FURUNO

Installation Manual
Multi Function Display
Model TZTBB

FURUNO ELECTRIC CO., LTD.

www.furuno.com

⚠ SAFETY INSTRUCTIONS

The installer must read the safety instructions before attempting to install the equipment.

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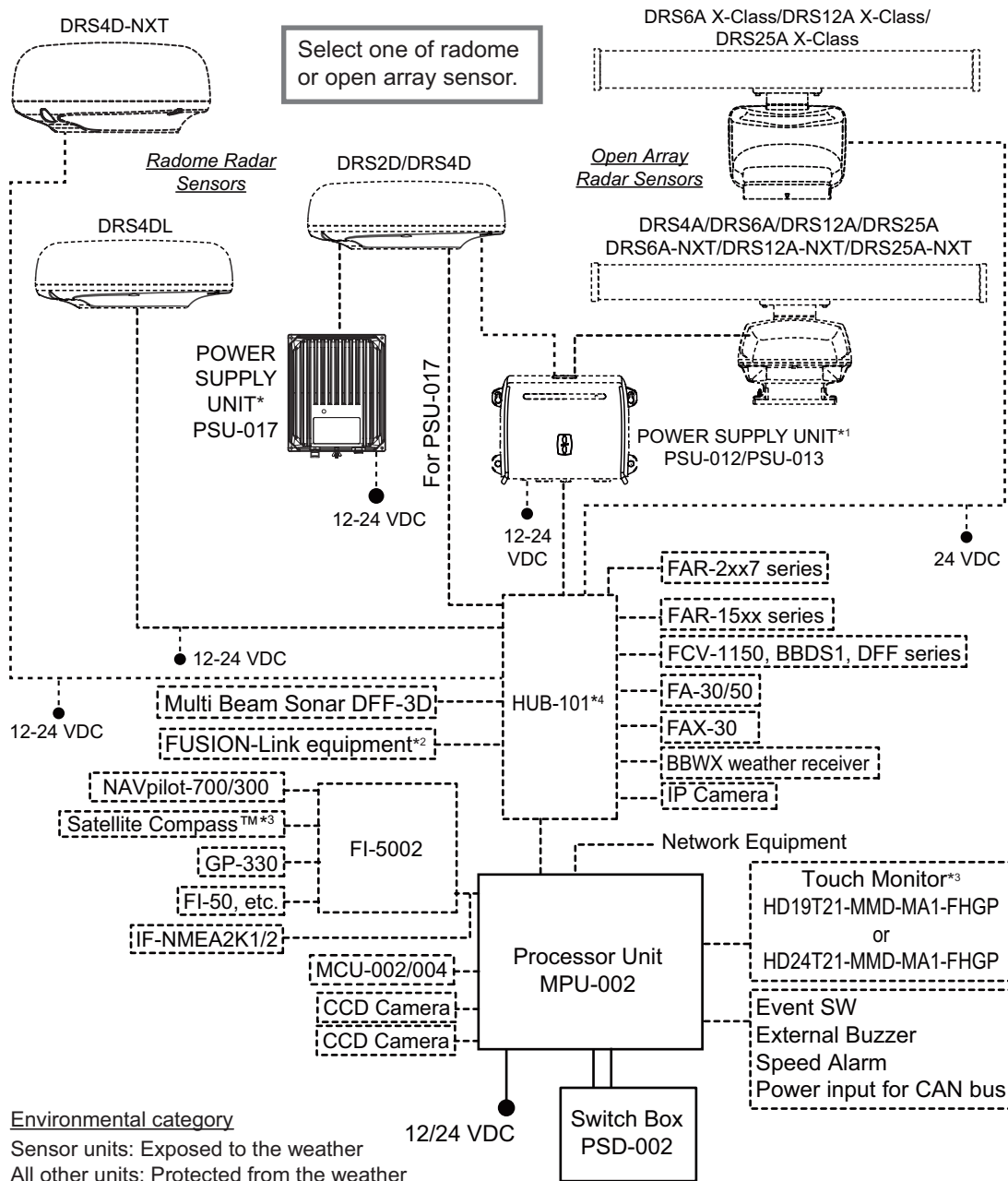
Observe the following compass safe distances to prevent interference to a magnetic compass:

	Standard compass	Steering compass
MPU-002	0.45 m	0.30 m
PSD-002	0.35 m	0.30 m
MCU-002	0.05 m	0.05 m

SYSTEM CONFIGURATION

Basic configuration is shown with solid line.

*[1]: A power supply is required for the following antenna units:
    DRS2D/4D/4A/6A/12A: PSU-012
    DRS25A: PSU-013
    DRS2D/4D: PSU-017
*[2]: FUSION APOLLO series (MS-RA770, MS-SRX400) and 755 series (MS-AV755, MS-UD755) only.
    Must be connected via Ethernet. Wireless connection and NMEA2000 connection not available.
*[3]: SC-30, SC-33, SCX-20 available.
*[4]: Maximum 3 HUB-101 units per network.

Note 1: Do not connect or disconnect the DVI cable between TZTBB and the touch monitor while TZTBB is powered.

Note 2: When the two monitors are connected, the resolutions and the aspect ratio should match between two monitors. The two monitors show same images (compatible with clone mode only).

EQUIPMENT LISTS

Standard supply

Name	Type	Code No.	Qty	Remarks
Processor Unit	MPU-002	-	1	
Switch Box	PSD-002	-	1	
Installation Materials	CP19-01700	000-022-530	1	CP19-01701
Accessories	FP19-01801	001-205-650	1	
Spare Parts	SP19-01401	001-205-630	1	Fuses

Optional supply

Name	Type	Code No.	Remarks
Joint Box	TL-CAT-012	000-016-714-01	For LAN network
Remote Control Unit	MCU-002	-	
	MCU-004	-	
NMEA2000-Interface Unit	IF-NMEA2K1	-	
NMEA Data Converter	IF-NMEA2K2	-	
Network HUB	HUB-101	-	
Junction Box	FI-5002	-	
Rectifier	RU-3423	000-030-443	
	PR-62	000-013-484	100VAC
		000-013-485	110VAC
		000-013-486	220VAC
		000-013-487	230VAC
	RU-1746B-2	000-030-439	
CAN bus Cable Assy.	M12-05BM+05BF-010	001-105-750-10	w/connectors (light), 1 m
	M12-05BM+05BF-020	001-105-760-10	w/connectors (light), 2 m
	M12-05BM+05BF-060	001-105-770-10	w/connectors (light), 6 m
	M12-05BFFM-010	001-105-780-10	w/connector (light), 1 m
	M12-05BFFM-020	001-105-790-10	w/connector (light), 2 m
	M12-05BFFM-060	001-105-800-10	w/connector (light), 6 m
	CB-05PM+05BF-010	000-167-968-10	w/connectors (heavy), 1 m
	CB-05PM+05BF-020	000-167-968-10	w/connectors (heavy), 2 m
	CB-05PM+05BF-060	000-167-970-10	w/connectors (heavy), 6 m
	CB-05BFFM-010	000-167-971-10	w/connector (heavy), 1 m
	CB-05BFFM-020	000-167-972-10	w/connector (heavy), 2 m
	CB-05BFFM-060	000-167-973-10	w/connector (heavy), 6 m
DVI-D Cable Assy.	DVI-D/D S-LINK 5M	001-132-960-10	24 pin, for video output, 5 m
	DVI-D/D S-LINK 10M	001-133-980-10	24 pin, for video output, 10 m
External Buzzer	OP03-136	000-086-443	Buzzer: PKB5-3A40

