

## *Installation Manual* **MULTI FUNCTION DISPLAY**

*Model TZT22X/TZT24X*

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# SAFETY INSTRUCTIONS



## 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, may result in minor or moderate injury.

(Examples of symbols)



Warning, Caution



Prohibitive Action



Mandatory Action



## WARNING



**ELECTRICAL SHOCK HAZARD**  
Do not open the equipment unless totally familiar with electrical circuits.

Only qualified personnel should work inside the equipment.



**Turn off the power at the switchboard before beginning the installation.**

Fire or electrical shock can result if the power is left on.



**Be sure that the power supply is compatible with the voltage rating of the equipment.**

Connection of an incorrect power supply can cause fire or damage the equipment.



**If your vessel is configured with an autopilot system, install an autopilot control unit (or emergency autopilot stop button) at each helm station, to allow you to disable the autopilot in an emergency.**

If the autopilot cannot be disabled, accidents may result.



## CAUTION



Ground the equipment to prevent electrical shock and mutual interference.



**Use the proper fuse.**

Use of an incorrect fuse may damage the equipment.



**The front panel is made of glass. Handle it with care.**

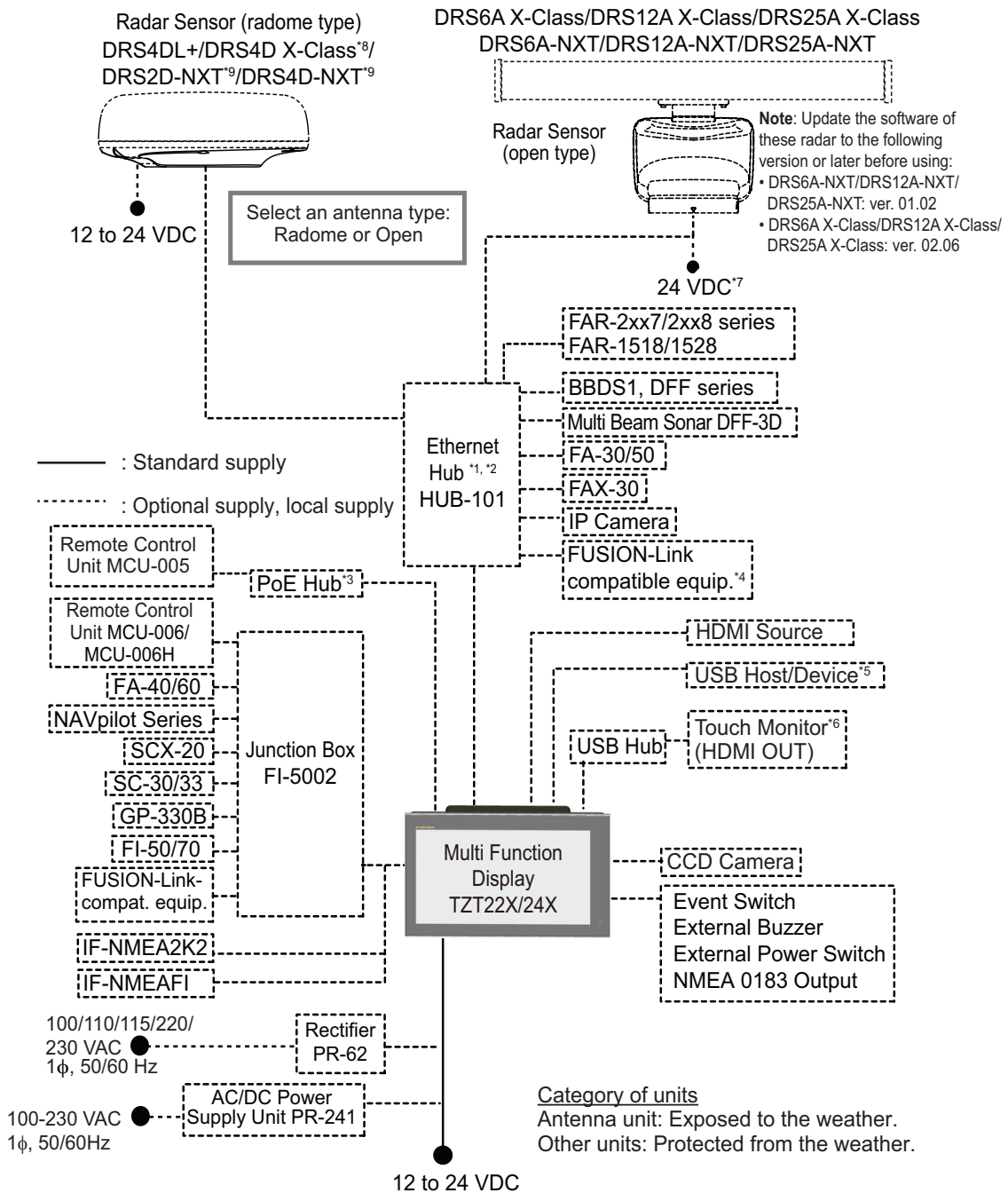
Injury can result if the glass breaks.



Observe the following compass safe distances to prevent interference to a magnetic compass:

Model	Standard compass	Steering compass
TZT22X	1.15 m	0.75 m
TZT24X	0.95 m	0.60 m

# SYSTEM CONFIGURATION



- \*1: A maximum of 3 units of HUB-101 can be connected.
- \*2: With the Ethernet HUB, up to six NavNet TZtouch series units can be connected (up to four units when the TZT2BB is included). NavNet TZtouch (TZT9/14/BB) and TZTL12F/15F of NavNet TZtouch2 cannot be connected. For connection combinations, see page xxi.)
- \*3: Use a commercially available PoE hub. The NETGEAR GS108PE has tested as compatible. The basic functions of the hub were verified, however the compatibility of all functions were not checked. FURUNO cannot guarantee proper operation.
- \*4: Available when FUSION-Link compatible equipment is connected via Ethernet.
- \*5: When connected to a USB host device using USB OTG (USB), this unit operates as a touch operation output device.
- \*6: The output image of HDMI OUT is fixed at 1920×1080. For a touch monitor, the resolution must be 1920×1080 (16:9 aspect ratio) and have HPD (Hot Plug Detection).
- \*7: Only DRS6A-NXT supports 12 to 24 V.DC
- \*8: DRS4D X-Class can only be used in Japan.
- \*9: DRS2D-NXT and DRS4D-NXT cannot be used in Japan.

**TZT series network connections**

The TZT series can be connected on the same network in the following combinations.

	<b>TZtouch: TZT9/14/BB</b>	<b>TZtouch2: TZTL12F/15F</b>	<b>TZtouch2: TZT2BB<sup>*1</sup></b>	<b>TZtouch3: TZT9F/12F/16F/19F<sup>*2</sup></b>
TZtouchXL: TZT22X/24X	No	No	Yes	Yes

<sup>\*1</sup>: Version 9.70 or later

<sup>\*2</sup>: Version 3.70 or later

# EQUIPMENT LISTS

## Standard supply

Name	Type	Code No.	Qty	Remarks
Multi Function Display	TZT22X	-	1	Including installation materials, accessories and spare parts.
	TZT24X	-	1	

## Optional supply

Name	Type	Code No.	Remarks
NMEA Data Converter	IF-NMEA2K2	000-020-510	
Remote Control Unit	MCU-005	000-035-097	
	MCU-006	000-042-803	
	MCU-006H	000-042-804	
Junction Box	FI-5002	005-008-400	
Network HUB	HUB-101	000-011-762	
Joint Box	TL-CAT-012	000-167-140	For LAN network
Rectifier	PR-62	000-013-484	100 VAC
		000-013-485	110 VAC
		000-013-486	220 VAC
		000-013-487	230 VAC
AC/DC Power Supply Unit	PR-241	-	
Ferrite Core	OP86-11	001-594-450	For PR-241
External Buzzer	OP03-136	000-086-443	Buzzer: PKB5-3A40
Network (LAN) Cable	FRU-RZWPNWP-002G	000-200-338-10	Single connector waterproofed
	FRU-RZWPNWP-005G	000-200-339-10	
	FRU-RZWPNWP-010G	000-200-340-10	
MULTI Cable	FRU-CCCAF14-R001G	000-200-330-10	
NMEA Cable Assy.	FRU-NMEA-PMMFF-010	001-533-060	1 m, two connectors
	FRU-NMEA-PMMFF-020	001-533-070	2 m, two connectors
	FRU-NMEA-PMMFF-060	001-533-080	6 m, two connectors
	FRU-NMEA-PFF-010	001-507-010	1 m, single connector
	FRU-NMEA-PFF-020	001-507-030	2 m, single connector
	FRU-NMEA-PFF-060	001-507-040	6 m, single connector
	FRU-MM1MF1MF1001	001-507-050	T connector
	FRU-MM1000000001	001-507-070	Male, terminator
	FRU-MF000000001	001-507-060	Female, terminator
Cable Assy.	FRU-F12F12-100C	001-560-390	
	FRU-F12F12-200C	001-560-400	
	FRU-F7F7-1A00C	001-560-420	
	FRU-F7F7-200C	001-560-430	
	FRU-HDDAP-005G	000-200-334-10	
USB Cable	FRU-UPCAP300UB	000-200-331-10	
	FRU-UAP300UAJC-30G	000-200-332-10	
USB OTG Cable	FRU-MAEF05-MBJ0300G	000-200-333-10	
Matching Box	MB-1100	000-027-226	
Extension Cable	C332 10M	001-464-120	

# 1. MOUNTING

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## 1.1 Installation of Multi Function Display

The TZT22X/24X is designed to be mounted in a console or panel.

The installer of this equipment must read and follow the descriptions in this manual. Wrong installation or improper maintenance can void the warranty.

### 1.1.1 Mounting considerations

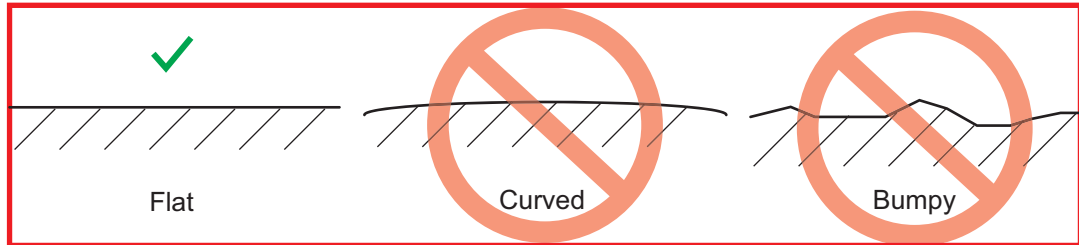
When selecting a mounting location for TZT22X/24X, keep the following in mind:

- The temperature at the mounting location shall be between -15°C and +55°C.
- The humidity at the mounting location shall be 93% or less at 40°C.
- Locate the unit away from exhaust pipes and ventilators.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal (compliant with IEC 60945 Ed.4).
- Keep the unit away from electromagnetic field generating equipment such as motors and generators.
- For maintenance and checking purposes, leave sufficient space around the unit and leave slack in cables. Minimum recommended maintenance space is shown in the outline drawing for the display units.
- A magnetic compass will be affected if the equipment is placed too close to it. Observe the compass safe distances shown in "SAFETY INSTRUCTIONS" to prevent disturbance to the magnetic compass.
- In the below cases, use the supplied mounting plates to reinforce the mounting location.
  - When removing and installing this unit repeatedly.
  - When replacing from another NavNet TZT unit to this unit.

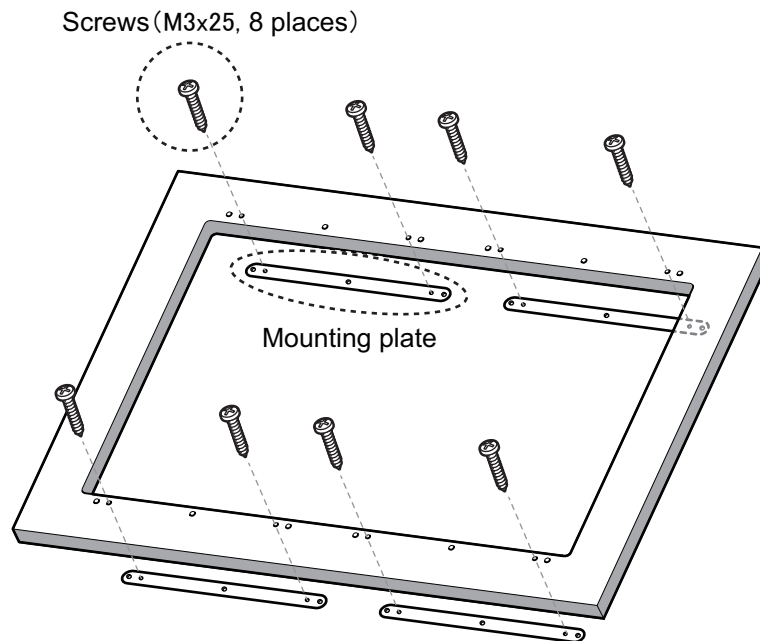
## 1.2 Flush Mounting

Referring to the figure below, select a flat mounting location. Read the installation instructions before starting. Pay particular attention to the notes; failure to follow these instructions may cause damage to the unit.

**Note:** Ensure the mounting location is flat, with no indents or protrusions, to allow a secure fit.



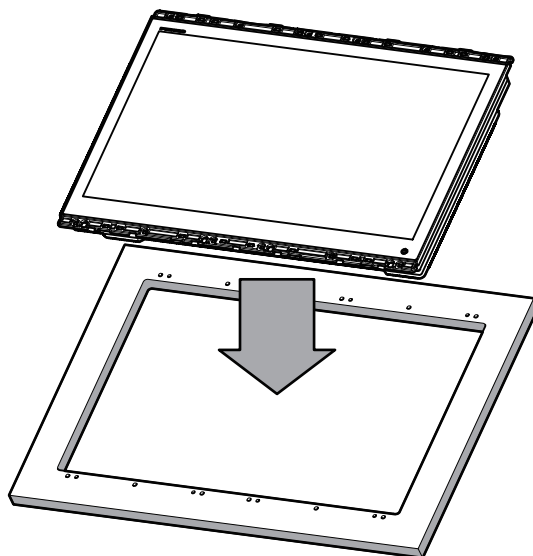
1. Prepare a cutout in the mounting location using the template supplied at the back of this manual.
2. Drill holes at each screw location (with mounting plate: total 20; without mounting plate: 12), using the supplied template.
3. For installations with no mounting plate, go to step 4. For installations with a mounting plate, fit the mounting plate to the inner side of the cutout, then secure the plate in place with two M3×25 screws (included as installation materials) per plate (total 8 places, indicated in the following figure).



