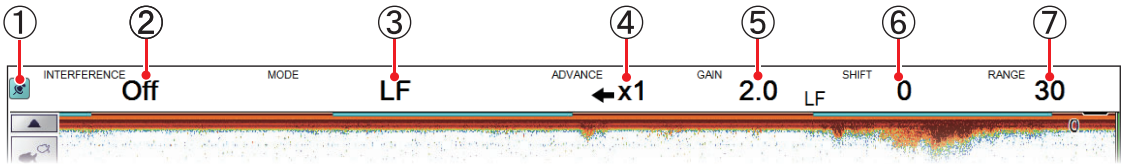
Sub monitor

- [On]: The sub monitor shows the IDENTI-FISH™ echo display. See "IDENTI-FISHecho display" on page 1-11.

Note: The same picture cannot be displayed on the main monitor and the sub monitor.

1.3.2 How to read the header

The header contains various settings and controls, all accessible with the cursor. Select an indication on the header to adjust that function.



No.	Name	Description
1	"Pinned" icon	Selects the "Pinned" icon to "pin" or "unpin" the header. A "pinned" header is always visible at the top of the screen. An "unpinned" header is hidden until the cursor is placed on the header's location. This icon is shown in green color when "pinned".
2	Miscellaneous settings	Select the indication, then scroll to select the desired setting. The functions available from this section of the header are: • Interference rejection. See section 1.10. • Smoothing. See section 1.11. • Clutter. See section 1.12. • Zoom mode. See section 1.13. • Fish size measurement and bottom trace. See section 2.3.5. • Fish size measurement and specific area. See section 2.3.6. • IDENTI-FISH™ graph. See section 2.2.2.
3	[MODE]	Selects the Display mode. See section 1.4 for available modes.
4	[ADVANCE]	Sets the speed at which echoes are scrolled across the screen. See section 1.6.
5	[GAIN]	Sets the transducer sensitivity level. See section 1.7.
6	[SHIFT]	Shifts the displayed area. See section 1.8.
7	[RANGE]	Changes the displayed range. See section 1.9.

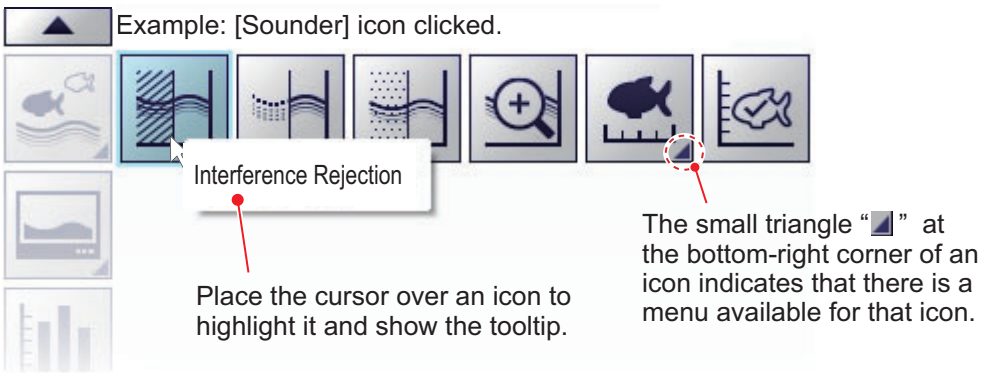
1.3.3 How to read the footer

The footer displays the date and time, how many screenshots are saved, and the amount of space available in the external memory.

No.	Name	Description
1	"Pinned" icon	The footer can be "pinned" or "unpinned". A "pinned" footer is always visible at the bottom of the screen. An "unpinned" footer is hidden until the cursor is placed on the footer's location. This icon is shown in green color when "pinned".
2	Internal memory screenshot counter	Shows the number of screenshots stored in the internal memory and the total capacity available. For example, if the indication reads "9/999", this means that nine screenshots are saved and the total capacity is 999 images.
3	External memory capacity	Shows the available capacity on the external memory device. When no device is connected, the indication is "0%".
4	Current date and time	The current date and time.

1.3.4 How to use the InstantAccess bar™

The InstantAccess bar™ is the vertical bar at the left edge of the screen. The bar contains the menus for functions and features, all in one compact icon-based format. You can show the InstantAccess bar™ by clicking ( ); hide it by clicking ( ). Another method to show/hide the InstantAccess bar™ is to place the cursor on a non-interactive section of the display, then right-click.



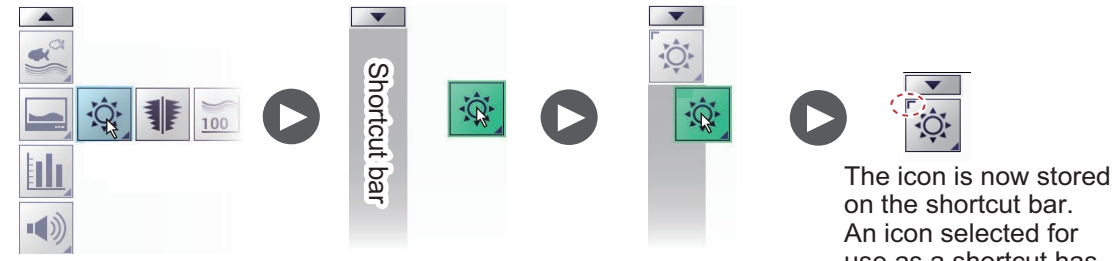
How to create and remove shortcuts

Most icons displayed on the InstantAccess bar™ can be stored as shortcuts (on the shortcut bar) and displayed always. Shortcuts are useful for accessing frequently used functions. Up to ten icons can be assigned to the shortcut bar. The shortcuts are displayed only when the InstantAccess bar™ is hidden.

To create a shortcut, drag and drop the desired icon into the shortcut area.

Note 1: The icons [Internal Settings 1]( ) - [Internal Settings 8]( ) (see section 1.27) cannot be stored as shortcuts.

Note 2: You can cancel a drop and drag operation in progress by right-clicking.



Display the icon you want to store, highlight it with the cursor, then press and hold the left button.

Drag the icon away from the menu with the trackball. The shortcut bar appears.

Drag and drop the icon to the shortcut bar.

The icon is now stored on the shortcut bar. An icon selected for use as a shortcut has an “arrow” at its top-left corner, as shown above.

To remove an icon from the shortcut bar, drag the icon out of the shortcut bar area.

1.3.5 InstantAccess bar™ icons list

The table below shows all the InstantAccess bar™ menus, their respective menu items and available options, along with a brief description. For full details on each menu and menu items, see the respective sections of the manual.

Icon		Description/Options
Menu	**Item**	
	[Sounder] menu icon. Accesses the sounder-related settings.	
		[Interference Rejection] icon. Accesses the [Interference Rejection] function. See section 1.10.
		[Smoothing] icon. Accesses the [Smoothing] function. See section 1.11.
		[Clutter] icon. Accesses the [Clutter] (low level noise reduction) function. See section 1.12.
		[Zoom Mode] icon. Accesses the [Zoom] functions. See section 1.13.
		[Measure Fish Size] icon. Accesses the fish measurement area settings. See section 2.3.2. The available settings are: Measures fish over the entire display. See section 2.3.3. Measures fish within a specified depth range. See section 2.3.4. Measures fish that appear near the seabed. See section 2.3.5. Measures fish within a specified area on the display. See section 2.3.6.
		[IDENTI-FISH] icon. Shows the IDENTI-FISH™ graph. See section 2.2.
	[Display] menu icon. Accesses the display-related settings.	
		[Window Color] menu. Changes the display colors to suit day or night viewing. See section 1.14. The available options are: Sets the display colors for Daytime viewing. Sets the display colors for Nighttime viewing.
		[A-Scope] icon. Shows/hides the A-scope. See section 1.15.
		[Depth] icon. Shows/hides the depth indication. See section 1.16.

Icon		Description/Options
Menu	**Item**	
		[Depth Scale] icon. Shows/hides the depth scale. See section 1.17.
		[VRM] icon. Shows/hides the VRM, which measures the distance to objects (school of fish, etc.). See section 1.18.
		[Minute Marker] icon. Shows/hides the minute marker. See section 1.19.
		[Color Bar] icon. Shows/hides the color bar. See section 1.20.
	[Graph] menu icon. Accesses the graph functions. See chapter 2.	
		[Fish Size Graph] icon. Activates/deactivates the fish size graph and fish size measurement functions. See section 2.3.
		[IDENTI-FISH Graph] icon. Activates/deactivates the IDENTI-FISH™ graph. See section 2.2.
		[Sonde Graph] icon. Activates/deactivates the sonde graph. See section 2.4.
		[Temp Graph] icon. Activates/deactivates the water temperature graph. See section 2.5.
	[Alarm] menu icon. Activates/deactivates alarms. See section 1.21.	
		[Bottom Alarm] icon. Activates/deactivates the bottom (seabed) alarm.
		[Fish Alarm] icon. Activates/deactivates the fish alarm.
		[Bottom Fish Alarm] icon. Activates/deactivates the fish alarm for fish near the seabed.
		[Water Temperature Alarm] icon. Activates/deactivates the water temperature alarm.
		[Fish Size Graph Alarm] icon. Activates/deactivates the fish size graph alarm.
		[IDENTI-FISH Alarm] icon. Activates/deactivates the IDENTI-FISH™ graph alarm.

Icon		Description/Options
Menu	**Item**	
	[Data Display] menu icon. Accesses navigation data fed from external sources. See section 1.22.	
		[Own Ship Position] icon. Shows/hides own ship latitude and longitude.
		[Time and Date] icon. Shows/hides the time and date.
		[Speed(SOG)] icon. Shows/hides your vessel's speed over the ground.
		[Speed(STW)] icon. Shows/hides your vessel's speed through the water.
		[Temperature] icon. Shows/hides the water temperature.
	[Echo Recording] menu icon. Accesses the echo recording and screenshot functions.	
		[Record] icon. Starts recording echo data. See section 3.2.1.
		[Play] icon. Plays back echo data. See section 3.2.2.
		[Pause] icon. Pauses the echo data playback. See section 3.2.2.
		[Stop] icon. • Stops echo data recording. See section 3.2.1. • Stops echo data playback. See section 3.2.2.
		[Multi-Screenshot Start/Stop] icon. Takes multiple screenshots. See section 3.1.3.

Icon		Description/Options
Menu	**Item**	
	[Advanced Settings] menu icon. Accesses the advanced settings menu; changes various settings for the FSS-3BB, and performs undo and redo actions.	
		[Internal Settings] menu. Saves/loads data to/from the Processor Unit's internal memory. See section 1.27. [Save Settings] icon: Saves current settings to media set to the Processor Unit.* [Load Settings] icon: Loads settings from the media set to the Processor Unit. *Eight sets of settings (~)
		[External Settings] menu. Saves/loads data to/from an external memory device. See section 1.27. [Save External Unit Settings] icon: Saves current settings to an external memory device. [Load External Unit Settings] icon: Loads settings from an external memory device.
		[Advanced Settings] icon. Accesses the [Advanced Settings] menu. See section 1.5.
		[Undo] icon. "Undo" the last operation. See section 1.28.
		[Redo] icon. "Redo" the last operation. See section 1.28.
		[Select External Memory Media] icon. Selects where to save data on an external memory device. See section 3.3. **Note:** Appears only in case of multiple memory devices.

1.4 How to Change the Display Mode

The FSS-3BB has several display modes, some of which can be displayed in a split screen.

1.4.1 How to change the display mode

1. If the header is not displayed, put the cursor at the top edge of the display to show it.
2. Select the [MODE] indication on the header. The indication is now highlighted in a green color.

[MODE] indication

3. Scroll to show the desired mode. The available modes depend on the [Mode] menu settings in the [System] menu. See section 4.7.7.
   The table below lists all the possible modes with their abbreviation (as displayed on-screen) along with the meaning.

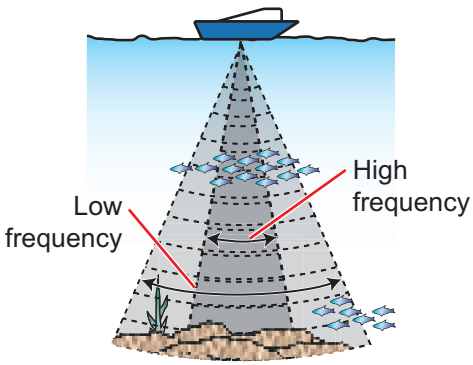
Abbreviation	Meaning
[LF]	Low frequency picture*. See below.
[HF]	High frequency picture*. See below.
[BL]	Bottom Lock mode. See section 1.13.1
[BZ]	Bottom Zoom mode. See section 1.13.2.
[MZ]	Marker Zoom mode. See section 1.13.3.
[BD]	Bottom Discrimination mode. See section 1.13.4.
[ID]	IDENTI-FISH™ mode. See "IDENTI-FISHecho display" on page 1-11.

* Normal echo display

Note: If the [ID] display is selected and the transducer is not IDENTI-FISH™ compatible, the message "The connected transducer is not compatible with IDENTI-FISH™ Echo. IDENTI-FISH™ echo display is not available." appears.

Low and high frequency displays

Low frequency: The sounder uses ultrasonic signals to detect bottom conditions. The lower the frequency of the signal, the wider the detection area. Therefore, the 50 kHz frequency is useful for general detection and judging bottom condition.
High frequency: The higher the frequency of the ultrasonic signal, the better the resolution. For this reason the 200 kHz frequency is ideal for detailed observation of schools of fish.

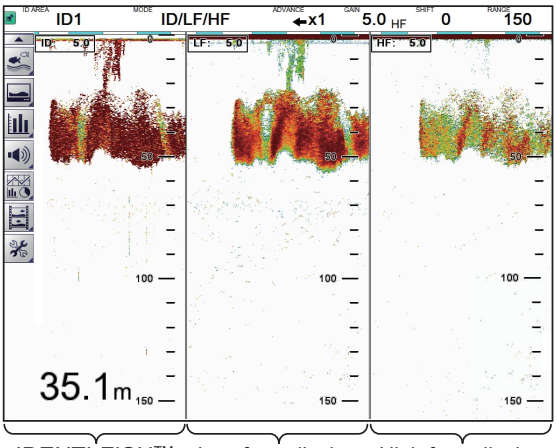


Coverage area

Freq.	Beam width	Resolution	Detection range	Seabed tail length
Low	Wide	Low	Deep	Long
High	Narrow	High	Shallow	Short

IDENTI-FISH™ echo display

With connection of an IDENTI-FISH™ compatible transducer, you can distinguish between swim bladder fish and swim-bladderless fish on the IDENTI-FISH™ echo display. The echo displayed in reddish-brown has a swim bladder (herring), and the echo displayed in light-blue-to-blue does not have a swim bladder (mackerel). The combination of the IDENTI-FISH™ graph (see section 2.2) and the IDENTI-FISH™ echo display is useful for distinguishing fish species.



Note: The setting of [External IDENTI-FISH Echo Window], which is set during installation of the system, enables or disables display of the IDENTI-FISH™ echo display on a sub monitor. See your dealer for details.

IDENTI-FISH™ usage notices:

- This function requires an IDENTI-FISH™ compatible transducer. See the Installation Manual (IME-23930) for a list of compatible transducers.
- When the IDENTI-FISH™ feature is active, the following menu items are automatically set as indicated in the table below.

Menu item	Setting
[TX/RX] menu ([HF] and [LF] menus)	
[TX Power]	• When [TX Mode] is set to [TruEcho CHIRP]?[Auto] • When [TX Mode] is set to [Normal]?[10]
[Auto Chirp]	[Off]
[TX Pulse Edge]	[Off]
[TX Pulse]	[Normal]
[RX Band]	[Normal]
[Range] menu	
[Split Range]	[Off]

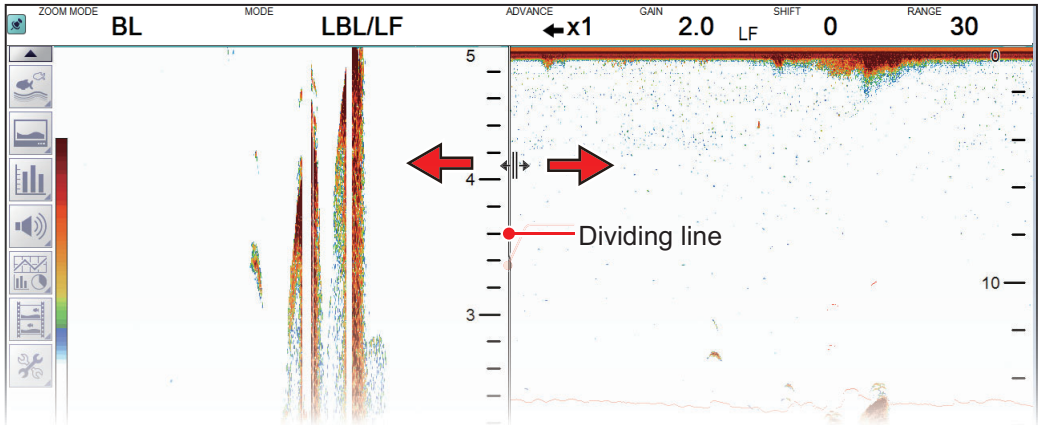
- Depending on fish species, the intensity of the echo from a school of fish varies. If the displayed value differs from the actual value, compensate for the difference following the instructions for "[Offset]" on page 2-12.
- Use the feature at depth between 5 and 200 m (when [TX Mode] is set to [TruEcho CHIRP]) or at depth between 5 and 300 m (when [TX Mode] is set to [Normal]).
- When using the Fish size measurement and the IDENTI-FISH™ function at the same time, [TX Mode] is [TruEcho CHIRP] regardless of the menu setting.

1.4.2 How to adjust the split screen division

You can adjust the size of each division of a split screen to suit your requirements. To adjust the size of a split screen, do the following:

1. Put the cursor on the display dividing line. The cursor shape changes from ( ) to ( ).
2. Drag the dividing line to resize the screens as required.

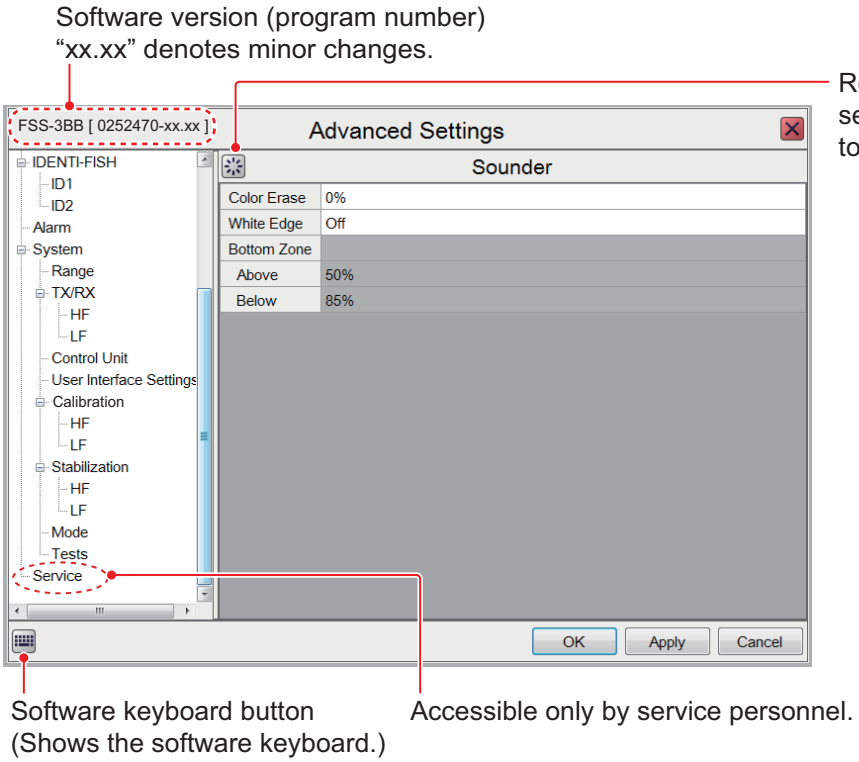
Note: You can cancel a drag operation in progress at any time by right-clicking.



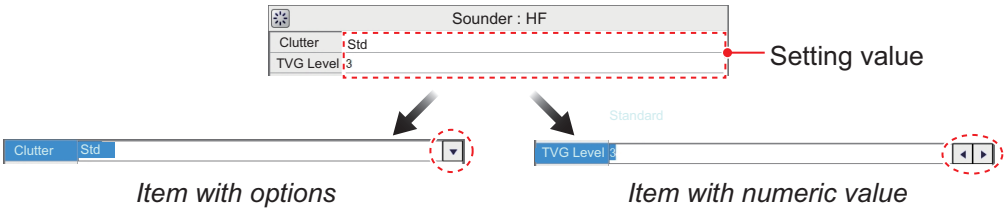
1.5 Advanced Settings Menu

The [Advanced Settings] menu contains less-often used functions for adjustment of the system.

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.



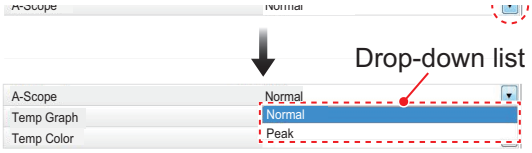
2. Use the trackball to click a menu item in the menu (left window). The selected menu item appears in the right window.
3. Use the trackball to click the setting value of the menu item in the right window. A triangle mark appears at the right edge of the setting value.
   Note: A greyed-out setting value means the corresponding menu item cannot be changed.



4. Change the setting as necessary.

Item with options

1) Click the triangle (▼) to show a drop-down list.

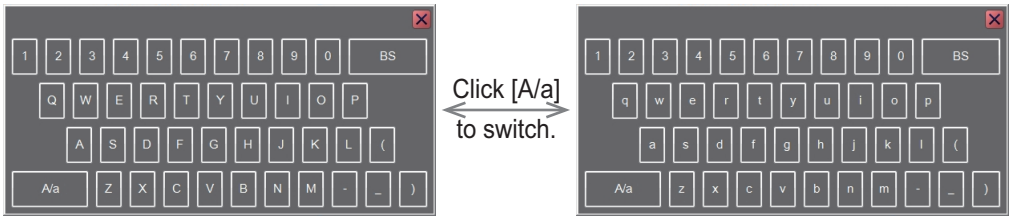


2) Select desired option from the list.

Item with numeric value

Click ◀ or ▶ to change the numeric value. Alternatively, you can use the software keyboard to change a numeric value, as shown in the procedure below.

1) Click the software keyboard button ( ) at the bottom-left corner of the menu screen. The keyboard accepts alphanumeric characters. You can switch between upper and lower case alphabet as shown in the figure below.



Upper case alphabet *Lower case alphabet*

2) Use the trackball to click desired character. You can use the BS key to erase the character to the left of the cursor.

3) To close the software keyboard, click the close button ( ).

5. Confirm settings, then click the [OK] button.

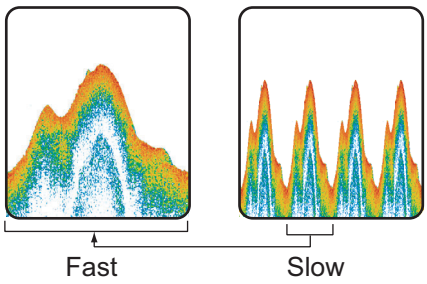
To save settings without closing the menu, click the [Apply] button. To cancel changes, click the [Cancel] button.

1.6 Picture Advance

The picture advance speed determines how quickly the echoes are displayed on-screen. When setting a picture advance speed, keep in mind that a fast advance speed will expand echoes horizontally on the screen and a slow advance speed will contract them. A fast advance speed is useful for observing a rugged seabed closely. A slow advance speed is useful for observing a smooth seabed.

⚠ CAUTION

Neither the picture nor the depth indication is refreshed while the picture is stopped. Use of depth data for navigation in this condition could lead to grounding or other dangerous situation.



To set the picture advance, do as follows:

1. If the header is not displayed, put the cursor at the top edge of the display to show it.
2. Click the [ADVANCE] indication on the header. The indication is now highlighted in a green color.

3. Scroll to select the appropriate advance speed. The table below lists each setting and resulting advance speed.

[ADVANCE] indication	Description
[STOP]	The picture is "paused".
[1/8]	One eighth of the normal speed.
[1/4]	One quarter of the normal speed.
[1/2]	Half the normal speed.
[×1]	Normal speed.
[×2]	Twice as fast as normal speed.
[×4]	Four times as fast as normal speed.

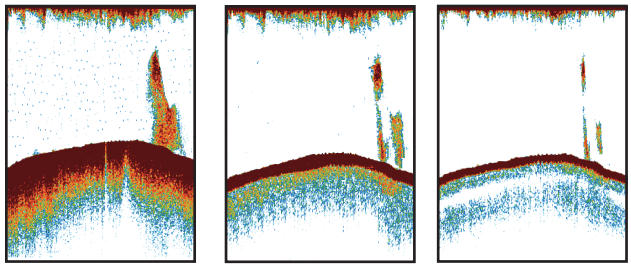
1.7 How to Adjust the Gain

Depending on the signal strength, gain can be adjusted to hide noise and other unnecessary echoes. A high gain setting increases signal strength and can show excessive noise as well as smaller, hard to detect echoes. A low gain setting eliminates noise and gives a clearer picture, however smaller echoes may also be removed.

NOTICE

Adjust the gain properly.

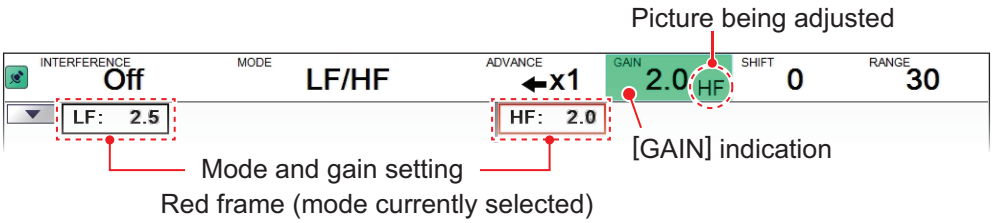
Too little gain may present no picture. Too much gain shows excessive noise on the picture.



Too high | Proper | Too low

To adjust the gain, do as follows:

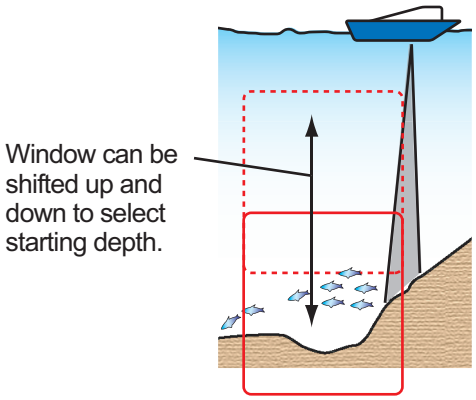
1. If the header is not displayed, put the cursor at the top edge of the display to show it.
2. Click the [GAIN] indication on the header. The indication is now highlighted in a green color.



3. Select one of the following gain adjustment methods.
   - Click the [GAIN] indication again. Each click changes the mode indication in the GAIN header in the sequence of [HF]→ [LF]→[ID]→[HF]... (inactive modes are skipped). For example, the [MODE] indication currently shows [LF/HF]. Then, each click of the [GAIN] indication shows [HF] or [LF] in the [GAIN] indication. Further, the red frame encloses the mode and gain setting indication (top-left corner of each image) of the image currently selected for adjustment.
   - Click the “Mode and gain settings indication” of the image that you want to adjust. The indication clicked is enclosed with the red frame, and the frequency indication in the [GAIN] indication changes accordingly.
4. Scroll to change the gain.
   Scroll downward to increase the gain; upward to decrease the gain. The current gain setting appears in the [GAIN] indication. Adjust it so that a slight amount of noise appears on the screen. In the case of low- and high-frequency echoes, the settings are applied to the past images displayed on the screen. For the IDENTIFISH™ echoes, the setting is applied to the image from the point of adjustment.

1.8 How to Shift the Display Range

When used together, the basic range and range shifting functions allow you to select the depth you can see on the screen. The basic range can be thought of as providing a "window" into the water column and range shifting as moving the "window" to the desired depth.

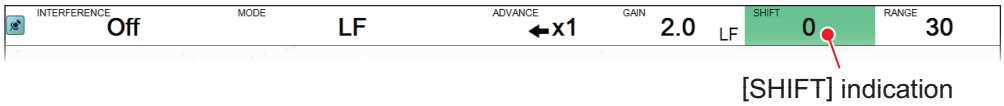


Note 1: This function is not available when auto range or auto shift is active.

Note 2: The seabed echo may be lost if the shift is at a greater value than the seabed depth.

To shift the display range, do as follows:

1. Display the header if it is not "pinned". If the header is displayed, go to step 2.
2. Click the [SHIFT] indication on the header. The indication is now highlighted in a green color.



3. Scroll to change the amount of shift used. The current shift setting appears on the header.

1.9 How to Change the Range

The range setting dictates the on-screen display distance and can be changed to suit your requirements. The system has eight presets, each of which can be changed. The default ranges are listed in the table below.

Unit of measurement	Default ranges							
	1	2	3	4	5	6	7	8
m	10	20	40	80	150	300	500	1000
ft	30	60	100	250	450	900	1500	2500
fa	5	10	20	40	75	150	250	400
Hiro*	6	12	25	50	100	200	300	600
pb	6	12	25	50	90	200	300	450

*: Japanese unit of depth measurement.

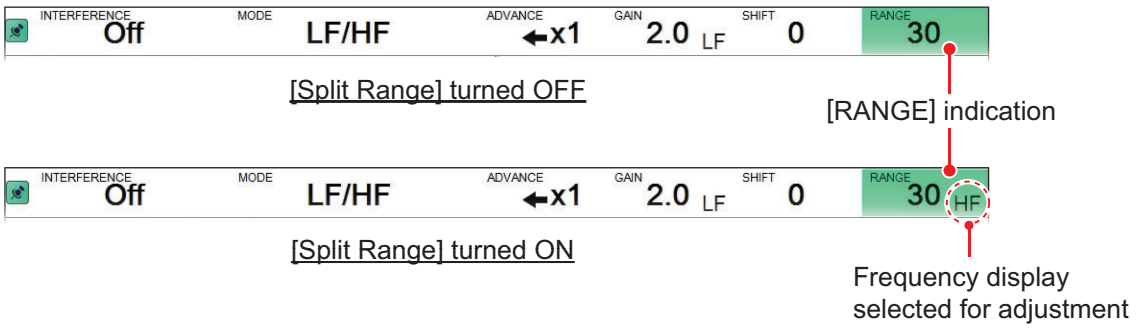
Note 1: You can change the default ranges according to your requirements. See section 4.7.1.

Note 2: The range cannot be changed when auto range selection is active.

Note 3: The [Split Range] function enables independent adjustment of range on the low and high frequencies on the normal echo display. See [Split Range] on page 4-9.

To change the range, do as follows:

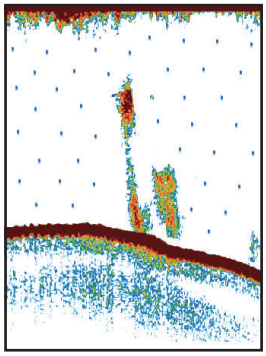
1. If the header is not displayed, put the cursor at the top edge of the display to show it.
2. Click the [RANGE] indication on the header. The indication is now highlighted in a green color.



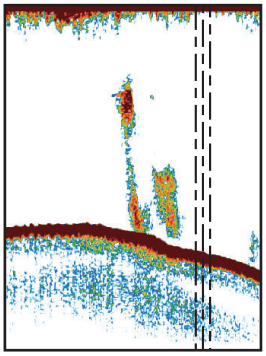
3. If the [Split Range] function is turned on, click the [RANGE] indication to select the frequency for which to adjust its range. Each click shows either [HF] or [LF] in the [RANGE] indication.
4. Scroll to change the range. The display changes automatically with each change in range. Roll downward to increase the range; upward to decrease the range. The [RANGE] indication shows the current range setting.

1.10 How to Reject Interference

Interference from other acoustic equipment operating nearby or other electronic equipment on your boat may show itself on the display as shown in the figure below. When this occurs use the interference rejector.



Interference from other sounder (blue dots)

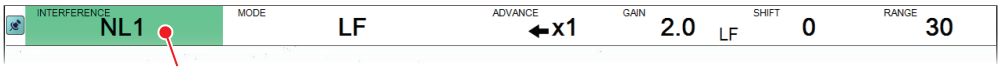


Electrical interference

Note: Set the rejection level with care. A high setting can also remove weak echoes (small targets).

To reject interference, do as follows:

1. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu, then click the [Interference] icon ( ). [INTERFERENCE] appears in the miscellaneous section of the header and is highlighted in a green color.



[INTERFERENCE] indication

2. Scroll to adjust the level of interference rejection, referring to the table below.

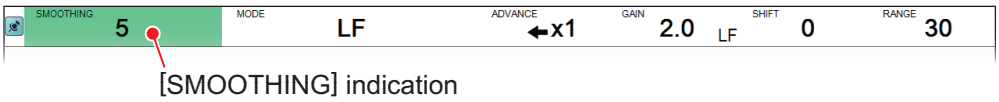
Setting	Description
[Off]	Disables interference rejection.
[NL1]	Lowest level of rejection.
[NL2]	Medium level of rejection.
[NL3]	Highest level of rejection.
[Auto]	Automatically adjusts the level of rejection to suit current conditions.