Name	Type	Code No.	Remarks
Network (LAN) Cable	MOD-Z073-030+	000-167-171-10	LAN cable, straight, 2 pairs, 3 m
	MOD-Z072-020+	001-167-880-10	LAN cable, cross-pair, 2 m
	MOD-Z072-050+	001-167-890-10	LAN cable, cross-pair, 5 m
	MOD-Z072-100+	001-167-900-10	LAN cable, cross-pair, 10 m
CAN bus Connector	SS-050505-FMF-TS001	000-168-603-10	Micro style: 3
	NC-050505-FMF-TS001	000-160-807-10	Mini style: 2, micro style: 1
	LTWMC-05BMMT-SL8001	000-168-604-10	Micro style, male, termination resistor
	LTWMN-05AMMT-SL8001	000-160-508-10	Mini style, male, termination resistor
	LTWMC-05BFFT-SL8001	000-168-605-10	Micro style, female, termination resistor
	LTWMN-05AFFT-SL8001	000-160-509-10	Mini style, female, termination resistor
	FRU-0505-FF-IS	001-077-830-10	w/inline terminator
MJ Cable Assy.	MJ-A6SPF0016-005C	000-159-689-10	for FAX-30
Operator's Manual	OME-44700-*	000-176-016-1*	English
	OMJ-44700-*	000-176-015-1*	Japanese

1. MOUNTING

1.1 Mounting Considerations

When selecting a mounting location for TZTBB, keep the following in mind:

- The temperature at the mounting location shall be between -15°C and +55°C (wireless LAN: 0°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 (comply 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 space is shown in the outline drawings.
- A magnetic compass will be affected if the equipment is placed too close to it. Observe the compass safe distances shown in the SAFETY INSTRUCTIONS to prevent disturbance to the magnetic compass.

1.2 Processor Unit

The processor unit MPU-002 can be mounted on the tabletop or a bulkhead. Refer to the outline drawing for mounting dimensions. For bulkhead mounting, be sure the unit bottom is oriented downward.

Tabletop/ bulkhead mount

1. Decide the mounting location for the unit.
2. Make four pilot holes for self-tapping screws in the mounting location.
3. Screw the self-tapping screws (ϕ6x20, 4 pcs.) into the pilot holes, leaving a clearance of 5 mm.
4. Hang the unit on the screws.
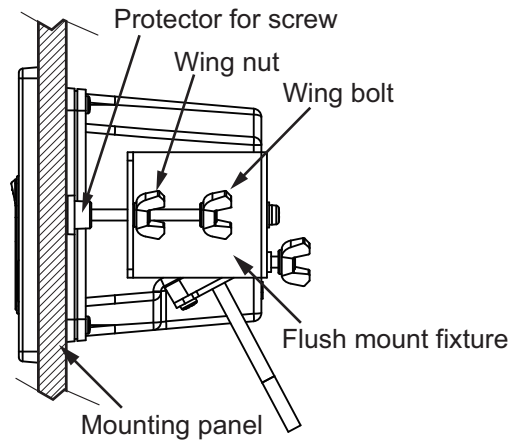5. Fasten all screws.

1.3   Switch Box

The switch box PSD-002 is designed to be flush mounted on a flat bulkhead. Refer to the outline drawing for mounting dimensions.

Procedure

1. Make a cutout in the mounting location as shown below.
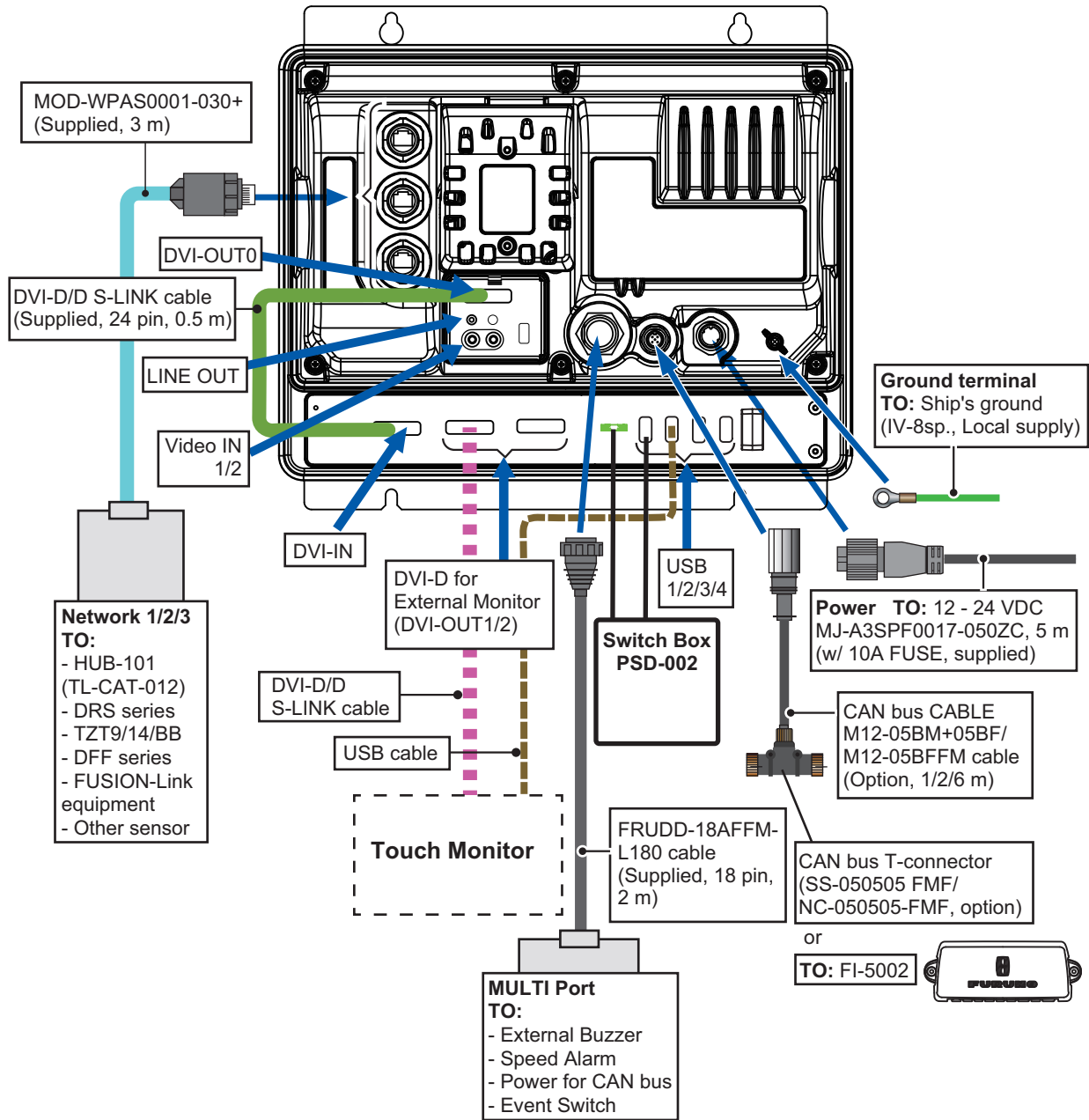

Cutout dimensions
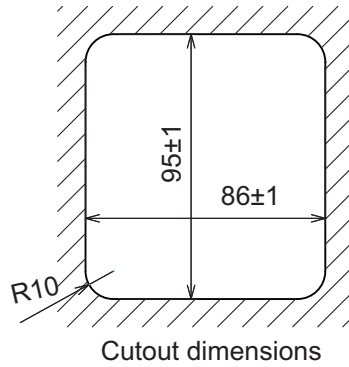
2. Insert the sponge to the switch box from the rear side.
3. Set the unit to the cutout and fix the flush mount fixture from the rear side with two screws.
4. Tighten the wing bolts to fasten the switch box.
5. Tighten the wing nuts to fasten the flush mount fixture.