4. Connect all cables at the back of the TZT22X/24X (see section 2.1 for details).



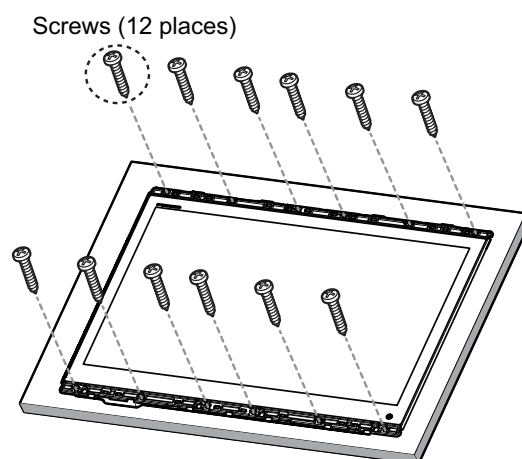
- Set the TZT22X/24X to the cutout made at step 1. For installations using the mounting plate, the screws fitted at step 4 should align with the gaps in the unit.



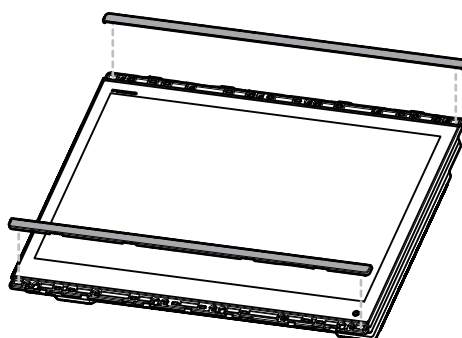
**Note 1:** Cables not shown in figure for simplification.

**Note 2:** Take care not to pinch the cables when fitting the unit.

- Fasten 12 screws at the locations indicated in following figure to secure the unit.  
With mounting plate: Use M4×30 screws.  
No mounting plate: Use 4×20 self-tapping screws.



- Fit the cosmetic plates (included as installation materials) to the top and bottom of the unit front.

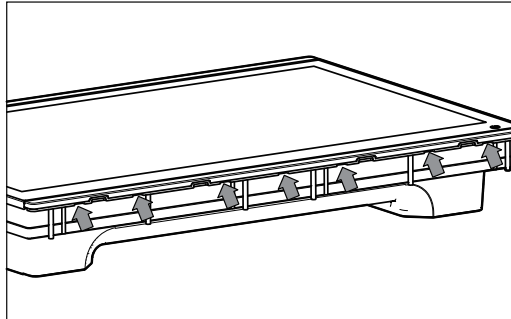


## 1. MOUNTING

### **How to remove the cosmetic plates**

Remove the top and bottom cosmetic plates from the front of the unit.

Use a flat-head screwdriver. Starting at one end of the cosmetic plate, insert the blade of the screwdriver into each of the release points (indicated with gray arrows in the figure below), then gently twist the screwdriver until a “pop” sound is heard.

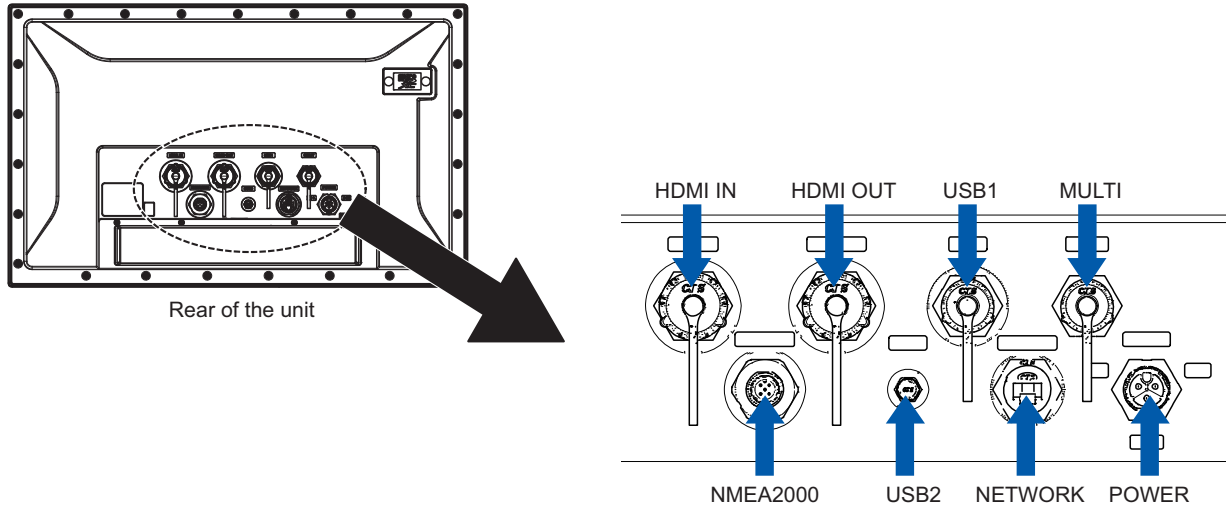


**Note 1:** To prevent damage to the cosmetic plate, release the plate from one end, then work towards the opposite end. Releasing the plate in any other manner may damage the plate and your TZT22X/24X.

**Note 2:** Do not use excessive force when removing the cosmetic plate. Use of excessive force can damage the cosmetic plate and the unit itself.

# 2. WIRING

## 2.1 Interface Connections (rear of the unit)



### Analog video input

The TZT22X/24X can use regular analog video inputs (PAL or NTSC) that connect to the TZT22X/24X directly via the Video In connector on the MULTI cable (connected to the MULTI port). Analog video can be viewed only on the equipment where the source is connected.

Additionally, a single FLIR camera may be connected to the TZT22X/24X. Connect the Video Out cable from the camera to the Video In cable on the TZT22X/24X.

**Note:** Some camera models may require an adapter for connection.

Cameras may be set up using the appropriate menu item on the [Camera] menu, accessed from the [Settings] menu. For details on camera setup, see the operator's manual (OME-45240-x)

### Network

You can connect to an external network device using a LAN cable. Use HUB-101 (option) when connecting multiple devices. The MCU-005 can also be connected via a PoE hub.

### Video out (external HDMI monitor)

A HDMI monitor can be connected to the TZT22X/24X to repeat the screen at a remote location. The TZT22X/24X is compatible with wide-screen HDMI monitors which meet the following minimum requirements:

Resolution	Vert. Frequency	Horiz. Frequency	Pixel clock
1920 × 1080	60 Hz	67.5 kHz	148.5 MHz

### Video in (HDMI source devices)

Video data from HDMI source devices can be watched on TZT22X/24X by connecting the device.

**NMEA2000 (CAN bus) port**

TZT22X/24X can be connected to multiple compatible NavNet TZT units using a micro type NMEA 2000 connector. In that case, connect them all to the same network backbone cable (Refer to section 2.6 for details).

**MULTI port**

You can connect to external devices such as buzzers and event switches. Refer to section 2.3 for details.

**USB port**

The TZT22X/24X has one USB Ver. 2.0 port and one USB Ver. 3.0 port which can be used to connect a remote control unit and/or to control a touch monitor.

## 2.2 Power Cable

Connect the power cable (FRU-PM03M-KCP01-RD, 2 m, supplied) to the connector. When connecting the power supply, connect the positive and negative terminals correctly.

**Note:** Turn off the power at the switchboard before beginning the connection.




## 2.3 MULTI Cable

Use the MULTI cable for the NMEA 0183 equipment, external buzzer to supply power to the NMEA 2000. The connector has 14 wires and a connector (SMP-11V). Use the table below for reference and connector (SMD-11V, local supply) when connecting the MULTI cable.

Wire color	Function	Description
White	NMEA-TD-B	NMEA 0183 Output
Blue	NMEA-TD-A	
Gray	EXT_BUZZER	External buzzer ON/OFF
Red	+12 V	External buzzer power (12 V)
Orange	EVENT_SW	Event switch (MOB, etc.)
Black	GND	Grounding for +12V/EVENT_SW
Purple	POWER_SW	Power switch
Brown	NC	Not used for TZT22X/24X
Red/White	NC	Not used for TZT22X/24X
Black/White	GND	Grounding for KP (not used for TZT22X/24X)
Brown/White	GND	Grounding for power switch
Braided (external)	SHIELD	FG
Signal	Signal	For video input (RCA Jack)
Braided (internal)	GND	For video signal

### 2.3.1 How to set up NMEA 0183 data output

**Note:** To set up data input from NMEA 0183 equipment, see "NMEA 0183 equipment data input" on page 2-4.

1. Tap the [FURUNO] icon (  ) to show the home screen and display mode settings.
2. Tap [Settings], then drag the menu to show [Initial Setup]. Tap [Initial Setup].
3. Tap [Data Sensors], then tap [NMEA0183 Output].
4. Tap [Baud Rate] to set the output baud rate. Available options are [4,800], [9,600] and [38,400].
5. Tap the appropriate setting then tap the  icon.
6. Tap [NMEA-0183 Version] to set the version. Available options are [1.5], [2.0] and [3.0].
7. Tap the appropriate setting then tap the  icon.
8. Select the sentences to output. Tap a sentence, then tap its flipswitch to set the sentence to [ON].
9. Tap the [Close] icon at the top right of the screen to close the menus.

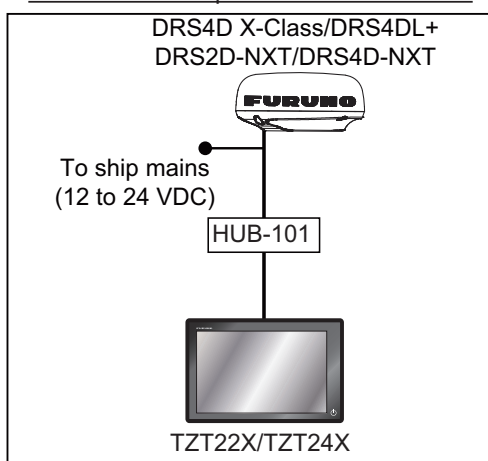
## 2.4 DRS Radar Sensor Connections

The figures below show connection examples with radar sensors which are compatible with the TZT22X/24X.

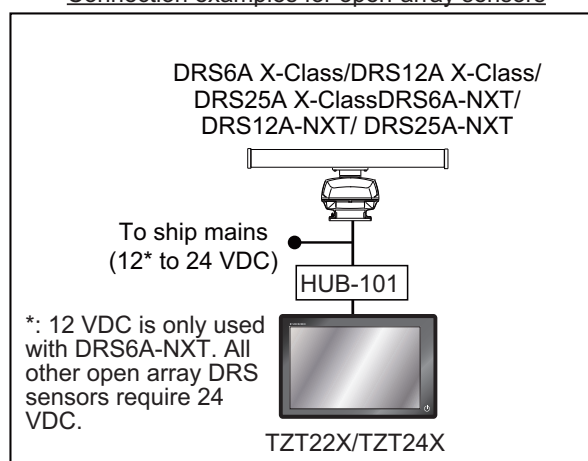
For details regarding connection and cables required for connection with the radar sensor, see the radar sensor's installation manual.

**Note:** DRS2D-NXT and DRS4D-NXT cannot be used in Japan.  
DRS4D X-Class is for Japanese market only.

Connection examples for radome sensors



Connection examples for open-array sensors



## 2.5 Network Connection with Other TZT Series Units

Your TZT22X/24X is equipped with a network connector (RJ45). Like previous NavNet series equipment, the TZT22X/24X is able to share Radar images and other information, across an Ethernet connection. Up to six NavNet TZtouch units may be connected to the same network at one time (see page iii for the details). However, for configurations with one or more TZT2BB included, the maximum number of networked NavNet TZtouch units is four. For example, a configuration with one TZT22X/24X and one TZT12F can have two TZT2BB units connected.

## 2.6 NMEA 2000 Connector

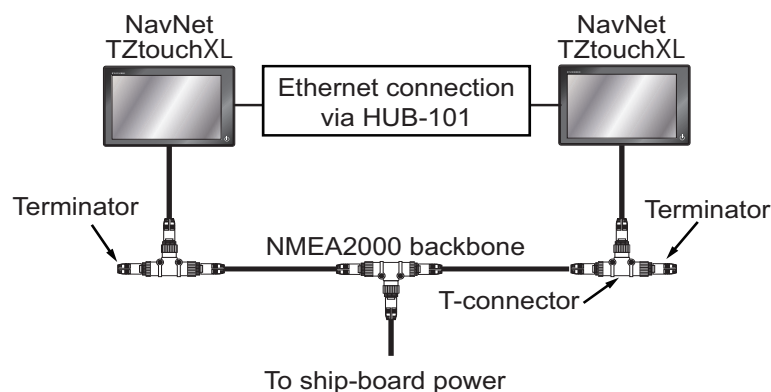
The TZT22X/24X has one NMEA 2000 connector (micro type connector). All TZT22X/24X must be connected to the same NMEA 2000 backbone.

### What is NMEA 2000?

NMEA 2000 (also known as CAN bus) is a communication protocol that shares multiple data and signals through a single backbone cable. You can simply connect any NMEA 2000 devices onto the backbone cable to expand your network on-board. With NMEA 2000, IDs are assigned to all the devices in the network, and the status of each sensor in the network can be detected. All the NMEA 2000 devices can be incorporated into the NMEA 2000 network. For detailed information about NMEA 2000 wiring, see "FURUNO CAN bus Network Design Guide" (Type: TIE-00170).

### 2.6.1 How to connect the NavNet TZtouchXL to NMEA 2000 equipment

Below is an example of two units, connected to NMEA 2000 sensors via the network.



**Note 1:** The NMEA 2000 network requires a dedicated NMEA 2000 power supply. Turn the NMEA 2000 network power on before turning your connected equipment on.

**Note 2:** Terminators must be installed at both ends of the NMEA 2000 backbone cable. See the "EQUIPMENT LISTS" on page iv for available terminators.

### 2.6.2 NMEA 0183 equipment data input

**Note:** To output NMEA 0183 data, see paragraph 2.3.1.

To connect NMEA 0183 equipment to TZT22X/24X, use the NMEA 2000 network via the optional NMEA data converter IF-NMEA2K2 (or IF-NMEA2K1). This NMEA connection can accept a baud rate of 4800 or 38400.

Heading input to TZT22X/24X allows functions such as Radar Overlay and course stabilization (North up, etc.) in the radar operating modes. The NMEA 0183 heading refresh rate needs to be 100 ms in order for any radar function to work properly. NMEA 0183 heading can be accepted on any NMEA 2000 port at a baud rate up to 38400 bps.