1.11 How to Use the Smoothing Function

The smoothing function, when activated, "smooths" the echo presentation. This is particularly useful when echoes appear "spotty" or "jagged". Smoothing can also be used to reduce screen flicker at night.

To use the smoothing function, do as follows:

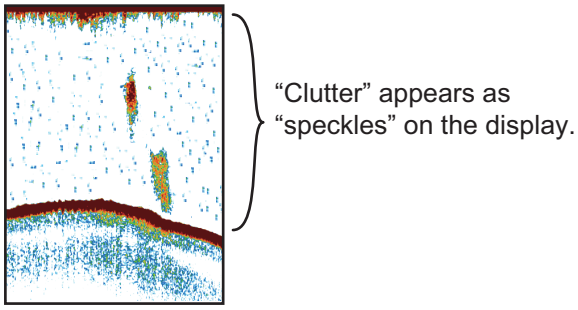
1. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu, then click the [Smoothing] icon ( ). [SMOOTHING] appears in the miscellaneous section of the header and is highlighted in a green color.



2. Scroll to adjust the level of smoothing. A high value increases the amount of smoothing applied to the picture.

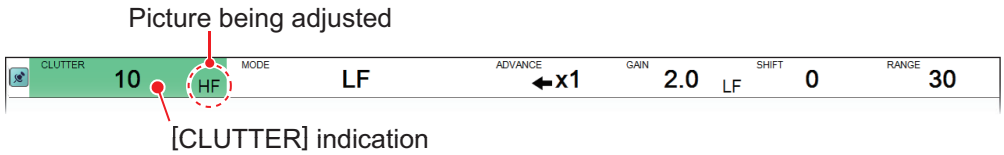
1.12 How to Reject Clutter

Low intensity "speckles" are referred to as clutter, and can appear over most of the screen. Clutter is often caused by sediment in the water or noise. These unwanted echoes can be rejected to clear up the picture.



To reject clutter, do as follows:

1. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu, then click the [Clutter] icon ( ). [CLUTTER] appears in the miscellaneous section of the header and is highlighted in a green color.



2. Click the [CLUTTER] indication. Each click displays either [LF] or [HF] in the [CLUTTER] indication.
3. Scroll to adjust the level of clutter rejection. Scroll downward to increase the level of clutter rejection; upward to decrease the level. The current setting appears in the [CLUTTER] indication. A high value reduces more clutter, but can also remove weak echoes (small targets).

1.13 Zoom Modes

The zoom modes (displays) expand the specified area of the single frequency echo. Four modes are available: bottom lock, bottom zoom, marker zoom, and bottom discrimination. The default mode is bottom lock. Zoom modes can be shown over the entire display, as well as the combination display. See section 4.7.7.

Note: The display modes to use, including single display zoom, can be set from the menu. See section 4.7.7.

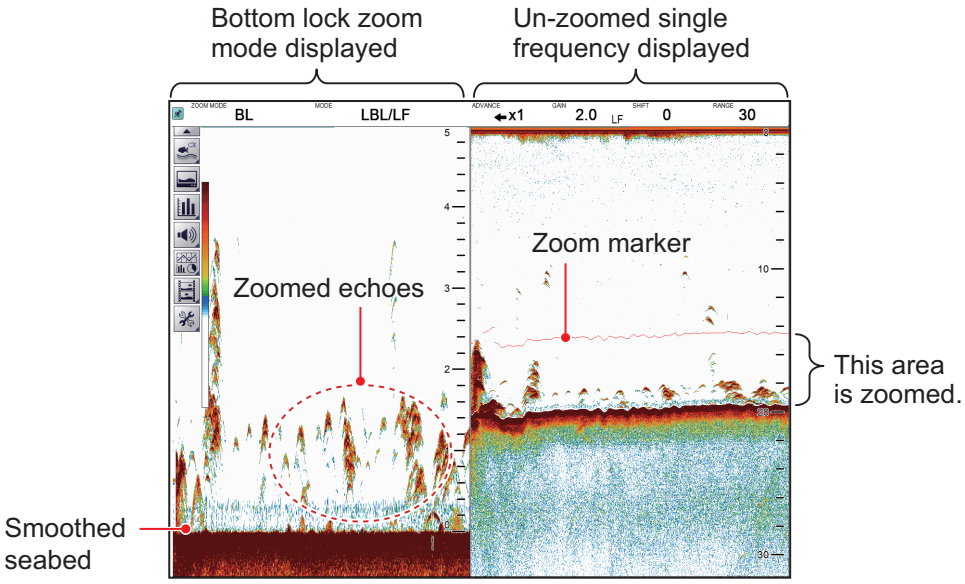
To select a zoom mode, do the following:

1. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu, then click the [Zoom] mode icon ( ). [ZOOM MODE] appears in the miscellaneous section of the header.

2. Scroll to show the desired zoom mode. The four modes are shown in abbreviations.
   - BL: Bottom Lock
   - BZ: Bottom Zoom
   - MZ: Marker Zoom
   - BD: Bottom Discrimination

1.13.1 Bottom lock mode

Bottom lock display provides a normal picture on the right-side of the screen and a magnified picture on the left-side of the screen. The zoomed area shows a smooth seabed, making it easier to detect fish near the seabed.

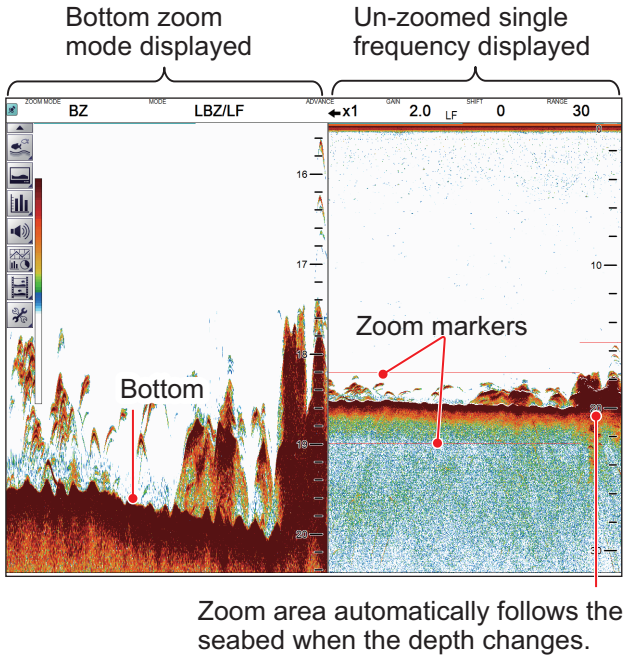


Note 1: The range for the zoom display can be adjusted from the [Range] menu. See section 4.7.1.

Note 2: The zoom marker encloses the zoomed area. The marker can be shown or hidden with [Zoom Marker] in the [Display] menu. See section 4.3.

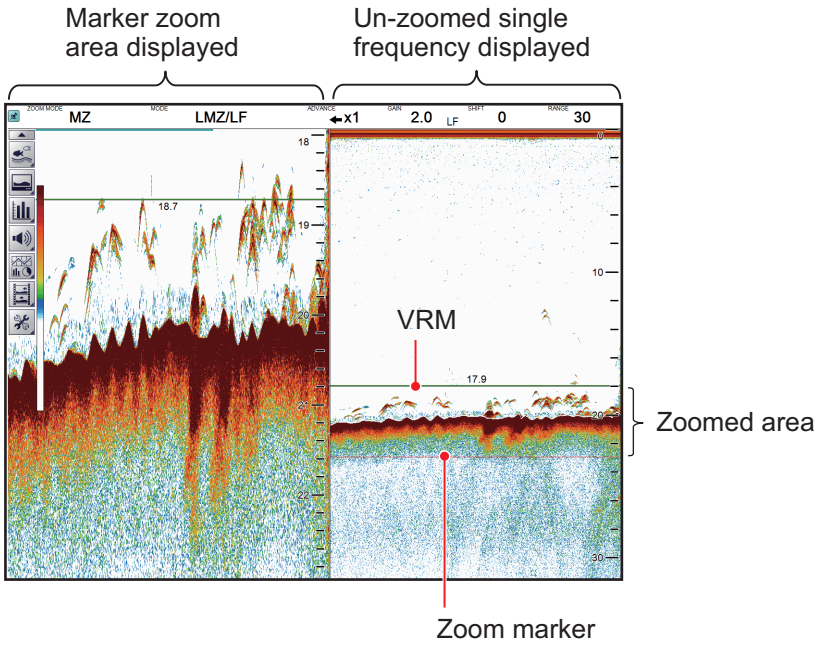
1.13.2 Bottom zoom mode

This mode magnifies the seabed, and also any fish near the seabed, on the left-side of the screen, and is useful for determining seabed contours. When the seabed depth increases, the display automatically shifts to keep the seabed echo at the lower part of the screen.



1.13.3 Marker zoom mode

The marker zoom mode magnifies the specified area of the normal picture to full vertical size of the screen on the left-side of the screen. You may specify the portion to expand by operating the VRM (Variable Range Marker). The area between the VRM and zoom marker is expanded. This mode is useful for determining the size of fish in the midwater.

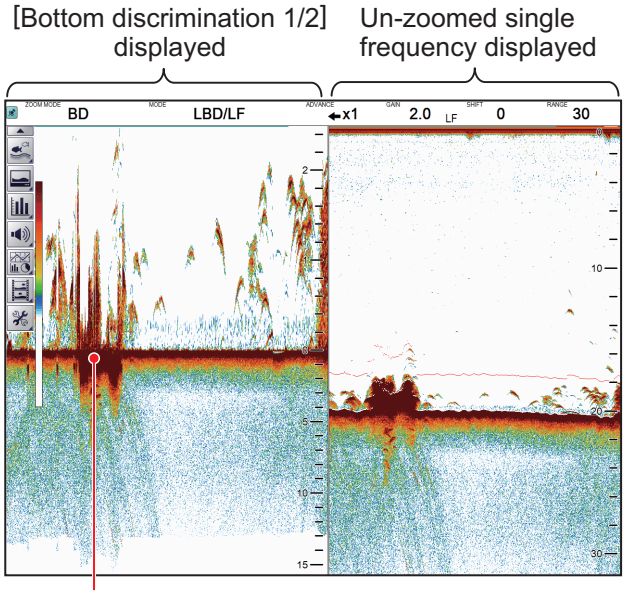


1.13.4 Bottom discrimination mode

Bottom discrimination mode has two zoom ratios which can be set from the [Range] section of the [System] menu. See section 4.7.1.

Bottom discrimination at 1/2 ratio

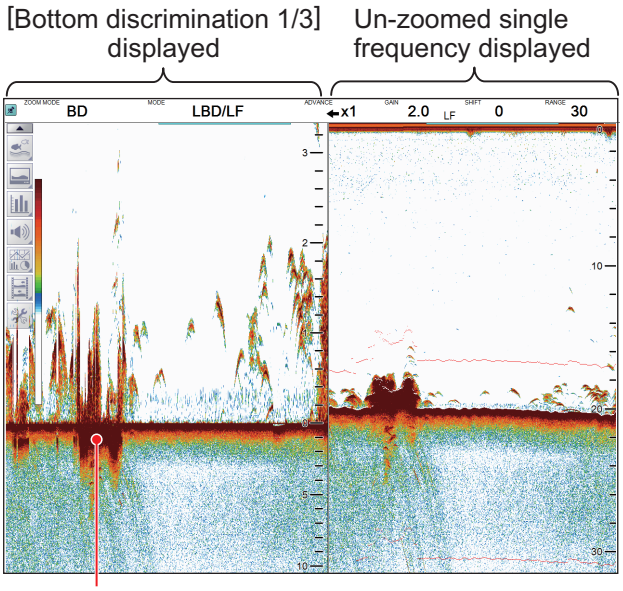
The left-side of the screen shows the seabed as a straight line at approximately the middle of the screen.



Seabed echo tail length, seabed hardness
Long tail: Hard seabed (rock, gravel, etc.)
Short tail: Soft seabed (mud, sand, etc.)

Bottom discrimination at 1/3 ratio

The left-side of the screen shows the seabed as a straight line at approximately one third of the screen-length from the screen bottom.



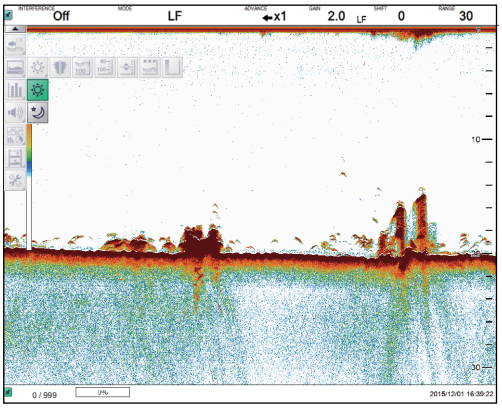
Seabed echo tail length, seabed hardness
Long tail: Hard seabed (rock, gravel, etc.)
Short tail: Soft seabed (mud, sand, etc.)

1.14 How to Switch Between Daytime and Nighttime Color Modes

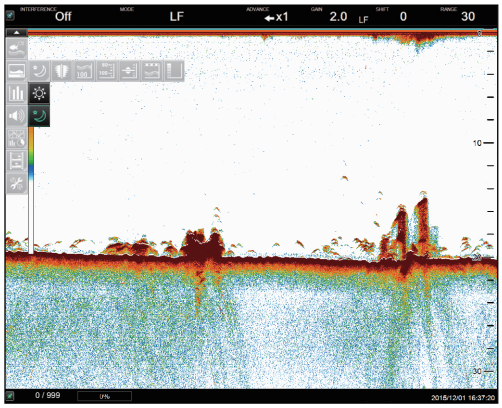
To assist on-screen visibility, the system has a Day display color mode and a Night display color mode. The modes can be changed at any time from the InstantAccess bar™ to suit your needs.

Unless otherwise specified, all example figures in this manual use the Day display mode.

1. Click the [Display] icon ( ) from the InstantAccess bar™ to show the [Display] menu bar, then click the [Window Color] icon ( ) to show menu options.
2. Click [Day] ( ) or [Night] ( ) as appropriate. Icon and text colors are reversed, as shown in the example figures below.



Day mode

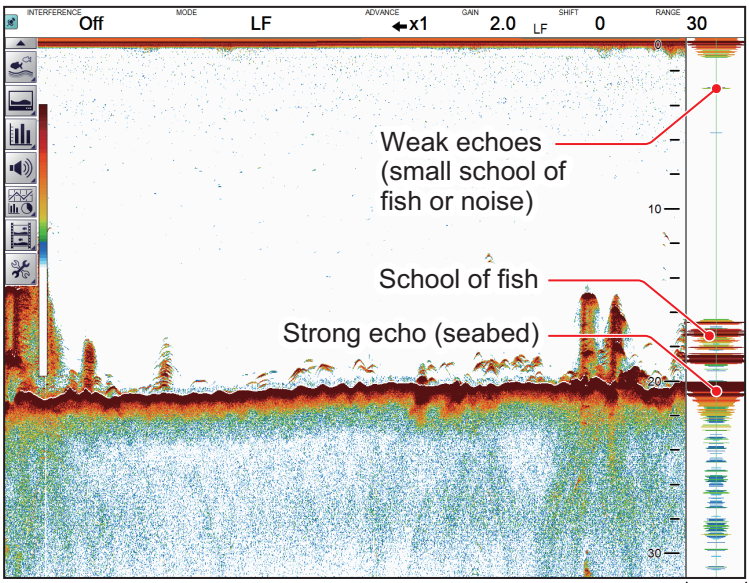


Night mode

3. Click the [Display] icon ( ) to hide the menu bar.

1.15 How to Use the A-scope Display

The A-scope display shows echoes at each transmission with amplitudes and tone proportional to their intensities, on the right side of the screen. It is useful for estimating the species of a school of fish or determining bottom composition.



A-scope display

To show or hide the A-Scope display, click the [A-Scope] icon ( ) from the [Display] menu, on the InstantAccess bar™. The icon changes to green color when the A-scope display is active.

1.16 How To Show/Hide The Depth Indication

The current depth indication appears at the bottom-left corner of the screen. You can show or hide the depth indication to suit your preferences.

To show/hide the depth indication, click the [Depth] icon ( ) from the [Display] menu on the InstantAccess bar™. The icon changes to green color when the depth is shown.

1.17 How To Show/Hide The Depth Scale

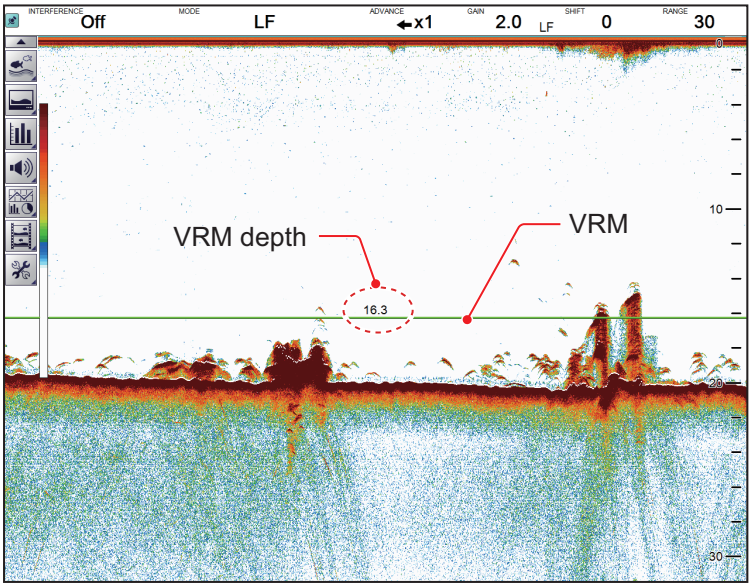
The depth scale is displayed to the far right-hand side of the screen.

To show/hide the depth scale, click the [Depth Scale] icon ( ) from the [Display] menu on the InstantAccess bar™. The icon changes to green color when the depth scale is shown.

1.18 How to Use the VRM to Measure Depth of a School of Fish

You can measure the depth to an object (school of fish, bottom, etc.) with the VRM (Variable Range Marker).

1. Click the [Display] icon ( ) from the InstantAccess bar™ to show the [Display] menu bar. Click the VRM icon ( ). The icon is now highlighted in green color and the VRM appears on the display.
2. Drag and drop the VRM so that it intersects the echo whose depth you want to measure.
   Note: Right-click at any time to cancel a dragging operation.
3. The depth is displayed above (or below) the VRM, at the center of the VRM.



4. To hide the VRM, click the [Display] icon ( ) from the InstantAccess bar™ to show the [Display] menu bar, then click the VRM icon ( ).

1.19 How To Show/Hide The Minute Marker

The minute marker appears at the top of the screen when displayed. It is displayed as a dashed line, with each dash, and gap between dashes, indicating a 30 second period of time. In other words, the time from the start of one dash to the start of the next dash is one minute.

To show/hide the minute marker, click the [Minute Marker] icon ( ) from the [Display] menu on the InstantAccess bar™. The icon changes to green color when the marker is turned on.

1.20 How To Show/Hide The Color Bar

The color bar appears at the left edge of the display, and shows the echo color scale in use. The strongest echo color is at the top of the scale and weakest echo color is at the bottom.

To show/hide the color bar, click the [Display] icon ( ) from the InstantAccess bar™ to show the [Display] menu, then click the [Color Bar] icon ( ). The icon changes to green color when the bar is shown.

1.21 How to Set, Show and Hide Alarms

The FSS-3BB has six alarms: Bottom Alarm, Fish Alarm, Bottom Fish Alarm, Temperature Alarm, Fish Size Graph Alarm, and IDENTI-FISH™ alarm.

When an alarm is set and the alarm conditions are met, the system releases an audible beep and the applicable alarm icon appears at the bottom-right corner*. To silence the audible beep, click anywhere on the screen. The alarm icon remains on the display until the cause of the alarm is removed or the offending alarm is disabled.

* If the depth indication is shown at the bottom-right corner, the alarm icon appears at the bottom-left corner.

: Bottom Alarm icon : Bottom Fish Alarm icon : Fish Size Graph Alarm icon

: Fish Alarm icon : Temperature Alarm icon : IDENTI-FISH Alarm icon

Alarm descriptions

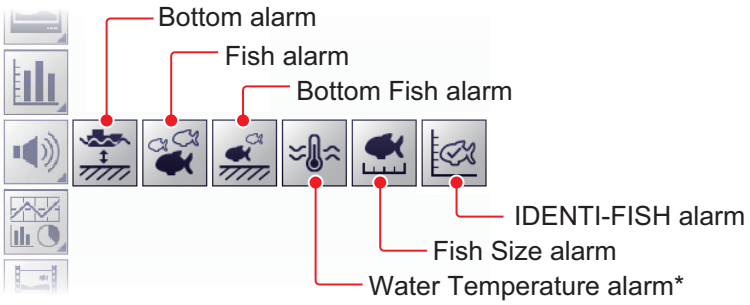
- **Bottom Alarm**: Alerts you when the seabed (bottom) enters the range set for this alarm.
- **Fish Alarm**: Alerts you when fish are detected within the range set for this alarm.
- **Bottom Fish Alarm**: Alerts you when fish are detected within the range set for this alarm.
- **Temperature Alarm**: Alerts you when the water temperature is within range or out of range, depending on your selection. This alarm requires water temperature data.
- **Fish Size Graph Alarm**: Alerts you when the selected fish size graph bar is “1st peak” and the specified distribution rate is exceeded. Valid only when the fish length graph is displayed.
- **IDENTI-FISH™ Alarm**: Alerts you when the selected model data exceeds the set similarity. Valid only when the IDENTI-FISH™ graph is active.

1.21.1 How to activate/deactivate the alarms

You can activate and deactivate alarms by selecting the respective alarm icon.

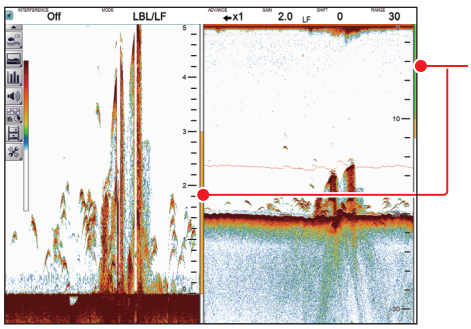
To activate or deactivate an alarm, do the following:

1. Click the Alarm icon ( ) from the InstantAccess bar™ to show the [Alarm] menu.
2. Referring to the figure below, select the alarm you want to activate or deactivate.



*Requires water temperature data.

The icon changes color depending on the status selected, green for active alarm, gray for inactive. For the Bottom alarm, Bottom Fish alarm and Fish alarm, an "alarm marker" appears at the right edge of the display. The alarm marker shows the alarm range.

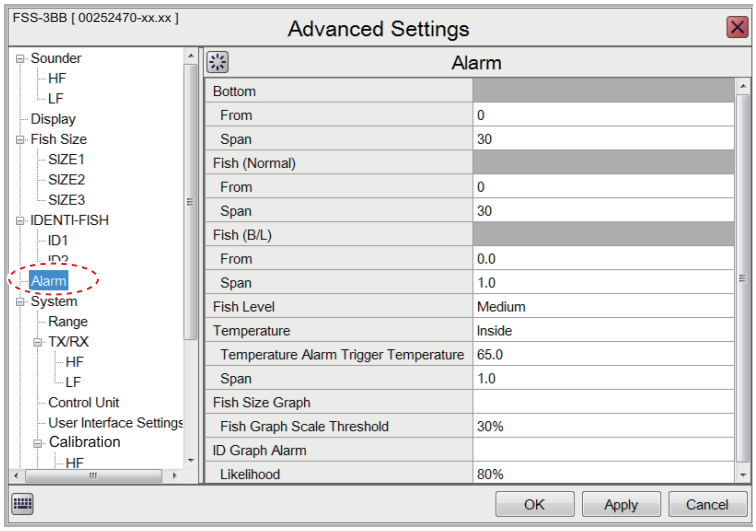


Alarm markers are displayed in the following colors:
• Bottom alarm: Green
• Fish alarm: Orange
• Bottom Fish alarm: Orange
Appears at the right-hand side of the Bottom Lock or Bottom Discrimination zoom screen only.

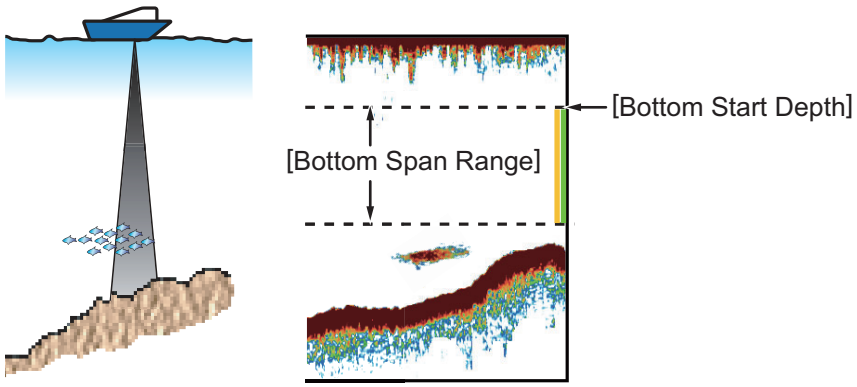
1.21.2 How to set the alarms

To set the conditions for each alarm, do the following:

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click the [Alarm] menu to show the [Alarm] menu (right-side of the window).



3. Refer to the table below to set the alarms.

Menu item	Description
[Bottom]	Set the bottom starting depth ([From]) and bottom span range [Span] for the depth alarm. The distance set here is measured from the location of the transducer face. 
[Fish (Normal)]	Set the starting depth ([From]) and span range [Span] for the fish alarm. The distance set here is measured from the location of the transducer face.
[Fish (B/L)]	Set the starting depth ([From]) and span range [Span] for the bottom fish alarm. The distance set here is measured from the location of the transducer face.
[Fish Level]	Set the echo strength at which the fish alarms are triggered. This setting is for both the [Fish Alarm] and the [Bottom Fish Alarm]. • [Weak]: Echoes stronger than light blue trigger the alarm. • [Medium]: Echoes stronger than yellow trigger the alarm. • [Strong]: Echoes stronger than red trigger the alarm.

Menu item	Description
[Temperature]*	[Temperature]: Set the water temperature alarm type. • [Inside]: Audiovisual alarm is released when the temperature is within the alarm range setting. • [Outside]: Audiovisual alarm is released when the temperature is outside the alarm range setting. [From]: Set the starting temperature for the alarm. [Span]: Set the span of the alarm.
[Fish Size Graph]	[Fish Size Graph]: Select the fish size(s) which trigger the Fish Size Graph alarm. Multiple selections are available. [Fish Graph Scale Threshold]: Set the distribution rate at which to trigger the alarm. For example, a setting of [30%] will trigger the alarm when the distribution rate for the selected size is over 30% and the selected fish size graph bar is “1st peak”.
[IDENTI-FISH Graph Alarm]	[IDENTI-FISH Graph Alarm]: Set the model data to use for the alarm. (Multiple models are possible.) [Likelihood]: Set the similarity that is the target of the alarm. For example, if "80%" is selected, the alarm is released when the similarity of the model data selected in [ID Graph Alarm] exceeds 80%.

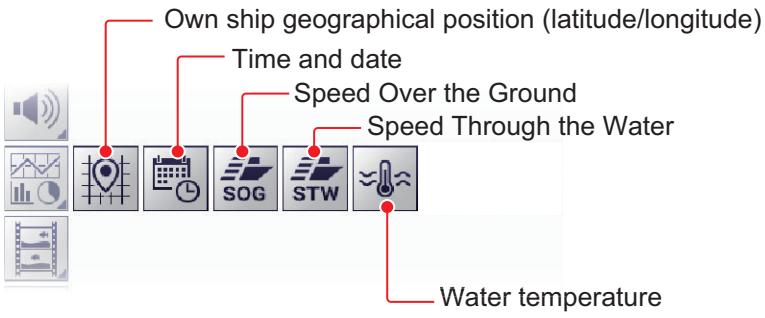
*: Requires water temperature data.

4. Click [Apply] to save the current changes and change or adjust other settings.
   Click [OK] to save the current changes and close the menu window.
   Click [Cancel] to abort all changes and close the menu window.

1.22 How To Show/Hide Navigation Data

Various data received from connected sensors can be shown on screen, or hidden, at any time.

To show/hide navigation data, click the [Data Display] icon ( ) from the InstantAccess bar™ then, referring to the figure below, select the data to show on-screen.

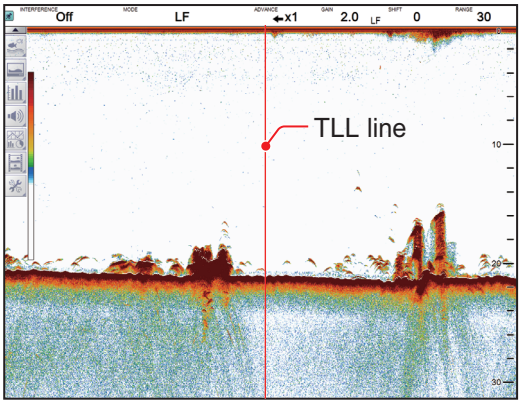


1.23 How to Inscribe TLL Lines

You can inscribe TLL (Target Latitude Longitude) lines on the display to mark the location of schools of fish, shoals, or other points of interest. The position of each TLL is output to the connected chart plotter.

Note 1: The position output function requires connection to an external EPFS device which provides own ship position data.

Note 2: Data other than latitude and longitude can be output to the connected chart plotter. See [TLL Output] on page 5-9.



To inscribe a TLL line, place the cursor on the display where you want to inscribe the line, then double-click. A vertical line, red in color, appears at the location. The TLL moves with the inscribed location. You can inscribe multiple lines at any time.

Under default settings, the FSS-3BB also outputs the TLL to the connected chart plotter.

1.24 How to Use the Scrollback Mode

The scrollback mode allows the user to view past screens of fish finder images, making it handy for comparing the sizes of schools of fish close to each other.

To use the scrollback mode, place the cursor on any location inside the display, other than the header, footer or menu bar. While pressing and holding the right button, drag and drop the screen to the right. The displayed echo moves with the cursor and is also paused.

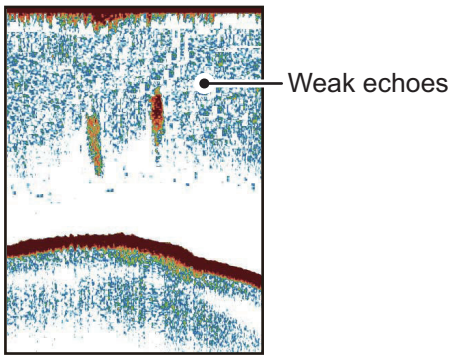
The display shows the scrollback mode indicator (Day mode: , Night mode:) at the top-right of the screen.

To cancel the scrollback mode and return to normal echo display, select the above-mentioned scrollback mode indicator.

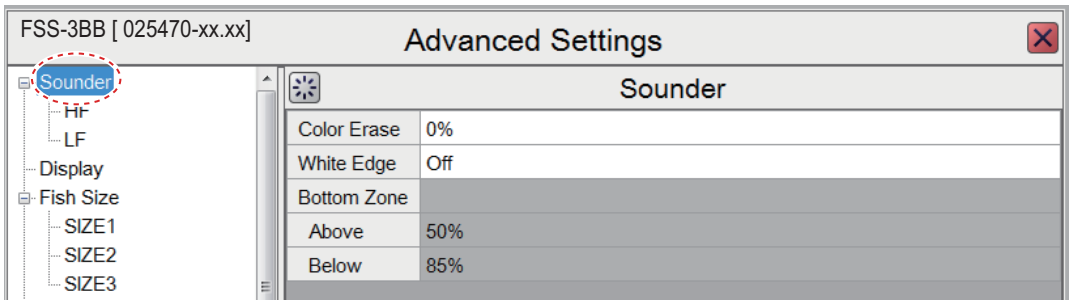
Note: All echoes stop when the scrollback mode is active. Use caution with this feature and avoid use when the vessel is underway.

1.25 How to Erase Weak Echoes

Sediment in the water or reflections from plankton may be painted on the display in low intensity tones, as shown in the figure below. You can remove these unwanted echoes with the color erase feature.



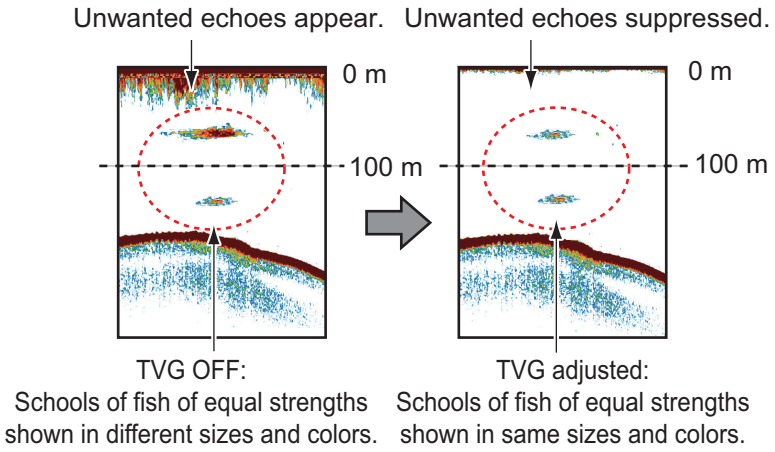
1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. The [Sounder] menu item is already selected and the [Sounder] menu appears on the right-side of the window. Click [Color Erase] from the [Sounder] menu.