2. WIRING

2.1 Wiring Instructions

MOD-WPAS0001-030+
(Supplied, 3 m)

DVI-OUT0

DVI-D/D S-LINK cable
(Supplied, 24 pin, 0.5 m)

LINE OUT

Video IN 1/2

DVI-IN

**Network 1/2/3
TO:**
- HUB-101
(TL-CAT-012)
- DRS series
- TZT9/14/BB
- DFF series
- FUSION-Link
equipment
- Other sensor

DVI-D for
External Monitor
(DVI-OUT1/2)

DVI-D/D
S-LINK cable

USB cable

Touch Monitor

**Switch Box
PSD-002**

USB
1/2/3/4

FRUDD-18AFFM-
L180 cable
(Supplied, 18 pin,
2 m)

**MULTI Port
TO:**
- External Buzzer
- Speed Alarm
- Power for CAN bus
- Event Switch

**Ground terminal
TO:** Ship's ground
(IV-8sp., Local supply)

Power   TO: 12 - 24 VDC
MJ-A3SPF0017-050ZC, 5 m
(w/ 10A FUSE, supplied)

CAN bus CABLE
M12-05BM+05BF/
M12-05BFFM cable
(Option, 1/2/6 m)

CAN bus T-connector
(SS-050505 FMF/
NC-050505-FMF, option)

or

TO: FI-5002

2.1.1 NETWORK ports

TZTBB uses a standard TCP/IP Ethernet to share radar/sounder images and other navigation information from devices connected to the network system. In any single NavNet TZtouch network, a combination of up to **six** TZT series devices may be connected to each other. All NavNet TZtouch network components have integrated regular RJ45 Ethernet port(s), three on TZTBB. The MOD-WPAS0001-030+ cable (supplied) connects to equipment in the network.

2.1.2   MULTI port

Use the cable assembly FRUDD-18AFFM-L180 (supplied, 2 m) for the event switch, external buzzer, speed alarm and the power for CAN bus. This cable has an 18-pin connector. For example, a MOB contact closure input may be connected to pin 15 and 11*.

*Note that any TZTBB interfaces to virtually any MOB system or event switch (point save) contact closure signal using these pins.

Pin No.	Color	Function	Remark (Port No.)
18	Light green	NET-C IN (0V)	CAN bus Power IN. When 12V DC power is applied to these pins, the CAN bus port will be powered (up to 1 ampere).
17	Pink	NET-S IN (+12V IN)	
16	Purple	Shield	
15	White	BUZZER or EVENT IN	External Buzzer Output or MOB/Event Input (Contact Closure)
14	Gray	SPEED-ALARM C	Speed alarm contact. Can trigger an external alarm or device when speed exceeds the limit specified.
13	Yellow	SPEED-ALARM H	
12	Black/White	+12V	External buzzer power ONLY (100 mA max.)
11	Black	GND	GND for Event/MOB Input
10	Blue/White	-	For debug
9	Blue	-	
8	Green/White	-	
7	Green	-	
6	Orange/White	-	
5	Orange	GND	
4	Brown/White	DC_N	
3	Brown	PWR_SW	
2	Red/White	GND	
1	Red	GND	

2.1.3   CAN bus port

Every TZTBB has one CAN bus port (micro style connector). All TZT9/14 MUST be connected to the same CAN bus backbone. However, the TZTBB and DRS (radar sensor) CAN bus ports cannot be connected together. The TZTBB and DRS (radar sensor) use "Ethernet Bridging" to link the DRS CAN bus and the TZTBB CAN bus data. Refer to paragraph 2.2.1 for more information. Note that the TZTBB CAN bus port is not powered unless external power is applied to the FRUDD-18AFFM-L180 cable of MULTI port and must be connected to a properly configured CAN bus network.

Note 1: When using a DC-DC converter to supply power to the NMEA200 network externally, use an isolated converter.

What is CAN bus?

CAN bus is a communication protocol that shares multiple data and signals through a single backbone cable. You can simply connect any CAN bus devices onto the backbone cable to expand your network onboard. With CAN bus, IDs are assigned to all the devices in the network, and the status of each sensor in the network can be detected. All the CAN bus devices can be incorporated into the NMEA2000 network. For detailed information about CAN bus wiring, see "FURUNO CAN bus Network Design Guide" (Type: TIE-00170) on Tech-Net.

DRS radar sensor

In addition to the CAN bus port found on the TZTBB, all DRS radar sensors have one powered CAN bus port (terminal strip connector). You may directly connect various FURUNO CAN bus sensors to the DRS radar sensor without having to run a separate CAN bus cable to the mast. The total number of sensors that can be connected to the CAN bus DRS port without external power connection depends on power consumption. The DRS can supply up to 1 amp (20LEN) to the DRS CAN bus network. Note that the CAN bus network connected to the DRS is its own independent CAN bus backbone and needs to be terminated at both ends by a terminating resistor. A 120 Ohm resistor is standard supply with the DRS to terminate the CAN bus. For example, if you install a SC-30/GP-330B with the DRS CAN bus port, you must have two terminators on the backbone. One can be at the sensor and the other located inside the DRS as shown in the inset at right.

Resistor assembly
(120 OHM-1007#24-L50,
supplied with DRS)

Twisting and soldering

White

Blue

CAN bus cable

GPS RECEIVER
GP-330B

SC-30

In the above example, the terminating resistors are necessary at DRS and SC-30.
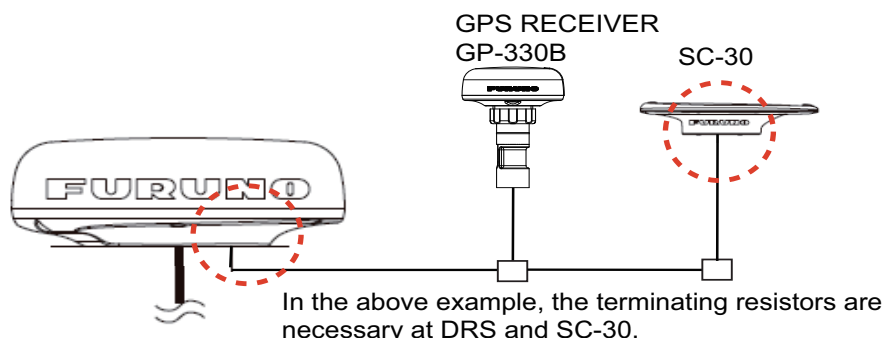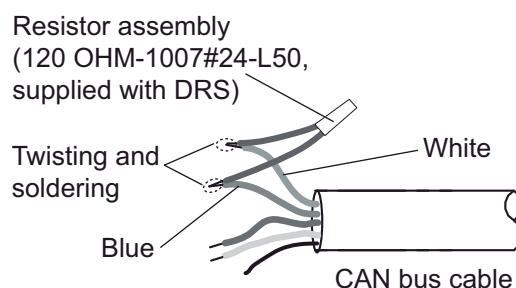
Refer to the DRS Installation Manual for more information about connection.

NMEA0183 equipment

To connect an NMEA0183 equipment to TZTBB, use the CAN bus 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 TZTBB allows functions such as Radar Overlay and course stabilization (North up, Course up, etc.) in the radar operating modes. The NMEA0183 heading refresh rate needs to be 100 ms in order for any radar function to work properly. NMEA0183 heading can be accepted on any CAN bus port at a baud rate up to 38400 bps. In other words, data sent (IF-NMEA) and received (TZTBB) must use the same baud rate for each individual data port.

Note: Heading data from a CAN bus source/sensor is always at the correct refresh speed for the DRS ARPA function.

2.1.4 VIDEO, DVI-D, AUDIO or USB ports

How to connect VIDEO, DVI-D, AUDIO or USB ports

The above-mentioned ports are behind the connector cover on the rear panel. Access the ports and connect cables as shown in the procedure below.