**Note 1:** When using the ARPA function, set the heading refresh rate to 100 ms.

**Note 2:** For more information on connecting and wiring IF-NMEA2K2, refer to their respective installation manuals.

## 2.6.3 NMEA 2000 input/output

### Input PGN

PGN	Description
059392	ISO Acknowledgment
059904	ISO Request
060928	ISO Address Claim
060160	ISO Transport Protocol, Data Transfer
060416	ISO Transport Protocol, Connection Management - BAM group function
065240	ISO Commanded Address
126208	NMEA-Request Group Function
	NMEA-Command Group Function
	NMEA-Acknowledge Group Function
126464	PGN List - Transmit PGN's group function
126992	System Time
126996	Product Information
126998	Configuration Information
127237	Heading/Track Control
127245	Rudder
127250	Vessel Heading
127251	Rate of Turn
127252	Heave
127257	Attitude
127258	Magnetic Variation
127488	Engine Parameters, Rapid Update
127489	Engine Parameters, Dynamic
127493	Transmission Parameters, Dynamic
127498	Engine Parameters, Static
127503	AC Input Status
127505	Fluid Level
127506	DC Detailed Status
127508	Battery Status
128259	Speed
128267	Water Depth
129025	Position, Rapid Update
129026	COG & SOG, Rapid Update

## 2. WIRING

<b>PGN</b>	<b>Description</b>
129029	GNSS Position Data
129033	Local Time Offset
129038	AIS Class A Position Report
129039	AIS Class B Position Report
129040	AIS Class B Extended Position Report
129041	AIS Aids to Navigation (AtoN) Report
129291	Set & Drift, Rapid Update
129538	GNSS Control Status
129540	GNSS Satellites in View
129793	AIS UTC and Date Report
129794	AIS Class A Static and Voyage Related Data
129795	AIS Addressed Binary Message
129797	AIS Binary Broadcast Message
129798	AIS SAR Aircraft Position Report
129801	AIS Addressed Safety Related Message
129802	AIS Safety Related Broadcast Message
129808	DSC Call Information
129809	AIS Class B "CS" Static Data Report, Part A
129810	AIS Class B "CS" Static Data Report, Part B
130306	Wind Data
130310	Environmental Parameters
130311	Environmental Parameters
130312	Temperature
130313	Humidity
130314	Actual Pressure
130316	Temperature, Extended Range
130576	Trim Tab Status
130577	Direction Data
130578	Vessel Speed Component

### **Output PGN**

The NMEA 2000 output PGN setting (found under the [Initial Setup] menu) is global to the network. Note that only one TZT22X/24X will output NMEA 2000 data on the network at a time: the TZT22X/24X which is powered ON first. If that display is turned OFF, another will take its place to output the data.

<b>PGN</b>	<b>Description</b>	<b>Output cycle (msec)</b>
059392	ISO Acknowledgment	
059904	ISO Request	
060928	ISO Address Claim	
126208	NMEA-Request group function	
	NMEA-Command group function	
	NMEA-Acknowledge group function	
126464	PGN List-Transmit PGN's group function	
	PGN List-Received PGN's group function	
126992	System Time	1000
126993	Heartbeat	
126996	Product Information	
126998	Configuration Information	

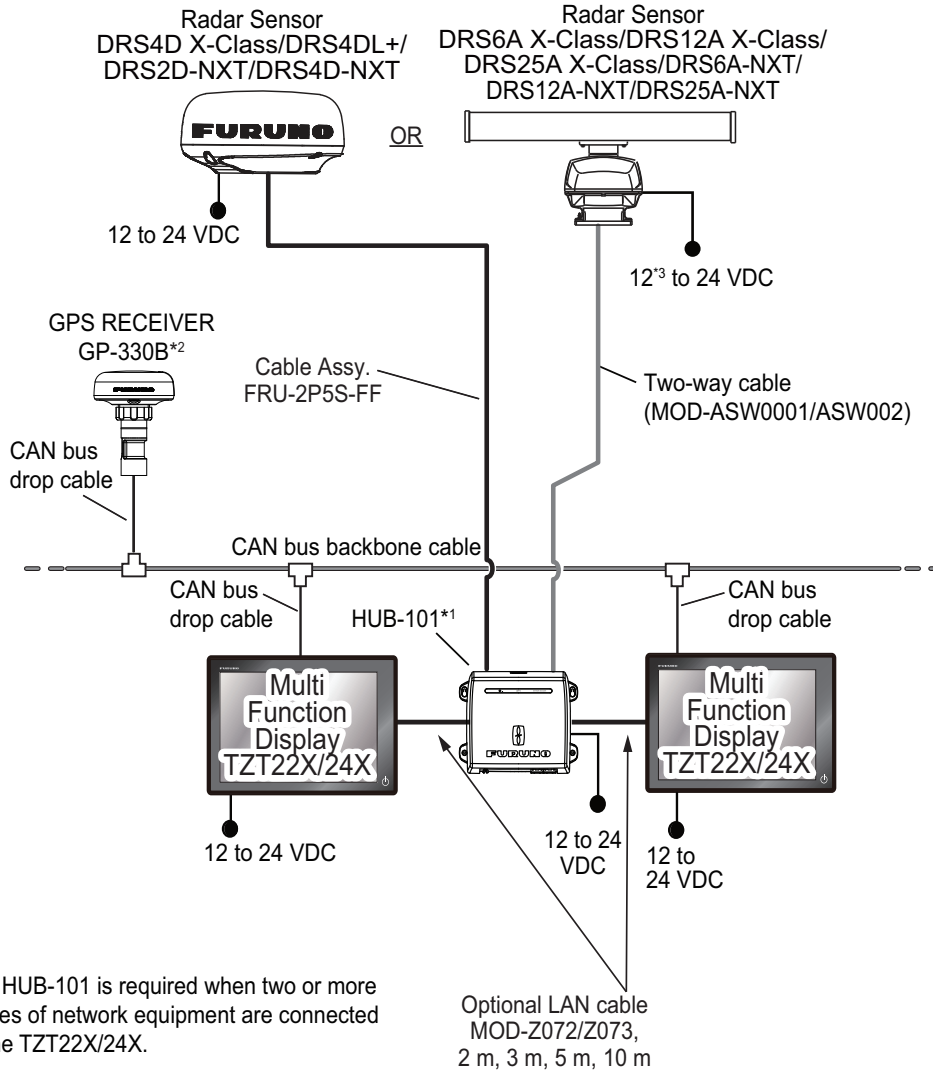


<b>PGN</b>	<b>Description</b>	<b>Output cycle (msec)</b>
127250	Vessel Heading	100
127251	Rate of Turn	100
127257	Attitude	1000
127258	Magnetic Variation	1000
128259	Speed	1000
128267	Water Depth	1000
128275	Distance Log	1000
129025	Position, Rapid Update	100
129026	COG &SOG, Rapid Update	250
129029	GNSS Position Data	1000
129033	Local Time Offset	1000
129283	Cross Track Error	1000
129284	Navigation Data	1000
129285	Navigation-Route/WP Information	
130306	Wind Data	100
130310	Environmental Parameters	500
130312	Temperature	2000
130313	Humidity	2000
130314	Actual Pressure	2000
130316	Temp., Extended Range	2000

## 2.7 Example TZT22X/24X System Configuration

### Mid/Large-size vessels (External GPS, Radar)

This is a single station chart plotter/radar installation. Refer to "SYSTEM CONFIGURATION" on page ii for more details.



\*1: The HUB-101 is required when two or more pieces of network equipment are connected to the TZT22X/24X.

\*2: Backup

\*3: 12 VDC is only used with DRS6A-NXT.

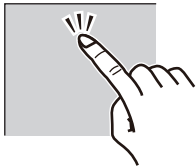

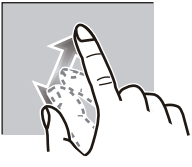

All other open array DRS sensors require 24 VDC.

# 3. HOW TO SET UP THE EQUIPMENT

This chapter shows you how to set up your system according to the equipment you have connected.



## Touch control description

The touch control depends on the screen type. The basic operations to use during the installation setup are in the following table.

	Operating by a finger	Function
Tap		<ul style="list-style-type: none"> <li>• Select a menu item.</li> <li>• Select a setting option where there are multiple options.</li> <li>• Select an object.</li> <li>• Display the pop-up menu where available.</li> </ul>
Drag		<ul style="list-style-type: none"> <li>• Scroll the menu.</li> </ul>
Pinch	  <p style="text-align: center;">Zoom in                  Zoom out</p>	Change the fish finder, plotter and radar range.

## How to operate the menus

The following procedure shows how to use the menu system.

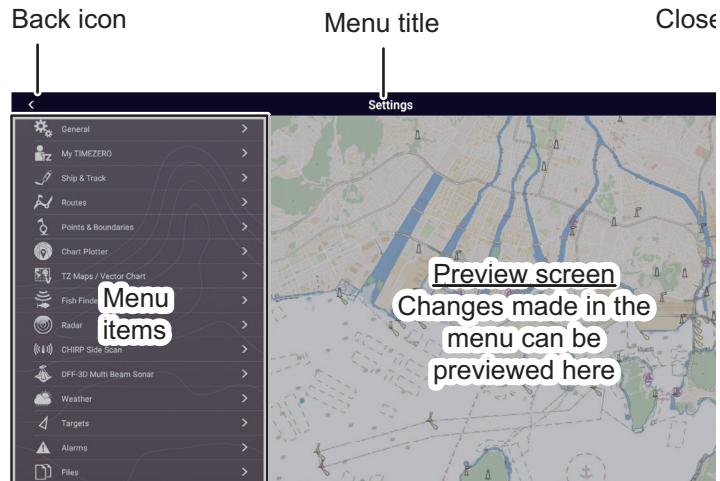
1. Tap  (power switch) to turn the power on.
2. After the startup process completes, the last used display appears and a warning message is displayed. Read the message, then tap [OK].
3. Tap the [FURUNO] icon (  ) to show the home screen and display mode settings.







4. Tap [Settings] to open the [Settings] menu.

### 3. HOW TO SET UP THE EQUIPMENT

5. Drag the menu to show [Initial Setup], then tap [Initial Setup].

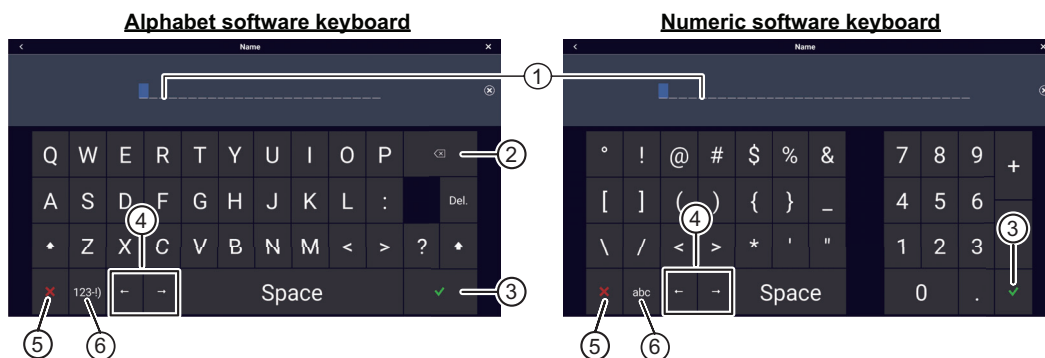


6. Depending on the menu item selected, the following operations are available:

- ON/OFF flipswitch. ON  OFF   
Tap to switch between [ON] and [OFF] to activate or deactivate the function.
- Sidebar and keyboard icon.   
Drag the sidebar to adjust the setting. Settings may also be adjusted using the software keyboard for direct input.
- Keyboard icon.   
Referring to the figure below, use the software keyboard to input alphabet or numeric characters.

7. Tap [x] at the top right-hand side of the screen to exit.

#### How to use the software keyboard

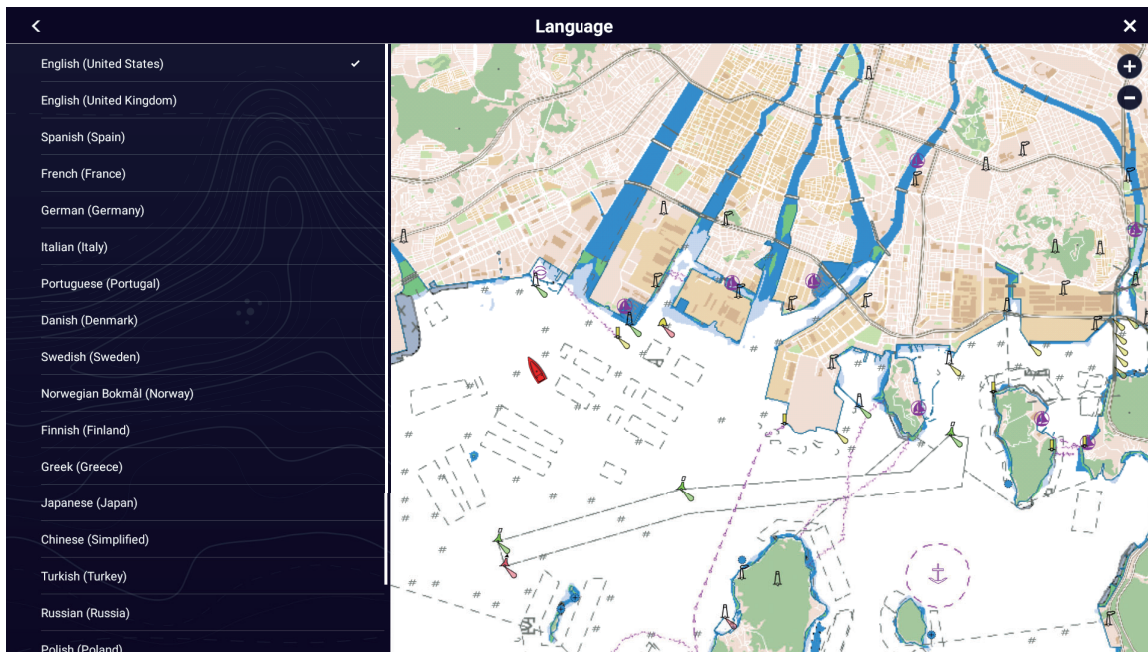


No.	Description
1	Cursor position is highlighted.
2	Backspace/Delete. Tap to erase one character at a time.
3	Enter button. Tap to complete character input and apply changes.
4	Cursor keys. Tap to move the cursor left/right.
5	Cancel button. Aborts character entry. No changes are applied.
6	Tap to switch between alphabet and numeric keyboards (where available).

## 3.1 How to Set Time Zone, Time Format and Language

Before setting up your equipment, select the time zone, language and units to use on your equipment as shown below.