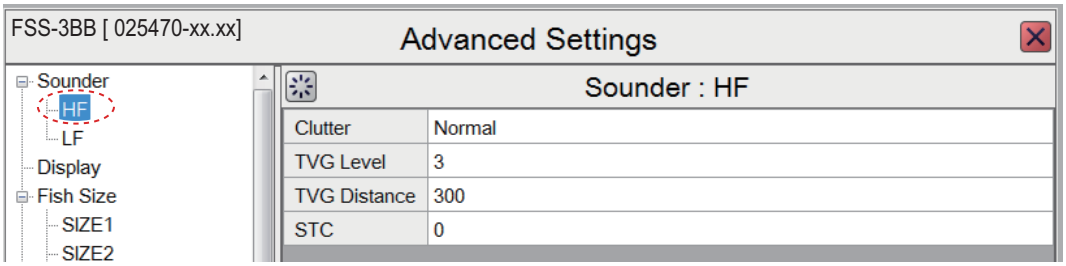
3. Adjust the [Color Erase] setting until the picture shows minimal reflections. As the setting increases, reflections are removed in order, from weakest to strongest.
4. Click [Apply] to save the current changes and keep your place in the menu window.
   Click [OK] to save the current changes and close the menu window.
   Click [Cancel] to abort all changes and close the menu window.

1.26 How to Adjust TVG (Time Varied Gain)

A school of fish at a deep depth is displayed in weak colors even if it is equal in strength to one in shallow waters. This is due to propagation attenuation of the ultrasonic wave. To compensate for this difference, use TVG. TVG automatically adjusts the gain with depth so that echoes of the same strength and different depths are shown in the same colors regardless of their depths. The gain is increased with depth to display echoes of equal strengths in the same colors. In the figure below, for example, the TVG is set for 100 m and the TVG level is adjusted. Then, unwanted echoes at a distance less than 100 m are deleted and echoes at depths greater than 100 m are not affected.



1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click the [Sounder] menu, then click [HF] or [LF] as appropriate. The example illustration below shows the HF menu (the contents of the LF menu are the same).



3. Use the buttons ( ) for [TVG Level] to adjust the TVG level. (You can also adjust the level by using the software keyboard.) A higher setting reduces the gain for nearby echoes.
4. Use the buttons ( ) for [TVG Distance] to set the TVG distance. (You can also adjust the distance by using the software keyboard.)
5. Click [OK] to save the current changes and close the menu window.
   Click [Cancel] to abort all changes and close the menu window.

1.27 How to Save and Load Settings

Settings can be stored to, or loaded from, either the FSS-3BB internal memory or an external storage device.

Note: The settings of the [TX/RX] menu (see section 4.7.2) are not applicable.

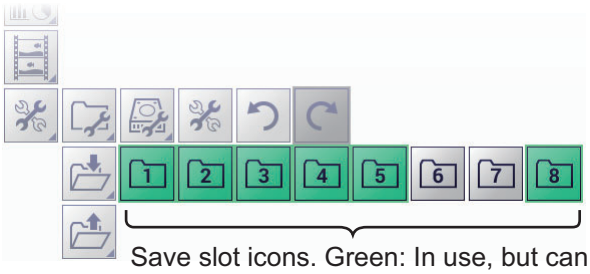
1.27.1 How to save settings

The internal memory can store up to 8 settings variations. For external memory, the maximum number of settings variations which can be stored depends on the external memory's available capacity.

Note: Settings which have been over-written (saved over) cannot be restored. Always check that the save location is correct before starting the save procedure.

How to save settings to internal memory

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Save Settings] icon ( ).



Save slot icons. Green: In use, but can over-write.
Gray: Unused.

2. Click the save slot icon (-) that you want to use. The message "Settings saved." appears upon completion of the save process.
3. Click [OK] to finish and close the pop-up.

How to save settings to external memory

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [External Setting] icon ( ).
2. Click the [Save External Unit Settings] icon ( ). The message "Settings saved." appears upon completion of the save process. The file is automatically named (date and time file was saved).
   Note: If there is no external memory connected, the [Save External Unit Settings] icon is gray and not selectable.
3. Click [OK] to finish and close the pop-up.

1.27.2 How to load settings

Previously saved settings can be loaded from their save location, either internal or external location, at any time.

Note: When the load procedure is complete, previous settings cannot be restored. Check that the settings to be loaded are correct before starting the procedure.

How to load settings from internal memory

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Internal Setting] icon ( ) to show the internal setting save/load icons.
2. Click the [Load Settings] icon ( ) to show the load slot icons.

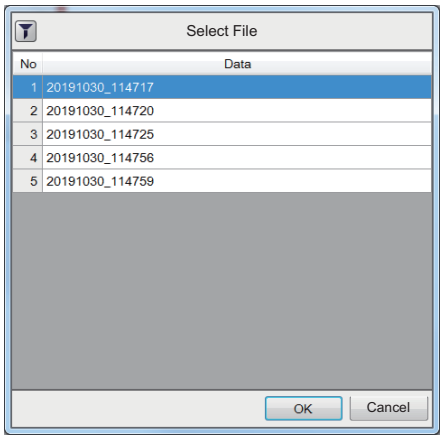
Folder is greyed out if no settings have been saved to the folder.

3. Click the load slot icon (-) that you want to use. The system applies the loaded settings.

How to load settings from an external memory

Note: This method requires connection to an external memory device. If there is no device connected, the [Load External Unit Settings] icon shown in the procedure below is not available (greyed out).

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™ to show the [Advanced Settings] menu, then click the [External Setting] icon ( ) to show the external setting save/load icons.
2. Click the [Load External Unit Settings] icon ( ). A pop-up window listing the available settings files appears.
   Note: If there is no external memory connected, the [Load External Unit Settings] icon is greyed out and not selectable.



3. Select the settings file to load, then click the [OK] button to finish and close the pop-up.

1.28 How to Undo/Redo Operations

The system stores the last 20 operations in temporary memory. This allows you to "undo" a mistaken operation, or several mistaken operations, at any time. You can also "redo" an operation which was undone.

Note 1: The undo and redo functions are not available with the following items.

- Operation done before the power is turned off.
- Operation from the TX/RX menu (see section 4.7.2).

Note 2: When recorded echo data is played back, all the history contents of the cancellation and redo of the operation performed before the playback are erased.

How to undo an operation

Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Undo] icon ( ) to undo the last operation. Repeat if necessary to undo other operations. If there are no operations to undo, the [Undo] icon ( ) is greyed out.

How to redo an operation

Click the [Advanced Settings] icon from the InstantAccess bar™, then click the [Redo] icon ( ) to redo the last operation. Repeat if necessary to redo other operations. If there are no operations to redo, the [Redo] icon ( ) is greyed out.

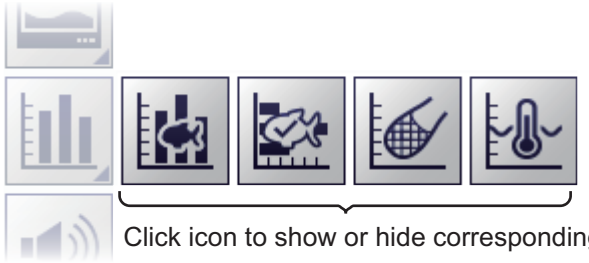
2. GRAPH FUNCTIONS

The FSS-3BB can display up to four graphs (listed in section 2.1, below), depending on vessel configuration.

2.1 How to Show/Hide Graphs

All graphs can be shown or hidden to suit your requirements. To show or hide a graph, do the following:

1. Click the [Graph] icon ( ) from the InstantAccess bar™ to show the [Graph] menu.



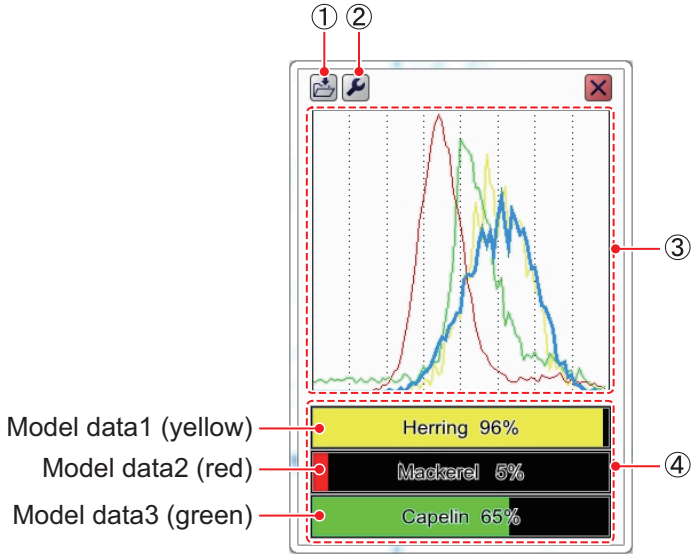
2. Click a graph icon to show or hide the corresponding graph. The icon changes color accordingly, green for shown, gray for hidden.

Menu icon	Description
	[Fish Size Graph]: Shows/hides the fish size graph. The fish size graph displays estimated fish size and related data with a bar graph. See section 2.3.
	[IDENTI-FISH™ Graph]: Shows/hides the IDENTI-FISH™ graph. The IDENTI-FISH™ graph compares the histograms of the fish within the measurement range with the model data, and shows the similarity of fish species in numerical values and a bar graph. See section 2.2.
	[Sonde Graph]: Shows/hides the net sonde graph. The net sonde graph plots the water temperature at the position of the net sonde transmitter. See section 2.4.
	[Temp Graph]: Shows/hides the water temperature graph. The water temperature graph displays the water temperature as a dotted line across the screen. See section 2.5.

2.2 IDENTI-FISH™

The FSS-3BB compares the histograms of schools of fish with the model data within the measurement range, and indicates the similarity of fish species by numerical values and bar graphs. This graph is called the "IDENTI-FISH™ graph.".

In the following display example, the fish within the measurement range are similar to herring with a 96% accuracy.



No.	Description
1	[Save ID1 (or ID2) Data] button. Click this button to open the [Save ID1 (or ID2) Data] window.
2	[Advanced Settings] button. Click the button to open the IDENTI-FISH™ [ID1] ([ID2]) menu.
3	The IDENTI-FISH™ histogram within the measurement range (ID1: blue, ID2: pink) and the histogram* of the past model data (up to three for each model data) are displayed. The color of the histogram of each model data corresponds to the color of the bar graph of similarity (see No. 4).
4	The fish species name of each model data* and the similarity to the model data* (shown by numerical values and bar graphs) are displayed (up to three).

* Displayed only when model data is set. Set the model data in the [ID1] (or [ID2]) menu in the [IDENTI-FISH] menu. See section 2.2.4.

You can freely change the window size of the graph by dragging the window frame. You can also move the graph position by dragging and dropping the graph.

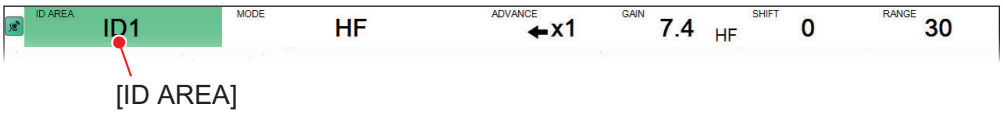
2.2.1 How to display the IDENTI-FISH™ graph

On the InstantAccess™ bar, click the [Graph] icon ( ) followed by the [IDENTI-FISH Graph] icon ( ). The icon is highlighted in green and the graph appears. To hide the graph, click the close button ( ).

2.2.2 How to set the measurement range for the IDENTI-FISH™ graph

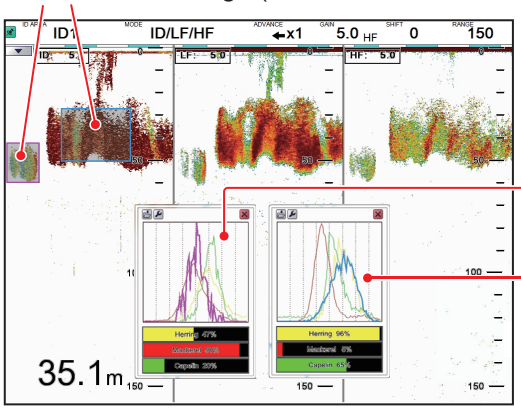
Note: The following setting can also be performed using recorded echo data.

1. Show the IDENTI-FISH™ echo display in the single or combination display.
2. On the InstantAccess™ bar, click the [Sounder] icon ( ) followed by the [IDENTI-FISH] icon ( ).
3. If the header is not displayed, put the cursor at the top edge of the screen.
4. Click [ID AREA] in the header, then scroll to select [ID1] or [ID2]. The [ID AREA] indication is highlighted in green. You can set two measurement ranges ([ID1], [ID2]) on the IDENTI-FISH™ echo display.



5. Place the cursor at the top-left corner of the area. Push the left button, drag the frame to the location for the bottom-right corner, then release the left button. A IDENTI-FISH™ graph appears for the ID no. selected at step 4. If model data has been set, the model data histogram, fish species name, and similarity value (numerical value and bar graph) are displayed.

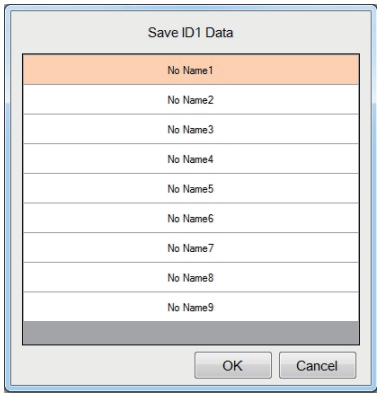
Measurement range (ID:1 Blue frame, ID2: Pink frame)



Note: You can adjust the location and size of the area by turning off [Selected Area Scroll] in the [IDENTI-FISH] menu. See page 2-12.

6. Do steps 4 and 5 to set the other area, if necessary.

7. To save as model data the echo histogram (measurement result) displayed on the IDENTI-FISH™ graph, click the [Save ID1 (or ID2) Data] button to show the [Save ID1 (ID2) Data] window.



8. Click one among [NoName1] - [NoName9].
9. Click the [OK] button. A message indicating the save destination and the file name (e.g., "Saved. reference_20230726153838_18-58kHz_175-225kHz.ref") appears. The file name is the save date and time and transmitting frequency. The file name can be changed later (see page 2-8).
10. Click the [OK] button to erase the message.

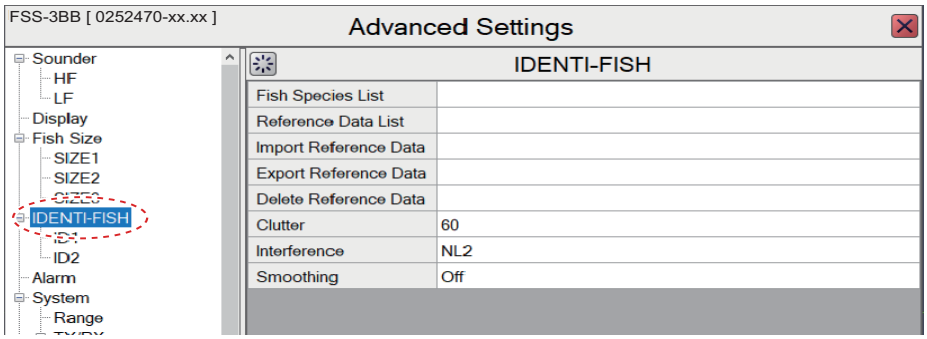
Note 1: If you selected [No NameX] (X: number) at step 8, register the relevant fish species name, using a name that is easy to remember (see section 2.2.3).

Note 2: To use the model data saved above as a comparison target, set the corresponding model data, referring to section 2.2.4.

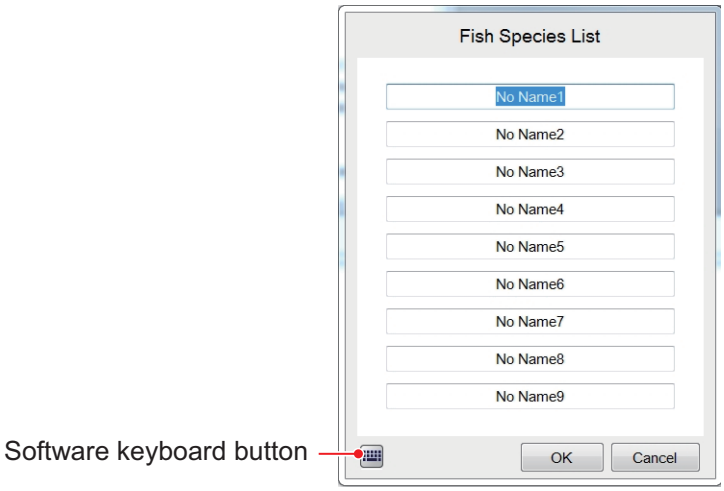
2.2.3 How to register fish species

Follow the procedure below to register a fish species name in the model data.

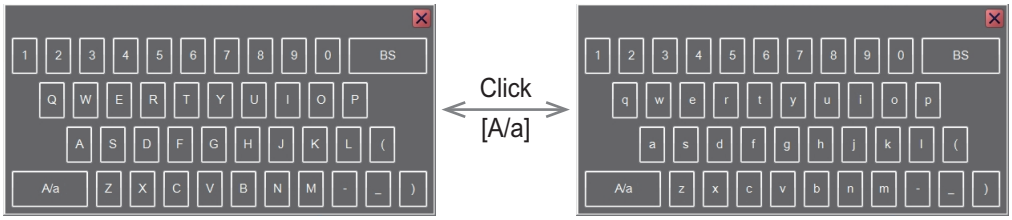
1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click [IDENTI-FISH] to show the [IDENTI-FISH] menu.



3. Click the ▶ button at [Fish Species List] to show the [Fish Species List].



4. Click the software keyboard button ( ) to show the software keyboard.



5. Use the keyboard to enter the name of the fish species. You can use a maximum of 15 alphanumeric characters. The name entered here is reflected to the [Save ID1 (ID2) Data] window.
6. Click the [OK] button. The message "This will overwrite a previously saved fish type. Are you sure?" appears.
7. Click the [Yes] button to confirm data and close the [Fish Species List] window.
8. Click the [OK] button to finish.

2.2.4 How to set model data

Set the model data to be compared with the IDENTI-FISH™ echo display in the measurement range. ID1 and ID2 model data can be set individually. There are two methods to set model data.

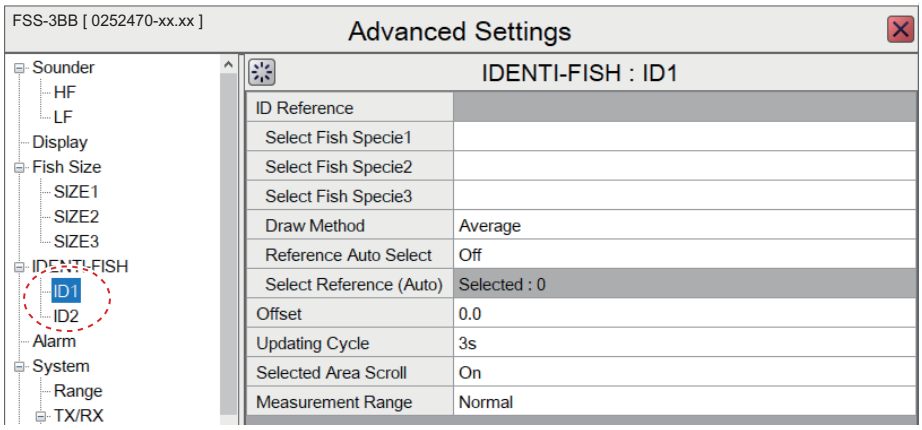
- Set three fish species to compare.
- Set four or more fish species to compare.

Set three fish species to compare

Set the fish type in [Select Fish Specie1] to [Select Fish Specie3]. The similarity of the fish species set here is displayed on the IDENTI-FISH™ graph.

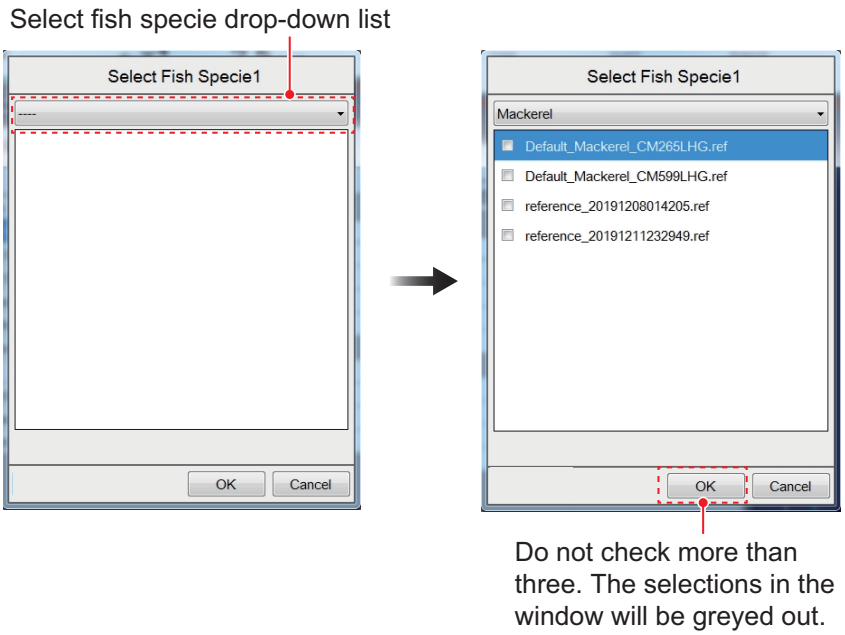
1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.

2. Click [ID1] or [ID2] as applicable.



3. Click the ▸ button at [Select Fish Specie1] to show the [Select Fish Specie1] window.
   Note: If [Select Fish Specie1] cannot be selected, turn off [Reference Auto Select] in the same menu.

4. Use the drop-down list to select fish species (selected at step 8 in section 2.2.2).



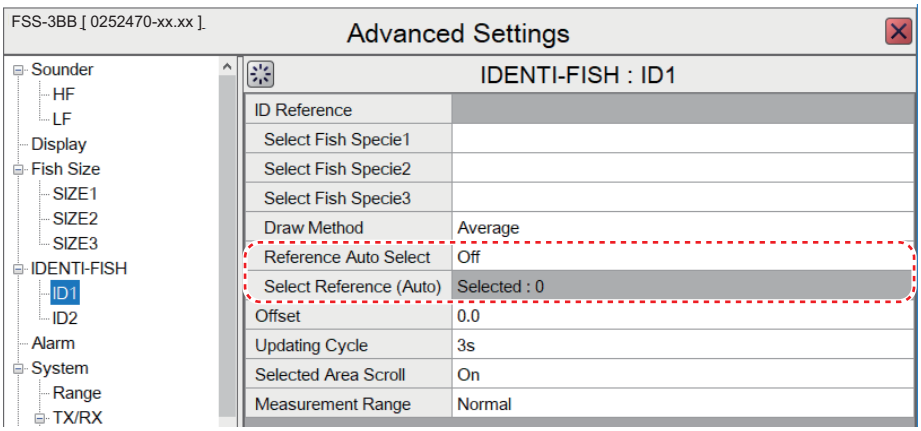
5. Select the model data to use for similarity calculation. You can select (checkmark ✓) a maximum of three. The model data is as below when [TX Mode] is [TruEcho CHIRP] and [Freq Control] is the default state.
   The factory default model data saved to the system are [Mackerel] and [Herring].
   - [Default Mackerel_CM265LHG.ref]: Mackerel model data used by the transducer CM265LHG.
   - [Default Mackerel_CM599LHG.ref]: Mackerel model data used by the transducer CM599LHG.
   - [Default Herring_CM265LHG.ref]: Herring model data used by the transducer CM265LHG.
   - [Default Herring_CM599LHG.ref]: Herring model data used by the transducer CM599LHG.

6. Click the [OK] button.
   The name selected at step 4 appears in [Select Fish Specie1].
7. Set [Select Fish Specie2] and [Select Fish Specie3] similarly to how you set [Select Fish Specie1].
8. Click the [OK] button.
   Use the [Cancel] button to cancel changes.

Set four or more fish species to compare

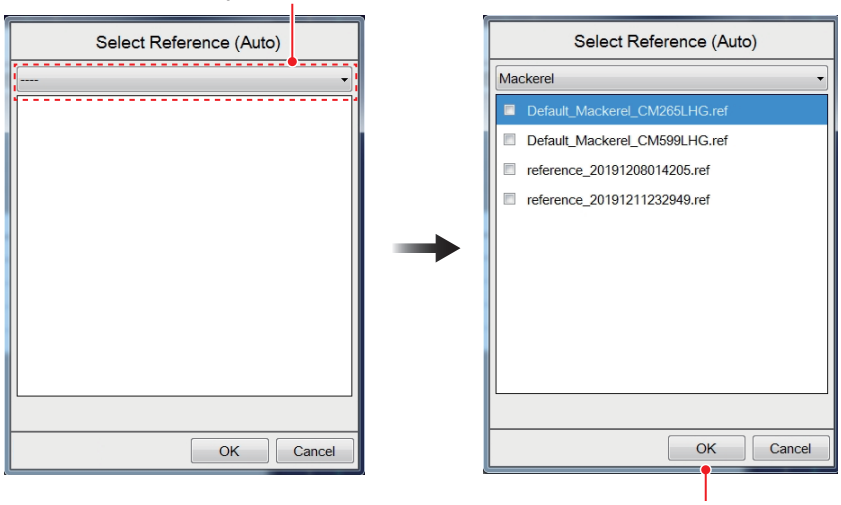
Set the fish species in [Select Reference (Auto)] (max. 9). From the fish species set here, three fish species names are displayed on the IDENTI-FISH™ graph, in the order of similarity value.

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click [ID1] or [ID2] as applicable.
3. Select On from the [Reference Auto Select] drop-down list.



4. Click the [▸] button at [Select Reference (Auto)] to show the [Select Reference (Auto)] window.
5. Use the drop-down list to select fish species (selected at step 8 in section 2.2.2).

Select reference drop-down list

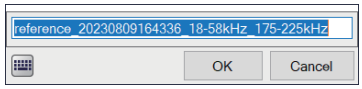


Do not check more than three. The selections in the window will be greyed out.

6. Select the model data to use for the similarity calculation. A maximum of three can be selected. The factory default model data are mackerel and herring. See page 2-6 for details on model data.
7. Click the [OK] button.
   The numeric value selected at step 6 is displayed in [Select Reference (Auto)].
8. Repeat steps 4 to 7 to set another model data. (A maximum of three for each fish species for a total of 27.)
   Use the [Cancel] button to cancel changes.
9. Click the [OK] button.
   Use the [Cancel] button to cancel changes.

How to change the model data name

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click [IDENTI-FISH].
3. Click the button at [Reference Data List] to show the [Reference Data List] window.
4. Use the drop-down list to select the fish species that contains the model data to change.
5. Select the model data to change. The edit window appears as shown on the right figure.



6. Click on the software keyboard button ( ) at the bottom-left corner of the window.
7. Change the file name using the software keyboard (maximum 50 characters).
8. Click the [OK] button.
9. Click the [Close] button to close the [Reference Data List] window.
10. Click the [OK] button to finish.

How to delete unnecessary model data

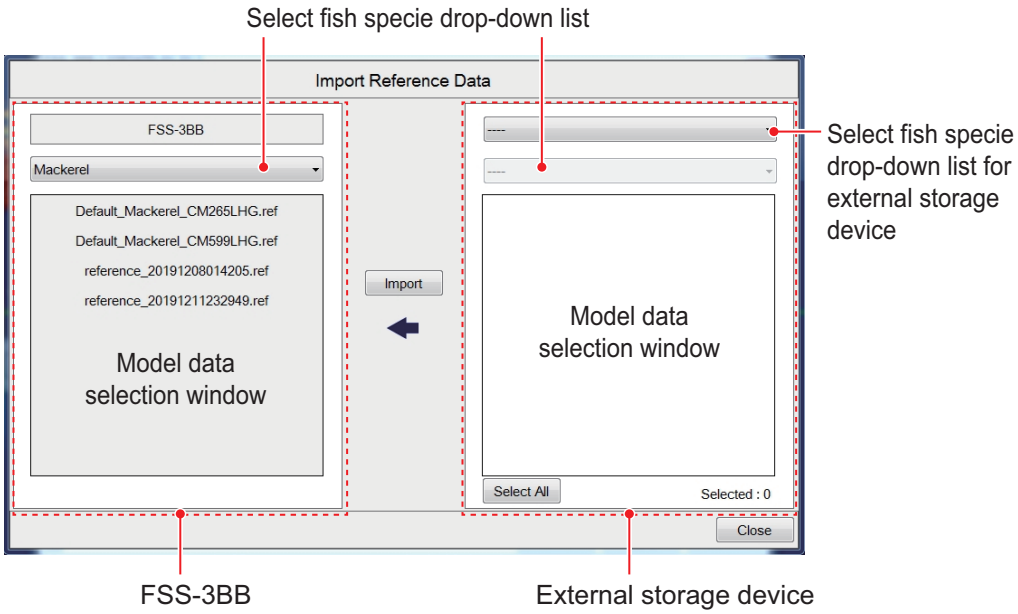
1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click [IDENTI-FISH].
3. Click the button at [Delete Reference Data] to show the [Delete Reference Data] window.
4. Use the drop-down list to select the fish species that contains the model data to delete.
5. Select the model data to delete. (Multiple deletion is possible.)
6. Click the [Delete] button. The message "Selected model data will be deleted. Are you sure?" appears.
7. Click the [Yes] button.
8. Click the [Close] button to close the [Delete Reference Data] window.
9. Click the [OK] button to finish.

2.2.5 How to import, export model data

How to import model data

Follow the procedure below to import model data from an external storage device.

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click [IDENTI-FISH].
3. Click the button at [Import Reference Data] to show the [Import Reference Data] window.



4. Use the drop-down list to select the external storage device where the model data to import is saved.
5. From the drop-down list, select the fish species to import.
   Fish species information for the fish species stored on the external storage device appears.
6. Select model data to import from the model data selection window of the external storage device. To import all model data, click the [All] button. The message "Selected model data will be deleted. Are you sure?" appears.
   Note: The model data name is not displayed in the model data selection window of the external storage device in the following cases.
   - The file name is more than 50 alphanumeric characters.
   - The file name contains characters that are prohibited by Windows®.
7. On the FSS-3BB, select the save destination for the fish species selected.
8. Click the [Import] button. The model data selected at step 6 is also displayed in the model data field on the FSS-3BB. A confirmation message is displayed in the following cases. Click the [Yes] button to continue, or the [No] button to cancel.
   - The model data was not taken from the installed transducer.
   - The model data name is different between the FSS-3BB and the external storage device.
   - Model data was recorded on a unit other than the FSS-3BB.

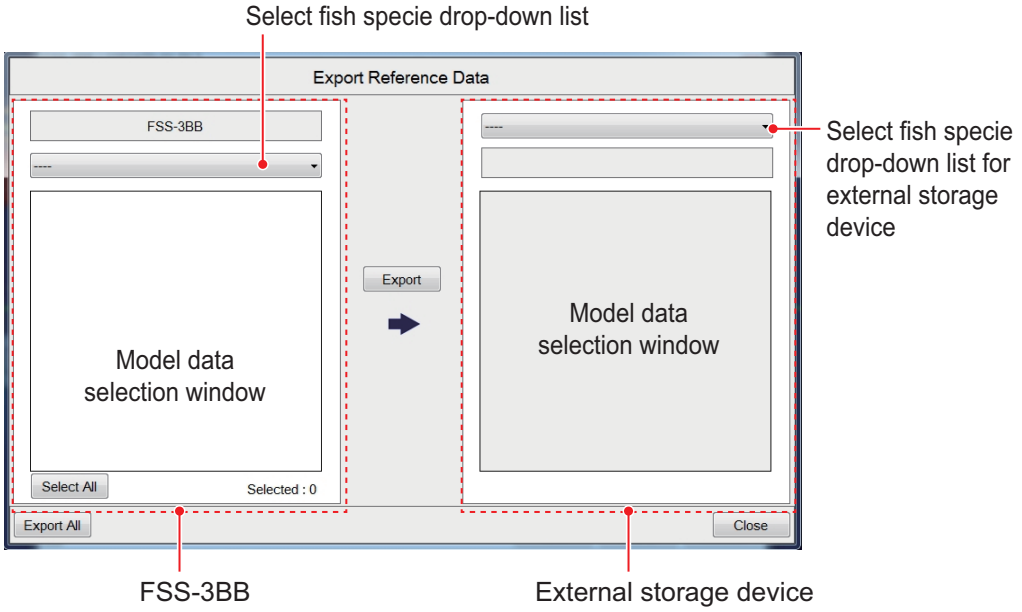
- Model data was recorded with a different [TX/RX] setting from the FSS-3BB.

9. Click the [Close] button to close the [Import Reference Data] window.
10. Click the [OK] button to finish.

How to export model data

Follow the procedure below to export model data to an external storage device.

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click [IDENTI-FISH].
3. Click the button at [Export Reference Data] to show the [Import Reference Data] window. To export all model stored in the FSS-3BB, go to step 6.