Note 1: The processor unit must be mounted indoors to do this connection because of reduced waterproofing.

Note 2: DVI OUT1 takes priority over DVI OUT2. Use DVI OUT1 port and USB2 to connect a single touch monitor.

1. Attach waterproofing tubes to the DVI cables.
   Open the slit on the waterproofing tube and set the tube to the DVI cable between the connector of port DVI-D OUT0 and the EMI core.
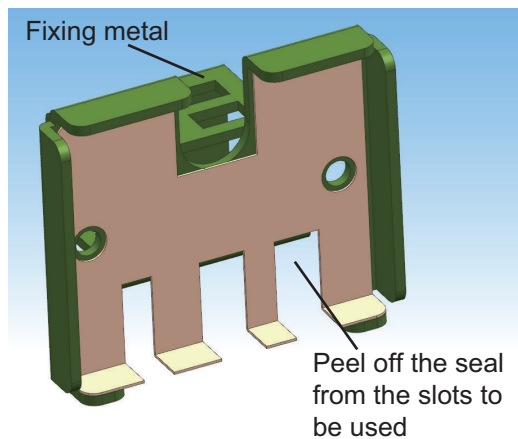   Attach supplied cable ties at each end of the tube.
   Note: Attach the waterproofing tube also to the external DVI monitor cable whose outer diameter is less than 9 mm.
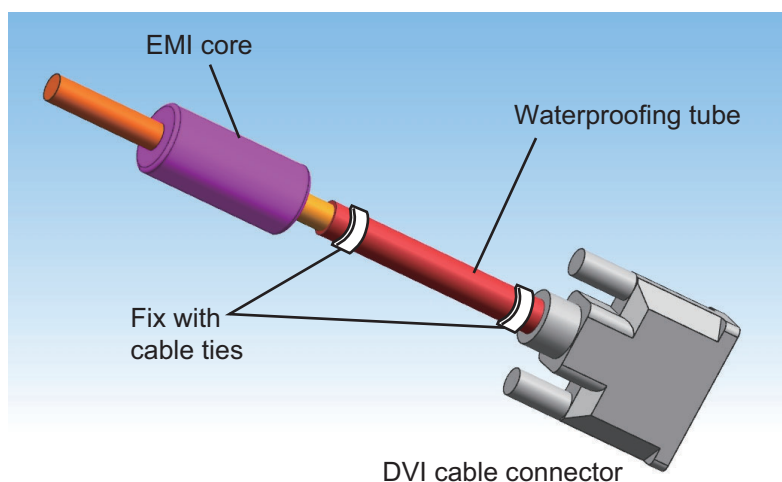
2. Attach the DVI-D, Video composite and Audio cable connectors to their respective ports.

DVI-D OUT0

Audio OUT

Video IN 1/2
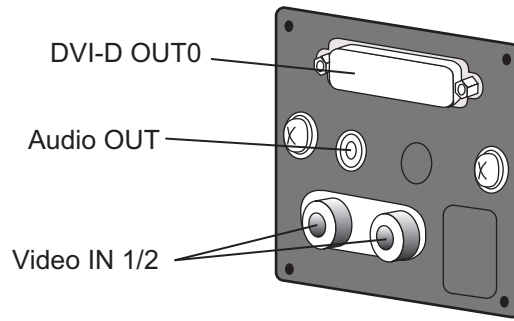
3. Set the waterproofing gasket to the boot cover then pass the cables through the boot cover.

4. Fasten the boot cover with four binding screws.

5. Attach the fixing plate to the boot cover.

6. Pass the cables through appropriate holes in the gasket. The largest hole is for the DVI-D cable.

7. Set the cable adapter to the entrance of the boot cover.

8. Peel off the seal from the slots to be used on the fixing metal.

Fixing metal

Peel off the seal from the slots to be used

9. Fasten the fixing metal to the boot cover with two binding screws.

Binding screw (4 pcs.)

Binding screw (2 pcs.)

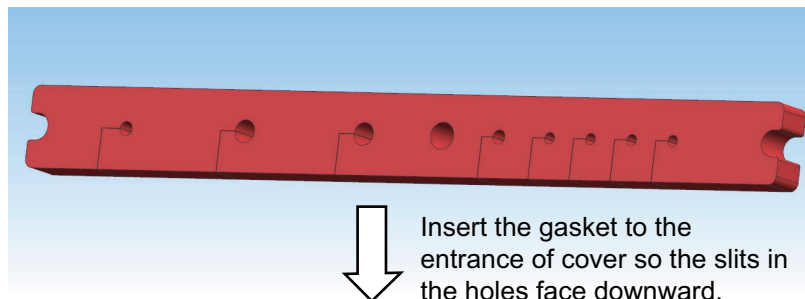Waterproofing gasket

Boot cover

Fixing plate

Gasket

Fixing metal
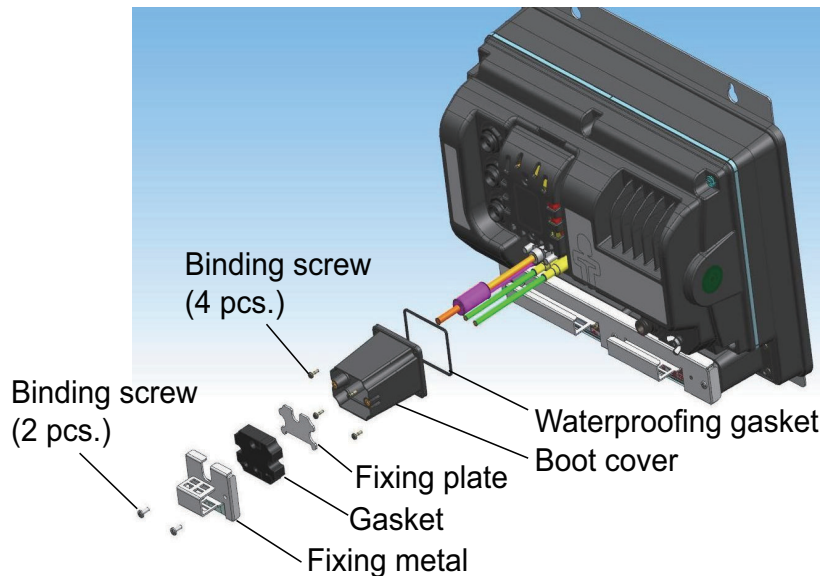
10. Fix the cables to the cable clamp with cable ties (2 pcs. each).
Attach a cable tie at the base of waterproofing tube.
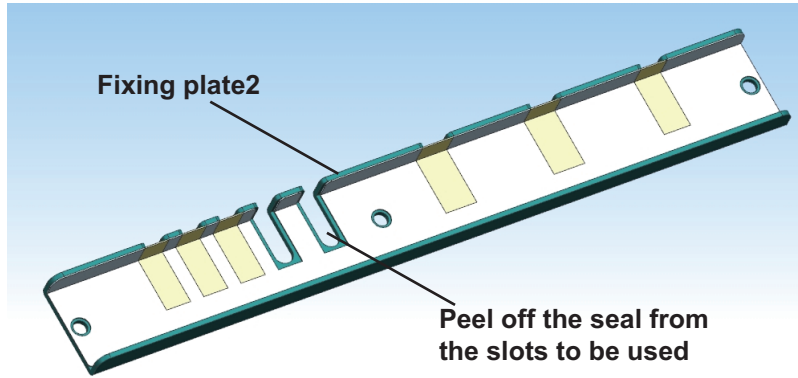**Note: Cable ties are necessary for waterproofing. Do not fail to attach them.**