1. Tap the [FURUNO] icon to show the home screen and display mode settings.
2. Tap [Settings] to show the [Settings] menu.
3. Tap [General] to show the [General] menu.
4. Tap [Local Time Offset] to show the numerical keyboard.
5. Input the time difference (using 15-minute intervals) between local and UTC, then tap [✓].
6. Tap [Time Format] to show the option window.
7. Select how to display time, in 12- or 24-hour format. [Auto] automatically inserts AM, PM indication in 24-hour clock, when the language is English.
8. Tap [<] at the top left of the screen to return to the [General] menu.
9. Tap [Language] to show the [Language] menu.



10. Tap the language to use. The unit will display a confirmation message. Tap [OK] to restart the unit and apply the new language settings. This process takes approximately five minutes to optimize the system for the new language setting. When the process is completed (five minutes later), the system restarts automatically.

## 3.2 How to Set Units of Measurement

1. Tap the [FURUNO] icon to show the home screen and display mode settings.
2. Tap [Settings] to show the [Settings] menu.
3. Drag the main menu to display [Units], then tap [Units].
4. Referring to the table below, set the units to show on the display.

Menu item	Description	Options
[Bearing Display]	Adjust the bearing display format.	[Magnetic], [True]
[True Wind Calculation Reference]	Set the reference for calculating true wind speed/angle.	[Ground], [Surface]
[Position Format]	Set the display format for position (Latitude/Longitude).	[DDD°MM.mmmm'], [DDD°MM.mmm'], [DDD°MM.mm'], [DDD°MM'SS.ss"], [DDD.dddddd°], [Loran-C], [MGRS]
[Loran C Station &GRI]	Available when [Position Format] is selected to [Loran-C].	Set Loran C station and GRI combination.
[Short/Long Change Over]	Set the distance at which to change between short and long range.	[0.0] to [2.0] (NM)
[Range (Long)]	Set the unit of measurement for long distances.	[Nautical Mile], [Kilometer], [Mile]
[Range (Short)]	Set the unit of measurement for short distances.	[Foot], [Meter], [Yard]
[Depth]	Set the unit of measurement for depth.	[Foot], [Meter], [Fathom], [Passi Braza]
[Height/Length]	Set the unit of measurement for height and length.	[Foot], [Meter]
[Fish Size]	Set the unit of measurement for fish sizes.	[Inch], [Centimeter]
[Fish Weight]	Set the unit of measurement for fish weight.	[Pound], [Kilogram]
[Temperature]	Set the unit of measurement for temperature.	[Fahrenheit Degree], [Celsius Degree]
[Boat Speed]	Set the unit of measurement for boat speed.	[Knot], [Kilometer per Hour], [Mile per Hour], [Meter per Second]
[Wind Speed]	Set the unit of measurement for wind speed.	[Knot], [Kilometer per Hour], [Mile per Hour], [Meter per Second]
[Atmospheric Pressure]	Set the unit of measurement for atmospheric pressure.	[HectoPascal], [Millibar], [Millimeter of Mercury], [Inch of Mercury]
[Oil Pressure]	Set the unit of measurement for oil pressure.	[KiloPascal], [Bar], [Pound per Square Inch]
[Volume]	Set the unit of measurement for tank volume.	[Gallon] (Gallon &Gallon/hour), [Litre] (Litre &Litre/hour)
[Reset Default Page Settings]	Restore default unit settings.	[OK], [Cancel]

### 3.3 Initial Setup

This section shows you how to set your system according to the sensors you have connected.

**Note:** Some units are set to metric in this section, actual setting ranges vary depending on the unit of measurement set in the [Units] menu.

1. Tap the [FURUNO] icon to show the home screen and display mode settings.
2. Tap [Settings] to show the [Settings] menu.
3. Drag the main menu, then tap [Initial Setup] to show the [Initial Setup] menu.
4. Refer to the tables on the next several pages to set up the equipment.

#### [Boat Information] section

Menu item	Description	Options (setting range)
[Boat Height]	Set the height of your boat.	0 (m) to 999 (m)
[Boat Width]	Set the width of your boat.	0 (m) to 999 (m)
[Boat Length]	Set the length of your boat.	0 (m) to 999 (m)
[Boat MMSI]	Set the MMSI for your boat (used for fleet tracking function).	
[Boat Name]	Set the name for your boat (used for fleet tracking function).	
[Size of Own Ship Icon]	Set the size of own ship icon.	50 to 150
[Depth Display]	Select the start point for depth measurement.	[Under Keel], [Under Sea Level]
[External Transducer Draft]	Set the draft for external transducers networked or multi-beam sonar. <b>For network transducers</b> , set the draft from the Home screen→[Settings]→[Fish Finder]→[Fish Finder Initial Setup]→[Transducer Draft]. <b>For multi-beam sonars</b> , set the draft from the Home screen→[Settings]→[DFF-3D Multibeam Sonar]→[Initial Setup]→[External Transducer Draft].	0.0 (m) to 99.9 (m)
[Keel Draft]	Set the keel draft.	0.0 (m) to 99.9 (m)
[Engine Count]	Set the number of engines.	0 to 6

#### [Instruments Setup] section


Menu item	Description	Options (setting range)
[Engine & Tank Automatic Setup]	See "[Engine & Tank Automatic Setup] section" on page 3-9.	
[Engine & Tank Manual Setup]	See "[Engine & Tank Automatic Setup] section" on page 3-9.	
[Graphic Instruments Setup]	See "[Graphic Instruments Setup] section" on page 3-8.	

#### [Manual Fuel Management] Section

Menu item	Description	Options (setting range)
[Total Fuel Capacity]	Enter the total fuel capacity of your tank(s).	0 to 9,999(L).
[Manual Fuel Management]	Set to [ON] for manual fuel management. See the Operator's Manual.	[OFF], [ON].

### 3. HOW TO SET UP THE EQUIPMENT

#### [Data Sensors] section

Menu Item	Description	Options (setting range)
[Data Sources]	Select the source for each data to input to the system. If two or more sources are connected for a data, select one using the pull-down dialog box. The FURUNO products are shown at the upper part of the list.	
[Sensor List]	Show the information for sensors connected to your equipment. Also, you can set "Nickname" for them here.	
[NMEA0183 Output]  <b>Note:</b> If the TTM sentence is received at the same time as another sentence, the constraints to communication bandwidth may cause a decrease in the number of TTM targets.	<ul style="list-style-type: none"> <li>• [Baud Rate]: Select the baud rate.</li> <li>• [NMEA-0183 Version]: Select the version for NMEA 0183.</li> </ul>	<ul style="list-style-type: none"> <li>• [4,800], [9,600], [38,400]</li> <li>• [1.5], [2.0], [3.0]</li> </ul>
	[Sentences]: Select the sentences to output.	[ON], [OFF]
[NMEA2000 PGN Output]	Select [ON] for the PGN's (Parameter Group Number, NMEA 2000 message) to output from the NMEA 2000 port. <b>Note:</b> The default setting of some PGNs is "ON".	[ON], [OFF]
[Sky View...]	Show the condition of GPS and GEO (WAAS) satellites on the [GPS SkyView] display. The bearing and elevation angle of all GPS and GEO satellites (if applicable) in view of your receiver appear. For the serviceman. <b>Note:</b> The [GPS SkyView] display can also be shown by tapping the GPS icon (shown right) on the Home page.	
[GP330B WAAS Mode]	Select [ON] to use the WAAS mode for the corresponding GPS antenna.	[ON], [OFF]
[WS200 WAAS Mode]		

#### [Network Sensor Setup] section

The [NETWORK SENSOR SETUP] section allows you to set up compatible FURUNO NMEA 2000 sensors. Calibrations and offsets applied in this menu are also applied to the sensor itself.

#### [Data Offset] section

Menu item	Description	Options (setting range)
[Heading]	Offset heading data.	-180.0° to +180.0°
[Speed Through Water]	Calibrate speed data. Enter amount in percentage.	-50% to +50%
[Wind Speed]	Offset wind speed data. Enter amount in percentage.	-50% to +50%
[Wind Angle]	Offset wind angle data.	-180° to +180°
[Sea Surface Temperature]	Offset sea surface temperature data.	-10°C to +10 °C



**[GPS Position] section**

Menu item	Description	Options (setting range)
[Longitudinal (from bow)]	Referring to the figure on the right, enter the GPS antenna positioning bow-stern (Longitudinal) and port-starboard (Lateral) position from the origin.	0 (m) to 999 (m)
[Lateral (-Port)]		-99 (m) to +99 (m) Port-side is negative, Starboard-side is positive.

**[Data Damping] section**

Menu item	Description	Options (setting range)
[COG & SOG]	Set data damping time. The lower the setting the faster the response to change.	0 to 59 seconds
[Heading]		
[Speed Through Water]		
[Wind Speed & Angle]		
[Rate of Turn]		

**[IF-NMEAFl Setup] section**

Menu item	Description	Options (setting range)
[Select IF]	Select [IF-NMEAFl] to set the analog data that is input from the IF-NMEAFl. The setting is made after restarting the IF-NMEAFl.	
[Category]	Select the use (category) for this sensor.	[Wind], [ST800_850], [Fuel], [FreshWater], [WasteWater], [LiveWell], [Oil], [BlackWater]
[Resistance Full]	The resistance, in Ohms, when the tank is full.	[0] (ohm) to [500] (ohm)
[Resistance Mid]	The resistance, in Ohms, when the tank is half full.	[0] (ohm) to [500] (ohm)
[Resistance Empty]	The resistance, in Ohms, when the tank is empty.	[0] (ohm) to [500] (ohm)
[Capacity]	The capacity of the tank.	[0] (G) to [2650] (G)
[Fluid Instance]	Select the NMEA instance for the tank.	[000] to [254]
[Self test]	Test results are displayed.	
[Set Hardware to Factory Default]	Resets the converter selected at [Select IF] to factory default.	[OK], [Cancel]

**[Fusion] section**

Menu item	Description	Options (setting range)
[Connect to Fusion]	Connects to your Fusion equipment.	
[Fusion Auto Volume]	Set to [ON] to allow the TZT22X/24X unit to control the FUSION volume automatically.	[ON], [OFF]
[Minimum Speed]	Set the minimum speed threshold. Exceeding this speed activates volume auto control.	0.0 (kn) to 98.9 (kn)
[Maximum Speed]	Set the maximum speed threshold.	0.1 (kn) to 99.0 (kn)
[Volume Increase]	Set the amount of extra volume to output .	10% to 50%

**[Service / Self Test / Log] section**

Menu item	Description	Options (setting range)
[Synchronization Log]	Shows synchronization with devices connected to the network.	

### 3. HOW TO SET UP THE EQUIPMENT

Menu item	Description	Options (setting range)
[Enable NMEA2000 Log]	Set to [ON] when using NMEA 2000 log.	[ON], [OFF]
[NMEA2000 Log Storage Location]	Show the location where to store the log.	
[Quick Self Test]	Displays various details regarding the TZT22X/24X unit, radar and fish finder.	
[Certification Mark]	Displays relevant certification for this equipment.	
[Service]	Requires login password. For the service technician.	
[Reset Default Settings]	Reset the system to default settings.	[OK], [Cancel]

#### **[Home Page] section**

Menu item	Description	Options (setting range)
[Factory Reset]	Click [OK] to restore the [HOME] screen's default settings.	

#### **[Network Sensor Setup] - [SC-30 SETUP] section**

Menu item	Description	Options (setting range)
[WAAS Mode]	Select [ON] to use the WAAS mode.	[ON], [OFF]
[Heading Offset]	Enter the offset value for heading.	-180° to +180°
[Pitch Offset]	Enter the offset value for pitching.	-90° to +90°
[Roll Offset]	Enter the offset value for rolling.	-90° to +90°

#### **[Browser Installation] section**

Menu item	Description	Option (setting range)
[FAX-30 Browser]	Show the Facsimile Receiver FAX-30 display.	
[FA-30 Browser]	Show the AIS Receiver FA-30 display.	
[FA-50 Browser]	Show the AIS Receiver FA-50 display.	

#### **Other menu items**

Menu item	Description	Option (setting range)
[Chart Master]	Set to [ON] to use this unit as the master, [OFF] to use this unit as a slave.	
[System ID]	The system ID for this device within the network.	
[Event Input Configuration]	Set the function for the event switch.	[OFF], [Event Mark], [MOB], [Ferry]
[Update Network Equipment]	For the service technician.	
[Remote Controller Configuration]	When there are multiple units in the NavNet network, the Remote Control Unit MCU-005/-006 can select the display to show on the unit with MCU-005/-006 connection. Further, the cycling order of displays can be set. See the Operator's Manual.	
[Sirius Radio Diagnostic]	Check the satellite radio of the FURUNO BBWX SiriusXM weather receiver for proper operation. See the Operator's Manual.	
[Sirius Weather Diagnostic]	Check the weather section of the FURUNO BBWX SiriusXM weather receiver for proper operation. See the Operator's Manual.	

#### **[Graphic Instruments Setup] section**

Menu Item	Description	Options (setting range)
[Maximum Boat Speed]	Set the transducer's maximum detectable speed.	1 (kn) to 99 (kn)

Menu Item	Description	Options (setting range)
[Maximum Wind Speed]	Set the transducer's maximum detectable speed.	1 (kn) to 99 (kn)

*[Graphic Instruments Setup] - [Depth]*

Menu Item	Description	Options (setting range)
[Minimum Depth]	Set the transducer's minimum detectable depth.	1 (m) to 1999 (m)
[Maximum Depth]	Set the transducer's maximum detectable depth.	1 (m) to 2000 (m)

*[Graphic Instruments Setup] - [Sea Surface Temperature]*

Menu Item	Description	Options (setting range)
[Minimum Sea Surface Temperature]	Set the transducer's minimum detectable temperature.	0.00°C to 98.99°C
[Maximum Sea Surface Temperature]	Set the transducer's maximum detectable temperature.	0.01°C to 99.99°C

*[Graphic Instruments Setup] - [Propulsion Engine] or [Other Engine]*

Menu Item	Description	Options (setting range)
[Max. RPM]	Set the maximum rpm of your engine to show on the RPM display.	1 (rpm) to 20,000 (rpm)
[Red Zone Oil Pressure]	Set the starting value for the red zone area of the oil pressure meter.	0 (psi) to 143 (psi)
[Max. Oil Pressure]	Set the maximum oil pressure of your engine.	1 (psi) to 144 (psi)
[Min. Temperature]	Set the minimum temperature for your engine.	0.00°C to 99.00°C
[Red Zone Temperature]	Set the starting value for the red zone area of the engine temperature indicator.	0.01°C to 999.00°C

*[Graphic Instruments Setup]-[CZone Setup]*

Menu item	Description
[Add Default CZone Pages]	Create, edit C-Zone pages.
[CZone DIP Switch Settings]	Set this unit's DIP switches. For the service technician. Do not change the settings.