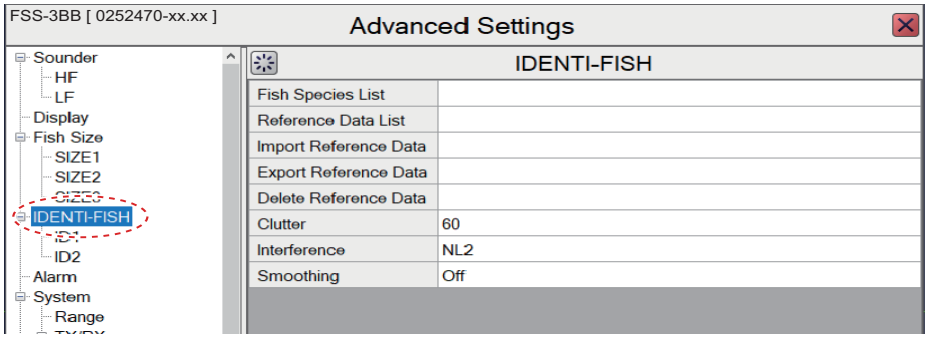
4. Select the fish type you want to export from the FSS-3BB's fish species drop-down list.
5. Select the model data you want to export from the FSS-3BB's model data selection window (multiple selections are possible). To select all model data, click the [Select All] button.
6. From the window for the external storage device, use the drop-down list to select where to save the data on the external storage device.
7. Click the [Export] button. The model data selected at step 5 is also displayed in the model data field of the external storage device's model data selection window.
   Note: To export all model data on the FSS-3BB, click the [Export All] button.
8. Click the [Close] button to close the [Import Reference Data] window.
9. Click the [OK] button to finish.

2.2.6 Settings for IDENTI-FISH™ echo display, IDENTI-FISH™ graph

The IDENTI-FISH™ and ID1/ID2 menus have items for setting up the IDENTI-FISH™ echo display and the IDENTI-FISH™ graph.

[IDENTI-FISH] menu

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click [IDENTI-FISH].



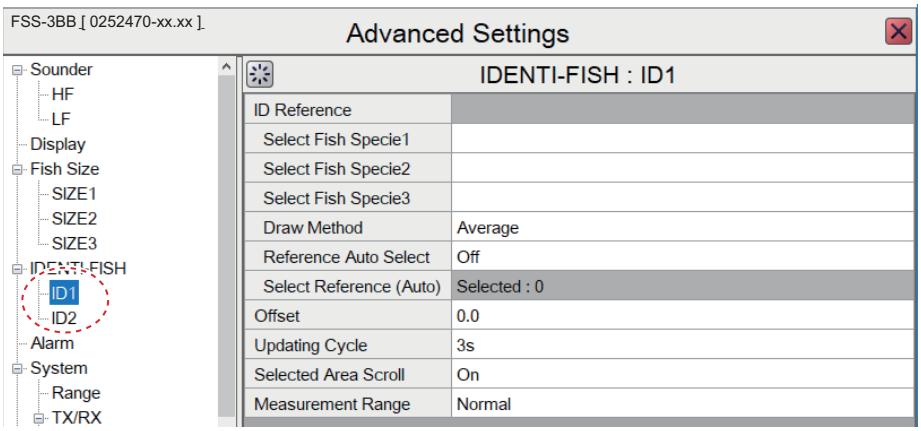
3. If necessary, adjust settings, referring to the table below.

Item	Description
[Fish Species List]	Registers model data for fish species. See section 2.2.3.
[Reference Data List]	Changes the file name of the model data. See page 2-8.
[Import Reference Data]	Imports model data from an external storage device. See "How to import model data" on page 2-9.
[Export Reference Data]	Exports model data to an external storage device. See "How to export model data" on page 2-10.
[Delete Reference Data]	Deletes model data. See "How to delete unnecessary model data" on page 2-8.
[Clutter]	Removes unwanted noise from the IDENTI-FISH™ echo display. The greater the numeric value, the more clutter is reduced.
[Interference]	Removes unwanted interference (electrical, etc.) from the IDENTI-FISH™ echo display. The degree of interference rejection increases in the order of [NL1]→[NL2]→[NL3]. Normally, use the same setting mentioned in section 1.10. If the interference cannot be removed from the IDENTI-FISH™ echo display by that method, adjust this setting.
[Smoothing]	If the echoes on the IDENTI-FISH™ echo display appear “spotty” or “jagged”, adjust this setting to smooth the echo presentation. The larger the setting, the greater the degree of smoothing.

4. Click the [OK] button to confirm settings.
   Use the [Cancel] button to discard changes to [Clutter], [Interference], [Smoothing].

[ID1]/[ID2] menu

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] window.
2. Click [ID1] or [ID2].



3. If necessary, adjust settings, referring to the table below.

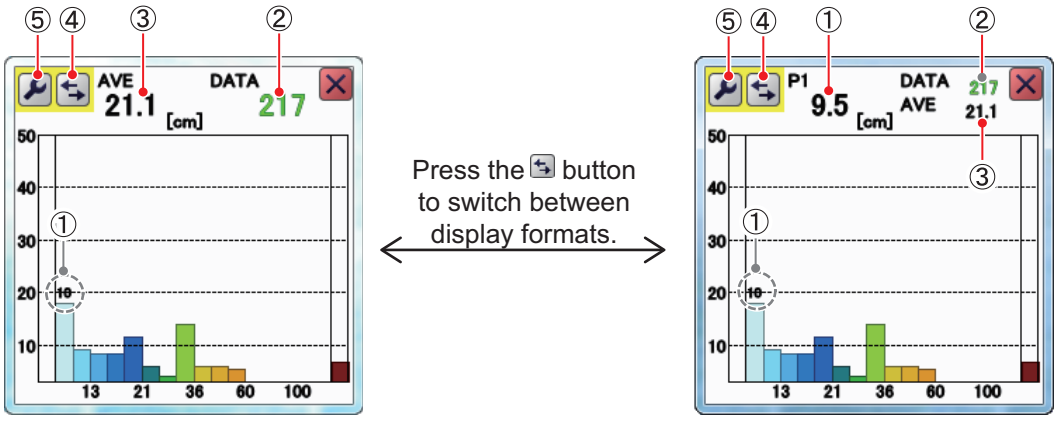
Item	Description
[Select Fish Specie1] - [Select Fish Specie3]	Effective when [Reference Auto Select] is turned on. Set fish species with [Select Fish Specie1] - [Select Fish Specie3]. See section 2.2.3.
[Draw Method]	Effective when [Reference Auto Select] is turned off. Set the method by which to draw the echo histogram. • [Average]: Averages the model data selected for each fish species and displays a histogram of average value. • [All]: Displays a histogram of all selected model data.
[Reference Auto Select]	Turn this item on to get automatic selection of the three fish species with the highest similarity among the fish species set in [Select Reference (Auto)] below.
[Select Reference (Auto)]	Effective when [Reference Auto Select] is turned on. Set the fish species. See page 2-5.
[Offset]	Corrects the histogram of the IDENTI-FISH™ echo display. For example, if there is a difference from the model data at the time of factory shipment, or if the measurement results gradually deviate from the histogram of the model data, enter an offset to compensate for the deviation.
[Updating Cycle]	Sets the interval at which to update the IDENTI-FISH™ graph.
[Selected Area Scroll]	Turn this item on to scroll the measurement range according to the sounder display.
[Measurement Range]	Sets the range for measuring school of fish. [Standard]: Measure to the seabed. [Entire Range]: Measure the entire range including the depth below the seabed. Since measurement of the IDENTI-FISH™ graph is not performed below the seabed, the echoes from schools of fish may be mistaken for the seabed, which can affect measurement results and accuracy. If this occurs, use [Entire Range].

4. Click the [OK] button to confirm settings, or [Cancel] to restore previous settings.

2.3 Fish Size Graph

The [Fish Size Graph] displays the fish size and distribution in a bar graph format. (A horizontal bar graph is also available.)

In the following example, fish size (in centimeters) is shown from left to right and the distribution (as a percentage) is shown from bottom to top.



Graph emphasis　　Peak emphasis

No.	Description
1	Estimated size of the largest fish detected (peak size). Depending on the setting selected at [Graph Peak] in the [Fish Size] menu, you can display up to the third largest fish (P1 to P3). See section 2.3.7. **Note:** When the graph emphasis format is selected, only the estimated size of the largest fish (P1) is displayed.
2	Total number of fish detected.
3	Overall average size of fish detected.
4	[Switch Display] button. Click to switch between graph emphasis and peak emphasis display formats.
5	[Advanced Settings] - [SIZE1] - [SIZE3] menu button. See section 2.3.7.

The [Fish Size Graph] can be moved to any location on the screen. Drag and drop the graph to move it.

Notices regarding transducer, menu settings

- This function requires a fish graph compatible transducer. See the installation manual (IME-23930).
- When this function is activated the following settings are automatically selected.

Menu item	Setting
[TX/RX] menu ([HF] and [LF] menus)	
[TX Power]	[Auto]
[TX Mode]	[TruEcho CHIRP]
[Auto Chirp]	[Off]
[Freq Control]	[Off] Default frequency, chirp width
[Range] menu	
[Split Range]	[Off]

Notices regarding the fish size graph

- Echo intensity depends on fish species. When the fish length differs between the indicated length and the actual length, you can compensate the difference on the [Calibration] menu (see section 4.7.5).
- The usable range is 2 m to 200 m. However, if the zero line is disabled (see page 4-14), fish size cannot be measured within the disabled area. Further, the measurement range can be affected by transducer model, installation method and sea conditions.
- In a school of fish, the echoes overlap. This causes a greater margin of error in fish size measurement.
- The [DATA] window shows the reliability of fish data in one of three colors, based on the reliability of the sensor data. The colors and their meaning are listed in the table below.

Color	Meaning
Green	Data is reliable, fish size is mostly accurate.
Yellow	Data is not totally reliable, fish size is somewhat accurate.
Red	Data is not reliable, fish size accuracy is very low.

2.3.1 How to show/hide the fish size graph

To show/hide the [Fish Size Graph], click the [Graph] icon ( ) from the InstantAccess bar™, then click the [Fish Size Graph] icon ( ). The icon is highlighted in green and the graph appears.

To close the graph, click the [Close Window] icon ( ), or click the graph icon.

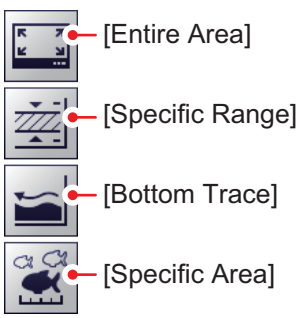
2.3.2 How to set the method of measurement

The FSS-3BB has the four methods of fish size measurement described below.

- [Entire Area]: Measures all detected fish.
- [Specific Range]: Measures the detected fish within a specific depth range.
- [Bottom Trace]: Measures the detected fish near the bottom.
- [Specific Area]: Measures the detected fish within the area specified.

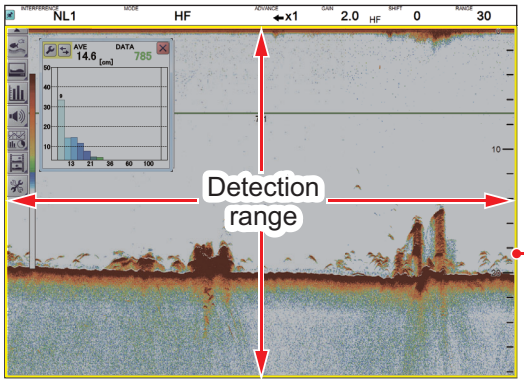
To select, or change, the method of measurement, do the following:

1. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu bar, then click the [Fish Size Measurement] icon ( ) to show menu options.
2. Select the appropriate method of measurement icon, referring to the figure below.



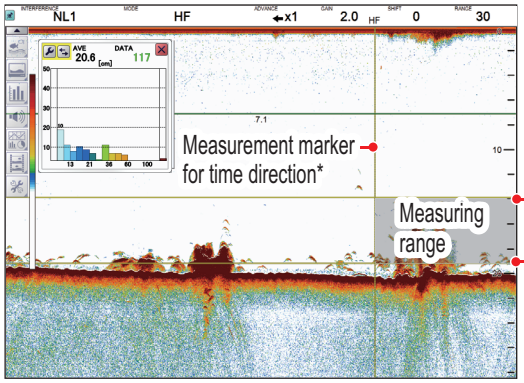
2.3.3 Entire area

1. Switch to a screen containing the normal echo display ([MODE] indication: [LF] or [HF]).
2. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu bar, then click the [Fish Size Measurement] icon ( ) to show menu options.
3. Click the [Entire Area] icon ( ).
   The area of detection (the entire screen) is surrounded with the measurement marker (yellow box), as shown in the example figure below. In a combination display, the marker appears on the normal echo screen with high frequency priority. For example, when the [MODE] window shows [HF/LF], the measurement marker is displayed on the high frequency screen.



2.3.4 Specific range

1. Switch to a screen containing the normal echo display ([MODE] indication: [LF] or [HF]).
2. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu bar, then click the [Fish Size Measurement] icon ( ) to show menu options.
3. Click the [Specific Range] icon ( ).
   Two measurement markers indicating the measurement start depth and measurement end depth (horizontal solid yellow lines) and a measurement marker indicating the time direction (vertical dashed yellow line) are displayed. In the case of the dual frequency display, the measurement markers are displayed on the normal echo screen with high frequency priority.



* The measurement marker for time direction cannot be moved within the range of 30 dots from the right edge of the screen.

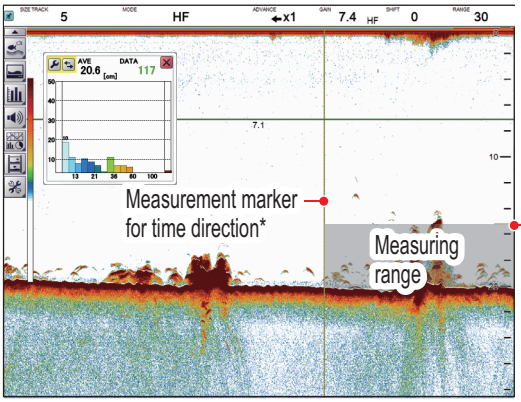
Measurement marker for start depth (horizontal solid yellow line)

Measurement marker for end depth (horizontal solid yellow line)

4. The measurement markers can be moved with drag and drop to adjust the measurement range.
   - **Change the starting depth**: Drag and drop the measurement starting depth marker up or down.
   - **Change the ending depth**: Drag and drop the measurement ending depth marker up or down.
   - **Move the measuring range up or down**: Set the cursor between the measurement starting and ending depth markers, then drag and drop to move the measuring range up or down.
   - **Adjust the horizontal width of the measuring range:** Drag and drop the measurement marker for time direction.

2.3.5 Bottom trace

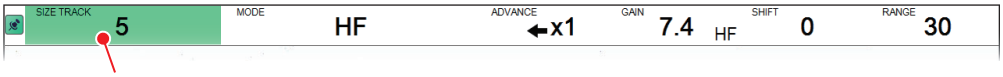
1. Switch to a screen containing the normal echo display ([MODE] indication: [LF] or [HF]).
2. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu bar, then click the [Fish Size Measurement] icon ( ) to show menu options.
3. Click the [Bottom Trace] icon ( ).
   The measurement marker for start depth (horizontal solid yellow line) and the measurement marker for time direction (vertical dashed yellow line) appear. [SIZETRACK] appears in the Miscellaneous section of the header. The measurement markers appear on the normal echo screen with high frequency priority.
   Note: If the bottom is not detected within the measurement range set on the normal echo display, the measurement markers do not appear.



* The measurement marker for time direction cannot be moved within the range of 30 dots from the right edge of the screen.

Measurement marker for start depth (horizontal solid yellow line)

4. If the header is not shown, put the cursor inside the header area.
5. Click [SIZE TRACK] on the header, then scroll to change the setting.
   When the setting is changed, the [SIZE TRACK] window turns green. Set a larger value to widen the measurement range, or set a smaller value to narrow the measurement range. The measurement marker (horizontal solid yellow line) moves according to setting selected.



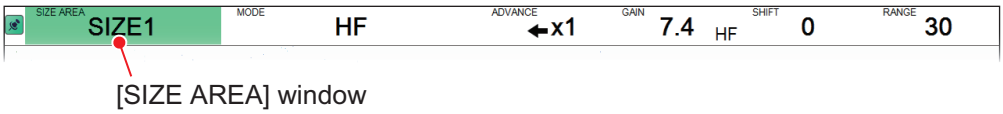
[SIZE TRACK] window

6. Drag the vertical measurement marker to change the measurement range.

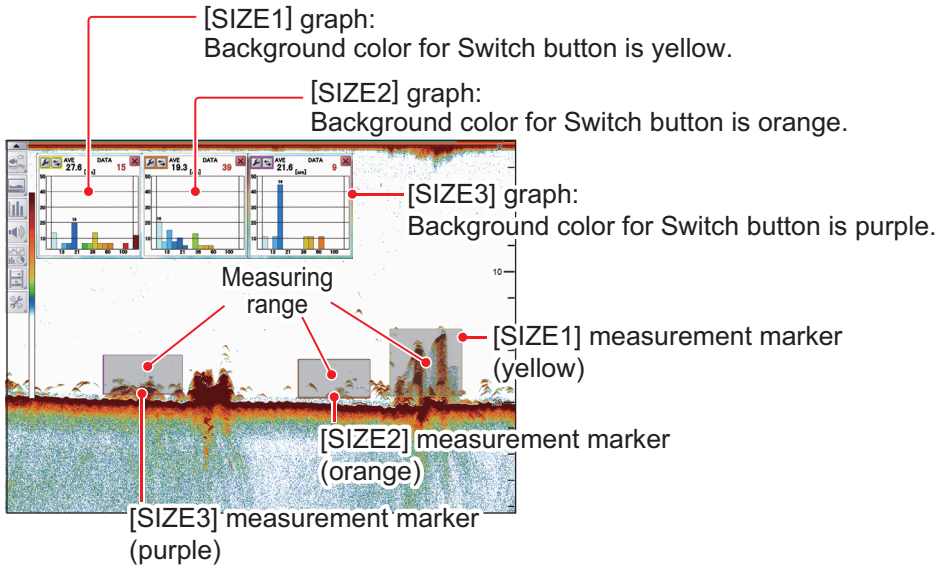
2.3.6 Specific area

This method allows you to specify up to three square-shaped areas. To set up one or more detection areas, do the following:

1. From the [MODE] indication, select a combination display that shows [LF] or [HF] on the normal echo display and [BL], [BZ], [MZ], or [BD] on the zoomed echo display.
2. Click the [Sounder] icon ( ) from the InstantAccess bar™ to show the [Sounder] menu bar, then click the [Fish Size Measurement] icon ( ) to show menu options.
3. Click the [Specific Area] icon ( ). [FISH AREA] appears in the Miscellaneous section of the header.
4. If the header is not shown, put the cursor inside the header area.
5. Click [SIZE AREA] on the header, then scroll to change the setting, among [SIZE1] - [SIZE3].
   The [SIZE AREA] window turns green. A maximum of three measurement ranges [SIZE1] - [SIZE3] can be set on all screens except for the IDENTI-FISH™ echo display.



6. Drag the cursor to the diagonally opposite corner of the area, then release the **left button**. The selected area is now highlighted with a colored box. See the figure below for box color.



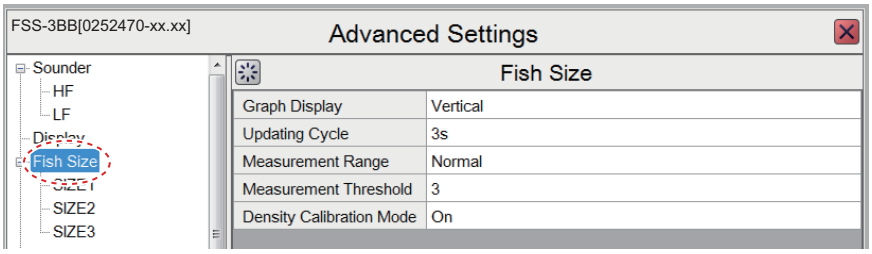
7. Change the location of the measuring marker and its size if necessary.
8. Do steps 5-7 to set other measuring ranges.

2.3.7 How to change fish size graph settings

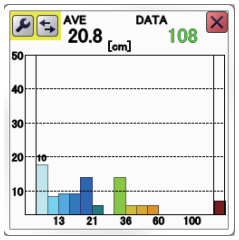
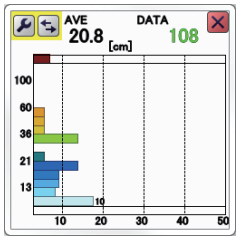
Several aspects of the graphs can be changed from the [Fish Size] menu.

Fish Size menu

1. Click the [Advanced Settings] icon ( ) on the InstantAccess bar™, then click the icon ( ) to show the [Advanced Settings] menu.
2. Click [Fish Size] to show the [Fish Size] settings on the right-side of the window.



3. Referring to the table below, select the measurement option to change, then change the settings as required.

Menu item	Description
[Graph Display]	Sets the orientation of the graph. Select [Horizontal] or [Vertical] as required.  *Vertical graph bars*  *Horizontal graph bars*
[Updating Cycle]	Sets how often to update the graph.
[Measurement Range]	When the measurement mode is other than the bottom track, set the range to measure fish length. [Std]: Measure to the bottom of the sea. [Entire Range]: Measure the entire range including the depth below the seabed. Fish depth graphs are not measured deeper than the seabed, so fish echoes may be misrecognized as the seabed and correct measurement results may not be obtained. In such a case, select [Entire Range].
[Measurement Threshold]	Sets the minimum fish length to detect.
[Density Correction]	In the [On] setting, the fish density correction function is activated and corrects the fish length to an appropriate value. Useful when measuring dense schools of fish. The [Off] setting may judge a dense school of fish to be one large fish.

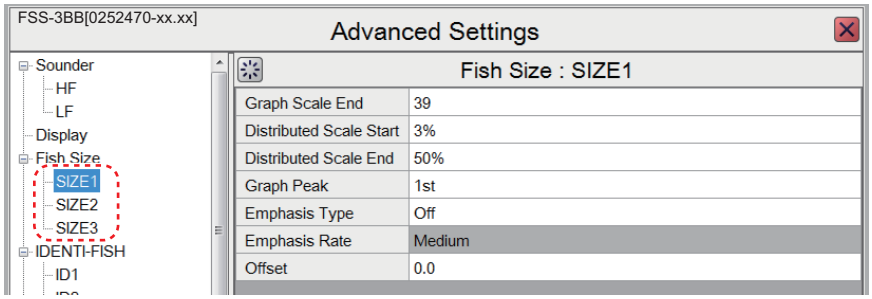
4. Click the [OK] button to save settings and finish, or click the [Cancel] button to restore previous settings and escape.

SIZE1 - SIZE3 menu

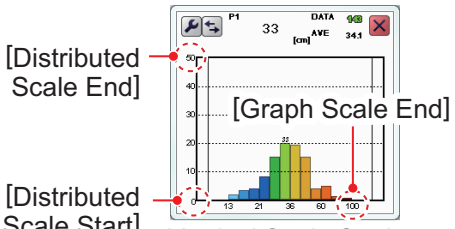
The following menu items change according to the measurement mode.

- [Specific Area] measurement mode: Since the [SIZE2] and [SIZE3] menus are enabled, the fish length graph can be set individually. For example, the [SIZE2] fish length graph is set in the [SIZE2] menu.
- Measurement mode other than [Specific Area]: The menu settings for the [SIZE1] menu are reflected to the fish graph.

1. Click the [Advanced Settings] icon ( ) on the InstantAccess bar™, then click the icon ( ) to show the [Advanced Settings] menu.
2. Click [Fish Size] to show the [Fish Size] settings on the right-side of the window.



3. Referring to the table below, select the measurement option to change, then change the settings as required.

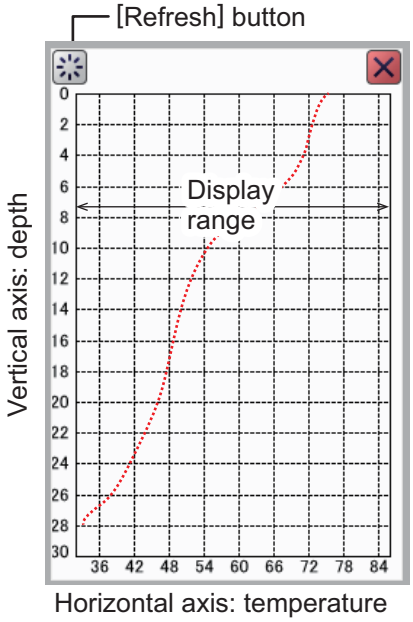
Menu item	Description
[Graph Scale End]	Sets the maximum fish size to be displayed on the graph.  *Vertical Scale Settings*
[Distributed Scale Start]	Sets the percentage of distribution at which data starts appearing on the graph. (See the above figure.)
[Distributed Scale End]	Sets the percentage of distribution at which data stops appearing on the graph. (See the above figure.)
[Graph Peak]	[1st]: Shows only the highest peak measurement. [1st + 2nd]: Shows the two highest peak measurements. [1st + 2nd + 3rd]: Shows the three highest peak measurements. Set the number of peak measurement to display on the graph.
[Emphasis Type]	Sets the degree of peak emphasis, among the following options. The larger the number, the longer the bar that shows peak • [Off]: Disable peak emphasis processing. • [Type 1]: Emphasize small peaks centering on 1st peak. • [Type 2]: Each peak is emphasized, multiple peaks are separated and emphasized. • [Type 3]: Emphasize large peaks centering on 1st peak.

Menu item	Description
[Offset]	Compensates for error in displayed fish size. For example, if the displayed value is smaller than the actual value, enter a positive value. Value set (dB) / Size to correct +6.0 / Approx. x2 +1.0 / Approx. x1.12 -6.0 / Approx. x1/2

4. Click the [OK] button to save settings and finish, or click the [Cancel] button to restore previous settings and escape.

2.4 Sonde Graph

The [Sonde Graph] plots the water temperature at the net sonde transmitter's position. The transmitter which feeds the data is selected at [Net Sensor Temp Graph] in the [Display] menu. See section 4.3.



To show the [Sonde Graph], click the [Graph] icon ( ) from the InstantAccess bar™ to show the [Graph] menu, then click the [Sonde Graph] icon ( ). The icon is highlighted in green and the graph appears.

The graph is painted in the color set with [Mark Color] in the [Display] menu. The horizontal axis shows temperature, and is linked with the depth scale. The horizontal axis shows temperature. If the temperature at the net goes out of the range of the current temperature scale, the scale is automatically changed to accommodate the new temperature.

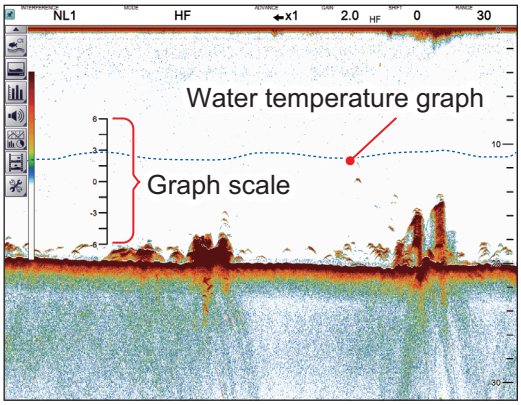
You can re-locate the graph and change its size by drag and drop.

To close the graph, click the [Close Window] icon ( ).

Note: You can clear the [Sonde Graph] and start a new graph at any time. Select the [Refresh] button (indicated in the figure above) to clear the graph and start a new graph.

2.5 Temp Graph

The [Temp Graph] plots water temperature using water temperature data. The source for water temperature data is set during the installation of the equipment.



To show the [Temp Graph], click the [Graph] icon ( ) from the InstantAccess bar™ to show the [Graph] menu, then click the [Temp Graph] icon ( ). The icon is highlighted in green and the graph appears. The graph scale and the graph line color can be changed. See section 4.3.

To close the graph, click the [Graph] icon ( ) from the InstantAccess bar™ to show the [Graph] menu, then click the [Temp Graph] icon ( ).

3. SCREENSHOTS & DATA RECORDING

3.1 Screenshots (still images)

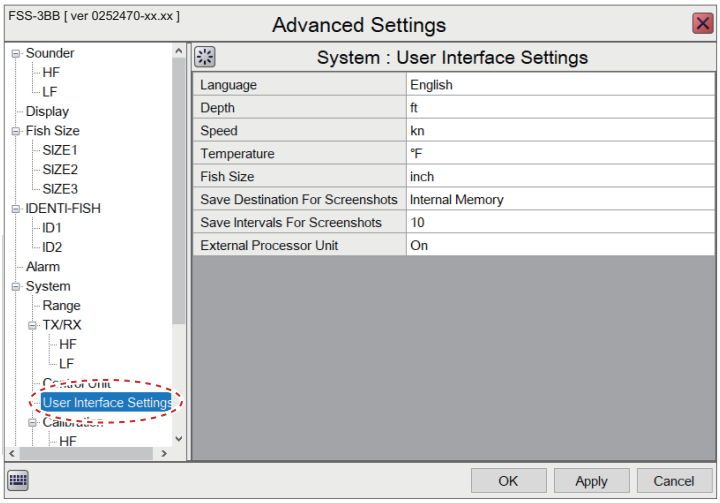
You can save a screenshot of the on-screen display and play it back at any time. This is helpful in comparing the sizes of schools of fish.

3.1.1 How to set the save destination for screenshots

Screenshots can be saved to the Processor Unit's internal memory, or to an external memory device. The Processor Unit can hold up to 999 screenshots. For external memory devices, the number of files that can be saved depends on the capacity of the external memory device.

To set the save destination for screenshots, do the following:

1. Click the [Advance Settings] icon ( ) on the InstantAccess bar™, then click the icon ( ) to show the [Advanced Settings] menu.
2. Double-click [System] to show the [System] section of the menu, then click [User Interface Settings] to show the [User Interface Settings] menu.

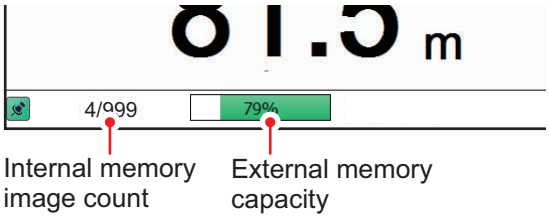


3. Click the [Save Destination For Screenshots] option. Select the options button, then select the appropriate destination. The available options are:
   [Internal Memory]: Saves the screenshots to the Processor Unit.
   [External Memory]: Saves the screenshots to the connected external memory device.
4. Click [Apply], then [OK] to finish.

3.1.2 How to take a screenshot

To take a screenshot, press the scrollwheel on the Trackball Control Unit.

Where the save destination is set to [Internal Memory], the footer shows the total number of screenshots saved to the Processor Unit.



Where the save destination is set to [External Memory], the footer shows the percentage of space available on the external memory device.

The file format for saved screenshots is JPEG (Joint Photographic Experts Group).

Note 1: Where the internal or external memory has insufficient space to save a new screenshot, the error message "Not enough memory to save screenshot. Delete unnecessary files." appears.
To rectify the problem, do one of the following:

- Delete unnecessary files. See section 3.1.6.
- Move saved files to an external memory device. See section 3.1.5.

Note 2: If a screenshot is taken when [External Memory] is selected and no external memory device is connected, the error message "External memory is not connected." appears. Check that the external memory is connected correctly.

Note 3: When two monitors are used, the screenshot from each monitor is saved.

3.1.3 How to take screenshots at a set interval

Several screenshots can be taken at set intervals. To use this function, do the following:

Note 1: The interval (in seconds) at which screenshots are recorded is set at [Save Intervals For Screenshots] in the [System] section of the [Advanced Settings] menu. See page 4-13.

Note 2: Connect the external memory device to the USB port on the Processor Unit. Do not connect the external memory device to the USB port on the Trackball Control Unit.

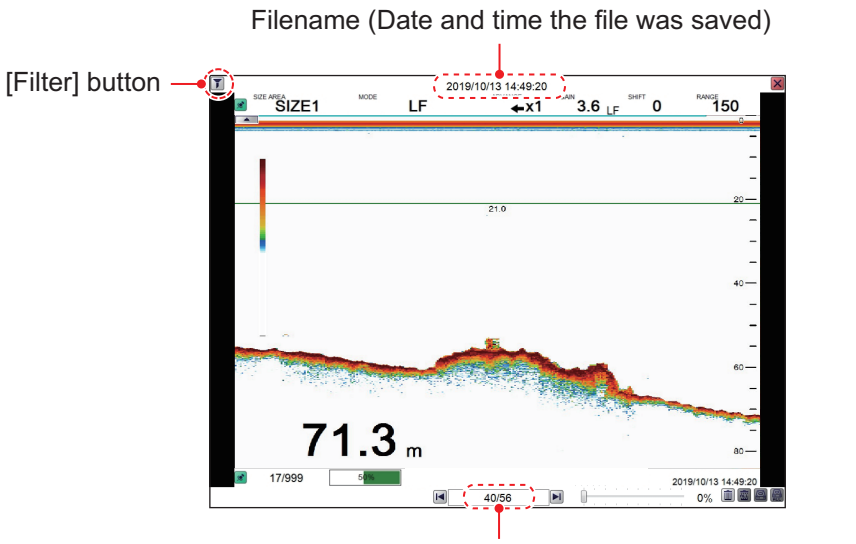
Note 3: [Static Display Recording: Start/Stop] is not selectable from the menu (the item is greyed out) if the external memory device is not correctly connected.

Note 4: For the Multi-Screenshot function, use of an external HDD is recommended.

1. Click the [Echo Recording] icon ( ) from the InstantAccess bar™, then click the [Multi-Screenshot Start/Stop] icon ( ).
   Screenshots are now saved at regular intervals and the [Static Display Recording: Start/Stop] icon is displayed in green color.
2. Click the [Multi-Screenshot Start/Stop] icon ( ) to stop recording.