Cable ties for fixing

Cable ties for waterproofing

Add a tie for waterproofing

Fix the cables with cable ties

Bottom side
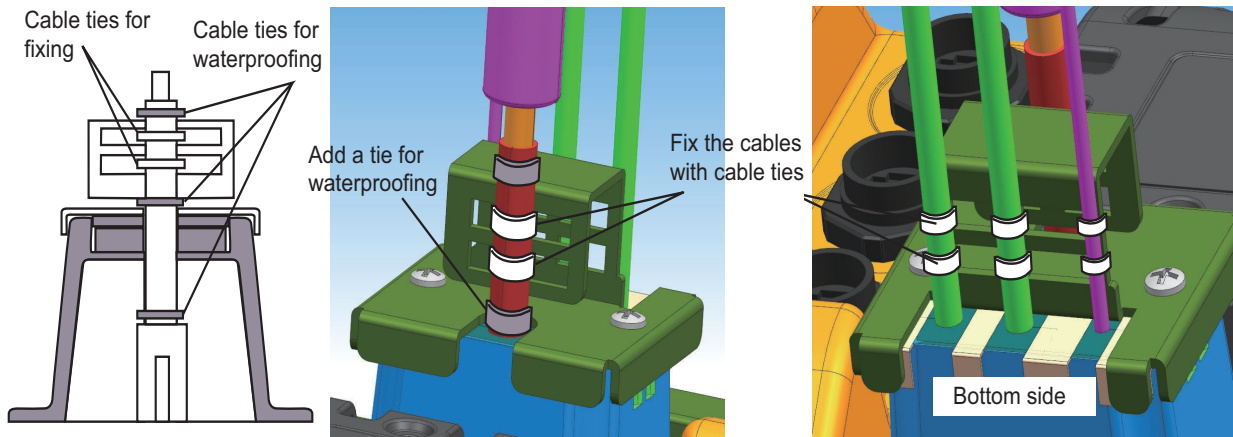
11. Pass the opposite end of the DVI-D cable (connected at step 1) through the outside entrance of the connector cover.

12. Connect the plug to the DVI-IN port and fasten the plug with the screws on the plug.

13. Pass the DVI-D cable and USB cable for external touch monitor through the outside entrance of the connector cover.

14. Connect the DVI-D plug to the DVI OUT1 port and connect the USB plug to the USB2 port.

15. If the second touch monitor is installed, connect the DVI-D plug to the DVI OUT2 port and connect the USB plug to the USB3 port.

16. Pass the power plug and USB plug from the switch box PSD-002 through the connector cover then connect them to the PWR SW port and the USB1 port, respectively.

17. If another USB device is installed, connect the USB plug to USB4 port.

18. Fasten the connector cover to the unit with six binding screws.

19. Attach the fixing plate1 to the entrance of the connector cover.

20. Pass the cables through appropriate holes in the gasket.

21. Set the gasket to the entrance of the cover.

Insert the gasket to the entrance of cover so the slits in the holes face downward.

22. Peel off the seal from the slots to be used on the fixing plate2.

Fixing plate2

Peel off the seal from the slots to be used

23. Attach the fixing plate2 to the entrance of the connector cover.

24. Fasten the fixing metal to the connector cover with three binding screws.

Binding screw
(6 pcs.)

Binding screw
(3 pcs.)

Connector cover
Fixing plate 1
Gasket
Fixing plate 2
Fixing metal
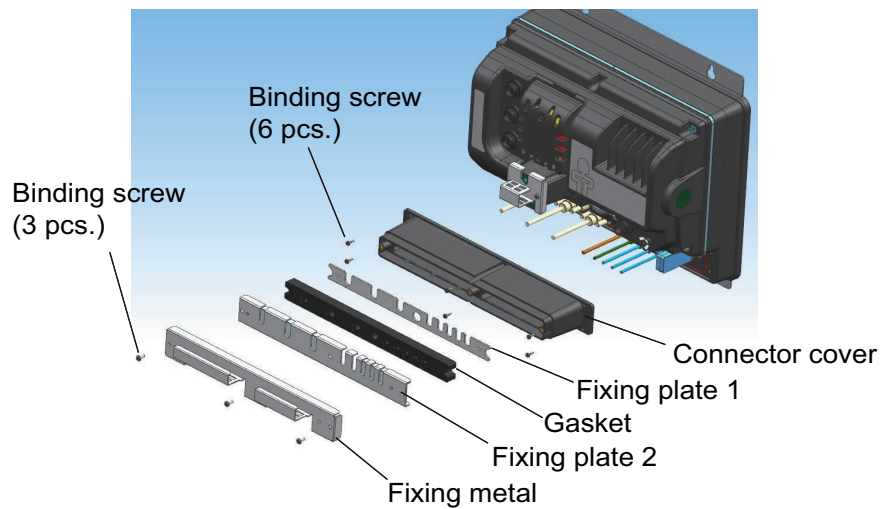
25. Fix the cables to the cable clamp with cable ties (2 pcs. each).
Attach a cable tie at the base of waterproofing tube projection.
Note: Cable ties are necessary for waterproofing. Do not fail to attach them.

Fix with cable ties

Add a tie for waterproofing

2-7
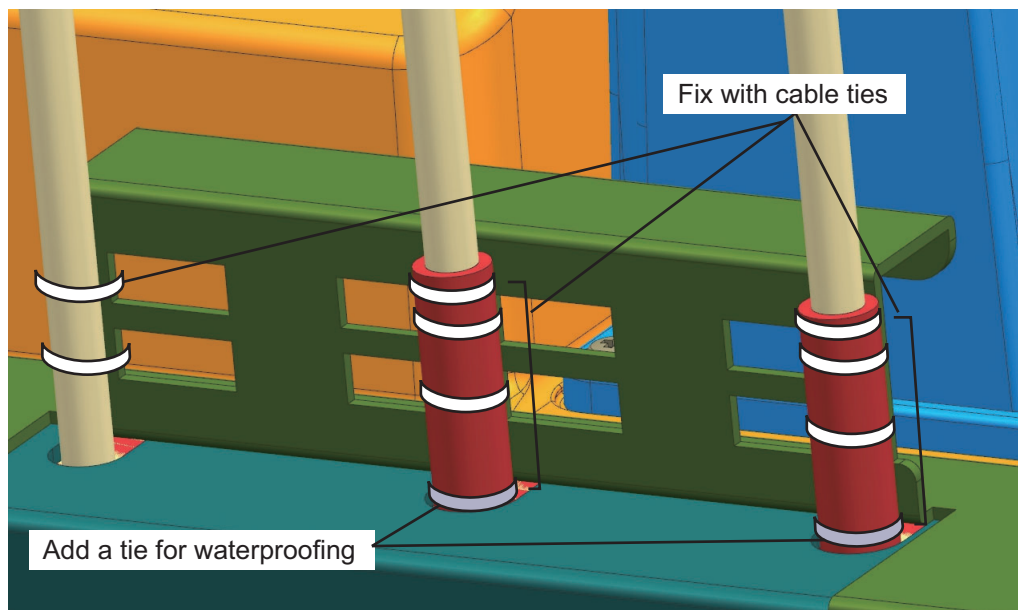
Video input

TZTBB can use regular analog video inputs (PAL or NTSC) that connect to the TZTBB directly or use IP cameras that connect directly to the network HUB. IP cameras can be seen by all TZTBB connected to the NavNet TZtouch network, unlike analog video that can be viewed only on the equipment where the source is connected. Additionally some IP cameras can be controlled from TZTBB.

Analog video

The TZTBB processor unit has two analog video inputs (PAL/NTSC) on 2 mm RCA type connectors located on the rear of the equipment. For this connection, the following cable is necessary (local supply).