Menu item	Description
[Reset Instrument Pages]	Resets all instrument pages to default. [OK], [Cancel]
[Reset Default Settings]	Resets applicable settings to default. [OK], [Cancel]

**[Engine & Tank Automatic Setup] section**

The TZT22X/24X will automatically detect engines and tanks connected to the same network.

This is the recommended method for setting up engines and tanks.

### 3. HOW TO SET UP THE EQUIPMENT

#### **[Engine & Tank Manual Setup] section**

The manual set up method should only be used if the automatic setup did not correctly detect your engines or tanks.



Menu Item	Description	Options (setting range)
[Nickname]	Change the nickname for the engine or tank.	
[Used For Propulsion]	Select which engine/tank is used to calculate the distance which may be traveled using the remaining fuel. [ON] uses the engine/tank for calculations, [OFF] ignores the engine/tank.	[ON], [OFF]
[Reset]	Resets the engine/tank details to default.	

### 3.4 How to Set Up the Radar

1. Tap the [FURUNO] icon to show the home screen and display mode settings.
2. Tap [Radar] from the [Settings] menu.
3. Tap [User Settings], [Radar Source] then tap appropriate radar source.

**Note:** If a DRS sensor is connected but does not appear in the [Radar Source] list, close the list and open it again. The name of the DRS sensor should appear with a check mark, as in the example below.



4. Tap [<] to go back one layer in the menu, then tap [Radar Initial Setup].
5. Referring to the tables on the next several pages to set up the radar.

*[Radar Initial Setup] section*

Menu item	Description	Options (setting range)
[Own Ship Icon]	Select to show or hide the own ship icon on the radar display.	[ON], [OFF]
[Bearing Scale Mode]	Select the range rings mode.	[True], [Relative]
[EBL Reference]	Select the EBL reference.	[True], [Relative]
[Antenna Rotation]	Select the speed of antenna rotation. Not available (grayed out) with DRS4DL+.	[Auto], [24 RPM]
[Antenna Heading Align]	See "How to align the antenna heading" on page 3-13.	[-179.9°] to [+180.0°]
[Main Bang Suppression]	If main bang appears at the screen center, slide the circle icon so that the main bang disappears, while watching the radar echo at the left-hand side of the display.	[0] to [100]
[Enable Sector Blanking]	Up to two sectors may be selected for blanking (no transmission). Select [ON] to enable this feature. Set the start and end angles (0° to 359°).	[ON], [OFF]
[Enable Sector 2 Blanking]		
[Position from Bow]	Referring to the figure on the right, enter the radar antenna positioning bow-stern (Longitudinal) and port-starboard (Lateral) position from the origin.	[0] m to [999] m
[Position from Port]		[-99] m to [+99] m Port-side is negative, Starboard-side is positive.
[Height from Surface]	Select the height of the antenna above the waterline. Not available (grayed out) with DRS4DL+.	[Under 3m], [3m-10m], [Over 10m]
[Antenna Length]	Select the length of the antenna.	[1.0m], [1.2m], [1.8m]
[Auto Tuning]	Enable/disable auto tuning for the connected radar. Not available (grayed out) with DRS2D-NXT/DRS4D-NXT/DRS6A-NXT/DRS12A-NXT/DRS25A-NXT.	[ON], [OFF]



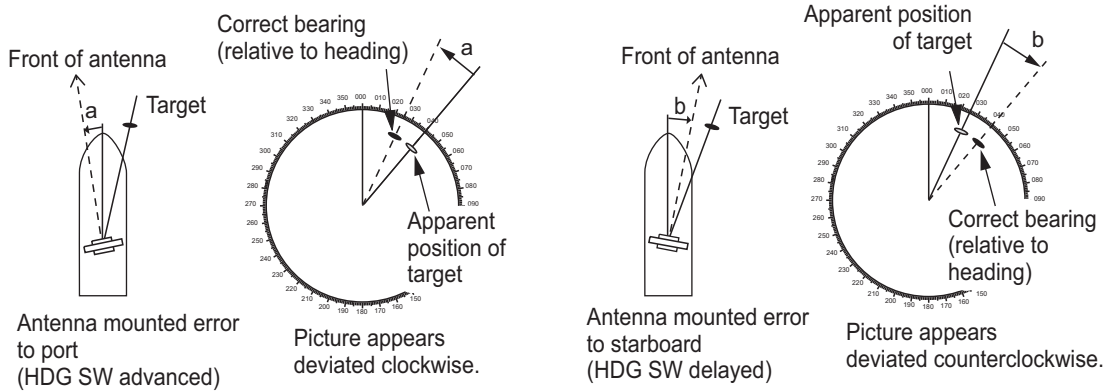
### 3. HOW TO SET UP THE EQUIPMENT

Menu item	Description	Options (setting range)
[Tuning Source]	Select a display in the dual range display to manually tune. Not available (grayed out) with DRS2D-NXT/DRS4D-NXT/DRS6A-NXT/DRS12A-NXT/DRS25A-NXT.	[Range1], [Range2]
[Manual Tuning]	Manually tune the radar. Not available (grayed out) with DRS2D-NXT/DRS4D-NXT/DRS6A-NXT/DRS12A-NXT/DRS25A-NXT.	[-50] to [50]
[Radar Monitoring]	Display various information regarding the connected radar.	
[Radar Optimization]	Automatically adjust magnetron output and tuning for the connected radar. Available when the [TX/STBY] setting is [ON]. Do not change these settings. Not available with DRS2D-NXT/DRS4D-NXT/DRS6A-NXT/DRS12A-NXT/DRS25A-NXT. <b>Note 1:</b> For service technicians only. <b>Note 2:</b> Use this function whenever the magnetron is replaced.	
[ARPA Advanced Settings]	For service technicians only. Do not change these settings. This item is available when [TX/STBY] is [ON]. Not available (grayed out) with FAR-2xx8 series, FAR-2xx7 series, and FAR-15x8 series radar antennas.	
[TX Channel]	Select [1], [2] or [3], the channel where the interference is smallest. See the operator's manual for details. Available with DRS2D-NXT/DRS4D-NXT/DRS6A-NXT/DRS12A-NXT/DRS25A-NXT.	[Auto], [1], [2], [3]
[Target Analyzer Mode]	You can emphasize rain clutter or target echoes when the target analyzer is active. Select [Rain] or [Target] as appropriate. See the operator's manual for details. Available with DRS2D-NXT, DRS4D-NXT, DRS6A-NXT and DRS12A-NXT.	[Rain], [Target]
[Auto Acquire by Doppler]	When set to [ON], approaching targets (ships, rain clutter, etc.) within 3 NM from own ship are automatically acquired by the Doppler calculated from the radar echo. See the operator's manual for details. Available with DRS2D-NXT, DRS4D-NXT, DRS6A-NXT and DRS12A-NXT.	[ON], [OFF]
[Reset Default Page Settings]	Resets [Radar] menu settings to default.	[OK], [Cancel]

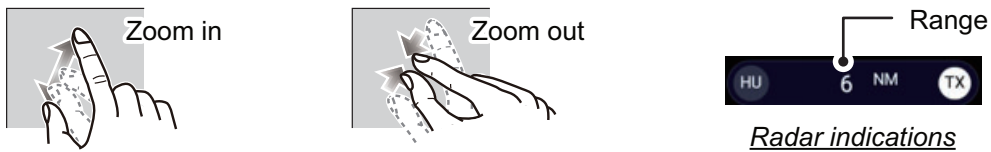
**How to align the antenna heading**

You have mounted the antenna unit facing straight ahead in the direction of the bow. Therefore, a small but conspicuous target dead ahead visually should appear on the heading line (zero degrees).

In practice, you will probably observe some small bearing error on the display because of the difficulty in achieving accurate initial positioning of the antenna unit. The following adjustment will compensate for the error.



1. Set your radar between 0.125 and 0.25 nm range and the head up mode. You can select a range by using the pinch action. The range appears at the bottom right of the screen. Range may also be selected using the slide bar displayed on the right-hand side of the radar display area. Drag the bar up to zoom in, or down to zoom out.



2. Turn the vessel's bow toward a target.
3. Tap the [FURUNO] icon to show the home screen and display mode settings.
4. Tap [Settings], [Radar], [Radar Initial Setup].
5. Tap [Antenna Heading Align].
6. Key in an offset value (setting range:  $-179.9^{\circ}$  to  $+180^{\circ}$ ) that puts the target at the very top of the screen, then tap the icon.  
 +: rotate echo in clockwise direction  
 -: rotate echo in counterclockwise direction
7. Confirm that the target echo is displayed at correct bearing on the screen.

## 3.5 How to Set Up the Fish Finder

If you have a BBDS1 or DFF series fish finder connected to the same network, you can set them up as shown in this section. If there is no networked fish finder in the configuration, the settings outlined in this section are not required.

**Note 1:** Some menu items are restricted to certain external depth sounders; some menu items may not be available with your networked fish finder.

**Note 2:** For DFF-3D setup instructions, see the DFF-3D operator's manual.

**Note 3:** In the following tables, the term "Shown with connection of..." means network connection.

1. Tap the [FURUNO] icon to show the home screen and display mode settings.
2. Tap [Settings], then tap [Fish Finder]
3. Tap [User Settings]. [Fish Finder Source], then select fish finder source.
4. Tap [<] to go back one layer in the menu.

### [Fish Finder Initial Setup] section

Menu item	Description	Options (setting range)
[Transducer Setup]	Setup Transducer and Motion Sensor. See "[Transducer Setup] section" on page 3-16.	
[Preset Frequency Setup]	Set to change the TX center frequency and CHIRP width. Please refer to the instruction manual for details. <b>Note:</b> This menu is available when DFF3-UHD or TZT9F/12F/16F/19F is connected.	[Preset Frequency 1 Setup], [Preset Frequency 2 Setup], [Preset-Frequency 3 Setup]
[Zero Line Rejection]	When you turn the zero line (transmission line) rejection on, the line is not shown, which allows you to see fish echoes near the surface. The width of the line changes with the transducer used and installation characteristics. If the width of the line is 1.4 m or more, select [ON]. <b>Note:</b> If a DFF3 or DFF3-UHD is connected and this item is set to [ON], set the range of rejection with [Zero Line Range].	[OFF], [ON]
[Zero Line Range]	You can set the zero line removal range by turning on [Zero Line Rejection]. If the tail of the zero line is long, set a large value. If the zero line still does not disappear, reduce the transmission power. The default setting is 2.0 <b>Note:</b> Shown with connection of DFF3 or DFF3-UHD.	DFF3: 1.4 to 2.5 DFF3-UHD: 1.4 to 3.8
[Transducer Draft]	Set the distance between the transducer and the draft line to show the distance from the sea surface.	0.0m to 99.9m
[Salt Water]	Select [ON] if you use this equipment in salt water.	[OFF], [ON]
[Transmission Format]	Select whether to transmit high and low frequencies simultaneously, or separately with a time delay. Normally, use [Parallel], which transmits the frequencies simultaneously. If you encounter interference near the bottom, select [Sequential A] or [Sequential B] in order to suppress the interference. <b>Note:</b> Shown with connection of DFF3-UHD.	[Parallel], [Sequential A], [Sequential B]



Menu item	Description	Options (setting range)
[Transmission Power Mode]	Set the TX power level. See the operator's manual for details.	DFF1-UHD: [Off], [Min], [Auto] DFF3-UHD: 0 to 10
[External KP]	Select on to synchronize with external sounder's keying pulse.	[OFF], [ON]
[Bottom Level HF] [Bottom Level MF] [Bottom Level LF]	The default bottom level setting (0) determines that two strong echoes received in sequence are bottom echoes. If the depth indication is not stable in the default setting, adjust the bottom level here. If vertical lines appear from the bottom echo in the bottom lock display, lower the bottom level to erase the vertical lines. If you can not identify the fish near the bottom from the bottom echo, increase the bottom level.	-40 to +40
[Auto Gain Offset HF] [Auto Gain Offset MF] [Auto Gain Offset LF]	If the auto gain offset is wrong, or there is a difference in the gain between the low and high frequencies, set an offset here to balance auto gain for the two frequencies.	-5 to +5
[STC HF] [STC MF] [STC LF]	Adjust the low (LF) or high (HF) STC frequency. See the operator's manual for details. <b>Note:</b> Shown with connection of DFF3, DFF1-UHD or DFF3-UHD.	0 to +10
[TX Pulse HF] [TX Pulse MF] [TX Pulse LF]	The pulse length is automatically set according to range and shift, however it can also be set manually. Use a short pulse for better resolution and a long pulse when detection range is important. To improve resolution on zoom displays, use [Short 1] or [Short 2]. <ul style="list-style-type: none"> <li>• [Short 1] improves the detection resolution, but the detection range is shorter than with [Std] (pulse length is 1/4 of [Std]).</li> <li>• [Short 2] raises the detection resolution, however detection range is shorter (pulse length is about 1/2 of [Std]) than [Std].</li> <li>• [Std] is the standard pulse length, and is suitable for general use.</li> <li>• [Long] increases the detection range but lowers the resolution (about 1/2 compared to the [Std] pulse length)</li> </ul> <b>Note:</b> Shown with connection of DFF3 or DFF3-UHD connected to a narrow band width transducer.	[Short1], [Short2], [Standard], [Long]
[RX Band HF] [RX Band MF] [RX Band LF]	Set the bandwidth for low (LF) or high (HF) frequency. The RX bandwidth is automatically set according to pulse length. To decrease noise, select [Narrow]. For better resolution, select [Wide]. <b>Note:</b> Shown with connection of DFF3, DFF3-UHD.	[Narrow], [Standard], [Wide]
[Temperature Port]	Set the data source for water temperature. <ul style="list-style-type: none"> <li>• [MJ Port]: Use the temperature/speed sensor for data.</li> <li>• [Low Frequency]: Use the LF sensor for data.</li> <li>• [High Frequency]: Use the HF sensor for data.</li> </ul> <b>Note:</b> Shown with connection of DFF3, DFF1-UHD.	[MJ Port], [Low Frequency], [High Frequency]
[Reset Default Page Settings]	Reset all menu settings to default.	[OK], [Cancel]

### 3. HOW TO SET UP THE EQUIPMENT

#### **[Transducer Setup] section**

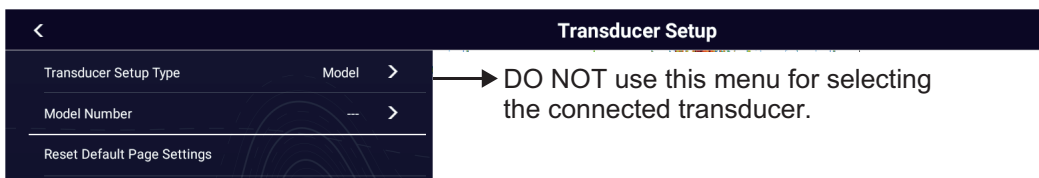
For motion sensor related settings, see "Motion sensor menu" on page 3-18.