3.1.4 How to replay a screenshot

To replay a saved screenshot, press and hold the scrollwheel on the Trackball Control Unit. The replay screen is displayed and the oldest screenshot is shown. A total of 1000 screenshots can be loaded for replay.



To change the displayed file, press the arrow buttons (or).

To close the replay screen, press the icon at the top-right of the screen.

Note 1: Where there are no screenshots to play back and the scrollwheel on the trackball is pressed and held, a blank screen (black color) appears.

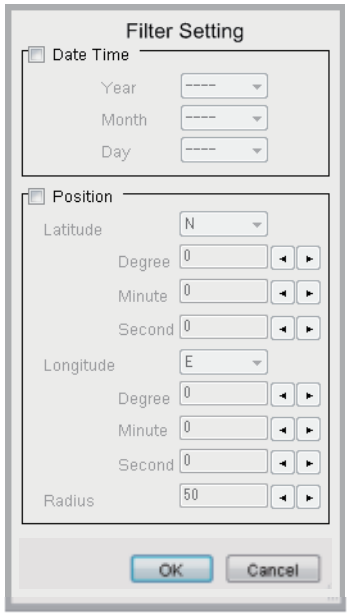
Note 2: The indication for the number of current screenshots and total screenshots is located at the bottom of the screen (see figure above). This indication shows the number of screenshots at the time of opening the replay screen and does not reflect any new screenshots taken while the replay screen is open. To refresh the count, close, then re-open the replay screen.

Note 3: Icons appear at the bottom-right corner of the playback display according to the save destination for screenshots.

Save destination for screenshots	Icon	
	Available	**Not available**
Internal memory	• [Copy] button ( ) • [Copy All] button ( ) • [Delete] button ( ) • [Delete All] button ( )	—
External memory	• [Delete] button ( )	• [Copy] button ( ) • [Copy All] button ( ) • [Delete All] button ( )

How to filter the screenshots that are displayed

1. Click the filter icon ( ) at the top-left of the screen to show the [Filter Setting] pop-up window.
2. Select the appropriate check box to show the filtering options. You can select either of, or both of the filters.
   - [Date Time]: Apply a filter based on date. You can select a single filter (for example, filter by month only) or a mixed filter (for example, filter by year, month and date).
   - [Position]: Apply a filter based on a specific location and/or a nautical mile radius from the specified point.
3. Click [OK] to apply the filters.



3.1.5 How to copy screenshots from internal to external memory

You can copy screenshot files from the internal memory of the Processor Unit to an external memory device (for example a USB flash drive).

Note 1: If the external memory device does not have the capacity to store the screenshot files, the error message "Not enough memory to copy screenshot. Delete unnecessary files." appears.
To rectify this problem, delete unnecessary files from the device to create room for the screenshot files, then repeat the applicable procedure.

Note 2: If no external memory device is connected, the [Copy] ( ) and [Copy All] ( ) icons are greyed out. You cannot move files.

How to copy a single screenshot file

1. Long-push the scrollwheel on the Trackball Control Unit to show the screenshot replay screen.
2. Click the arrow buttons (or) to select the file to copy.
3. Click the [Copy] ( ) icon at the bottom-right corner to copy the screenshot.

How to copy all screenshot files

1. Long-push the scrollwheel on the Trackball Control Unit to show the screenshot replay screen.
2. Click the [Copy All] ( ) icon at the bottom-right corner to copy all screenshot files.

3.1.6 How to delete screenshot files

You can delete screenshot files in two manners: individually, or all at once.

How to delete a single screenshot file

1. Long-push the scrollwheel on the Trackball Control Unit to show the screenshot replay screen.
2. Press the arrow buttons (or ( ) to select the file to delete.
3. Click the [Delete] ( ) icon at the bottom-right corner to delete the screenshot file.

How to delete all screenshot files (internal files only)

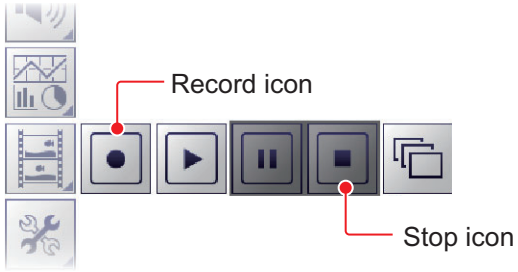
1. Long-push the scrollwheel on the Trackball Control Unit to show the screenshot replay screen.
2. Click the [Delete All] ( ) icon at the bottom-right corner. You are asked if you are sure to delete all screenshot files.
3. Click [Yes] to proceed with the file deletion. Click [Cancel] to abort the file deletion.

3.2 Echo Data Recording and Playback

The echo data recording and playback function requires connection to an external memory device. Echo data is recorded as a "movie", allowing you to playback previously recorded echo data. This is useful for re-viewing a school of fish and registering model data for the IDENTI-FISH™ graph.

3.2.1 How to record echo data

To start data recording, click the [Echo Recording] menu icon from the InstantAccess bar™, then click the [Record] icon. To stop the recording at any time, click the [Stop] icon.



The amount of memory used for recording echo data varies, depending on configuration and settings. For example, if the range is 150 m and the single display is used, recording will be done at approximately 4.7 GB/h.

Note 1: An external memory device with 500 GB capacity, or higher, is recommended for this function.

Note 2: When there is no external memory device connected, the [Echo Recording] icon is not selectable.

Note 3: Connect the external memory device to the USB port on the Processor Unit. Do not connect the external memory device to the USB port on the Trackball Control Unit.

Note 4: When an external memory device is connected and the capacity for the device reaches its limit, recording is stopped and the message "Recording stopped because memory capacity is full. Check capacity." appears.
Delete unnecessary files from the external memory device, or take other appropriate measures to allow sufficient capacity to save the echo data.

Note 5: When the external memory device does not have sufficient memory to begin data recording, and you attempt to record data, the message "Not enough memory to start recording. Delete unnecessary files." appears.
Delete unnecessary files from the external memory device, or take other appropriate measures to allow sufficient capacity to save the echo data.

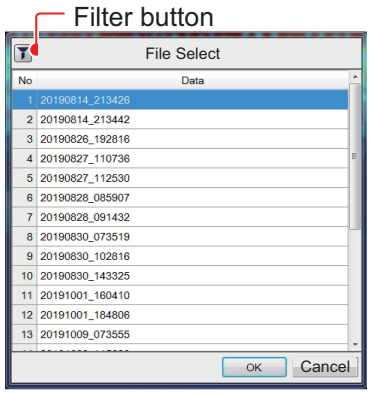
3.2.2 How to play back recorded echo data

The playback function lets you view echo data you previously recorded. The display mode used for playback should match the settings used when the echo data was recorded, or the echoes may not be displayed correctly.

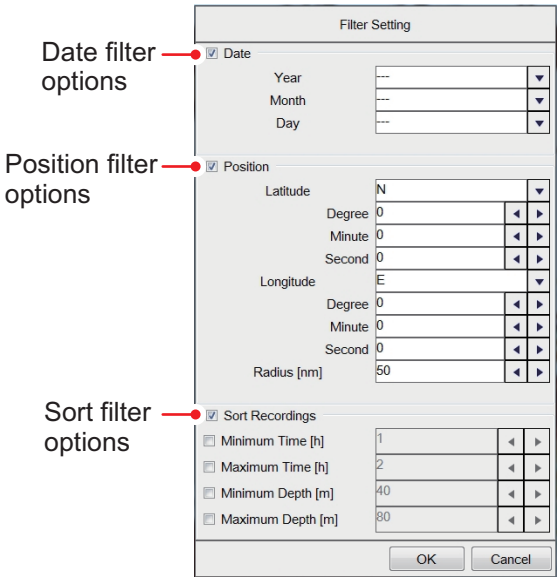
Adjustments made to gain and other echo settings are not reflected to the echo data being played back.

To play back recorded echo data, do the following:

1. Click the [Echo Recording] icon ( ) from the InstantAccess bar™, then click the [Play] icon ( ). The file selection dialog shown in the right-hand figure appears.



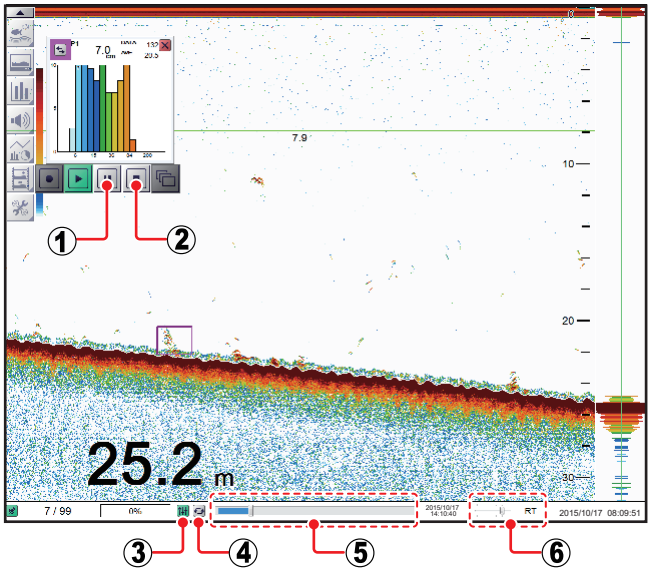
2. If you need to filter the files, select the filter button, indicated in the figure on the previous page. The [Filter Setting] window, shown below, appears. If you do not need to filter the files, go to step 4.



3. Referring to the table below, set the appropriate file filters, then click [OK].

Filter type	Description
[Specify Date]	Apply a filter based on date. You can select a single filter (for example, filter by month only) or a mixed filter (for example, filter by year, month and date).
[Specify Position]	Apply a filter based on a specific location and/or a nautical mile radius from the specified point.
[Sort Recordings]	Apply a filter based on the playback time of the record, the depth recorded, or a mix of time and depth. • [Minimum Time]/[Minimum Depth]: Records with a time/depth below this setting are not displayed. • [Maximum Time]/[Maximum Depth]: Records with a time/depth above this setting are not displayed.

4. Select the file to play back, then click [OK]. The selected file is played back. Some settings, such as gain and fish size measurements, can be adjusted during playback.



No.	Name	Description
1	[Pause] icon	Select to pause the playback. Click the [Play] icon to resume playback.
2	[Stop] Icon	Select to stop the playback.
3	[Settings] icon	Apply your current settings to the playback file. This icon is shown in green color when in use.
4	[Loop] icon	Select to loop the playback.
5	[Playback Location] indicator	Indicates your current location in the overall playback. Select the slider bar, then drag the locater to change the playback location.
6	[Playback Speed]	Select the speed to use to play back the recording. The available options are: • [2000]/[1500]/[1000]/[500] ms: Play the record at the set millisecond speed. • [RT]: Play the record at real time speed (the speed at which it was recorded). • [MAX]: Play the record at maximum playback speed.

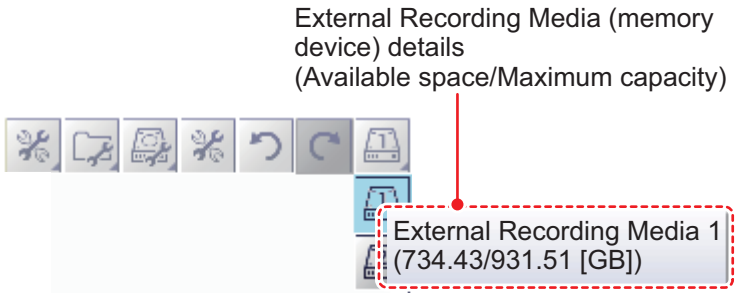
5. Click the [Stop] icon ( ) to stop the playback.

3.3 How to Select an External Memory Device

Where more than one external memory device is connected to the FSS-3BB, you can select the device to use for data recording and saving screenshots*.

*: [Screenshot Recording Destination] must be set to [External Memory] to save screenshots to an external memory device.

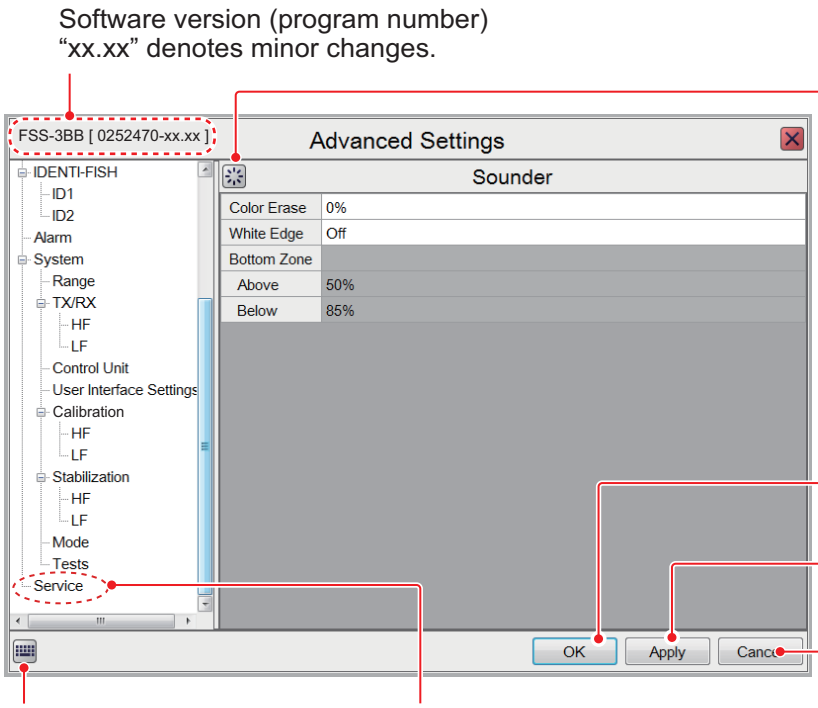
1. Click the [Advance Settings] icon ( ) from the InstantAccess bar™.
2. Click the [Select External Memory Media] ( ) icon.
   Note: The [Select External Memory Device] icon is only displayed when there is more than one external memory device connected to the FSS-3BB.
3. Select the appropriate external memory device to use.
   When the cursor is placed on the icon for an external memory device, the high-lighted device's capacity (available space/maximum space) is displayed.



4. ADVANCED SETTINGS

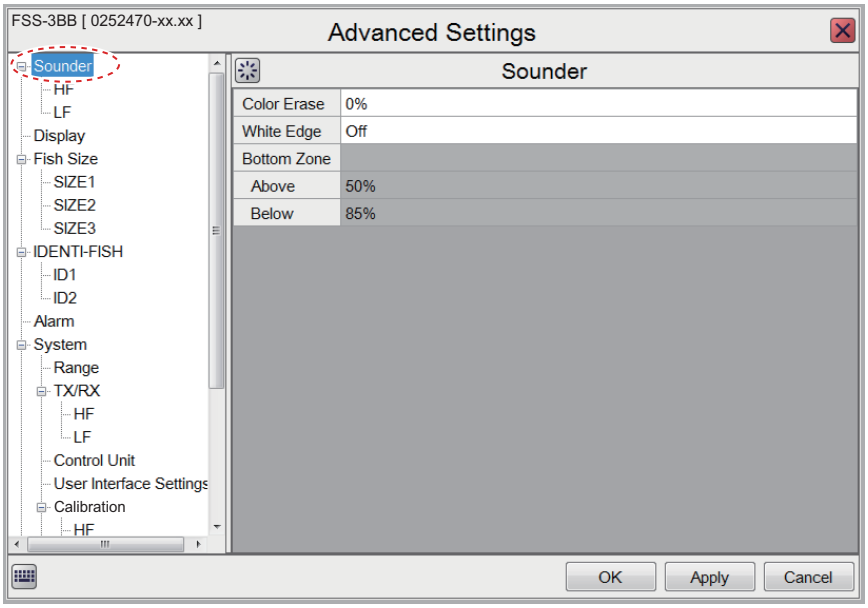
4.1 How to Access the Advanced Settings Menu

Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) to show the [Advanced Settings] menu.



4.2 Sounder Menu

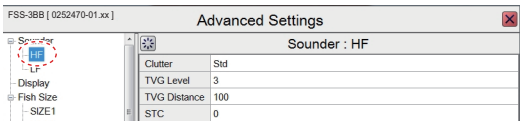
The [Sounder] menu contains items related to adjustment of the sounder picture.



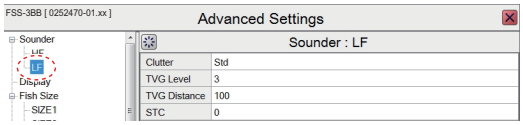
Menu item	Description
[Color Erase]	Erases unwanted noise. See section 1.25.
[White Edge]	Gives the seabed echo a white edge. Useful when trying to separate bottom-feeding fish from the seabed. Set a high value for a thick white line or a low value for a thin white line. Set to [Off] to disable this function.
[Bottom Zone] - [Above]& [Bottom Zone] - [Below]	Sets the area in which the seabed is displayed when auto-range mode is active. **Note:** This menu item is available only if [Auto Range] is not selected from the [Range][Auto] menu in the [System] menu.

HF and LF menus

The HF and LF menus set up the high and low frequencies as related to TX, RX.



[HF] menu

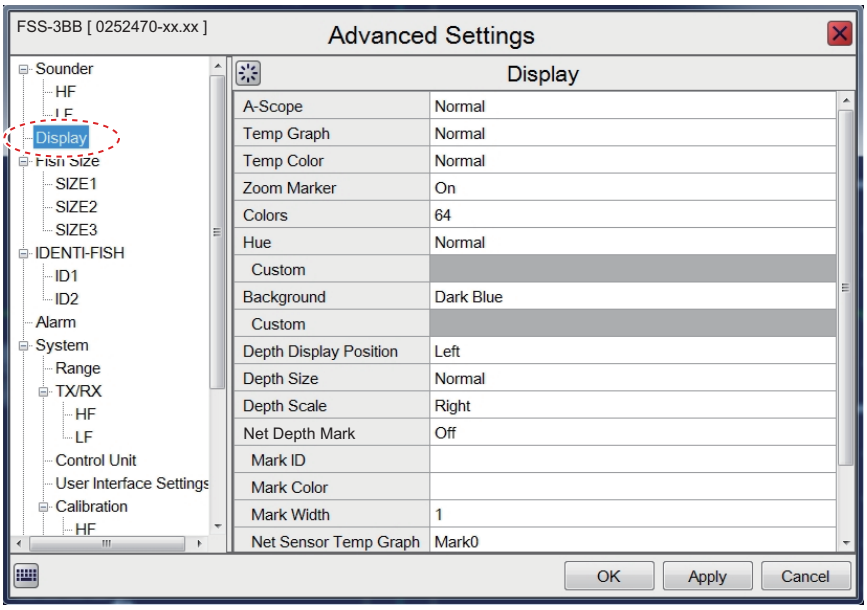


[LF] menu

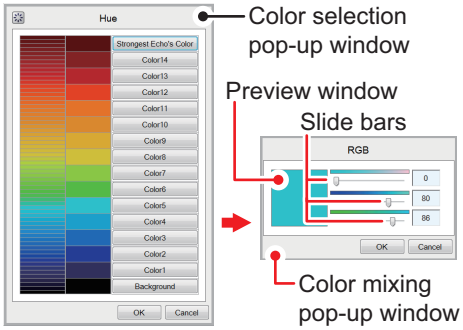
Menu item	Description
[Clutter]	Removes unwanted echoes (sediment, etc.). See section 1.12.
[TVG Level]	Time Varied Gain. Adjusts the TVG level. See section 1.26.
[TVG Distance]	Adjusts the maximum distance at which TVG is applied. See section 1.26.
[STC]	Sensitivity Time Control. Removes unwanted echoes near the surface. Use this function when you want to see fish near the surface clearly. Set the STC value according to your requirement. A setting of [0] disables the STC.

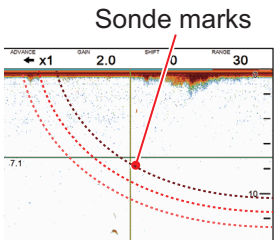
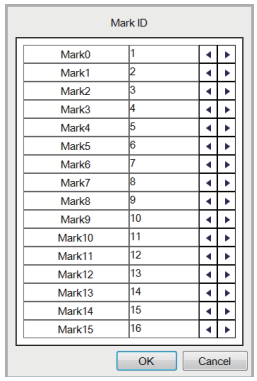
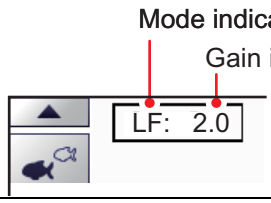
4.3 Display Menu

The [Display] menu contains the settings for what data to display and how to display the data on your screen.



Menu item	Description
[A-Scope]	Shows echoes at each transmission with amplitudes and tone proportional to their intensities. • [Normal]: The display shows echoes at each transmission with amplitudes and tone proportional to their intensities. • [Peak]: "Normal" A-scope display plus peak-hold amplitude picture for last five seconds, shown in dots.
[Temp Graph]	Displays a graph showing the water temperature in one of three layouts ([Narrow], [Normal], or [Wide]). Requires water temperature data.
[Temp Color]	Sets the color for the water temperature graph, which plots water temperatures. The [Normal] setting displays the graph in light blue.
[Zoom Marker]	When the zoom display is active, shows/hides the zoom marker (marks zoom start and zoom end positions) on the normal echo display.
[Colors]	Sets the number of colors available for both the color bar and echoes in the high and low frequency displays. **Note:** The number of echo colors is fixed to 16 for the IDENTI-FISH™ echo display.

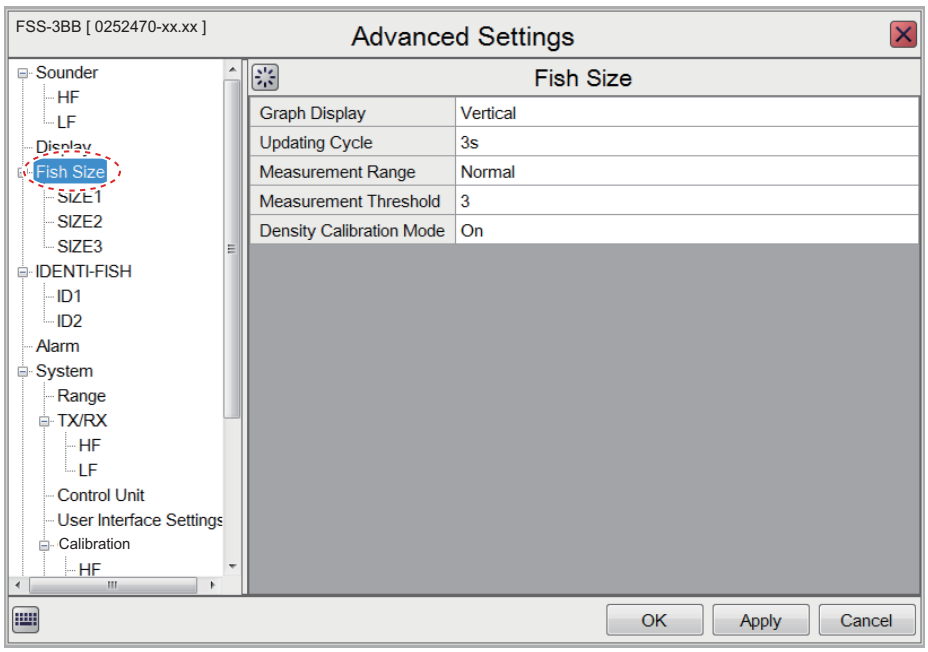
Menu item	Description
[Hue]	Adjusts the color scheme to suit your needs. There are eight options: • [Normal]: Factory default color scheme. • [Hue1] to [Hue6]: Preset color schemes. • [Custom]: Create a custom color scheme. Where [Custom] is selected, the Custom menu item is selectable. Click the ( ) icon to show the color selection pop-up window. Select a color, then adjust the color settings from the color mixing pop-up window. Adjust the slider bars to create a color. Click the [OK] button to finish, or click the [Cancel] button to revert to the previous color setting. 
[Background]	• [Background]: Changes the background color. This setting is not selectable when [Hue] is set for [Custom]. In this case the background color is set on the [Hue] window. • [Custom]: Sets a custom background color, or select a preset color. The setting is changeable when [Background] is set to [Custom]. Change the background color as follows: 1) Click the ( ) icon next to [Custom] to show the color setting window. 2) Adjust the slider bar to select a color. 3) Click the [OK] button to save the color, or click the [Cancel] button to cancel changes.
[Depth Display Position]	Sets the location where to show the depth indication, [Left], [Center], or [Right].
[Depth Display Size]	Sets the size of the depth indication, [Normal], or [Zoom].
[Depth Scale]	Sets the location for the depth scale, [Right], or [Center].

Menu item	Description
[Net Depth Mark]	• [Net Depth Mark]: Shows/hides the net depth mark (depth at the installation position of the net sonde transmitter) on the high and low frequency displays. • [Mark ID]: Assign the net depth mark and net sonde/net sensor ID (ID number of the transmitter you want to display depth information). Set net depth mark ID as follows: 1) Click the ( ) icon to show the [Mark ID] window. 2) Set the net sonde/net sensor ID corresponding to the net mark number (0 - 15). For example, to set [Net ID0] as [ID20], click the arrow buttons ( ) for [Net ID0] to set [20]. **Note:** The same ID number cannot be set for net mark 0 to net mark 15. 3) Click the [OK] button to confirm setting, or click the [Cancel] button to escape and restore previous setting. • [Mark Color]: Sets the color for the displayed net depth marks and the temperature graph. 1) Click the ( ) icon to show the color selection pop-up window. 2) Select the appropriate sonde number at the right-side of the color selection pop-up window. 3) Adjust the slider bar to change the displayed color of the sonde. 4) Click [OK] to confirm the changes, or click [Cancel] to cancel the changes. • [Mark Width]: Sets the thickness of the sonde line. The higher the setting, the thicker the line. • [Net Sensor Temp Graph]: The assigned net mark ID (0 - 15) appears on the net water temperature graph. The graph displays only one mark ID.  
[Transparency]	Adjusts the level of transparency for the fish size graph, IDENTIFISH™ graph, and the water temperature graph. A higher setting increases the transparency, however the graph bars, scale and indications in the graph are not made transparent. **Note:** This equipment uses AlphaBlend technology for transparency processing.
[Mode&Gain Display]	 Show/hide the mode/gain display (at the top-left corner of the screen).
[Data Position]	Selects where to display position data on the screen. The choices are [Upper Left], [Lower Left], [Upper Right], or [Lower Right].

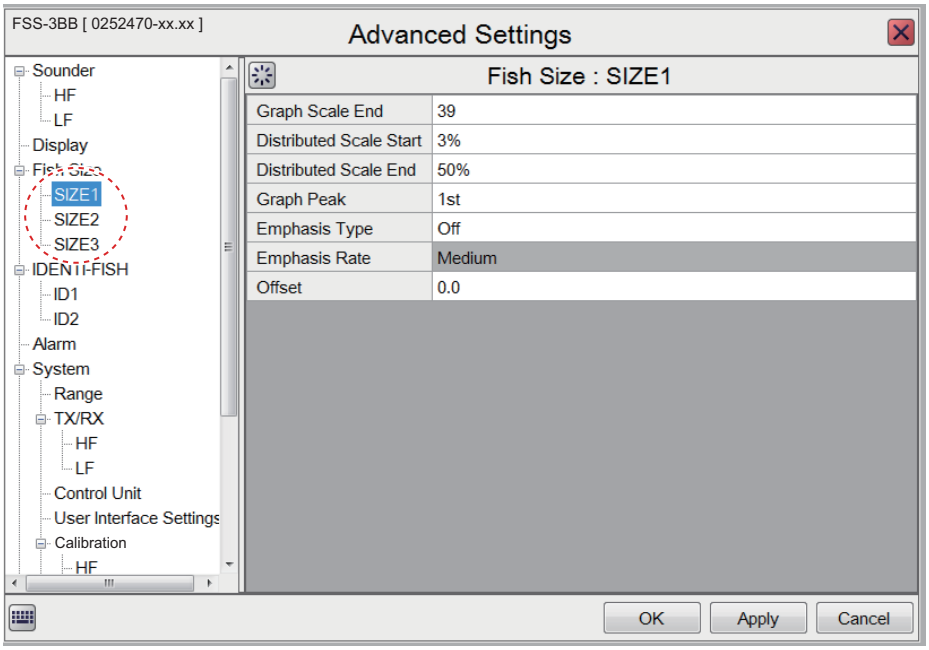
4.4 Fish Size Menu

The [Fish Size] menu consists of four menus, [Fish Size] menu and [SIZE1] - [SIZE3] menus. Fish size graph-related measurement can be set from the [SIZE1] - [SIZE3] menus. For details, see section 2.3.7.

Fish Size menu



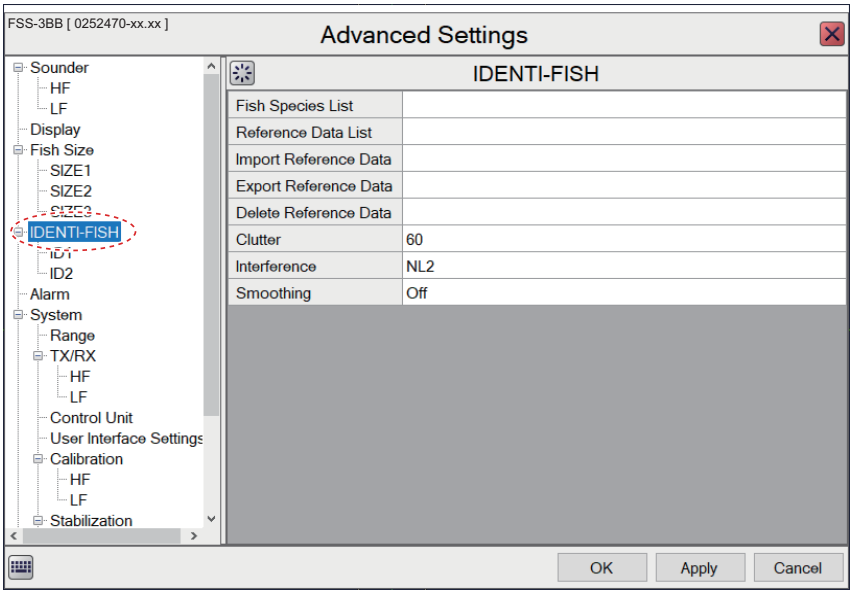
SIZE1 - SIZE3 menus



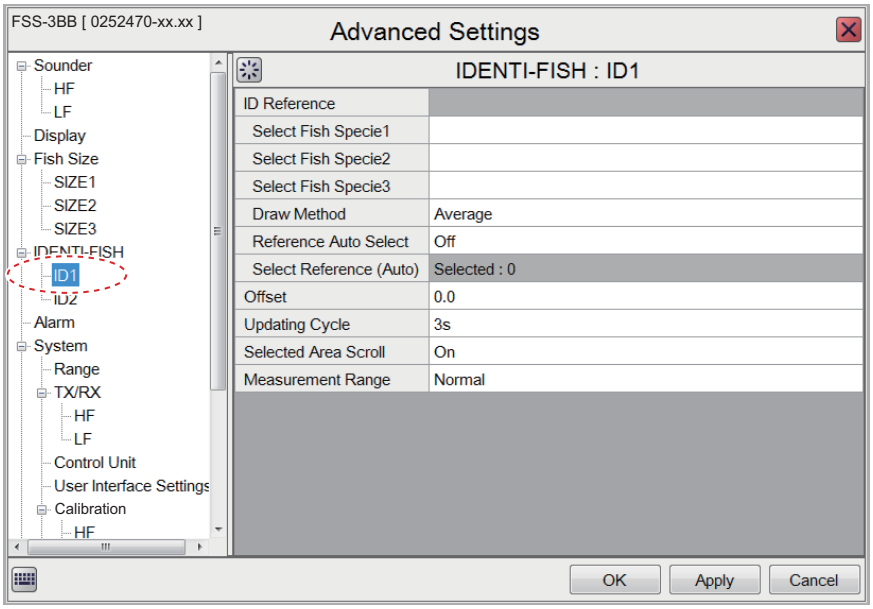
4.5 IDENTI-FISH Menu

The [IDENTI-FISH] menu consists of the [IDENTI-FISH], [ID1] and [ID2] menus, which set up the IDENTI-FISH™ function. See section 2.2.6.

IDENTI-FISH menu (IDENTI-FISH echo display, IDENTI-FISH graph settings)

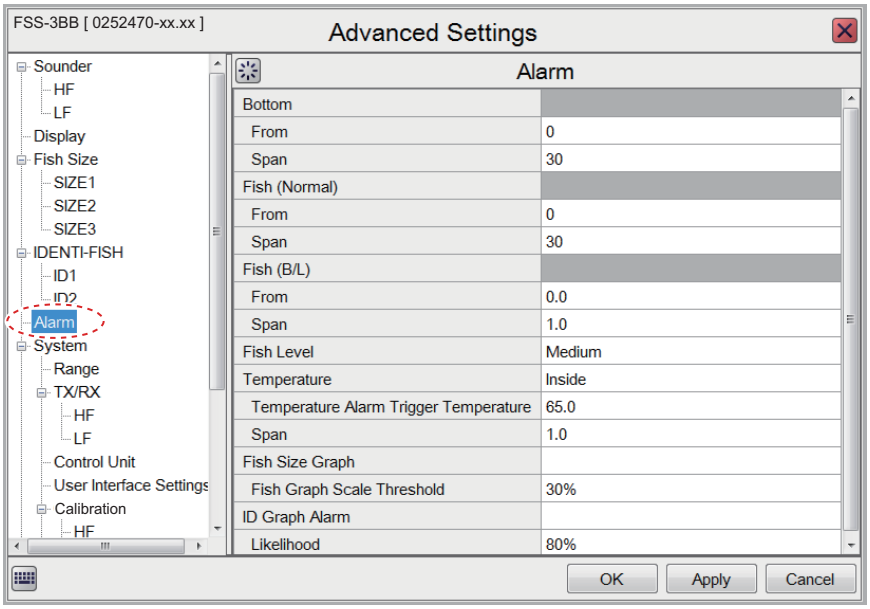


ID1 and ID2 menus (IDENTI-FISH graph settings)



4.6 Alarm Menu

The [Alarm] menu sets the conditions for the alarms. For further details on setting alarms and their conditions, see section 1.21.