• 3C2V (Japan Industrial Standard (JIS), or the equivalent) coaxial cable (impedance: 75Ω)
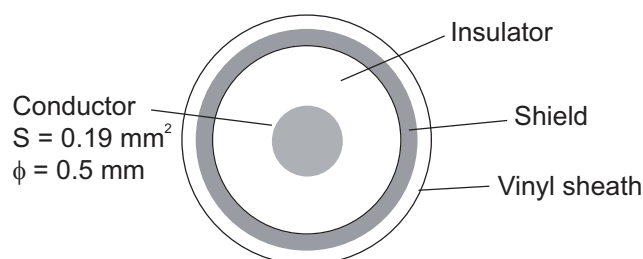
IP camera

IP cameras are network devices that connect directly to a HUB. Up to four IP cameras can be connected to one NavNet TZtouch network. At this time, only AXIS IP cameras that support MPEG4 video are functional in the network. For more details, see the operator's manual for the AXIS IP cameras.

DVI-D (external monitor)

A DVI monitor is required for the TZTBB. The plug is DVI-D format and only a DVI-D monitor with VESA DDC (Display Data Channel) can be connected. The TZTBB uses the monitor information (EDID) given via DDC to output the video data with the appropriate resolution. FURUNO offers two lengths of DVI-D cables, 5 m and 10 m.

Note: When a second monitor is used, use the same aspect ratio and resolutions monitor as the first monitor. The DVI-OUT1 port should be used in DVI-D connection. If this port is converted into HDMI, the DVI-OUT2 port may not transmit the picture signal.

USB port

The TZTBB has six USB Ver. 2.0 ports. The USB port2/3 are used to connect USB Touch Monitor (compatible with Windows® 7 HID generic driver) and USB port 1 is used to connect to switch box for SDXC card. The USB port5/6 are used to connect the devices for internal installation.
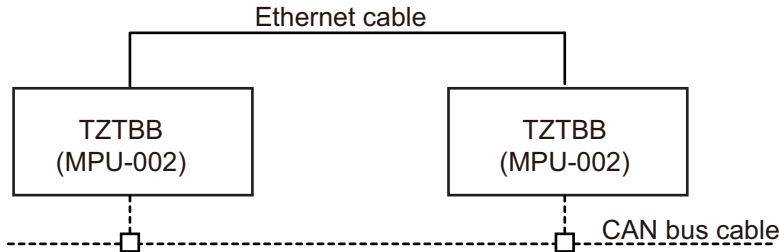
Audio

Outputs the audio line from the left-hand connector.

2.2 CAN bus/NMEA0183 Data Conversion

2.2.1 Connection with DRS radar sensor

Connection of multiple TZTBBs, no DRS radar sensor

Connect multiple TZTBBs with Ethernet and CAN bus cables.

Connection of TZTBB and DRS radar sensor

Most DRS radar sensors do not have a CAN bus port and connect to your ship-board network via LAN (see your DRS operator/installation manual for details).

For DRS radar sensors which have a CAN bus port, you can connect other CAN bus devices via the DRS radar sensor.

For DRS radar sensors with no CAN bus port, run a CAN bus backbone cable up the mast.

Note: The example configurations below show some of the radar sensors which have a CAN bus port.
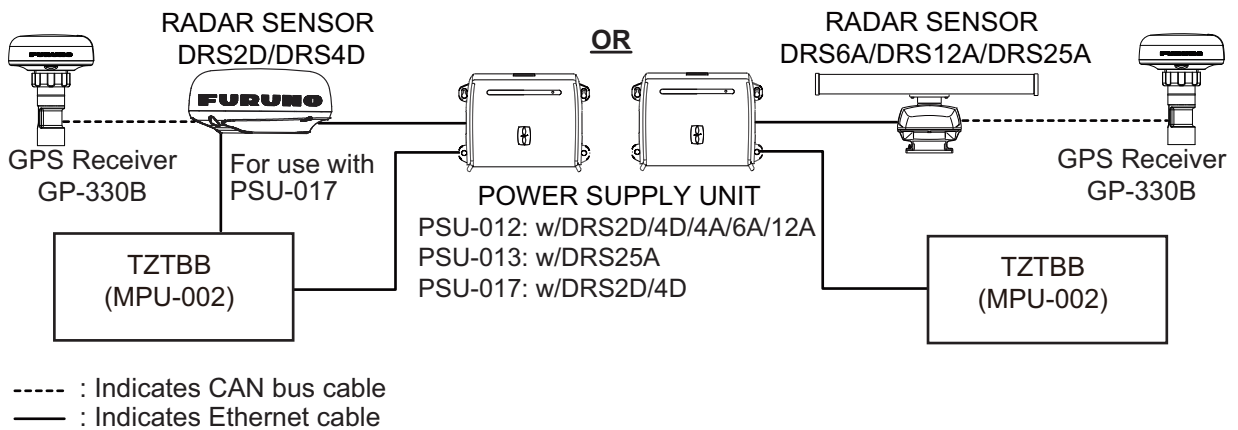
2.2.2 CAN bus (NMEA2000) input/output PGN

Input PGN

No.	PGN	Description
01.	059392	Acknowledgement
02.	059904	Request
04.	060928	Address Claim
06.		NMEA-Request Group Function
07.	126208	NMEA-Command Group Function
08.		NMEA-Acknowledge Group Function
11.	126992	System Time
12.	126996	Product Information
13.	127237	Heading/Track Control
14.	127245	Rudder
15.	127250	Vessel Heading
16.	127251	Rate of Turn
17.	127257	Attitude
18.	127258	Magnetic Variation
19.	127488	Engine Parameters, Rapid Update
20.	127489	Engine Parameters, Dynamic
21.	127505	Fluid Level
22	128259	Speed, Water Referenced
23.	128267	Water Depth
24.	129025	Position, Rapid Update
25.	129026	COG & SOG, Rapid Update
26.	129029	GNSS Position Data
27.	129033	Time & Date
28.	129038	AIS Class A Position Report
29.	129039	AIS Class B Position Report
30.	129040	AIS Class B Extended Position Report
31.	129041	AIS Aids to Navigation (AtoN) Report
32.	129291	Set & Drift, Rapid Update
33.	129538	GNSS Control Status
34.	129540	GNSS Sats in View
35.	129793	AIS UTC and Date Report
36.	129794	AIS Class A Static and Voyage Related Data
37.	129795	AIS Addressed Binary Message
38.	129797	AIS Binary Broadcast Message
39.	129798	AIS SAR Aircraft Position Report
40.	129801	AIS Addressed Safety Related Message
41.	129802	AIS Safety Related Broadcast Message
42.	129808	DSC Call Information
43.	129809	AIS Class B "CS" Static Data Report, Part A
44.	129810	AIS Class B "CS" Static Data Report, Part B
45.	130306	Wind Data
46.	130310	Environmental Parameters
47.	130311	Environmental Parameters
48.	130312	Temperature
49.	130313	Humidity

No.	PGN	Description	
50.	130314	Actual Pressure	
51.	130577	Direction Data	
52.	130578	Vessel Speed Component	

Output PGN

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

| No.	PGN	Description	Remarks	Output cycle (msec)
01.	059392	Acknowledgement	For Certification Level A/B Refusing output requirement	
02.	059904	Request	For Certification Level A/B Requiring output	
04.	060928	Address Claim	For Certification Level A/B • Address autonomy • Receiving output requirement	
05.		NMEA-Request group function	For Certification Level A/+α • Address autonomy • Receiving output requirement	
06.	126208	NMEA-Command group function	For Certification Level A/+α Changing the setting of other equipment	
07.		NMEA-Acknowledge group function	For Certification Level A/+α Sending the confirmation for NMEA-Request group function and NMEA-Command group function	
08.	126464	PGN List-Transmit PGN's group function	For Certification Level A/+α Receiving output requirement	
09.		PGN List-Received PGN's group function	For Certification Level A/+α Receiving output requirement	
12.	126992	System Time		1000
13.	126996	Product Information	For Certification Level A/B Receiving output requirement	
14.	127250	Vessel Heading		100
15.	127251	Rate of Turn		100
16.	127257	Attitude		1000
17.	127258	Magnetic Variation		1000
18.	128259	Speed		1000
19.	128267	Water Depth		1000
20.	128275	Odometer		1000
21.	129025	Position, Rapid Update		100
22.	129026	COG & SOG, Rapid Update		250
23.	129029	GNSS Position Data		1000
24.	129033	Time & Date		1000
25.	129283	Cross Track Error		1000
26.	129284	Navigation Data		1000
27.	129285	Navigation-Route/ WP Information	• Outputs when waypoint is set/changed (own ship's position is required) • Outputs when receiving ISO request	