Menu item	Description	Options (setting range)
[Transducer Setup Type]	Select the type of transducer connected. When the connected sounder is a DFF1-UHD and the transducer has a compatible TDID, [TDID] is automatically selected. <b>Note:</b> When the transducer model is changed or TDID is detected, the frequency and bandwidth set on [Manual] is to be reset. <ul style="list-style-type: none"> <li>• [Manual]: Manually set up the transducer.</li> <li>• [Model]: Select the appropriate transducer model (for FURUNO or AIRMAR transducers).</li> </ul>	[Manual], [Model]
[Model Number]	Select the appropriate model number from the list. <b>Note:</b> Only available when [Transducer Setup Type] is set to [Model].	
[High Frequency Min]	Display the high frequency minimum.*	
[High Frequency Max]	Display the high frequency maximum.*	
[Low Frequency Min]	Display the low frequency minimum.*	
[Low Frequency Max]	Display the low frequency maximum.*	
[Reset Default Page Settings]	Reset the Transducer Setup menu settings to default.	[OK], [Cancel]

\*: Shown with connection of DFF3.

**Note 1:** Make sure that the unit is set to stand-by when setting up the transducer.

**Note 2:** When using with the DI-FFAMP, DO NOT set the [Model Number] menu if the [Transducer Setup Type] menu is set to [Model]. This can cause damage to the transducer. Select [Transducer Setup Type] menu and select the model of connected transducer at [High Frequency] and [Low Frequency] menus.



**Note 3:** When the DI-FFAMP is connected and [Transducer Setup Type] menu is set to [Manual], the message "Power amplifier unit detected: In order to manually adjust your transducer setup, please contact your Furuno dealer." appears. Contact your FURUNO dealer for setup.

*When [Transducer Setup Type] is set to [Model] and connected to DFF3*

Menu item	Description
[High Frequency]	Set the frequency (kHz) of the connected high frequency transducer.
[Frequency Adjust HF]	Fine-tune the high-frequency TX frequency to eliminate interference (setting range: -50 to +50). Set to [0] where there is no interference.
[Low Frequency]	Set the frequency (kHz) of the connected low frequency transducer.
[Frequency Adjust LF]	Fine-tune the low frequency TX frequency to eliminate interference (setting range: -50 to +50). Set to [0] where there is no interference.

When [Transducer Setup Type] is set to [Model] and connected to DFF3-UHD

Menu item	Description	Options (setting range)
[TX Mode HF]	Band adjustment mode for center frequency and CHIRP frequency of the transducer connected to the high frequency side.	[Auto CHIRP], [FM (Manual CHIRP)] <sup>*1</sup> , [CW (Fixed Frequency)] <sup>*2</sup>
[High Frequency]	Set the high frequency (kHz) of the transducer connected to the high frequency side.	
[Frequency Adjust HF]	If <sup>*1</sup> or <sup>*2</sup> is selected at [TX Mode HF], fine-tune the high-frequency TX frequency to eliminate interference (setting range: -50 to +50). Set to [0] where there is no interference.	
[CHIRP Width HF]	If <sup>*1</sup> is selected in [TX Mode HF], set the CHIRP frequency band of the transducer connected to the high frequency side.	
[TX Mode LF]	Band adjustment mode for center frequency and CHIRP frequency of the transducer connected to the low frequency side.	[Auto CHIRP], [FM (Manual CHIRP)] <sup>*1</sup> , [CW (Fixed Frequency)] <sup>*2</sup>
[Low Frequency]	Set the low frequency (kHz) of the transducer connected to the low frequency side.	
[Frequency Adjust LF]	If <sup>*1</sup> or <sup>*2</sup> is selected at [TX Mode LF], fine-tune the low-frequency TX frequency to eliminate interference (setting range: -50 to +50). Set to [0] where there is no interference.	
[CHIRP Width LF]	If <sup>*1</sup> is selected in [TX Mode LF], set the CHIRP frequency band of the transducer connected to the low frequency side.	

When [Transducer Setup Type] is set to [Manual]

Menu item	Description	Options (setting range)
[High Frequency]	Set the kHz frequency for high frequency. Setting ranges vary depending on the transducer connected. <b>Note:</b> Shown with connection of DFF1, BBDS1, DFF3 or DFF1-UHD.	
[Transducer Power HF]	Set the transmission power for high frequency. <b>Note 1:</b> Shown with connection of DFF1 or BBDS1. <b>Note 2:</b> For DFF1-UHD users, when the connected transducer TDID is not supported by the DFF1-UHD, the setting is fixed as [1000].	[600], [1000]
[Band Width (HF)]	Set the bandwidth for high frequency. <b>Note:</b> Shown with connection of DFF3.	
[Low Frequency]	Set the kHz frequency for low frequency. Setting ranges vary depending on the transducer connected. <b>Note:</b> Shown with connection of DFF1, BBDS1, DFF3 or DFF1-UHD.	
[Transducer Power LF]	Set the transmission power for low frequency. <b>Note 1:</b> Shown with connection of DFF1 or BBDS1. <b>Note 2:</b> For DFF1-UHD users, when the connected transducer TDID is not supported by the DFF1-UHD, the setting is fixed as [1000].	[600], [1000]
[Band Width (LF)]	Set the bandwidth for low frequency. <b>Note:</b> Shown with connection of DFF3.	

### 3. HOW TO SET UP THE EQUIPMENT

*When [Transducer Setup Type] is set to [Manual] and connected to DFF3-UHD*

Menu item	Description
[TX Volt HF]	Not available (grayed out).
[TX Volt LF]	Not available (grayed out).
[High Frequency]	Set the frequency (kHz) of the transducer connected to the high frequency side.
[Low Frequency]	Set the frequency (kHz) of the transducer connected to the low frequency side.
[Transducer Power HF]	Set the power of the transducer connected to the high frequency side.
[Transducer Power LF]	Set the power of the transducer connected to the low frequency side.

#### **Motion sensor menu**

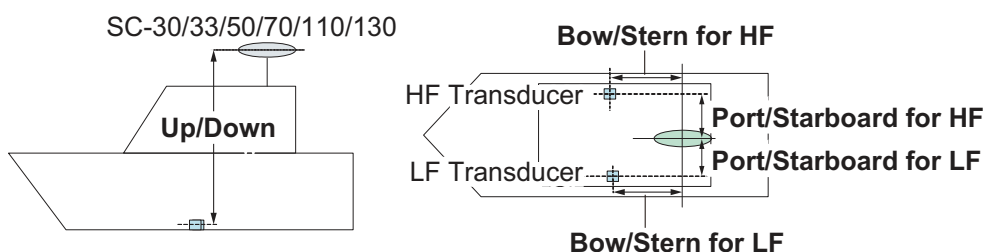
The [Motion Sensor] menu sets up the motion sensor, which provides for stable display of the seabed, schools of fish, etc. in moderate-to-rough seas.

**Note 1:** For connection of NMEA 0183 equipment to the TZT22X/24X, ask your FURUNO dealer to set up the equipment.

**Note 2:** To use the heaving function, the following settings are required at the satellite compass. For the setting procedure, see the operator's manual for your satellite compass. Settings for SC-30 are done from the [IF-NMEASC] menu, settings for SC-50/110 are done from the [DATA OUT] menu.

	NMEA 0183	NMEA 2000
Sentence	ATT, HVE	
Baud rate	38400BPS	
Cycle	25ms	
PGN		Heave: 65280 Attitude: 127257

The [MOTION SENSOR] menu appears in the [Transducer Setup] menu when the [Heaving Correction] is activated in the [Fish Finder] menu. If the satellite compass SC-30 or SC50/110 is connected, set the distance between the antenna unit (or sensor) of the satellite compass and transducer (high and low if connected) here.



Menu item	Description	Options (setting range)
[Motion Sensor Type]	Select the sensor connected to your TZT22X/24X unit. For all sensors other than SC-50 and SC-110, select [SC-30].	[SC30], [SC50_SC110]
[Antenna Position Bow/Stern HF (LF)]	Set the distance from the antenna unit to the transducer in the bow-stern direction. If the transducer is located on the fore side, set a positive value.	-99 to +99
[Antenna Position Up/Down HF (LF)]	Set the distance from the transducer to the antenna unit in the vertical direction. If the transducer is located on the bow side, set a positive value.	-0.00 to +99.9

Menu item	Description	Options (setting range)
[Antenna Port/Starboard HF (LF)]	Set the distance from the antenna unit to the transducer in the port-starboard direction. If the transducer is located on the starboard side, set a positive value.	-99.9 to +99.9

**Transducer mis-mount correction**


If the DFF-3D or a CHIRP side scan compatible transducer is installed 180° in reverse (facing stern), turn on the following item:

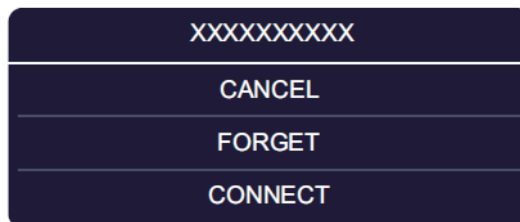
- DFF-3D: [Settings]→[Multi Beam Sonar]→[Initial Setup]→[Transducer Set-up]→[Transducer Mis-mount Correction]→[ON]
- CHIRP Side Scan: [Settings]→[CHIRP Side Scan]→[Transducer Mis-mount Correction]→[ON]

## 3.6 Wireless LAN Setting

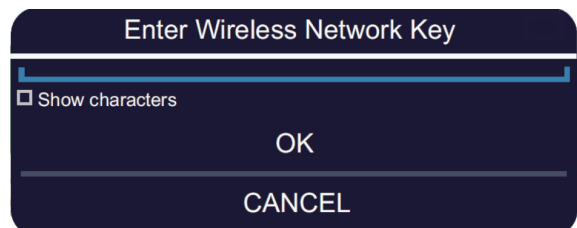
### 3.6.1 How to join an existing wireless network

By connecting to an existing network, you may download software updates and weather information from the Internet.

1. Tap the [FURUNO] icon (  ) to show the home screen and display mode settings.
2. Tap [Settings], then [General].
3. Tap [Connectivity].
4. Tap [Wireless LAN Settings].
5. Tap [Wireless Mode].
6. Tap [Connect to existing LAN], then tap the [<] icon at the top left of the display.
7. Tap [Wireless] in the [ENABLE WIRELESS] menu.
8. Tap [Scan] to scan the vicinity for accessible WLAN networks. Available networks are listed. To delete all WLAN networks, select [Forget All Available Networks].
9. Tap the appropriate WLAN network to show the following display.



10. Tap [Connect], and the display shown in the right figure appears.






### 3. HOW TO SET UP THE EQUIPMENT

11. Use the software keyboard to enter the network key, then tap the [OK] button. To see what you have input, check [Show characters].  
**Note:** If the network key is incorrect, an error message appears. Enter the correct key and tap [OK] again.
12. Tap [X] on the title bar to close the menu.

#### 3.6.2 How to create a wireless LAN network

Smart devices connected to this wireless network may also connect directly to the unit, allowing use of the TZT22X/24X applications.

1. Tap the [FURUNO] icon (  ) to show to show the home screen and display mode settings.
2. Tap [Settings], [General], [Connectivity].
3. Tap [Wireless LAN Settings].
4. Tap [Wireless Mode] in the [WIRELESS MODE] menu.
5. Tap [Create Local Network], then tap the [<] icon at the top left of the display.
6. Tap [Name] in the [LOCAL NETWORK SETTINGS] menu.
7. Using the software keyboard, name the unit, then tap .
8. Tap [Password] in the [LOCAL NETWORK SETTINGS] menu.
9. Using the software keyboard, set the password, then tap .
10. Tap [Local Network] in the [ENABLE LOCAL NETWORK] menu to activate the wireless network.
11. Your smart device may now be connected to the unit, through the network.
  - 1) From the smart device, select the network set at step 7.
  - 2) Input the password set at step 9.
12. Tap [X] on the title bar to close the menu.

#### 3.7 Ferry Mode

**Note:** Only the SC-30, SC-33, and SCX-20 support the Ferry Mode.

The Ferry mode allows the user to rotate the screen orientation by 180°. Note that all the above heading sensors must support heading offset command from the TZT22X/24X. Both the heading sensor and radar sensor must be powered when the TZT22X/24X sends the heading offset command to them. If TZT22X/24X sends the command and one of the sensors does not receive it, the heading data may be reversed. See "[Event Input Configuration]" of "Other menu items" on page 3-8.

#### 3.8 How to Manage Your Charts

The NavNet TZtouch series uses the Mapmedia charts. There are two types of charts, free and paid. Paid charts require an unlock code. To share the system ID and unlock code among the NavNet TZtouch units connected on the network, open the Home page on a NavNet TZtouch unit, then tap [Settings]→[Initial Setup]→[Chart Master Device]→[ON].

**Note:** When the unlock code is shared among two or more NavNet TZtouch units, it is necessary to reacquire an unlock code to change the master settings. For example, to change a unit from “primary” ([Chart Master Device] setting: [ON]) to “secondary” ([Chart Master Device] setting: [OFF]) or vice versa, you must reacquire an unlock code.

### 3.8.1 How to view your charts

Tap the [FURUNO] icon to show the home screen, then tap [Charts], [MM3D Charts Catalog] to display your charts catalog.