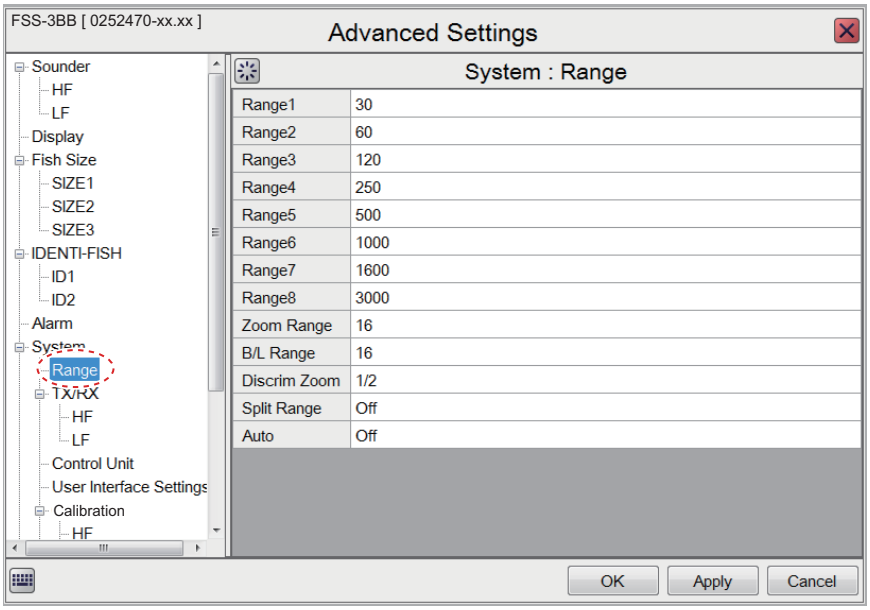


4.7 System Menu

The [System] menu contains settings which do not require regular adjustment.

4.7.1 Range menu

The [Range] menu contains range-related settings.

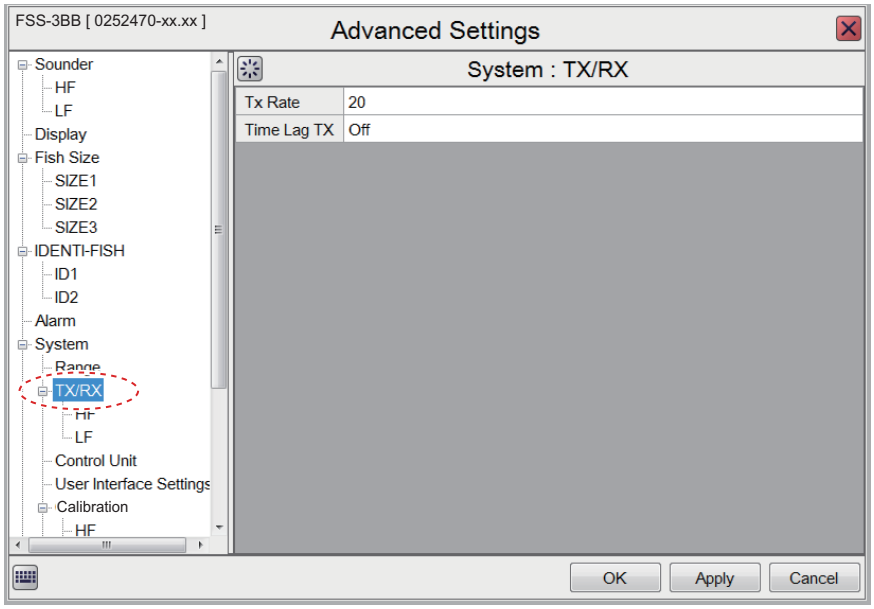


Menu item	Description
[Range1] to [Range8]	Changes the range setting for the preset ranges.
[Zoom Range]	Changes the range at which zoomed items appear on the display.
[B/L Range]	Changes the range for the bottom lock and bottom discrimination displays.

Menu item	Description
[Discrim Zoom]	Sets the zoom ratio for the Discrimination Zoom function. See section 1.13.4.
[Split Range]	This feature is available when the fish size graph or IDENTI-FISH™ echo display is inactive. The [On] setting permits independent adjustment of range on the high and low frequency displays on the normal echo display.
[Auto]	Click [Auto Range] or [Auto Shift] to enable the respective functions. Click [Off] to disable both [Auto Range] and [Auto Shift]. **Note 1:** Both the [Auto Range] and [Auto Shift] can only be selected individually. **Note 2:** While [Auto Range] is active, the range indication on the header shows "AT" and the shift indication shows "N/A". Neither range nor shift can be operated manually. **Note 3:** While [Auto Shift] is active, the shift indication on the header shows "AT". Shift cannot be operated manually. Range can be adjusted.

4.7.2 TX/RX menu

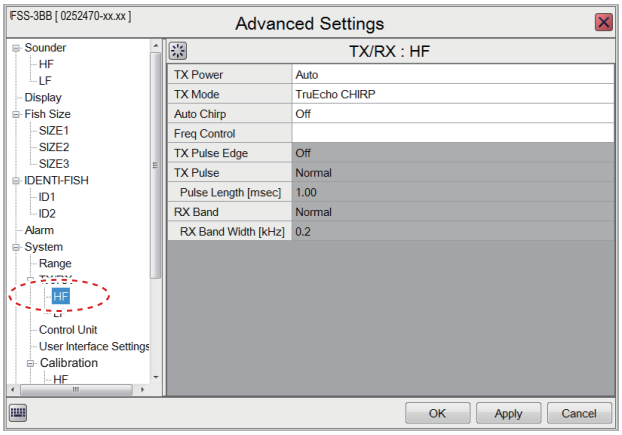
The [TX/RX] menu contains settings related to transmitting and receiving.



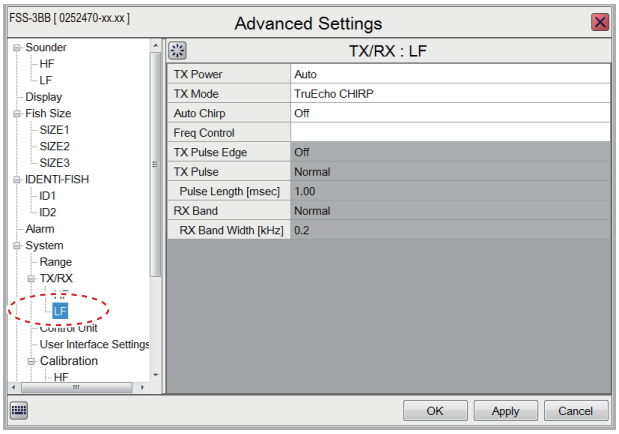
Menu item	Description
[TX Rate]	Changes the rate at which the fish finder transmits a pulse. Adjust this setting to erase false seabed echoes which may appear between the surface and the actual seabed in shallow waters. This function is inoperative when [TX Cycle Select] is set to [Manual].
[Time Lag TX]	Transmit high and low frequencies simultaneously or with a time delay. Certain high and low frequency combinations, when transmitted simultaneously, may produce false echoes near the seabed. If this occurs, you can transmit the frequencies with a time delay. Set this item to [HF] or [LF] to prevent false echoes. • [Off]: HF and LF are transmitted simultaneously. • [HF]: HF is transmitted first, followed by LF. • [LF]: LF is transmitted first, followed by HF. If continuous interference appears when this function is active, remove the interference with the interference rejector.

HF and LF menus

The [HF] and [LF] menus set up the high and low frequencies related to TX, RX. Not available when the fish size graph or IDENTI-FISH™ echo display is active.

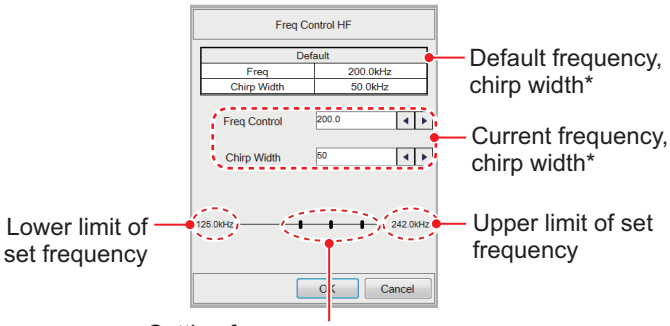


HF menu



LF menu

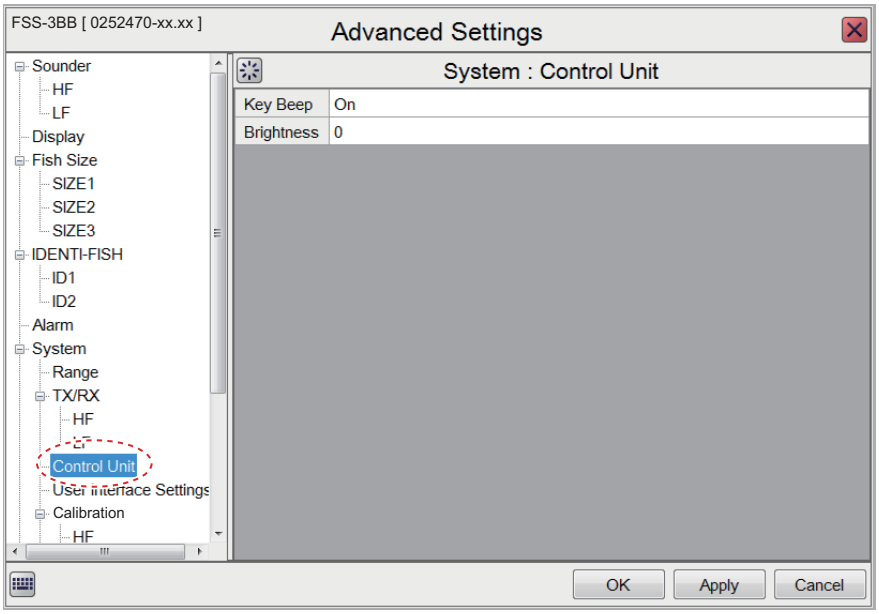
Menu item	Description
[TX Power]	When using more than one fish finder with the same frequency, in close proximity, interference can occur. To reduce the interference, the offending ships contact one another to request reduction of TX power. To stop transmission set this item to [Off]. In the [Auto] setting, TX power is automatically reduced so that the bottom echo is displayed correctly. [Auto] is available when [TX Mode] is set to [TruEcho CHIRP]. **Note:** The [Auto] setting automatically adjusts the gain. If necessary, readjust the gain to display the bottom echo, etc. properly.
[TX Mode]	Operative when [Auto Chirp] (below) is set to [Off]. In normal operation turn on [TruEcho CHIRP]. For deeper detection, click [Normal]. However the resolution is lower when using [Normal]. **Note:** Whenever the mode is changed, the [Freq Control] setting is returned to the default setting.
[Auto Chirp]	Operative when [TX Mode] is set to [TruEchoCHIRP]. [On] automatically selects the optimum chirp width. The detection range is longer, however the resolution decreases.

Menu item	Description
[Freq Control]	Operative when [Auto Chirp] is set to [Off], and adjusts the frequency and chirp width. This function is useful for adjusting the frequency in the following conditions. • Set the frequency according to targeted fish species. • Shift the frequency to reduce interference. • Lower the frequency to increase detection range, decrease chirp width. • Raise the frequency to raise the resolution (when viewing a school of fish), widen chirp width. To adjust the frequency do as follows: 1) Click the ( ) icon of [Freq Control] to show the [Freq Control HF] (or [Freq Control LF]) window. The content of the window changes with transducer model and TX mode. The example below is the high frequency side of the transducer CM265LHG.  Setting frequency range: Frequency and chirp calculations appear. The black dot in the center is the current frequency setting and the black dot at the right and left are chirp width*. Further, if the set chirp width* is outside the transducer's acceptable range, the dots to the right and left appear in red color. * The chirp width indications and the black dots (see the figure above) are greyed out when the [TX Mode] is [Normal]. 2) Click the arrow buttons ( ) of [Freq Control] to adjust the frequency. The software keyboard may also be used to adjust the frequency. **Note:** The frequency may not be adjustable depending on the [Chirp Width]. If this happens, reduce the chirp width to enable frequency adjustment. 3) When the [TX Mode] is [TruEchoCHIRP], click the arrow buttons ( ) of [Chirp Width] to adjust the chirp width. The software keyboard may also be used to adjust the chirp width. If the chirp width cannot be adjusted, the default chirp width settings may need to be restored. To restore the default setting, close the [Freq Control HF] (or [Freq Control LF]) window, navigate to the [TX/RX: HF] (or [TX/RX: LF]) menu then click the reset button ( ). 4) Click the [OK] button to finish, or the [Cancel] button to revert to previous settings.
[TX Pulse Edge]	[TX Pulse Edge] is operative when [TX Mode] is set to [Normal]. Turn this feature on to reduce noise generated by echo sounders or sonars onboard your vessel or another vessel.

Menu item	Description
[TX Pulse]	[TX Pulse] is operative when [TX Mode] is set to [Normal]. Pulse length is automatically selected according to range and shift settings, however it can also be set manually. Select a shorter pulse length for better resolution; a longer pulse to increase detection range. To raise resolution on the zoom displays, for example, select the setting [1/4] or [1/2]. • [1/4]: Resolution is increased but the detection range is shorter than with [1/2]. • [1/2]: Resolution is increased but the detection range is shorter. • [Normal]: For general detection of schools of fish. • [x2]: Resolution is decreased; detection range is increased. Depending on the range, the number of transmissions is 1/2 of [Normal]. • [Manual]: Pulse length can be set manually regardless of the range.
[Pulselength (msec)]	Operative when the [TX Mode] is [Normal] and [RX Band Width] is [Manual]. A smaller number provides better resolution but decreases the detection range. A larger number provides greater detection range but decreases the resolution.
[RX Band]	Operative when the [TX Mode] is [Normal]. RX band is automatically set according to TX pulse length. To reduce noise, switch from [Normal] to [Narrow]. For better resolution, switch from [Normal] to [Wide]. To set RX band manually, click [Manual].
[RX Band Width (kHz)]	[RX Band Width (kHz)] is operative when [TX Mode] is set to [Normal] and [RX Band] is set to [Manual]. Choose a smaller figure to reduce noise; a larger figure to improve resolution.

4.7.3 Control unit menu

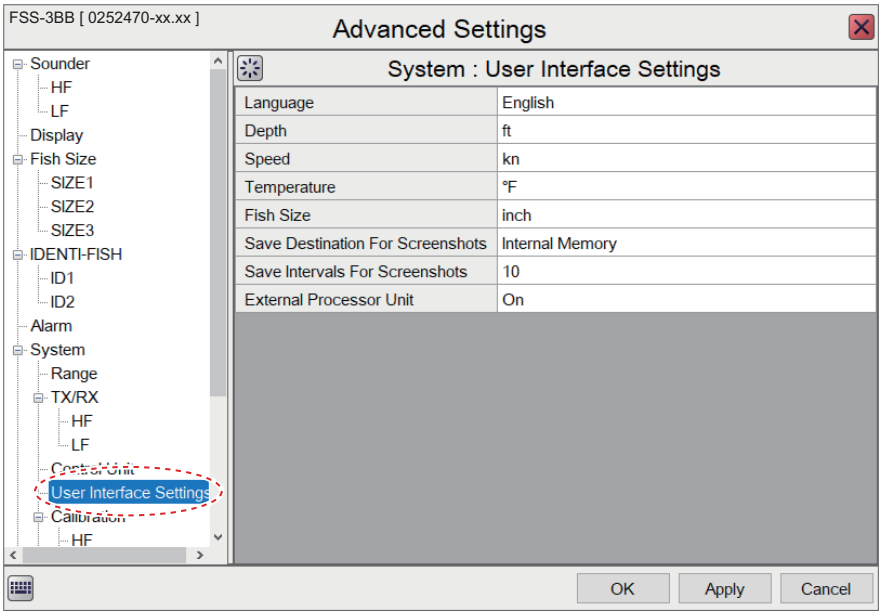
The [Control Unit] menu provides settings for the Trackball Control Unit.



Menu item	Description
[Key Beep]	Set to [On] or [Off] to enable or disable the key beeps.
[Brightness]	Adjusts the brightness for the Trackball's power LED and the back-light for the power button.

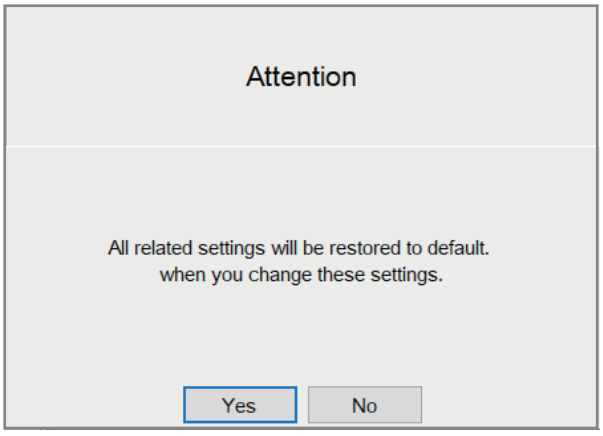
4.7.4 User Interface Settings menu

The [User Interface Settings] menu changes the language, units used for measurement, screenshot settings, etc.



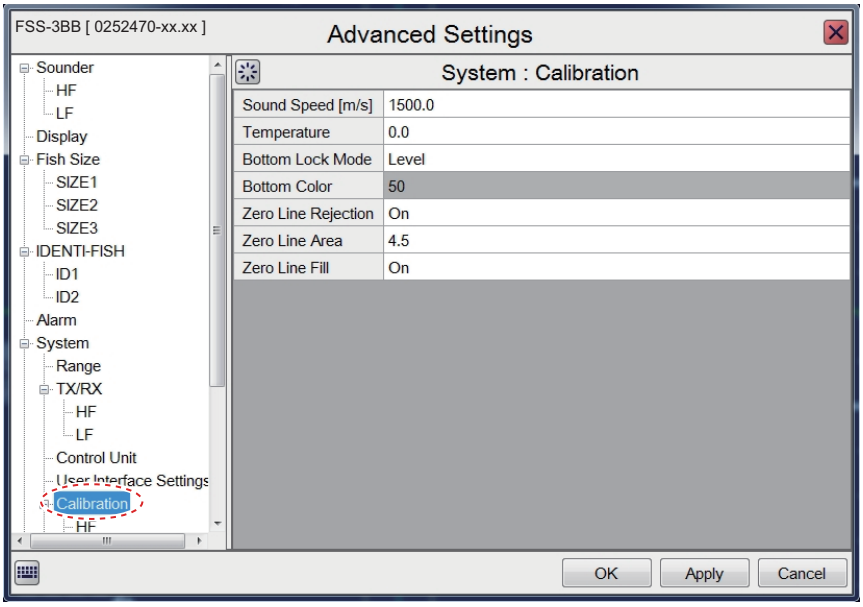
Menu item	Description
[Language]	Selects the language to display the menus and on-screen indications in.
[Depth]*	Selects the unit of measurement for depth.
[Speed]	Selects the unit of measurement for speed.
[Temperature]*	Selects the unit of measurement for temperature.
[Fish Size]*	Selects the unit of measurement for fish size.
[Save Destination For Screenshots]	Selects the save destination for screenshots. See section 3.1.1.
[Save Intervals For Screenshots]	Selects the interval timing (in seconds) for taking repeated screenshots. See section 3.1.3.
[External Processor Unit]	Not used.

* Whenever a unit of measurement is changed, the message shown below appears. If you are sure to proceed, click the [Yes] button.



4.7.5 Calibration menu

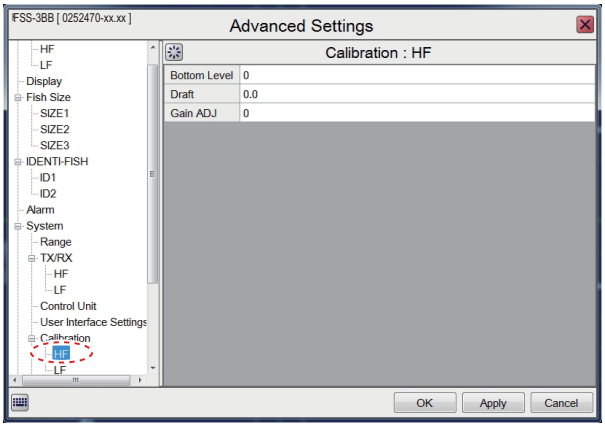
The [Calibration] menu compensates for error in water temperature and other data.



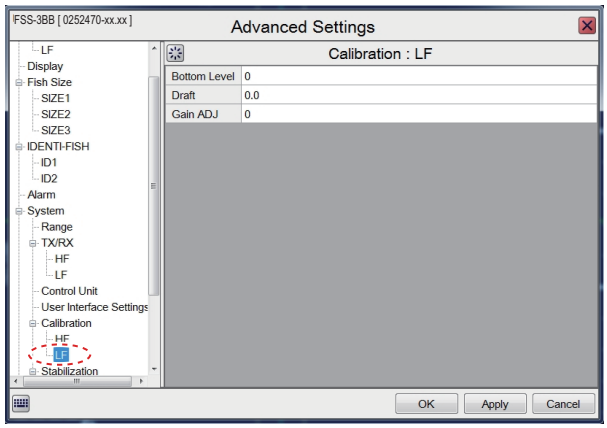
Menu item	Description
[Sound Speed [m/s]]	If the depth indication is incorrect, you can change the sound speed setting to compensate for the error.
[Temperature]	Compensates for incorrect water temperature data. For example, if the shown water temperature is two degrees higher than the actual temperature, enter -2.0.
[Bottom Lock Mode]	Set how the bottom edge is determined, by signal level or display color. • [Level]:Determine the bottom edge by signal level. When the method is [Color], bottom fish may be hidden in the bottom edge. With [Level] the shape of the bottom echo may change depending on the bottom contour of the bottom. • [Color]: Determine the bottom edge by display color. When bottom fish are well separated from the bottom, the bottom is displayed with a straight line, making discrimination of bottom fish easier. However, the bottom presentation may change depending on gain setting.
[Bottom Color]	When [Bottom Lock Mode] is set to [Color], you can select the color (0-63) to be judged as the bottom echo.
[Zero Line Rejection]	Turns the zero line (transmission line) on or off. When turned [On], the transmission line disappears, which allows you to see fish echoes near the surface clearly. The width of the transmission line changes with transducer used and installation characteristics.
[Zero Line Area]	Adjusts the transmission line so that the line disappears when the [Zero Line Rejector] is turned on. For a long tail, increase the value. If the transmission line does not disappear, lower the TX power.
[Zero Line Fill]	Turn off to see fish echoes near the surface.

HF and LF menus

The [HF] and [LF] menus set up the high and low frequencies in calibration.



HF menu



LF menu

Menu item	Description
[Bottom Level]	In the default bottom level setting [0], the equipment judges consecutive strong echoes to be bottom echoes. If, in that setting, the depth indication is unstable, adjust the bottom level. If vertical lines extend upward from the bottom echo in the bottom lock display, lower the bottom level to erase the vertical lines. If the level is too low, however, it may be difficult to distinguish bottom fish from the bottom echo.
[Draft]	To display the depth from the surface (rather than the transducer), enter ship's draft. If the draft settings for HF and LF do not match, the message "The setting values are different for HF and LF. If you don't use an integrated transducer, the measurement accuracy of the Fish Size Graph and ID Graph will be reduced." appears.
[Gain ADJ]	If the gain is too high or too low, or the gain for the low and high frequencies appears unbalanced, you can compensate it here.

4.7.6 Stabilization menu

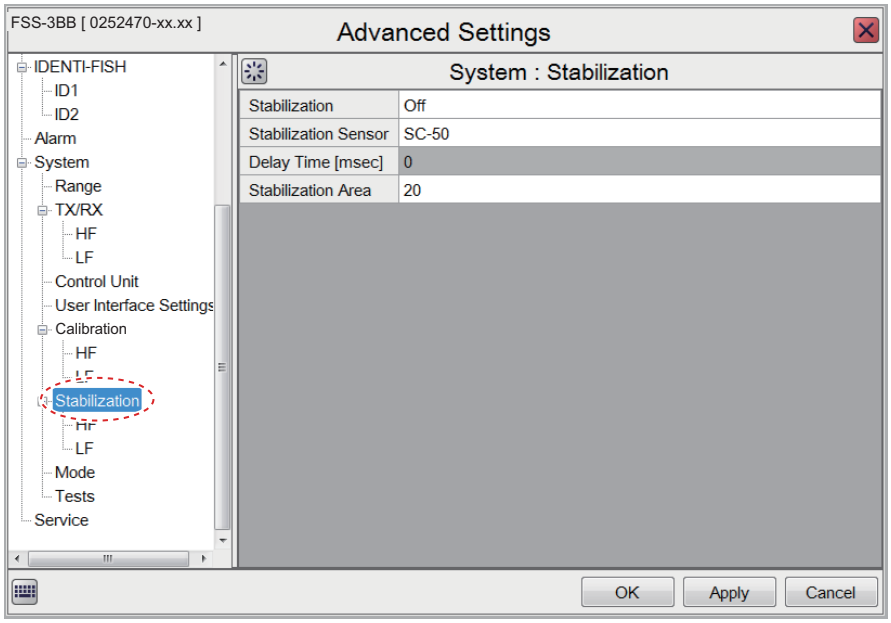
The [Stabilization] menu mainly compensates for heaving. See the Notes below to enable use of this function.

Note 1: This function requires connection to a SATELLITE COMPASS™. If data from the compass is lost or interrupted, the function is disabled.

Note 2: To use stabilization, set output data on the SATELLITE COMPASS™ as shown below. See the operator's manual for the SATELLITE COMPASS™.

- Output sentence: ATT (GPatt), HVE (GPhve)
- Baud rate: 38,400 bps
- Output interval: 25 ms or less
- Version (SC-50/110 only): IEC ED1

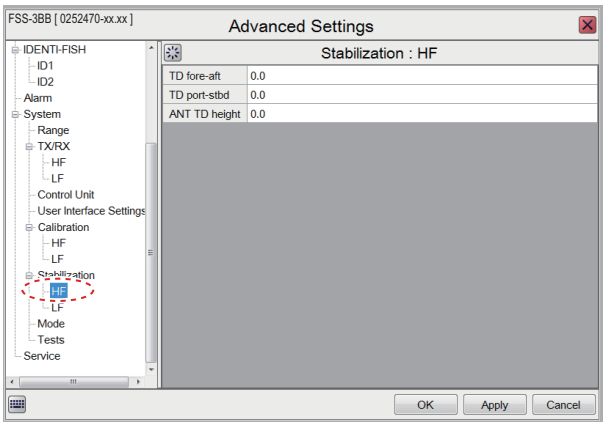
Note 3: This function is unavailable if [KP Input] is set to [On] at installation.



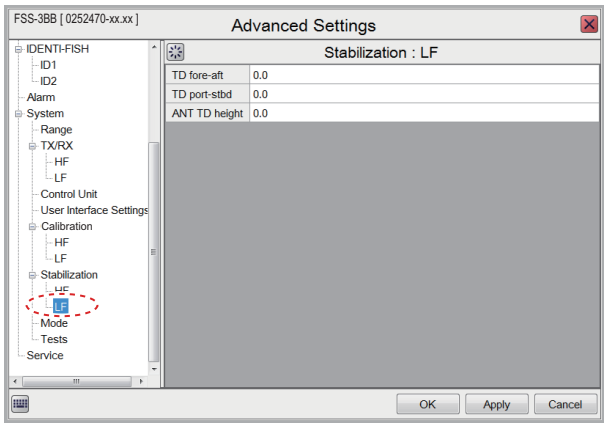
Menu item	Description
[Stabilization]	Turn heaving compensation on or off. Turn it on when seas are rough to get stable echoes. When turned on, the stabilization icon ( ) appears in the [Picture Advance] indication in the header. **Note:** Where data from the SATELLITE COMPASS™ is interrupted or lost, the stabilization icon is overlaid with a cross to indicate that it is not in use. When data from the SATELLITE COMPASS is received again, the cross is removed.
[Stabilization Sensor]	Selects the SATELLITE COMPASS™ model connected to the FSS-3BB. The sensor is optimally set up during installation. Do not change this setting.
[Delay Time [msec]]	Operative when [Stabilization Sensor] is set to [Manual]. This item is optimally set up during installation. Do not change this setting.
[Stabilization Area]	When heaving exceeds the value set here, stabilization is stopped and an “X” is overlaid on the stabilization icon at the top of the screen, indicating stabilization is stopped. However, the setting for [Stabilization] is kept [On]. When heaving is once again less than the value set here, stabilization is restarted and the "X" disappears.

HF and LF menus

The [HF] and [LF] menus set up antenna position of the Satellite Compass™. This menu is set properly during the installation. Do not change the settings.



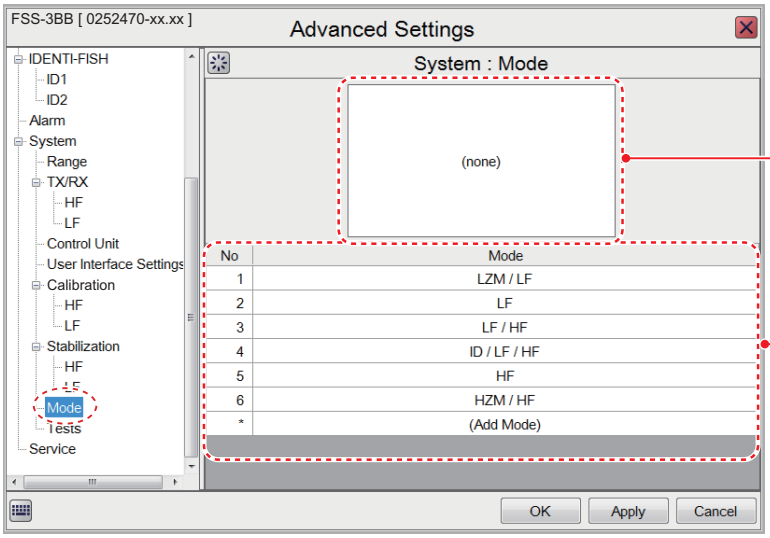
HF menu



LF menu

4.7.7 Mode menu

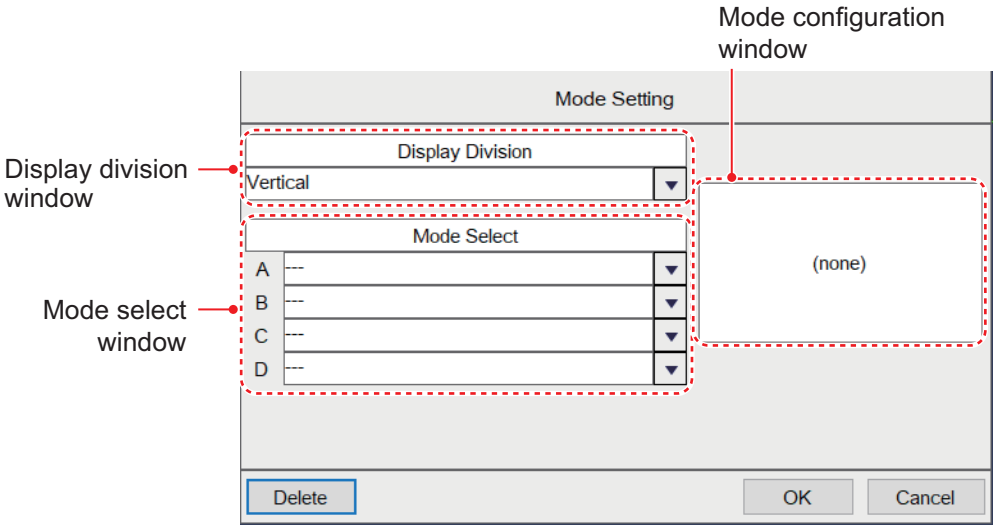
The [Mode] menu sets the display modes to use. The modes available for use appear in the [MODE] indication in the header.



How to add a mode

You can have a maximum of eight modes. To add a mode, do the following:

1. With the [Mode] menu displayed, click the applicable ( ) button of an empty mode number. The screen should look something like the one shown below.



2. For two or more screens in a mode, select desired display orientation from the [Display Division] drop-down list. The choices are [Vertical], [Horizontal] and [Complex]. See Appendix 2 for the layout available with each screen division.
3. From the [Mode Select] window, select up to five items to display on the mode selected The choices are outlined in the table below.

[Mode Select] window items

[Mode Select] window items	Description
[---]	No selection.
[HF]	Adds the high frequency display.
[HZM]	Adds the high frequency zoom display.
[LF]	Adds the low frequency display.
[LZM]	Adds the low frequency zoom display.
[ID]*	Adds the IDENTI-FISH™ display.