2-11

No.	PGN	Description	Remarks	Output cycle (msec)
28.	130306	Wind Data		100
29.	130310	Environmental Parameters		500
31.	130312	Temperature		2000
32.	130313	Humidity	Outputs when receiving the ISO request	
33.	130314	Actual Pressure		2000

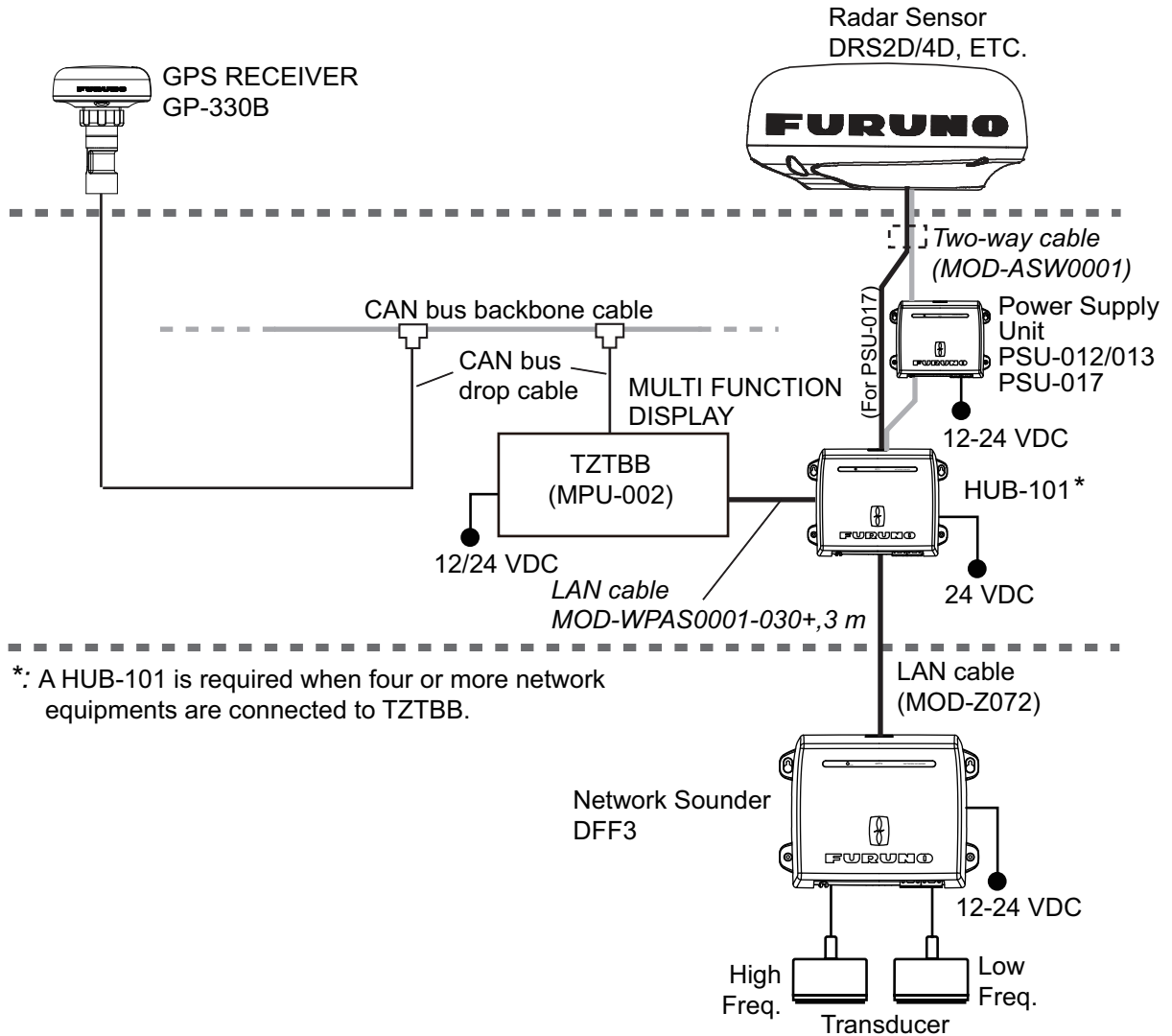## 2.3 Example NavNet TZtouch System Configurations

Basic plotter/fish finder installation

The FURUNO GP-330B is connected to the CAN bus backbone cable. The DFF1/3 network sounder is connected to the LAN port of the TZTBB using the standard supply cable
MOD-WPAS0001-030+(3 m) and a junction box TL-CAT-012.
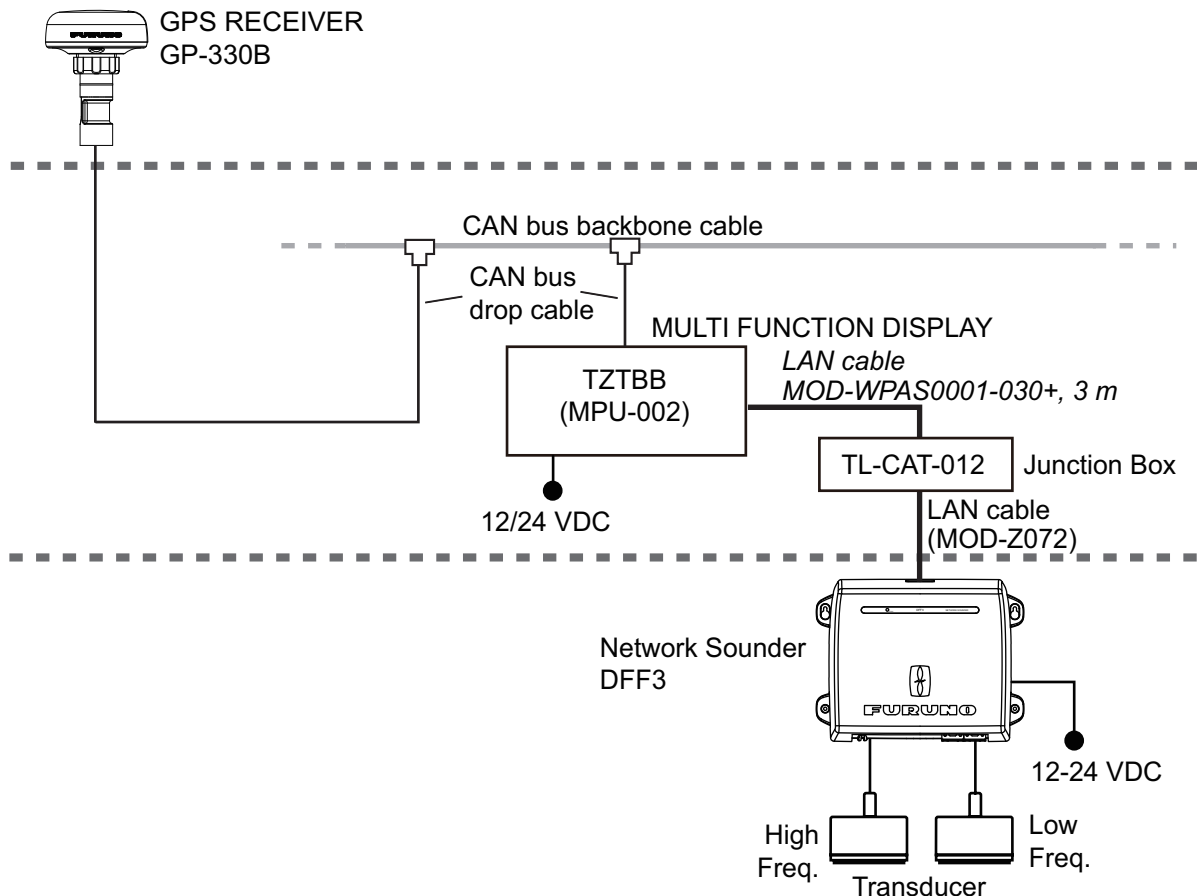
Basic plotter/radar/fish finder installation