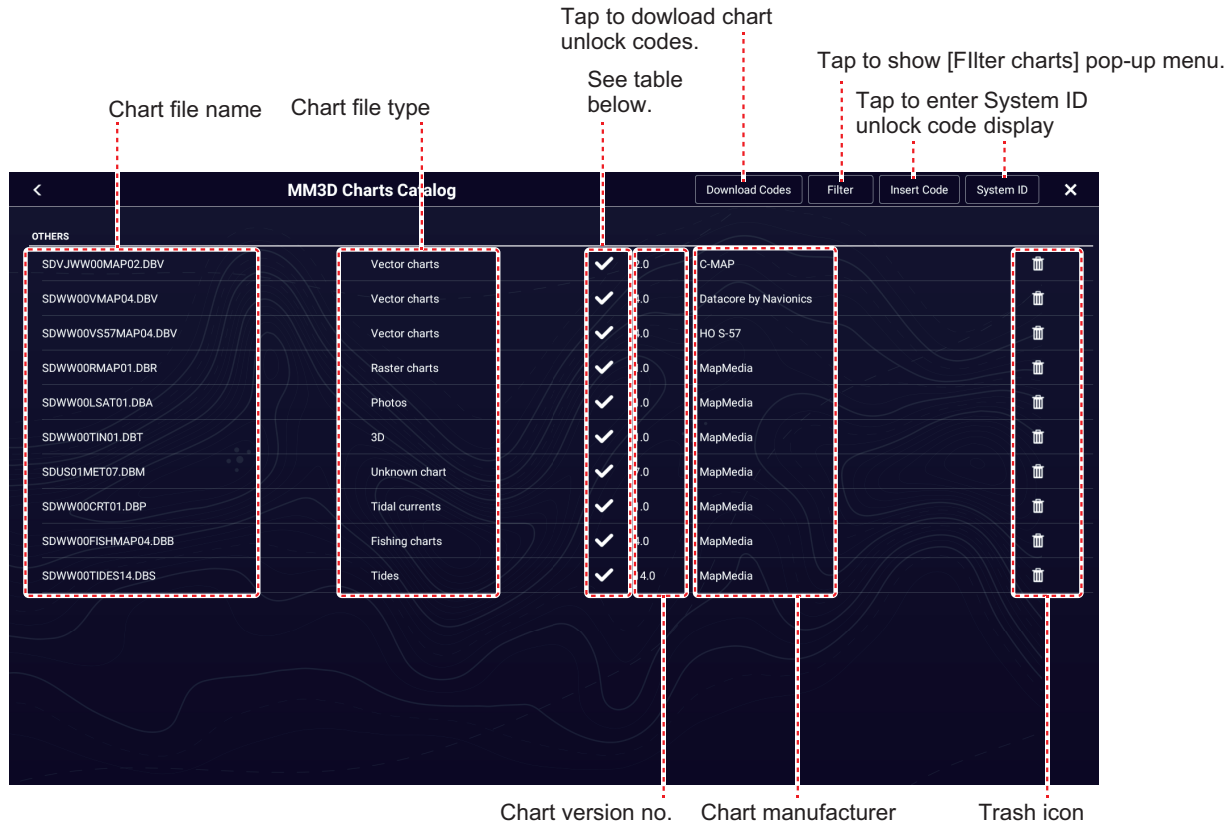




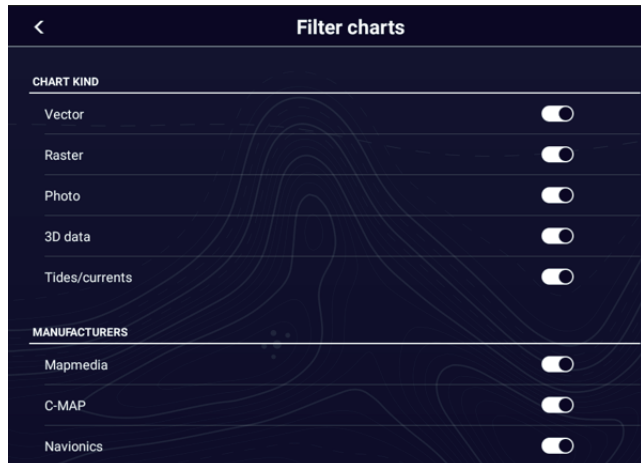


Chart status icon	Meaning	Chart status icon	Meaning
	Free chart. An unlock code is not necessary.		Paid chart. Unlock code entered.
	Paid chart. Unlock code is necessary to use the chart. Tap [Insert Code] at the top of the [Charts Catalog] screen. Enter the unlock code then tap [✓] to finish.		Chart cannot be used because it is corrupted.

### 3. HOW TO SET UP THE EQUIPMENT

#### **How to hide unnecessary charts on the chart catalog list**

1. Tap [Filter] on the chart catalog list title bar to show the [Filter charts] window.
2. Select [OFF] for the items that you want to hide. The factory setting shows all charts. To restore all charts, tap [Reset Filters].
3. Tap < on the title bar to return to the chart catalog list. [Filter] on the title bar changes to [Change Filter].
4. Tap the close button to close the chart catalog list.



#### **3.8.2 How to update or add charts**

Free (USA and NOAA) and for-fee compatible charts are provided by FURUNO and Mapmedia. Go to the URL shown below to download Mapmedia charts. For FURUNO-supplied charts, contact your local FURUNO dealer.

#### **3.8.3 How to delete charts**

Before replacing a chart, you should delete the old chart data on every NavNet TZtouch2/3 and TZT22X/24X unit. Only delete the chart data that you intend to replace or no longer require.

Open the charts catalog. Tap the trashcan icon of the chart to delete. You are asked "ARE YOU SURE YOU WANT TO DELETE THIS FILE?" Tap [OK] to delete the file.

### **3.9 IP Camera Setup**

When connecting one or more IP camera (maximum 4), the following settings are required at the camera.

- IP Address: 172.31.200.003~172.31.200.006
- Subnet Mask: 255.255.0.0



PACKING LIST

19BN-X-9851 -0 1/1

N A M E	PRODUCT NAME	O U T L I N E	DESCRIPTION / CODE No.	Q T Y
ユニット UNIT	指示部 Multi Function Display UNIT		TZT22X+ 0019427000 **	1
予備品 SPARE PARTS	予備品 SPARE PARTS		FRU-60V-FU-10A 00019481410	1
付属品 ACCESSORIES	付属品 ACCESSORIES		18-028-3129-7 0003687710	1
工事材料 INSTALLATION MATERIALS	工事材料 INSTALLATION MATERIALS		JE07012-Y140 00020066310	4
	ネジ締め部品 PACKAGED SCREW		JE07012-C070 00020066410	1
	ネジカバー TzT22X用 SCREW COVER For TzT22X		JE07012-Y030 00020034010	2
	電源ケーブル POWER CABLE		FRU-3P-FF-A002M-001R 00020032910	1
	ネットワークケーブル NETWORK CABLE		FRU-RZWPWP-005G 00020033910	1
図書 DOCUMENT	図書 DOCUMENT		BM-45240+ 0002001541+ **	1
	取扱要領書(和/英) INSTALLATION MANUAL(JP/EN) TZT2X/24X		OS-45240+ 0002001561+ **	1
	型紙(サイズ:A2/TZT2X)(和/英) FLUSH MOUNTING TEMPLATE (SIZE: A2/TZT2X)(JP/EN)		C42-02208+ 0002001511+ **	1

コード番号末尾の(\*\*)は、選択品の代表コードを表します。  
CODE NUMBER ENDING WITH "\*\*" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.



(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

JE07012-Y066

PACKING LIST

19BN-X-9852 -0 1/1

N A M E	PRODUCT NAME	O U T L I N E	DESCRIPTION / CODE No.	Q T Y
ユニット UNIT	指示部 Multi Function Display UNIT		TZT24X+ 0019427000 **	1
予備品 SPARE PARTS	予備品 SPARE PARTS		FRU-60V-FU-10A 00019481410	1
付属品 ACCESSORIES	付属品 ACCESSORIES		18-028-3129-7 0003687710	1
工事材料 INSTALLATION MATERIALS	工事材料 INSTALLATION MATERIALS		JE07012-Y140 00020066310	4
	ネジ締め部品 PACKAGED SCREW		JE07012-C070 00020066410	1
	ネジカバー TzT24X用 SCREW COVER For TzT24X		JE07012-Y230 00020064110	2
	電源ケーブル POWER CABLE		FRU-3P-FF-A002M-001R 00020032910	1
	ネットワークケーブル NETWORK CABLE		FRU-RZWPWP-005G 00020033910	1
図書 DOCUMENT	図書 DOCUMENT		BM-45240+ 0002001541+ **	1
	取扱要領書(和/英) INSTALLATION MANUAL(JP/EN) TZT2X/24X		OS-45240+ 0002001561+ **	1
	型紙(サイズ:A2/TZT24X)(和/英) FLUSH MOUNTING TEMPLATE (SIZE: A2/TZT24X)(JP/EN)		C42-02208+ 0002001521+ **	1

コード番号末尾の(\*\*)は、選択品の代表コードを表します。  
CODE NUMBER ENDING WITH "\*\*" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.



(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

JE07012-Y063



FURUNO

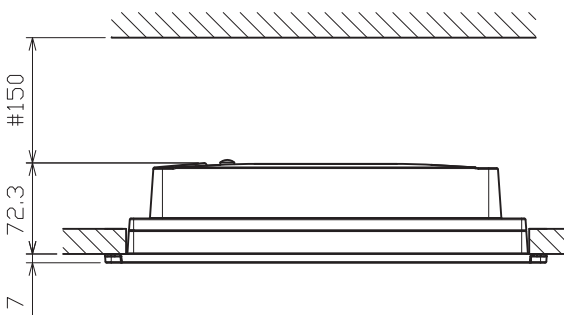
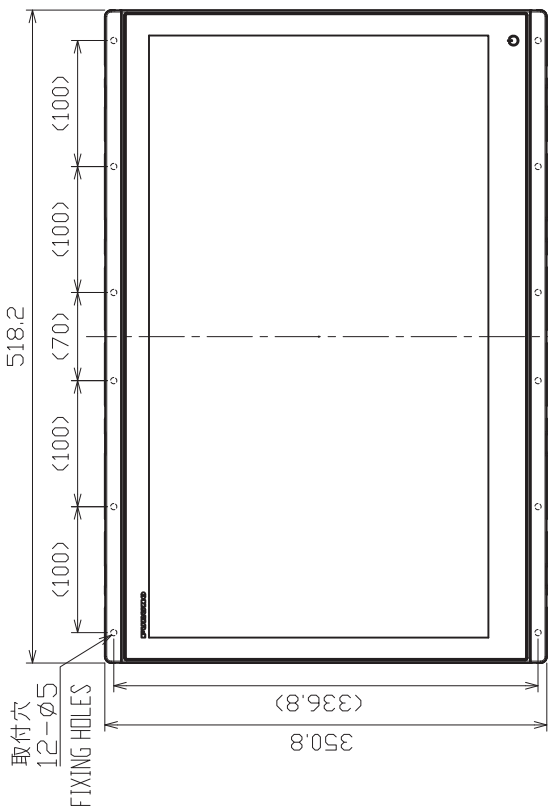
CODE NO.	00020066410	19BN-X-9401
TYPE	JE07012-C070	1/1

番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 QTY	用途/備考 REMARKS
1	ネジ(M3) SCREW (M3)		J6-SBD3-25200 CODE NO.	8	
2	ネジ(M4) SCREW (M4)		J6-SBD4-30200 CODE NO.	12	
3	ネジ(呼び4) SCREW (D4)		JE82001-0026 CODE NO.	12	
MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.		1/1	

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3
500 < L ≤ 1000	±4



12-取付穴位置  
PILOT HOLES

(9.8)