*Not shown when [External IDENTI-FISH Echo Window] is set to [On] (at installation).

4. Click [OK] to apply the changes to the mode selected at step 1 and close the menu. Click [Cancel] to cancel any changes made and close the menu.

How to edit a mode

You can edit the contents of a display mode at any time. To edit a mode, do the following:

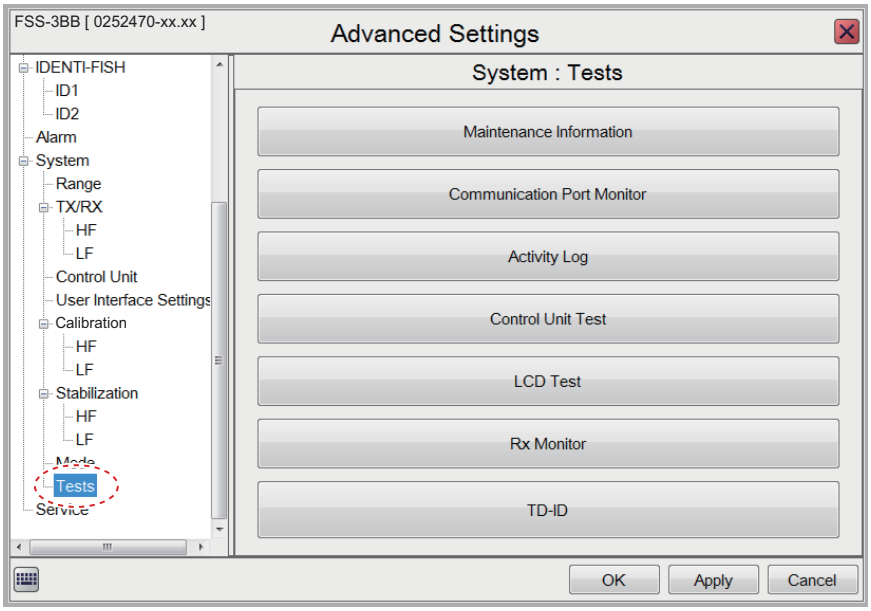
1. With the [Mode] menu displayed, select the display mode you wish to edit, from the Mode list, with the applicable ( ) button.
2. Use the [Mode Select] and [Display Division] windows to edit the mode as required.
3. Click [OK] to apply the changes and close the menu. Click [Cancel] to cancel any changes made and close the menu.

How to delete a mode

1. With the [Mode] menu displayed, select the display mode you wish to edit, from the Mode list, with the applicable ( ) button.
2. Click the [Delete] button to delete the selected mode.

4.7.8 Tests menu

The [Tests] menu provides maintenance information, diagnostic tests, and other maintenance tools.



For details, see section 5.7.

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5. MAINTENANCE AND TROUBLE-SHOOTING

This chapter contains maintenance and basic troubleshooting procedures for the operator. If you feel that something is wrong with the equipment, do not check inside any unit. Contact an authorized FURUNO agent or dealer for advice.

⚠ WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment.

This equipment uses high voltage that can cause electrical shock. Only a qualified technician may work inside the equipment.

NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to plastic parts or equipment coating.

Those items contain products that can damage plastic parts and equipment coating.

5.1 Maintenance

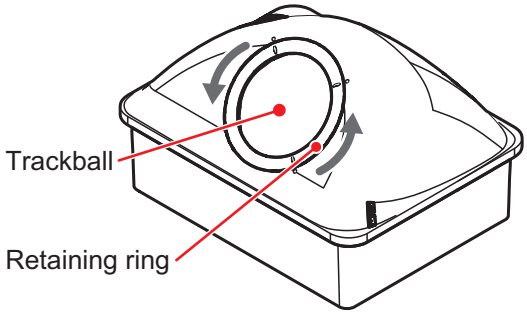
Regular maintenance is essential for good performance. Periodically check the points shown in the table below to help keep the equipment in good working order.

Check Point	Action	Remedy, remarks
Cables	Check that all cabling is firmly connected and is not damaged.	• Connect any cable that has loosened. • Replace damaged cables.
Connectors on units	Check for tight connection.	• Reconnect as necessary.
Ground on units	Check for tight connection and rust.	• Fasten if loosened. • Remove rust if present.
Dust on units	Remove dust or dirt from the units with a soft, dry cloth.	• Do not use chemical-based cleaners to clean the equipment because they can remove paint and markings.
Transducer	Marine life on the transducer face will result in a gradual decrease in sensitivity. Check the transducer face for cleanliness each time the boat is dry-docked.	• Carefully remove any marine life to prevent damage to the transducer. • Do not paint (including hull paint) the transducer. • Do not use chemical-based cleaners to clean the transducer.

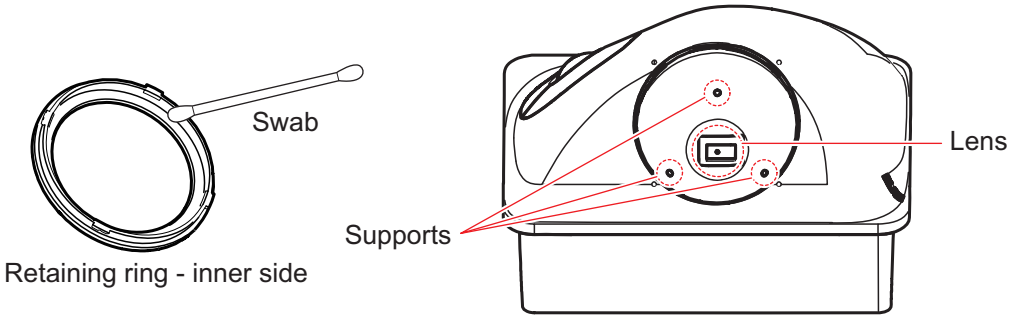
5.2 Trackball Maintenance

If the cursor moves abnormally, clean the trackball and inside the trackball housing (including the lens) as shown below:

1. Turn the retaining ring on the trackball module in the direction of the arrows (see figure below) to unlock it, then remove the retaining ring.



2. Put cellophane tape on the trackball then pull on the tape to remove the trackball from the trackball housing.
   Place the trackball and the retaining ring on a clean, soft cloth laid on a flat surface.
3. Clean the ball with a damp, soft cloth, then use a dry, lint-free cloth to carefully wipe the ball dry.
4. Use a swab, moistened with water, to carefully clean the inside of the retaining ring, the inside of the trackball housing, the supports and the lens. Change the swab regularly so that dirt and dust build-up is easily removed. Use a dry swab to wipe away moisture.



5. Re-set the ball and retaining ring. Be sure the retaining ring is not inserted reversely.

5.3 Fuse Replacement

The Processor Unit and Transceiver Unit are protected from overcurrent and equipment fault by their fuse. If a unit cannot be powered, its fuse may have blown. If a fuse has blown, find the reason before replacing the fuse. If a fuse blows after replacement, contact a FURUNO agent or dealer for advice.

⚠ WARNING

Use the proper fuse.
Use of a wrong fuse can cause fire or damage the equipment.

Fuse location	Fuse type	Remarks
Processor Unit (on power cable)	FGBO-A 125V 15A PBF	12 VDC
	FGBO-A 125V 7A PBF	24 VDC
Transceiver Unit (on power cable)	FGBO-A 125V 15A PBF	

5.4 Battery Replacement

The mother board in the Processor Unit contains a backup battery. When the battery voltage is low, the time shown on the clock is incorrect. However, if the time and date are fed from an external source, with the ZDA sentence, the correct time is shown.

⚠ CAUTION

Use only the specified battery.
When replacing the battery, make sure the polarity is correct.

Incorrect replacement of the battery can cause the battery to explode.

Name	Type	Estimated life
Battery Kit	BATTERY KIT-FJ	10 years

Note 1: When the battery voltage is 2.6 V or lower, the error window (error code: P01) appears at the center of the screen. Have a FURUNO representative replace the battery at your earliest convenience.

Note 2: Used batteries should be disposed of according to the applicable local standards and laws. Cover the battery terminals with tape to prevent heat generation, fire, etc. by short circuit.

5.5 Troubleshooting

The table below provides basic troubleshooting procedures which the user may follow to restore normal operation. If you cannot restore normal operation, do not check inside the equipment. Have a FURUNO agent or dealer check the equipment.

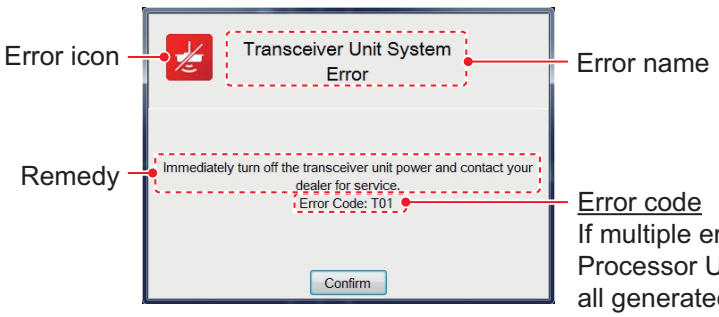
Problem	Reason, remedy
Cannot turn on power.	• The power cable is disconnected or damaged. Check the cable, and reconnect or replace it as necessary. • The cable connected to the Trackball Control Unit or the Transceiver Unit is disconnected or damaged. Check the cable, and reconnect or replace it as necessary. • Check the ship's mains. • Check the fuse on the Processor Unit and Transceiver Unit. If a fuse has blown, find the cause then replace it.
There is no response when the Trackball Control Unit is operated.	• The cable connected to the Trackball Control Unit is disconnected or damaged. Check the cable, and reconnect or replace it as necessary. • Reboot the system. If you do not get a response, the Trackball Control Unit may be damaged. Contact your dealer for instructions.
USB flash memory is inserted in USB port on the Trackball Control Unit, however screenshots cannot be saved.	• The USB cable between the Trackball Control Unit and the Processor Unit is disconnected or damaged. Check the cable, and reconnect or replace it as necessary.
No echo appears but characters and markers appear.	• The picture advance is stopped. Referring to section 1.6, set [Pic. Advance] to other than [Stop]. • Check if the scrollback feature (see section 1.24) is active. If it is active, deactivate it. • The transducer cable is disconnected or damaged. Check the cable, and reconnect or replace it as necessary.
Echo appears but no zero line.	• The displayed area is shifted. Referring to section 1.8, set the shift to [0]. • The zero line rejection is turned on. Referring to section 4.7.5, turn it off. • The draft setting is improper. Referring to section 4.7.5, set the draft correctly.
Sensitivity is low.	• The gain setting is too low. Referring to section 1.7, increase the gain. • Marine life is adhering to transducer face. Clean the transducer face. • Your vessel is in heavily sedimented water. • The bottom is too soft to return an echo.
Extreme interference or noise.	• The transducer may be too close to the engine. Stop the engine and check for noise on the screen. If noise is present contact a FURUNO agent or dealer for advice. • The ground wire of a unit has loosened or is damaged. Check the wire, and reconnect or replace it as necessary. • Same-frequency fish finder is operating nearby.
No depth indication.	• The bottom echo is not shown. Referring to section 1.9, adjust the range setting. • The depth indication is not shown. Referring to section 1.16, show the depth indication. • [Bottom Search] is set to [Off]. Referring to section 4.7.2, change the setting to [On].
Speed and/or water temperature readout is unrealistic or not shown.	• The sensor cable is disconnected or damaged. Check the cable, and reconnect or replace it as necessary. • The sensor is malfunctioning. Check the sensor.

Problem	Reason, remedy
Position readout is unrealistic or not shown.	• The cable connected to the navigation equipment is disconnected or damaged. Check the cable, and reconnect or replace it as necessary. • The navigation equipment is malfunctioning. Check the navigation equipment.
On-screen display is not showing correctly after replacing the monitor.	A new monitor must be set up from the [Service] menu. Contact your local dealer.

5.6 Error Messages and Icons

When an error occurs, the system does the following:
• Releases an aural alarm,
• displays the error window at the screen center, and
• displays the applicable error icon at the bottom-right corner on the screen.

The error window, an example of which is shown below, displays the applicable error icon, error name, error code, and error remedy.



When an error occurs, click the [OK] button in the error window to silence the aural alarm. The error icon remains on the screen until the error is resolved. The error icon can be clicked to display error content, in the error window. If multiple errors occur simultaneously, the error having the highest priority is displayed. The table below shows the error icon, error name, error code, reason/remedy and priority order for each error type.

If the error window appears repeatedly, contact a FURUNO dealer to request service.

Error Icon	Error name	Error code	Reason, remedy	Priority Order
	Control Unit Communication Error	C01	Communication error between the Trackball Control Unit and the Processor Unit. Check the connection between the Trackball Control Unit and Processor Unit.	1

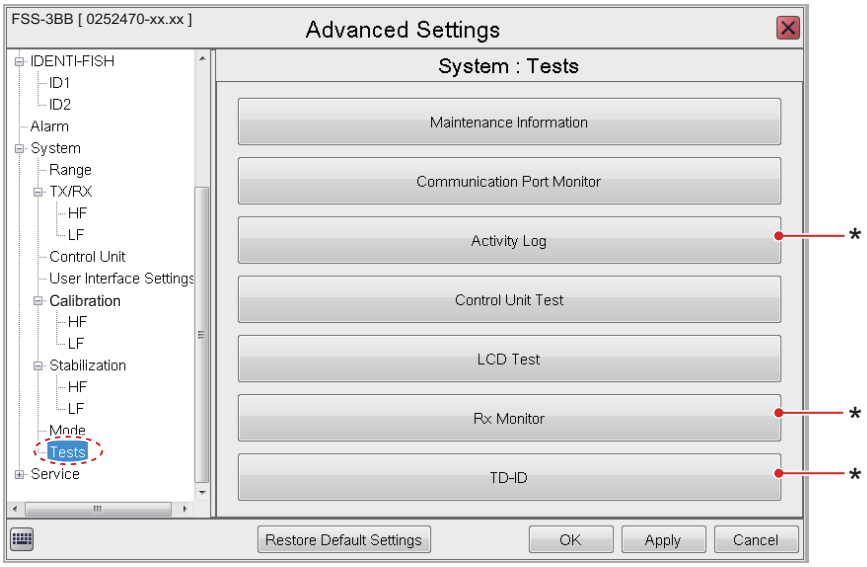
Error Icon	Error name	Error code	Reason, remedy	Priority Order
	Processor Unit System Error	P01	The voltage of the battery inside the Processor Unit is low. Turn the equipment off, then contact your local dealer to request replacement of the battery.	3
		P02	The fan in the Processor Unit is rotating too slowly. Turn the equipment off, then contact your local dealer to request replacement of the fan.	4
		P03	Multiple alike IP addresses found. Turn the equipment off, then contact your local dealer for advice. (IP address setup cannot be changed from this equipment. Change the IP address at the external device.)	5
	Transceiver Unit System Error	T01	Communication error between the Transceiver Unit and Processor Unit. Turn the equipment off, then contact your local dealer for service.	2
		T02	The rotating speed of the fan in the Transceiver Unit is abnormal. Turn the equipment off, then contact your local dealer for service.	6
		T03	Overcurrent detected in the Transceiver Unit. Turn the equipment off, then contact your local dealer for service.	7
		T04	TX voltage error detected in the Transceiver Unit. Turn the equipment off, then contact your local dealer for service.	8
		T06	Transducer connection error (short circuit) detected. Turn the equipment off, then contact your local dealer for service.	9

5.7 Tests Menu

You can run a diagnostic test, or view detailed information about your equipment, from the [Tests] menu.

To access the [Tests] menu, do the following:

1. Click the [Advanced Settings] icon ( ) from the InstantAccess bar™, then click the [Advanced Settings] icon ( ) from the [Advanced Settings] menu to show the [Advanced Settings] window.
2. Click [Tests] to show the [Tests] menu.

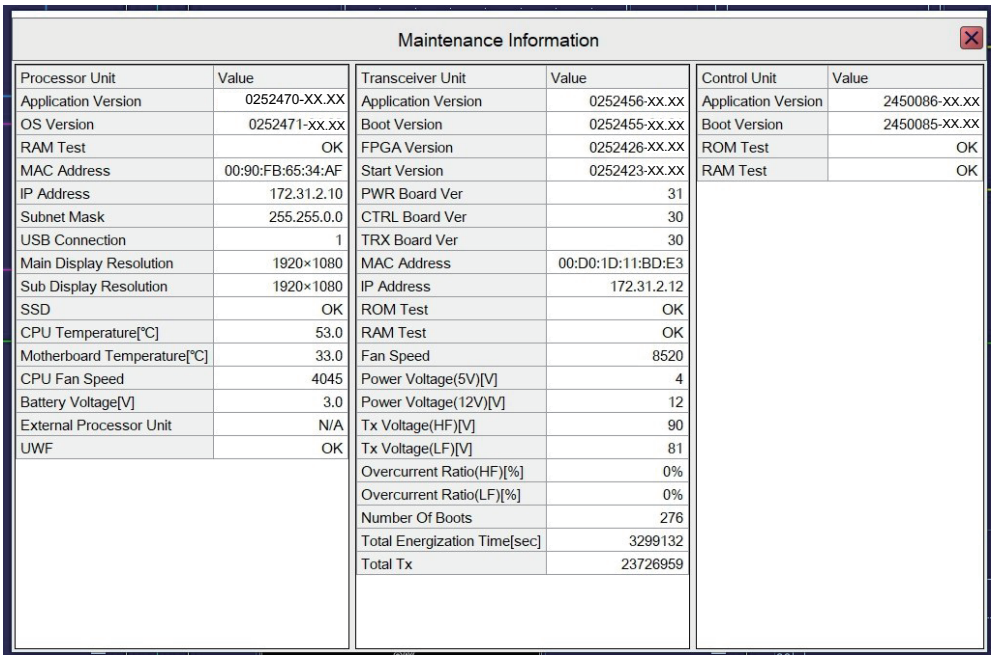


* These items are for maintenance/service purposes and cannot be accessed in normal use.

5.7.1 Maintenance information test

If you feel the system is not working properly, you can run the maintenance information test to locate the possible problem. The test shows the operational status of connected equipment, checks the status of the RAM and ROM, and displays software versions for your equipment.

To run the test, click [Maintenance Information] from the [Tests] menu. The test results look something like the example figure below.



Processor Unit	Value
Application Version	0252470-XX.XX
OS Version	0252471-XX.XX
RAM Test	OK
MAC Address	00:90:FB:65:34:AF
IP Address	172.31.2.10
Subnet Mask	255.255.0.0
USB Connection	1
Main Display Resolution	1920×1080
Sub Display Resolution	1920×1080
SSD	OK
CPU Temperature[℃]	53.0
Motherboard Temperature[℃]	33.0
CPU Fan Speed	4045
Battery Voltage[V]	3.0
External Processor Unit	N/A
UWF	OK

Transceiver Unit	Value
Application Version	0252456-XX.XX
Boot Version	0252455-XX.XX
FPGA Version	0252426-XX.XX
Start Version	0252423-XX.XX
PWR Board Ver	31
CTRL Board Ver	30
TRX Board Ver	30
MAC Address	00:D0:1D:11:BD:E3
IP Address	172.31.2.12
ROM Test	OK
RAM Test	OK
Fan Speed	8520
Power Voltage(5V)[V]	4
Power Voltage(12V)[V]	12
Tx Voltage(HF)[V]	90
Tx Voltage(LF)[V]	81
Overcurrent Ratio(HF)[%]	0%
Overcurrent Ratio(LF)[%]	0%
Number Of Boots	276
Total Energization Time[sec]	3299132
Total Tx	23726959

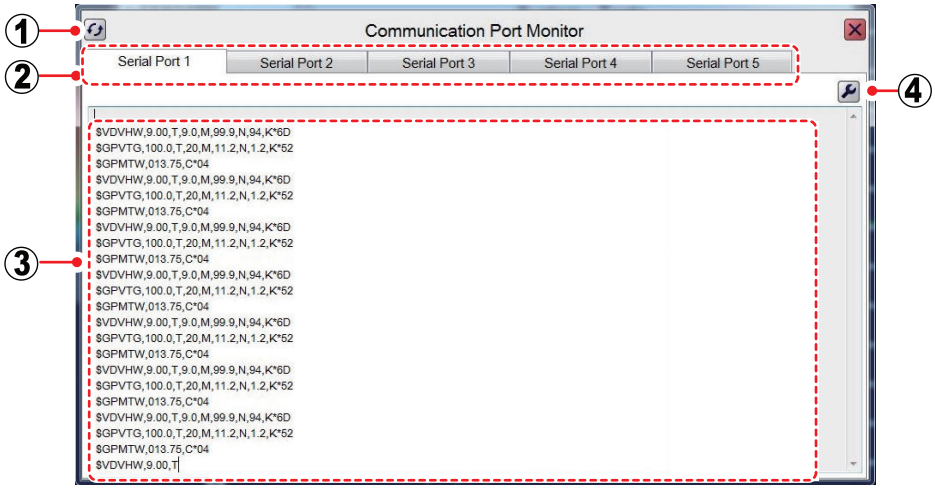
Control Unit	Value
Application Version	2450086-XX.XX
Boot Version	2450085-XX.XX
ROM Test	OK
RAM Test	OK

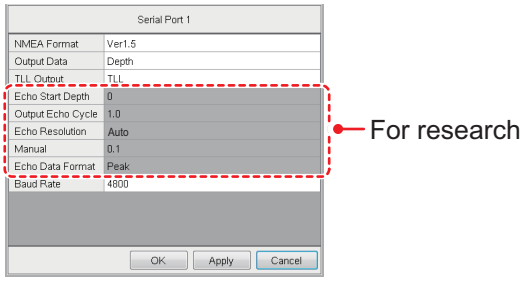
If the indication "NG" appears for any item, consult a FURUNO agent or dealer.

To close the test results, click the [Close Window] icon ( ) at the top-right corner of the window.

5.7.2 Communication port monitor

The [Communication Port Monitor] shows the incoming data for each communication port in the Processor Unit. To access the [Communication Port Monitor], click [Communication Port Monitor] from the [Tests] menu.



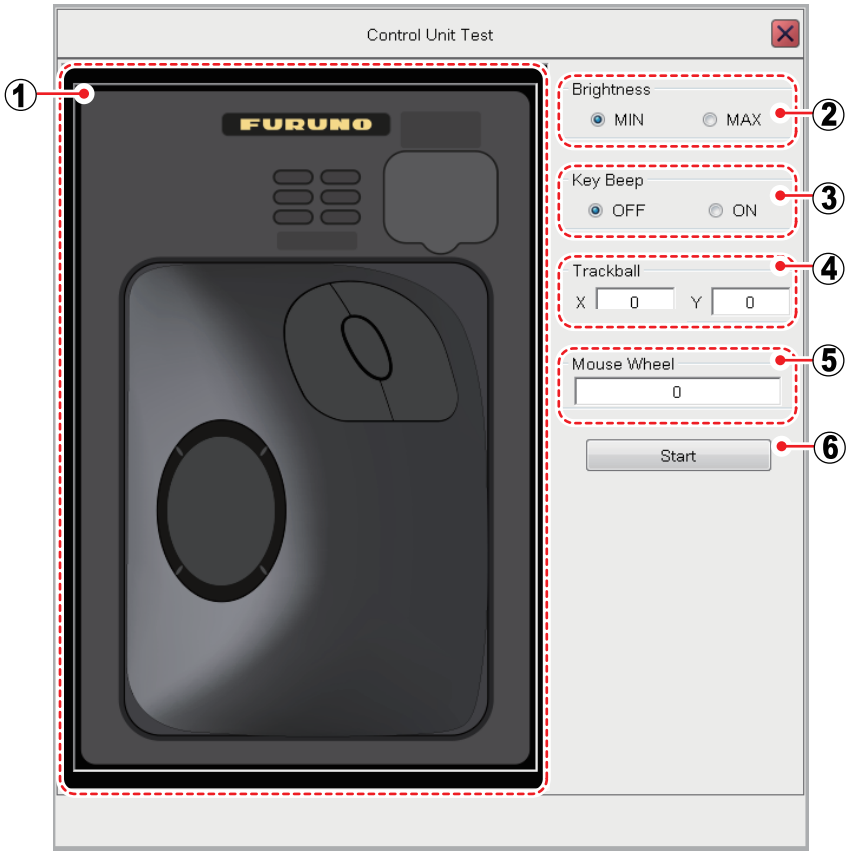
No.	Item name	Description
1	[Refresh] button	Select to update the display area.
2	Port tabs	Select a tab to show the corresponding port details in the display area. • [Serial Port 1] - [Serial Port 5]: Shows incoming NMEA data for ports 1 - 5.
3	Display area	Shows the incoming data details for the selected port.
4	[Settings] button	Access the output settings window for the selected port.  • [NMEA Format]: Set the NMEA format to use for data output. The available options are [Ver1.5], [Ver2.0], [Ver3.0], or [Echo]. **Note 1:** After changing a setting, the default settings for all other items in the setting window are restored. **Note 2:** [Echo] is intended for use in research surveys. Do not use this mode in normal use. Echo data is output from the NMEA port (baud rate (bps): 38400, 57600, or 115200), however navigation data cannot be received. • [Output Data]: Where [TLL Output] is set to [FURUNO-TLL], select the information to output. More than one item can be selected, among the following: [Depth]: Output depth data. [Temperature]*1: Output water temperature data. [Fish Size]*2: Output fish size data. • [TLL Output]: Select which TLL data to output. The data will be output when a TLL line is inscribed. [Off]: No TLL data is output. [TLL]: Only latitude and longitude are output. [FURUNO-TLL]: Latitude, longitude and items selected at [Output Data] are output. (Requires connection to a FURUNO-TLL compatible device.) • [Baud Rate]: Set the data transfer speed. The available options are [4800], [38400] (bps). When the settings are changed, click the [Apply] button to apply new settings. *1: Requires applicable data. *2: Displayed when [Baud Rate] is set to 38400.

To close the [Communication Port Monitor], click the [Close Window] icon (⊠) at the top-right corner of the window.

5.7.3 How to test the Trackball Control Unit

You can test the buttons, scrollwheel and trackball of the Trackball Control Unit at any time.

To test the control unit, click [Control Unit Test] from the [Tests] menu.

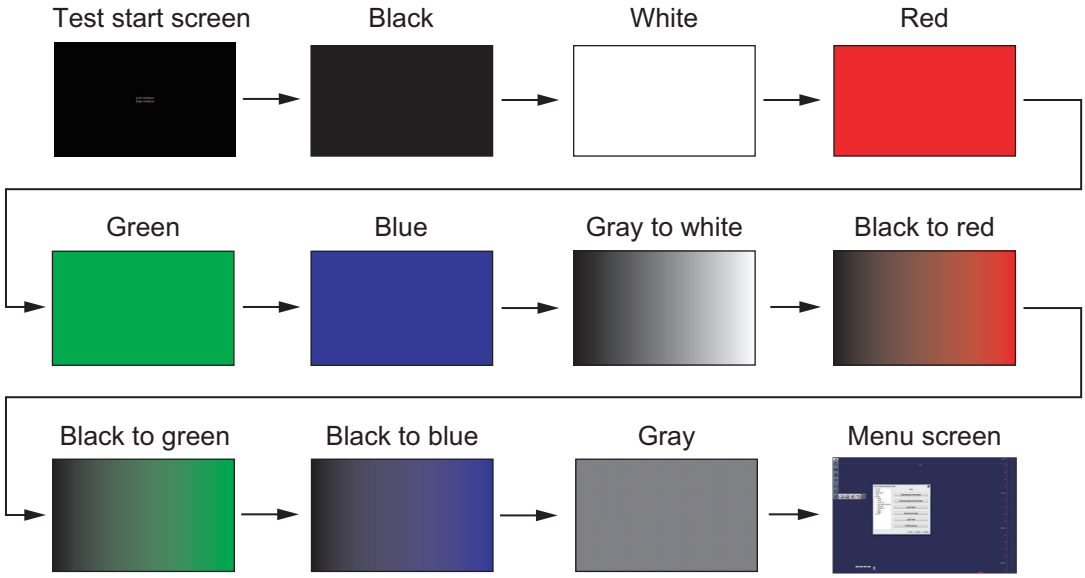


No.	Function
1	Check the buttons, scrollwheel, and trackball for proper operation. • **Button**: Hold down a button. The button's on-screen location turns light-blue if the button is normal. • **Scrollwheel**: Push and scroll the scrollwheel. The scrollwheel's on-screen location turns light-blue if the scrollwheel is normal. • **Trackball**: Roll the trackball. The trackball's on-screen location turns light-blue if the trackball is normal.
2	Turns the unit's back-light on or off.
3	Turns the unit's operation beeps on or off.
4	Shows the coordinates of the cursor. If these values change with trackball movement, the trackball is functioning normally.
5	Shows the scrollwheel movement. If the value changes, the scrollwheel is functioning normally.
6	Starts the [Control Unit] test. To quit the test, right click three times.

To close the [Control Unit Test], click the [Close Window] icon ( ) at the top-right corner of the window.

5.7.4 LCD test

The [LCD Test] tests if the connected monitor can display all available colors clearly. **Left-click** to change screens in the order shown below. To stop the test at anytime, **right-click**.



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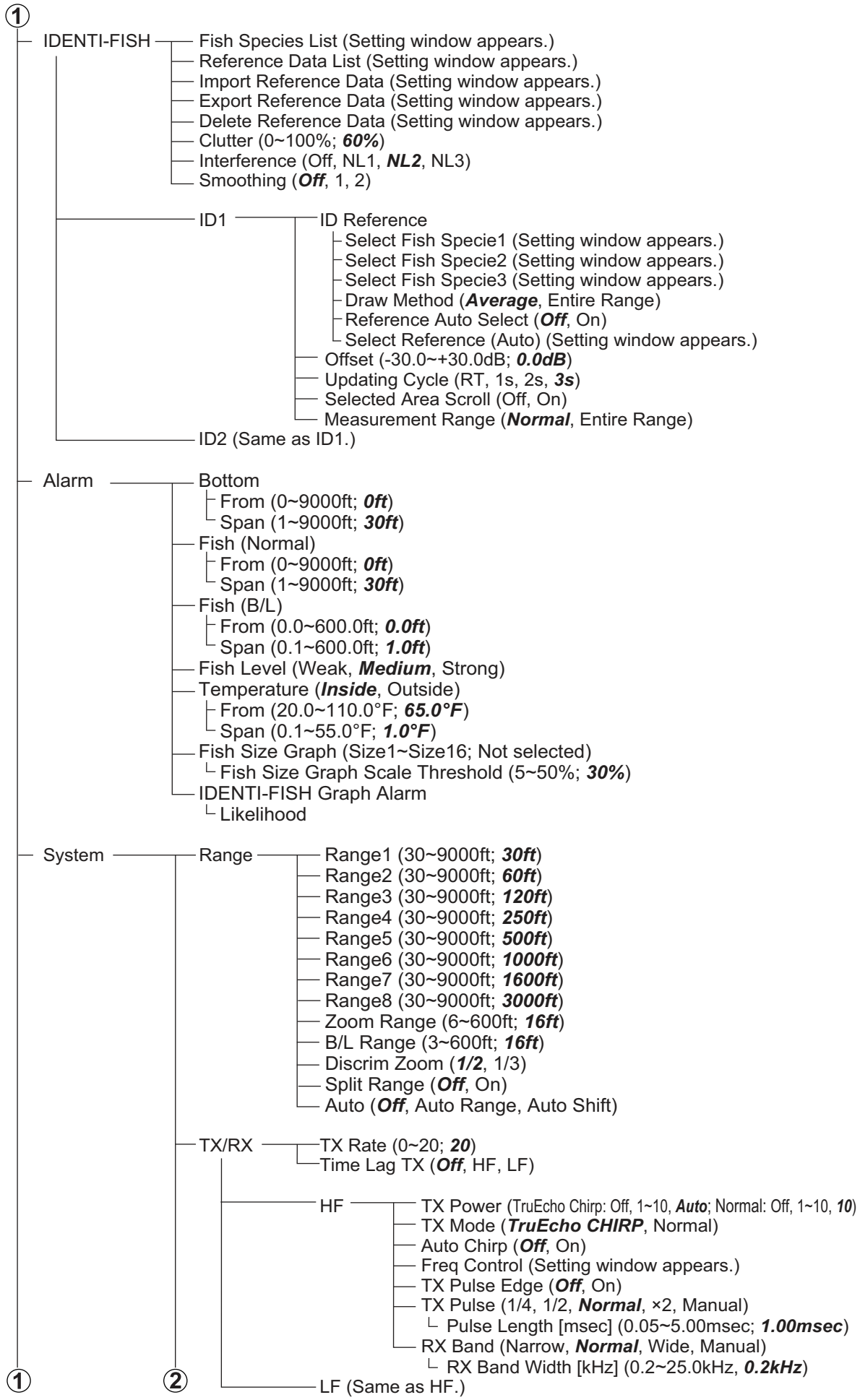
APPX. 1 MENU TREE

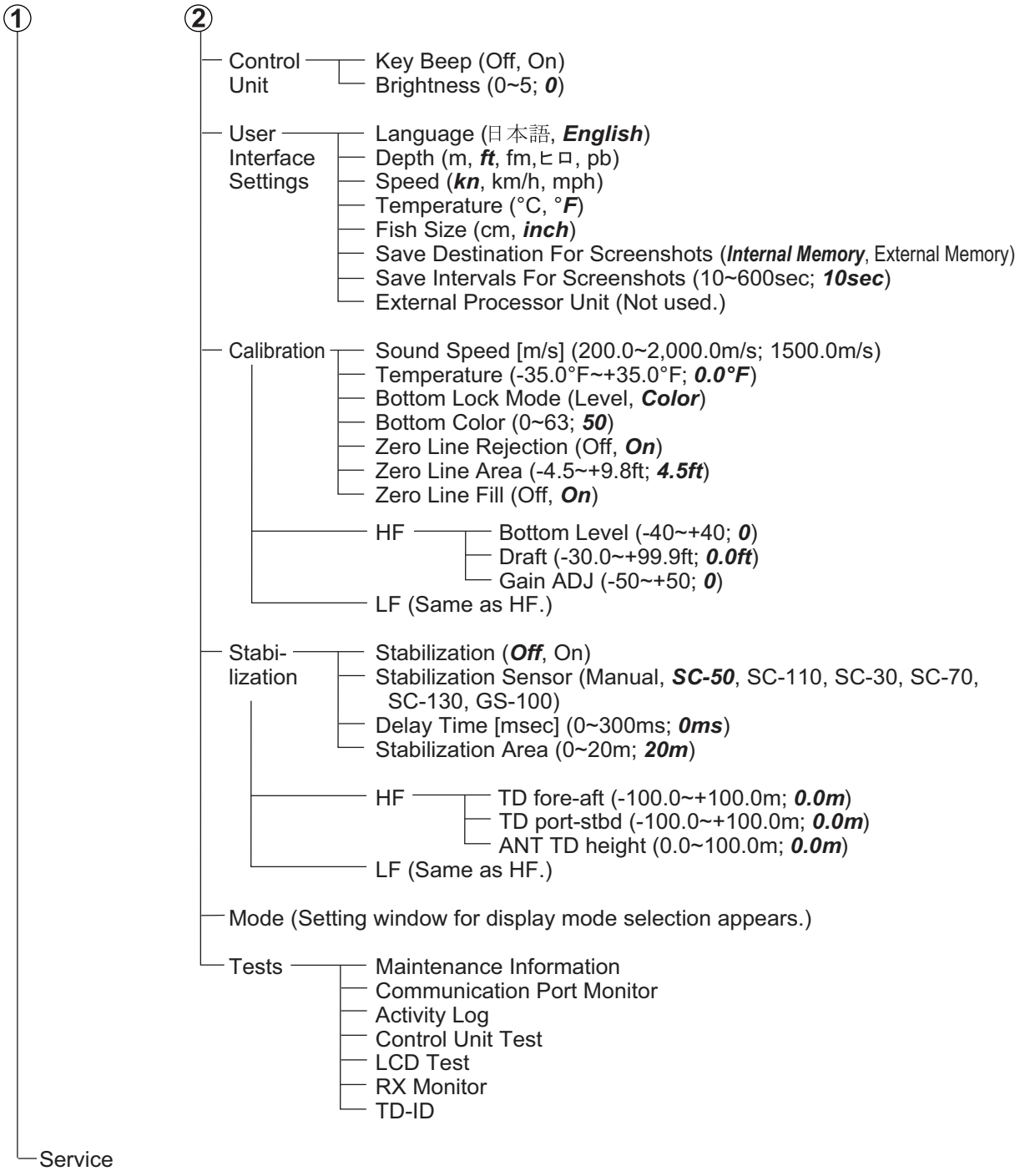
(Advanced Settings)

Default settings in boldface italic.