336.8±0.5

7±0.5

100±0.5 100±0.5 70±0.5 100±0.5 100±0.5

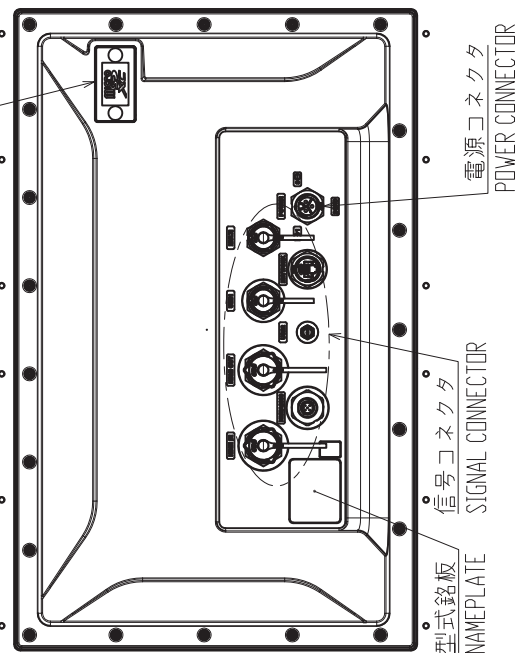
取付穴寸法  
CUTOUT DIMENSIONS

320±1

509.2±1

取付穴  
12-φ5  
FIXING HOLES

SDカードスロット  
SD CARD SLOT



注 記

- 1) 指定外の寸法公差は表1による。
- 2) #印寸法は最小サービスマウント用寸法とする。
- 3) 取付用ネジはバイネジ呼び径4×20を使用すること。

NOTE

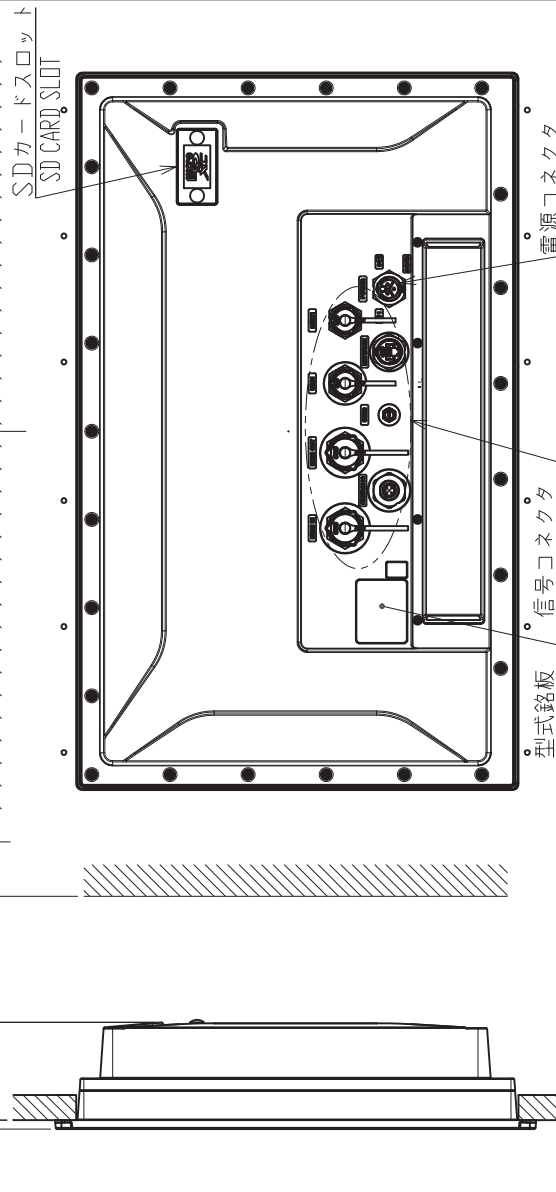
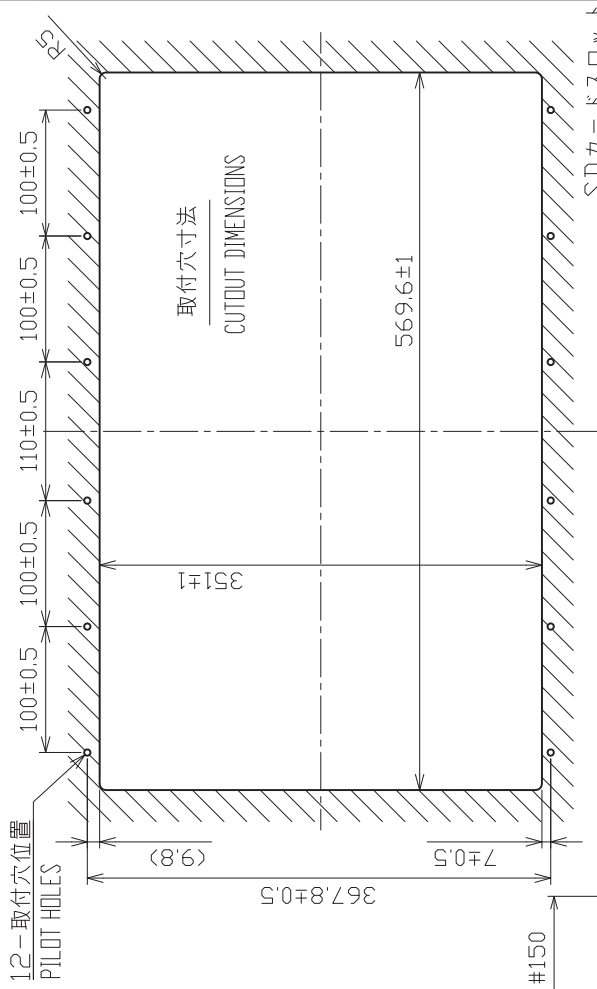
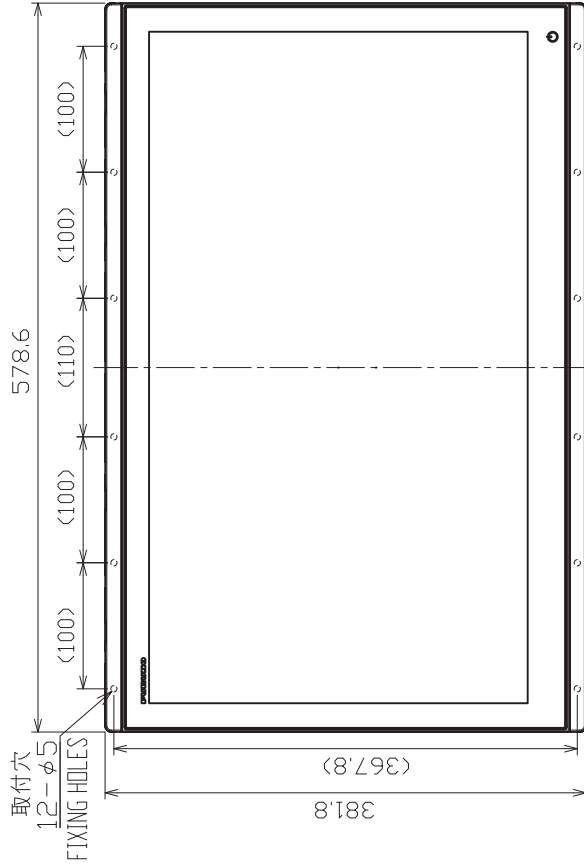
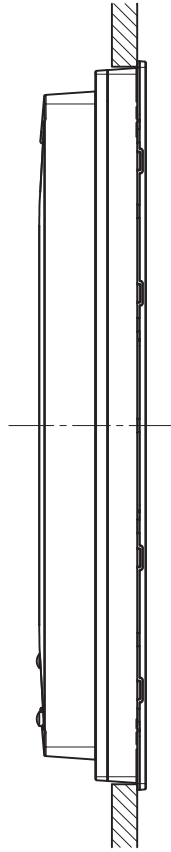
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. # MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS φ4x20 FOR FIXING THE UNIT.

DRAWN	11/Dec/2023	I.YAMASAKI	TITLE	TZ122X
CHECKED	11/Dec/2023	H.MAKI	名称	マルチファンクションディスプレイ (埋込装備1)
APPROVED	22/Jan/2024	H.MAKI	外寸図	
SCALE	1/6	1/6	NAME	MULTI FUNCTION DISPLAY FLUSH MOUNT 1)
DWG.No.	C4523-601-B	REF.No.	19-036-130G-1	OUTLINE DRAWING



表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3
500 < L ≤ 1000	±4



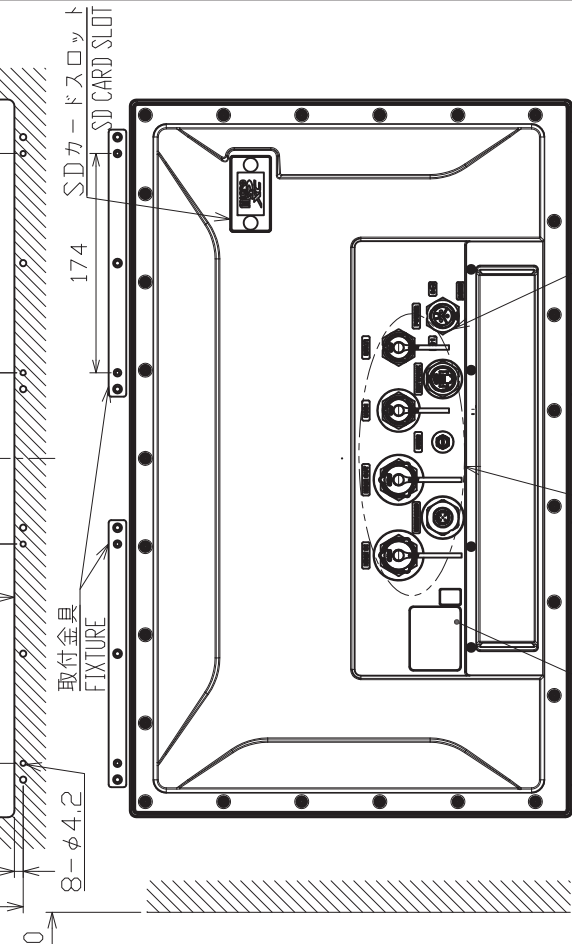
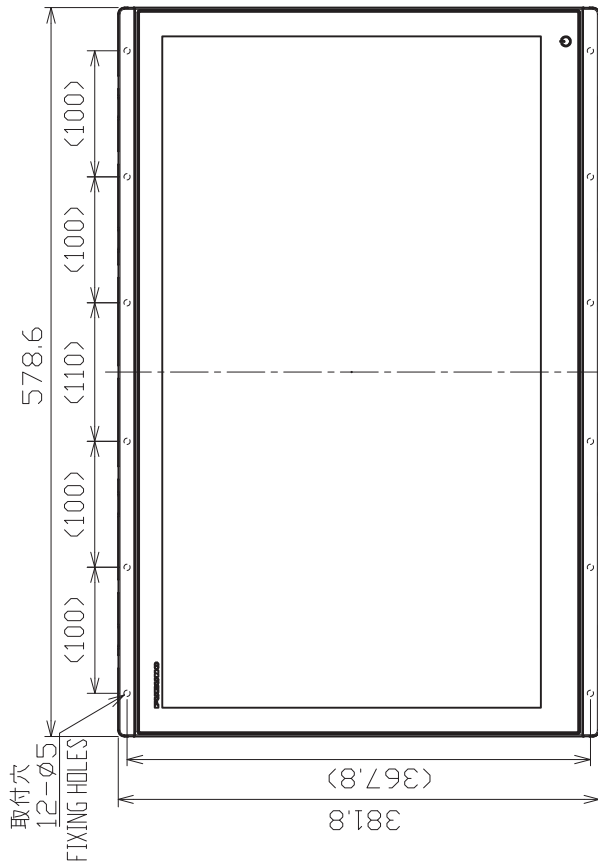
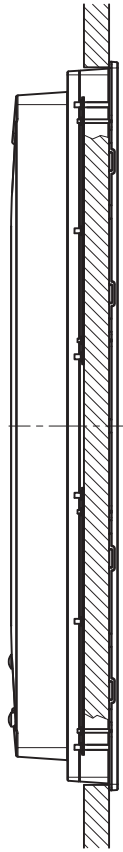
注記  
 1) 指定なき寸法公差は表1による。  
 2) #印寸法は最小サービスクリアランスとする。  
 3) 取付にはバインドット呼び径4x20を使用のこと。

NOTE  
 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.  
 2. # MINIMUM SERVICE CLEARANCE.  
 3. USE TAPPING SCREWS Ø4x20 FOR FIXING THE UNIT.

DRAWN	11/Dec/2023	T.YAMASAKI	型式銘板	NAMEPLATE
CHECKED	11/Dec/2023	H.MAKI	信号コネクタ	SIGNAL CONNECTOR
APPROVED	22/Jan/2023	H.MAKI	電源コネクタ	POWER CONNECTOR
SCALE	1/6	MASS 8.0 kg	SDカードスロット	SD CARD SLOT
DWG.No.	C4524-G01-B	REF.No.	19-036-140G-2	
TITLE	TZT24X	名称	マルチファンクションディスプレイ (埋込装備1)	
		NAME	外寸図	
			MULTI FUNCTION DISPLAY (FLUSH MOUNT 1)	
			OUTLINE DRAWING	

表1 TABLE 1

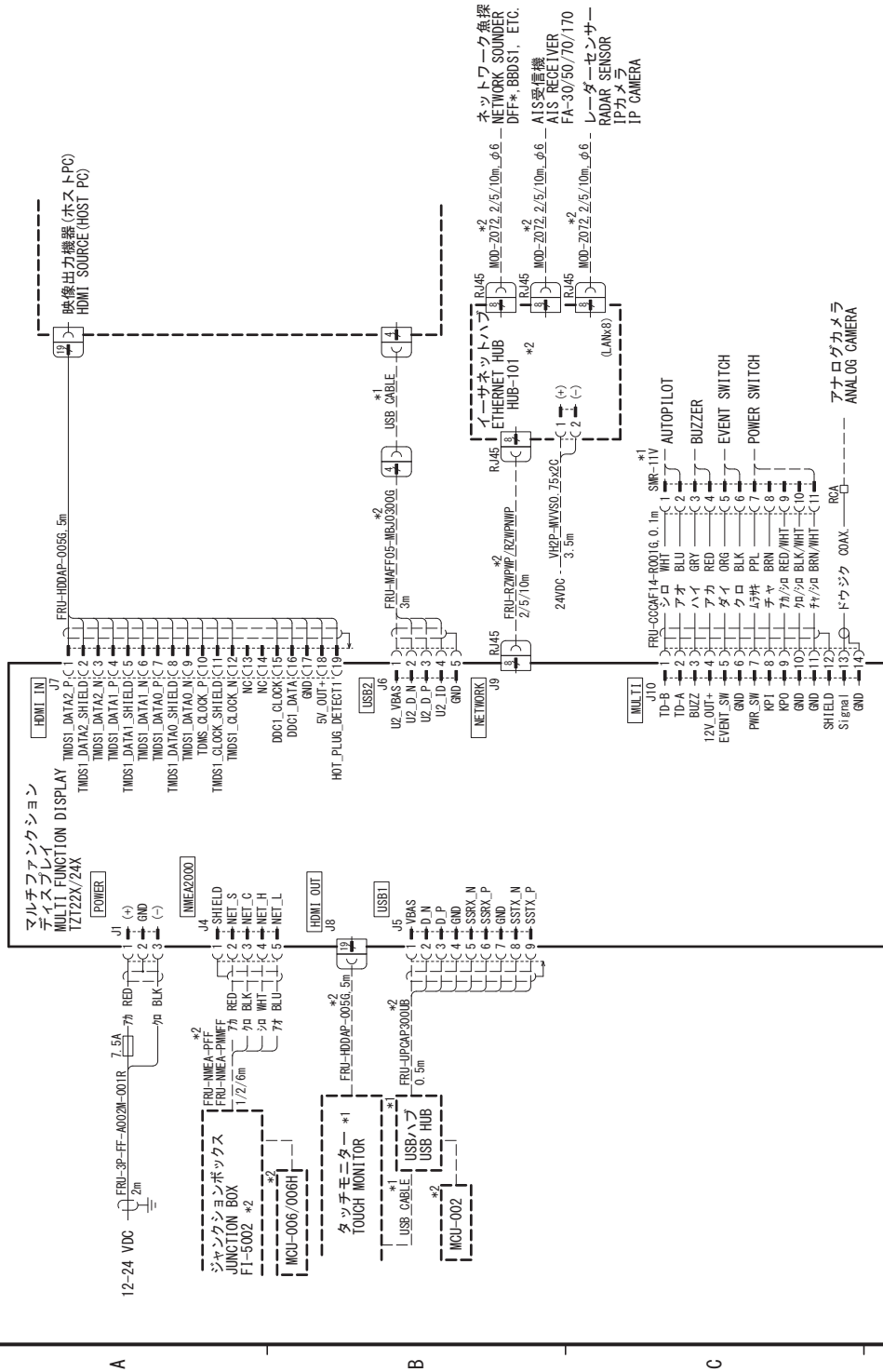
寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3
500 < L ≤ 1000	±4



注記  
 1) 指定なき寸法公差は表1による。  
 2) #印寸法は最小サービス空間寸法とする。  
 3) 壁の厚さ(B)は最小5、最大20とする。  
 4) 取付金具はバインドネジM3×25、本体はバインドネジM4×30で固定する。

NOTE  
 TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.  
 1. # MINIMUM SERVICE CLEARANCE.  
 2. BULKHEAD THICKNESS (B): 5 ≤ B ≤ 20.  
 3. USE BINDING SCREWS M3×25 FOR FIXING FIXTURES AND BINDING SCREWS M4×30 FOR FIXING THE UNIT.

DRAWN	11/Dec/2023	T.YAMASAKI	TITLE	TZT24X
CHECKED	11/Dec/2023	H.MAKI	名称	マルチファンクションディスプレイ (埋込装備2)
APPROVED	22/Jan/2024	H.MAKI	外寸図	
SCALE	1/6	MASS 8.1 100g kg	NAME	MULTI FUNCTION DISPLAY (FLUSH MOUNT 2)
DWG.No.	C4524-G02-B	REF.No.	16-036-141G-1	OUTLINE DRAWING



注記  
\* 1) 造船所手配。  
\* 2) オプション。

NOTE  
\* 1: SHIPYARD SUPPLY.  
\* 2: OPTION.

DRAWN	17/Jan/2024	I. YAMASAKI	TITLE	TZT22X/24X
CHECKED	17/Jan/2024	H. MAKI	名称	マルチファンクションディスプレイ
APPROVED	22/Jan/2024	H. MAKI	相互結線図	
SCALE	1/25	kg	NAME	MULTI FUNCTION DISPLAY
DWG No.	04523-C01-B	kg	REF. No.	INTERCONNECTION DIAGRAM