- Sounder
  - Color Erase (0~50%; ***0%***)
  - White Edge (***Off***, 1~10)
  - Bottom Zone
    - Above (15~70%; ***50%***)
    - Below (35~85%; ***85%***)
  - HF
    - Clutter (***Std***, Linear)
    - TVG Level (0~9; ***3***)
    - TVG Distance (100~3000ft; ***300ft***)
    - STC (0~10; ***0***)
  - LF (Same as HF.)
- Display
  - A-Scope (***Normal***, Peak)
  - Temp Graph (Narrow, ***Normal***, Wide)
  - Temp Color (***Normal***, White, Red, Black)
  - Zoom Marker (Off, ***On***)
  - Colors (16, ***64***)
  - Hue (***Normal***, Hue1~Hue5, Custom)
    - Custom (Setting window appears.)
  - Background (White, Light Blue, Blue, ***Dark Blue***, Black, Custom)
    - Custom (Setting window appears.)
  - Depth Position (***Left***, Center, Right)
  - Depth Size (***Normal***, Zoom)
  - Depth Scale (***Right***, Center)
  - Net Depth Mark (***Off***, On)
    - Mark ID (Setting window appears.)
    - Mark Color (Setting window appears.)
    - Mark Width (1~4; ***1***)
    - Net Sensor Temp Graph (Mark0~Mark15; ***Mark0***)
  - Transparency (***Off***, 1~4)
  - Mode&Gain Display (Off, ***On***)
  - Data Position (***Upper Left***, Lower Left, Upper Right, Lower Right)
- Fish Size
  - Graph Display (Horizontal, ***Vertical***)
  - Updating Cycle (RT, 1s, 2s, ***3s***)
  - Measurement Range (***Normal***, Entire Range)
  - Measurement Threshold (2~8inch; ***3inch***)
  - Density Correction (Off, ***On***)
  - SIZE1
    - Graph Scale End (16inch, 24inch, 32inch, ***39inch***, 47inch, 63inch, 79inch)
    - Distributed Scale Start (0~5%; ***3%***)
    - Distributed Scale End (10~100%; ***50%***)
    - Graph Peak (***1st***, 1st+2nd, 1st+2nd+3rd)
    - Emphasis Type (***Off***, Type1, Type2, Type3)
    - Emphasis Rate (Weak, ***Medium***, Strong)
    - Offset (-10.0~+30.0dB; ***0.0dB***)
  - SIZE2 (Same as SIZE1.)
  - SIZE3 (Same as SIZE1.)

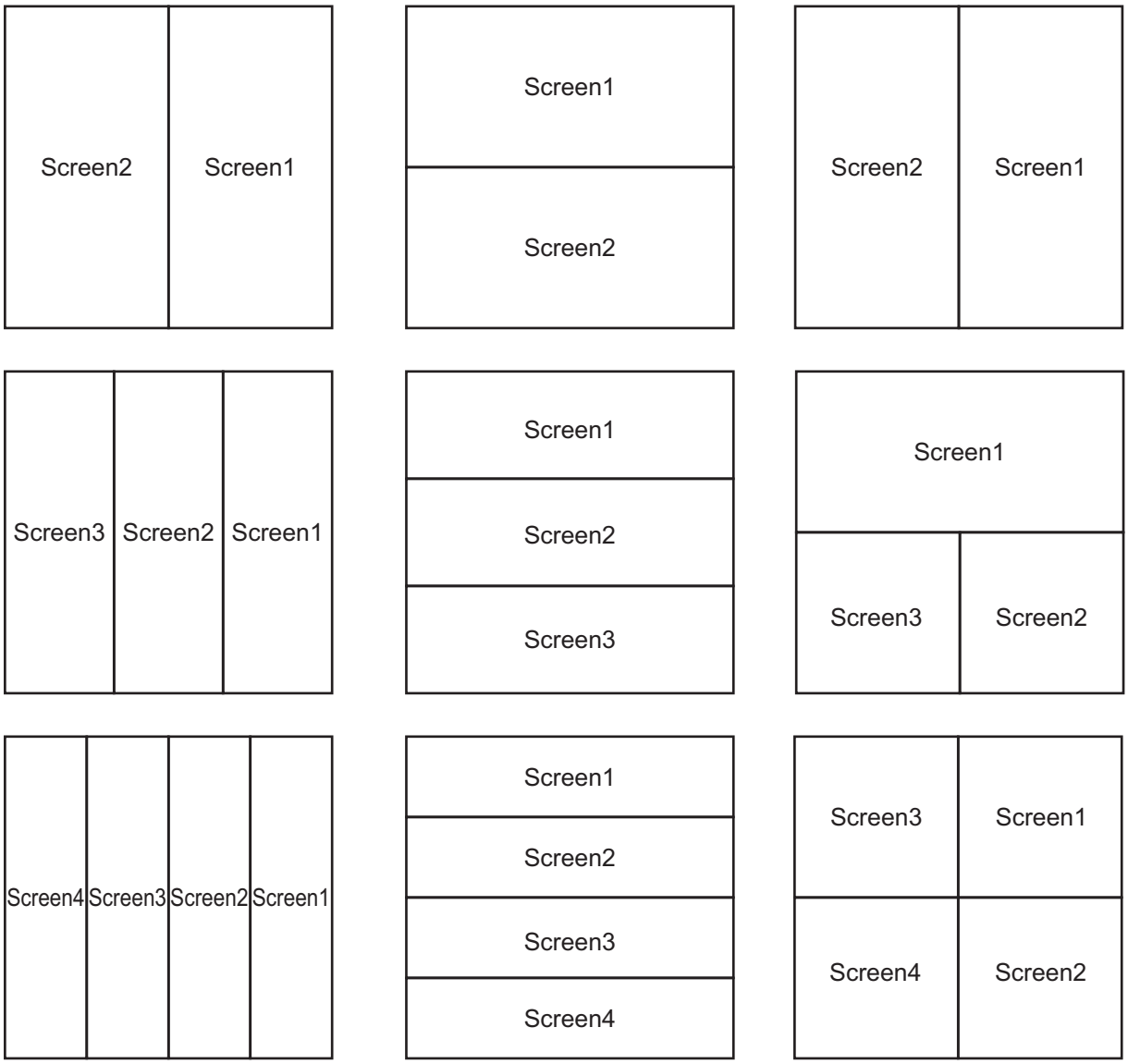
①


①
IDENTI-FISH
Fish Species List (Setting window appears.)
Reference Data List (Setting window appears.)
Import Reference Data (Setting window appears.)
Export Reference Data (Setting window appears.)
Delete Reference Data (Setting window appears.)
Clutter (0~100%; 60%)
Interference (Off, NL1, NL2, NL3)
Smoothing (Off, 1, 2)
ID1
ID Reference
Select Fish Specie1 (Setting window appears.)
Select Fish Specie2 (Setting window appears.)
Select Fish Specie3 (Setting window appears.)
Draw Method (Average, Entire Range)
Reference Auto Select (Off, On)
Select Reference (Auto) (Setting window appears.)
Offset (-30.0~+30.0dB; 0.0dB)
Updating Cycle (RT, 1s, 2s, 3s)
Selected Area Scroll (Off, On)
Measurement Range (Normal, Entire Range)
ID2 (Same as ID1.)
Alarm
Bottom
From (0~9000ft; 0ft)
Span (1~9000ft; 30ft)
Fish (Normal)
From (0~9000ft; 0ft)
Span (1~9000ft; 30ft)
Fish (B/L)
From (0.0~600.0ft; 0.0ft)
Span (0.1~600.0ft; 1.0ft)
Fish Level (Weak, Medium, Strong)
Temperature (Inside, Outside)
From (20.0~110.0°F; 65.0°F)
Span (0.1~55.0°F; 1.0°F)
Fish Size Graph (Size1~Size16; Not selected)
Fish Size Graph Scale Threshold (5~50%; 30%)
IDENTI-FISH Graph Alarm
Likelihood
System
Range
Range1 (30~9000ft; 30ft)
Range2 (30~9000ft; 60ft)
Range3 (30~9000ft; 120ft)
Range4 (30~9000ft; 250ft)
Range5 (30~9000ft; 500ft)
Range6 (30~9000ft; 1000ft)
Range7 (30~9000ft; 1600ft)
Range8 (30~9000ft; 3000ft)
Zoom Range (6~600ft; 16ft)
B/L Range (3~600ft; 16ft)
Discrim Zoom (1/2, 1/3)
Split Range (Off, On)
Auto (Off, Auto Range, Auto Shift)
TX/RX
TX Rate (0~20; 20)
Time Lag TX (Off, HF, LF)
HF
TX Power (TruEcho Chirp: Off, 1~10, Auto; Normal: Off, 1~10, 10)
TX Mode (TruEcho CHIRP, Normal)
Auto Chirp (Off, On)
Freq Control (Setting window appears.)
TX Pulse Edge (Off, On)
TX Pulse (1/4, 1/2, Normal, ×2, Manual)
Pulse Length [msec] (0.05~5.00msec; 1.00msec)
RX Band (Narrow, Normal, Wide, Manual)
RX Band Width [kHz] (0.2~25.0kHz, 0.2kHz)
LF (Same as HF.)
①
②


①
②
Control Unit
Key Beep (Off, On)
Brightness (0~5; 0)
User Interface Settings
Language (日本語, English)
Depth (m, ft, fm,ヒロ, pb)
Speed (kn, km/h, mph)
Temperature (°C, °F)
Fish Size (cm, inch)
Save Destination For Screenshots (Internal Memory, External Memory)
Save Intervals For Screenshots (10~600sec; 10sec)
External Processor Unit (Not used.)
Calibration
Sound Speed [m/s] (200.0~2,000.0m/s; 1500.0m/s)
Temperature (-35.0°F~+35.0°F; 0.0°F)
Bottom Lock Mode (Level, Color)
Bottom Color (0~63; 50)
Zero Line Rejection (Off, On)
Zero Line Area (-4.5~+9.8ft; 4.5ft)
Zero Line Fill (Off, On)
HF
Bottom Level (-40~+40; 0)
Draft (-30.0~+99.9ft; 0.0ft)
Gain ADJ (-50~+50; 0)
LF (Same as HF.)
Stabi-lization
Stabilization (Off, On)
Stabilization Sensor (Manual, SC-50, SC-110, SC-30, SC-70, SC-130, GS-100)
Delay Time [msec] (0~300ms; 0ms)
Stabilization Area (0~20m; 20m)
HF
TD fore-aft (-100.0~+100.0m; 0.0m)
TD port-stbd (-100.0~+100.0m; 0.0m)
ANT TD height (0.0~100.0m; 0.0m)
LF (Same as HF.)
Mode (Setting window for display mode selection appears.)
Tests
Maintenance Information
Communication Port Monitor
Activity Log
Control Unit Test
LCD Test
RX Monitor
TD-ID
Service

APPX. 2 SCREEN LAYOUTS

The A-scope display appears at the right edge of each display.



Vertical division | Horizontal division | Mixed division

SPECIFICATIONS OF FISH FINDER
FSS-3BB

1 GENERAL

1.1	Transmitting frequency	15 to 242 kHz nominal
1.2	Output power	1 to 3 kW
1.3	Transmitting method	Dual simultaneously
1.4	Transmitting mode	TruEcho CHIRP™ or standard mode selected either
1.5	External monitor (required specs.)	
	Resolution	1920 x 1200 (WUXGA), 1920 x 1080 (FHD), 1600 x 1200 (UXGA), 1024 x 1280 (SXGA), 1024 x 768 (XGA)
	Interface	HDMI type-A

2 PROCESSOR UNIT

2.1	Color indication	64/16 colors
2.2	Hue	7 steps (Standard, Hue 1 to 5, customized)
2.3	Depth range	5 to 3000 m
2.4	Range shift	2000 m max.
2.5	Expansion range	5 to 200 m
2.6	Echo display mode	High frequency single, Low frequency single, Dual frequency, Discrimination
2.7	Zoom display	Bottom-lock expansion, Bottom zoom, Marker zoom, Discrimination zoom
2.8	Fish size measurement	Histogram
2.9	Display advance speed	7 steps (Lines/TX: Freeze, 1/8, 1/4, 1/2, 1/1, 2/1, 4/1)
2.10	Language	Danish, English (UK/US), French, Japanese, Norwegian, Spanish

3 INTERFACE

3.1	Number of ports	
	Serial	5 ports, NMEA0183 V1.5/2.0/3.0
	LAN	2 ports, Ethernet, 10/100/1000Base-T
	USB	USB2.0: 2 ports, USB3.0: 2 ports
	Video output	2 ports, HDMI type-A
	KP control (transceiver unit)	1 port
3.2	Data sentences	
	Input	GGA, GLL, GNS, MTW, VHW, VTG, ZDA, GPatt, GPhve, pireq, IIDAD, IIDBS, IIHFB, IITPC, IITPT, MPMSD, SDDBS, SDfnz
	Output	DBS, DBT, DPT, MTW, TLL, SDes1, SDes2, SDesd, SDflg, SDmrk, pidat

4 POWER SUPPLY

4.1	Processor unit	12-24 VDC: 4.0-2.0 A
4.2	Transceiver unit	12-24 VDC: 8.3-4.1 A (St-by: 0.79-0.46 A)
4.3	AC/DC power supply unit (option)	
	PR-241	100-230 VAC, 1 phase, 50-60 Hz

5 ENVIRONMENTAL CONDITIONS

5.1	Ambient temperature	-15°C to +55°C
5.2	Relative humidity	93% or less at +40°C
5.3	Degree of protection	
	Processor/transceiver unit	IP22
	Control unit	IP22 (IPx0: USB cover opened)
5.4	Vibration	IEC 60945 Ed.4

6 UNIT COLOR

6.1	Processor/ Transceiver/ Control unit	N2.5

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FURUNO

FISH FINDER
(Product Name: FISH SPECIES AND BIOMASS SOUNDER)

English

Model **FSS-3BB** **Operator's Guide**

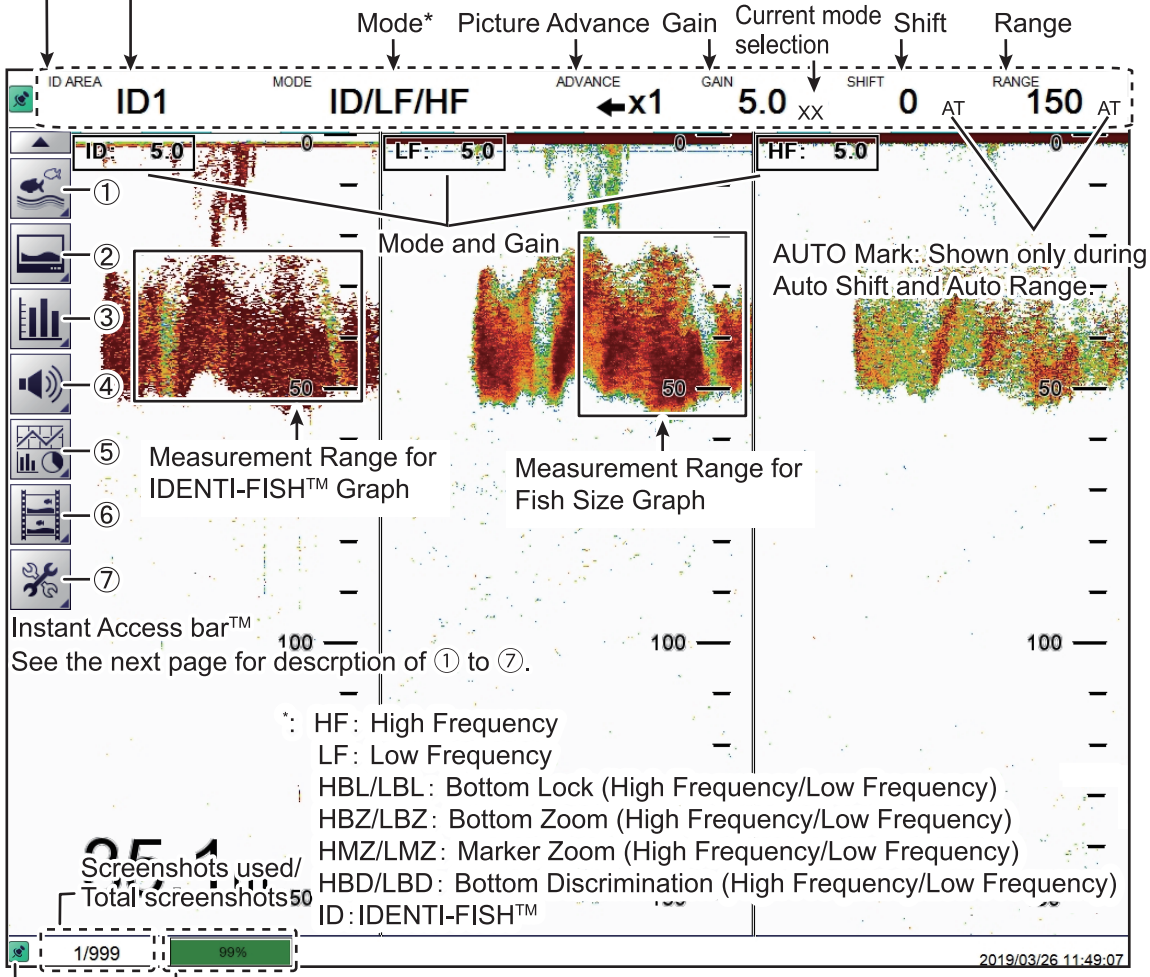
The purpose of this guide is to provide the basic operation for this equipment. For more detailed information, see the Operator's Manual.

All brand and product names are trademarks, registered trademarks or service marks of their respective holders.

Display Description

Header: Click then spin the scrollwheel to change the setting.

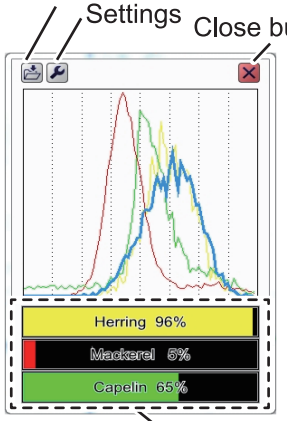
Various Settings Information: Displays the settings for the Interference Rejection, Smoothing, Clutter, Zoom Mode, Bottom Trace, Specific Area or IDENTI-FISH™ Graph.



When an external memory is connected: Shows the empty space.
When external memory is not used: Shows "0%".

"Pinned" icon: The footer is always visible when this icon is active. When deactivated, the footer is hidden until the cursor is placed on the footer's location. (The header also has this icon.)

IDENTI-FISH™ Graph



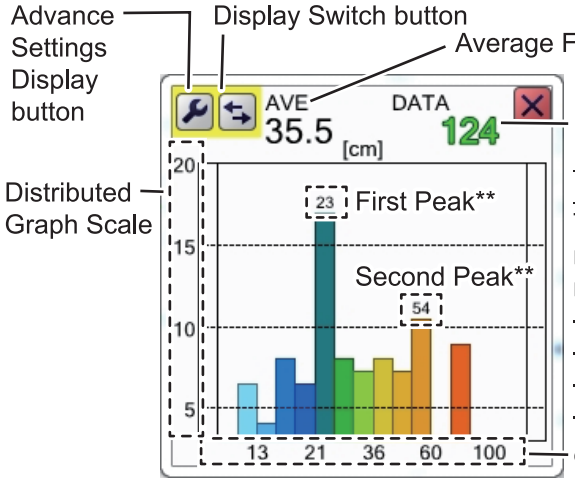
How to show IDENTI-FISH™ graph

1. Put the cursor on the MODE of header and left click.
2. Use the scrollwheel to select the mode which include the ID.
3. Drag the area to measure on the IDENTI-FISH™ echo display. (A maximum of two displays, ID1 and ID2, can be shown.)

IDENTI-FISH™ graph appears (two graphs can appear as the maximum. The histogram for the model data (three model data for each fish species as the maximum.) are available.

Note: Requires the IDENTI-FISH™ compatible transducer.

Fish Size Graph



How to show the Fish Size Graph

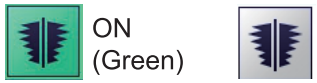
The are frour methods of measurement:
- Entire Area
- Specific Range
- Bottom Trace
- Specific Area

**: Estimated fish length which occupies the highest percentage in the measurement range.

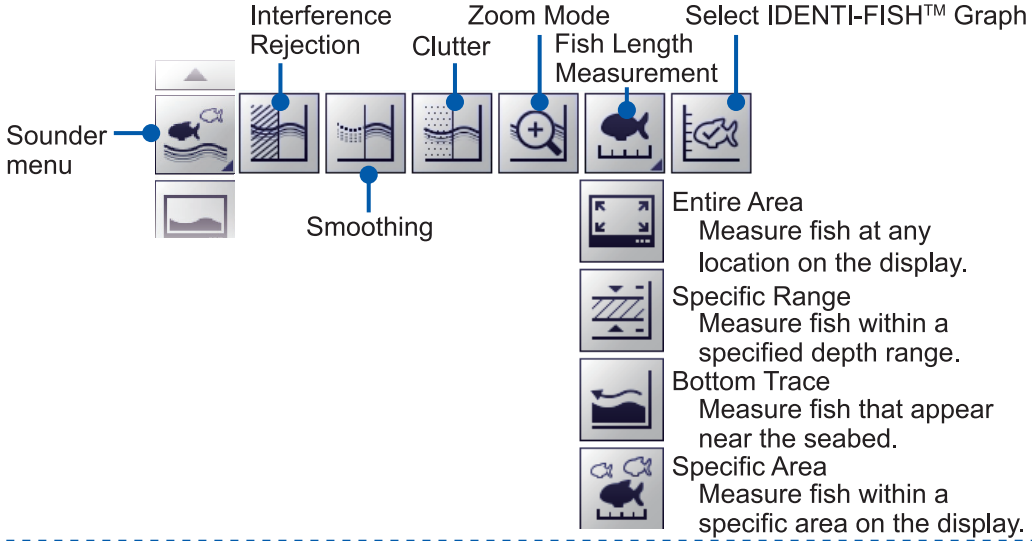
Note: Requires appropriate transducer.

Icons on InstantAccess bar™

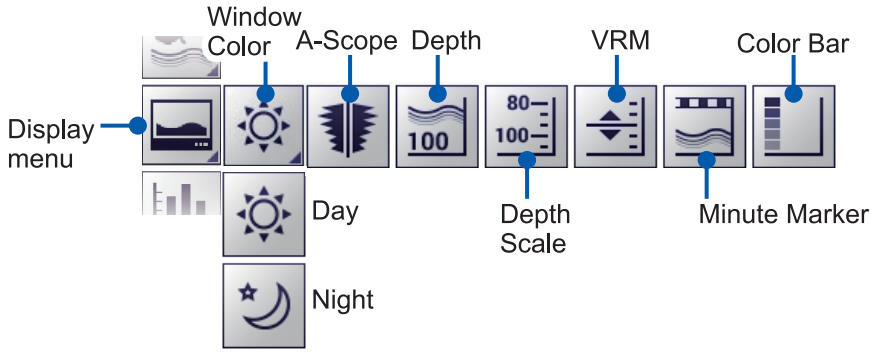
The color of the icon changes according to function status.



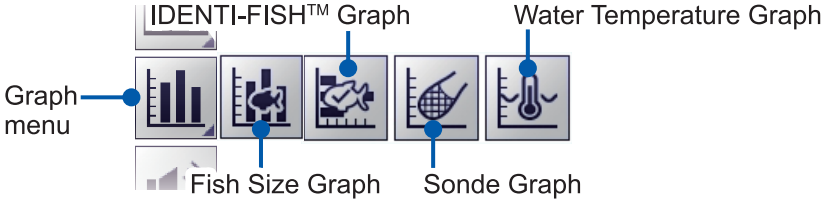
① [Sounder] menu: Select this icon to access the sounder-related settings.



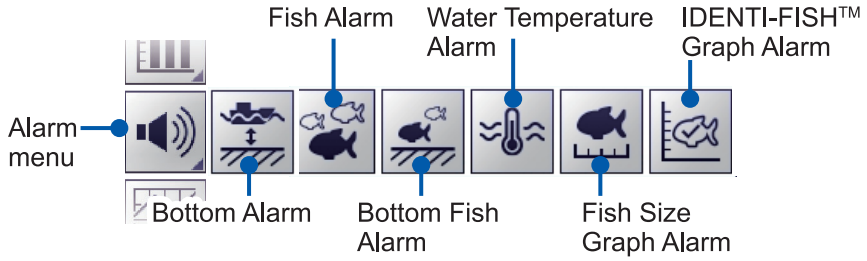
② [Display] menu: Select this icon to access the display-related settings.



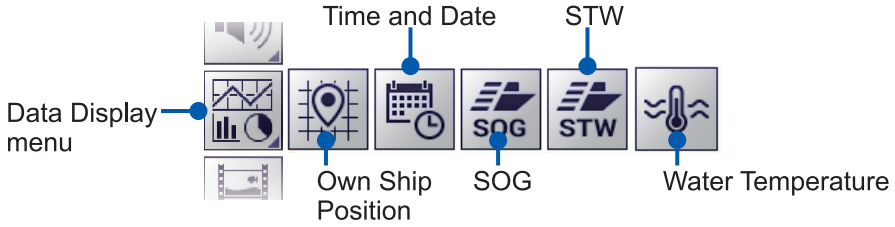
③ [Graph] menu: Select this icon to access the graph functions.



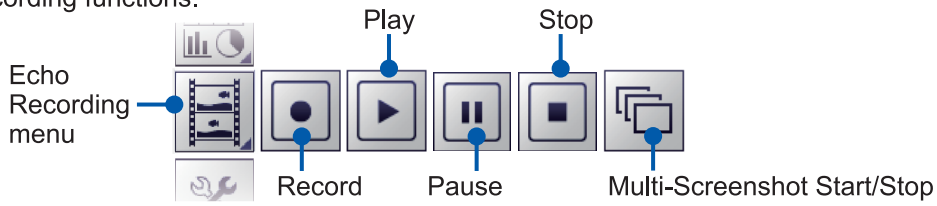
④ [Alarm] menu: Select this icon to activate/deactivate alarms.



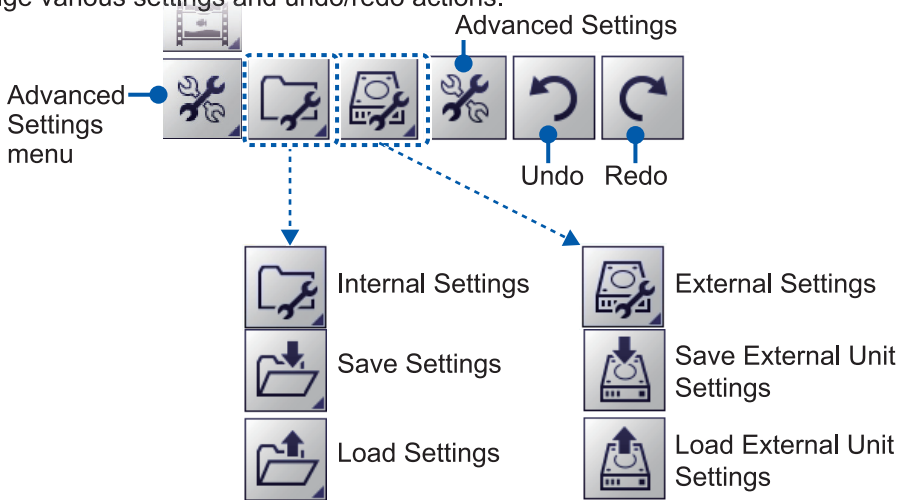
⑤ [Data Display] menu: Select this icon to turn navigation data on or off.



⑥ [Echo Recording] menu: Select this icon to access the echo recording and image recording functions.



⑦ [Advanced Settings] menu: Select this icon to access the advanced settings menu, change various settings and undo/redo actions.



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Publication No. DOCQA1497

Declaration of Conformity

We FURUNO ELECTRIC CO., LTD.

(Manufacturer)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address)

declare under our sole responsibility that the product

FISH FINDER FSS-3BB

(Model name, type number)

to which this declaration relates conforms to the following standard(s) or other normative document(s)

EU
EMC Directive 2014/30/EU

IEC 60945 Ed.4.0: 2002

For assessment, see
- Test report
  Labotech International Co., Ltd.
  LIC 12-19-184, 11 Nov 2019
  LIC 12-18-113, 21 Dec 2018
  Furuno Labotech International Co., Ltd.
  FLI 12-11-111, 26 Dec 2011
- Declaration
  Furuno Electric Co., Ltd.
  K02-18-751, 22 Nov 2019

UK
SI 2016 No.1091 EMC Regulations 2016 as amended

EN 60945: 2002

For assessment, see
- Test report
  Labotech International Co., Ltd.
  LIC 12-19-184, 11 Nov 2019
  LIC 12-18-113, 21 Dec 2018
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- Declaration
  Furuno Electric Co., Ltd.
  K02-18-751, 22 Nov 2019

(title and/or number and date of issue of the standard(s) or other normative document(s))

On behalf of Furuno Electric Co., Ltd.

Nishinomiya City, Japan
26 July 2021

(Place and date of issue)

Akihiko Kanechika
Department General Manager
Quality Assurance Department A. Kanechika

(name and signature or equivalent marking of authorized person)

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Publication No. SOCQA0008

PSTI Statement of Compliance

We FURUNO ELECTRIC CO., LTD.

(Name of manufacturer of the product)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address of manufacturer of the product)

declare under our sole responsibility that the product

FISH FINDER,
FSS-3BB

(Product type, batch)

January / 9 / 2029

(Support period for the product)

https://www.furuno.co.jp/en/csr/sociality/customer/product_security.html

(Weblink for latest information and contact to report to the manufacturer security issues)

to which this declaration relates conforms to the following standard(s) or other normative document(s)

Product Security and Telecommunications Infrastructure Act 2022
Product Security and Telecommunications Infrastructure (Security Requirements for Relevant Connectable Products) Regulations 2023 Schedule 1

On behalf of Furuno Electric Co., Ltd.

Nishinomiya City, Japan
23 April 2024

(Place and date of issue)

Akihiko Kanechika
Department General Manager
Quality Assurance Department

(Signature, name and function of the signatory)