This is a single station plotter/radar/fish finder installation. Connection of multiple sensors, such as DFF3 and DRS series, requires the optional Ethernet Hub HUB-101. Also, the power supply unit PSU-012, PSU-013 or PSU-017 is required for the connection with DRS series radar sensor.

GPS RECEIVER
GP-330B

Radar Sensor
DRS2D/4D, ETC.

Two-way cable (MOD-ASW0001)

Power Supply
Unit
PSU-012/013
PSU-017

12-24 VDC

(For PSU-017)

CAN bus backbone cable

CAN bus
drop cable

MULTI FUNCTION
DISPLAY

TZTBB
(MPU-002)

12/24 VDC

HUB-101 *

24 VDC

*LAN cable
MOD-WPAS0001-030+,3 m*

: A HUB-101 is required when four or more network
    equipments are connected to TZTBB.

LAN cable
(MOD-Z072)

Network Sounder
DFF3

12-24 VDC

High
Freq.

Low
Freq.

Transducer

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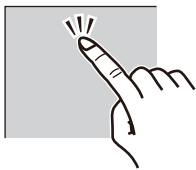
3. SETTING UP THE EQUIPMENT

This chapter shows you how to set up your system according to the equipment you have connected. You can do almost all operations on this equipment by just touching the display, following the instructions below.

Touch control description

The touch control depends on the screen type. The basic operations to use at the installation setting are in the table shown below.

Operation by a finger

Operating by a finger		Function
Tap		• Select a menu item. • Select an object. • Display the pop-up menu.
Drag		• Scroll the menu.

Operation by two fingers

Operation by two fingers		Function
Pinch	Zoom in Zoom out	Change the radar range.

About menu operations

The following procedure shows how to use the menu system.

1. Press the ⏻ key on the switch box to turn the power on. The chart plotter display appears after the start-up screen appears.

2. Tap the **Home** icon (◉) at the top right-hand corner of the screen. The menu icon bar appears on the menu selection display.

Menu icon bar ⟶

This icon appears only when fusion equipment is connected.

3. Select (tap) the **Menu** icon ( ) to open the main menu.

Select [Close] to exit menu.

Main menus

Menu currently selected
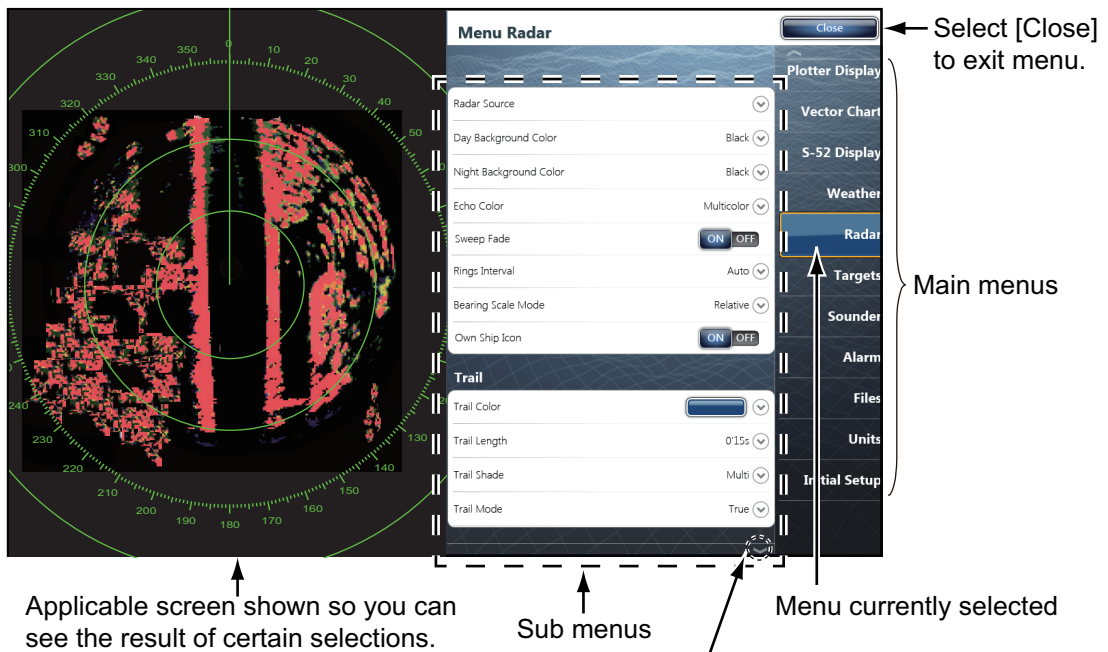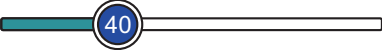
Applicable screen shown so you can see the result of certain selections.

Sub menus

Scroll mark (Indicates menus currently not shown on the screen. You can see the menus currently not shown by dragging.
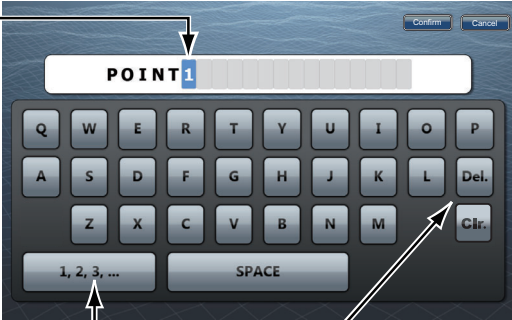
4. Drag the main menus on the right-hand side of the screen. The current selection is circumscribed with a yellow rectangle. The sub menus for the selected menu appear.

5. Select the menu item to set from the sub menu.
   There are four types of icons to indicate how to set a menu item, and each has the unique function as shown on the next page.

Icon	Description
⌄	This icon means that a menu item has some options. Touch it to show the option window (pull-down list).
⌨	Touch the menu item with this icon to display the software keyboard, to enter alphanumeric data. For details, see "How to use the software keyboard" shown below.
▭	• Shows a sub menu. • Switches a functions ON or OFF. • Selects a color.
━━●40━━	Drag the circle icon to adjust the setting value.

6.   Select [Close] at the top right-hand side of the screen to exit the menu.

**(How to use the software keyboard)**

Alphabet software keyboard   Numeric software keyboard

Cursor

Select this to switch to the numeric software keyboard.

Del. : Delete the character selected.

Clr. : Clear all characters.

Select this to switch to the alphabet software keyboard.

3.1 How to Set Time Difference, Time Format, Language and Units

Before setting up your equipment, set the time difference (local time and UTC), display time, language and units to use on your equipment as shown below.

1. Tap the **Home** icon, then select [Menu] icon () from the menu icon bar.

2. Select [General] on the main menu to show the [Menu General] sub menus.

3. To use local time (instead of UTC), do this step and step 4. Otherwise, skip to step 5.
    Select [Local Time Offset]. A software keyboard appears.
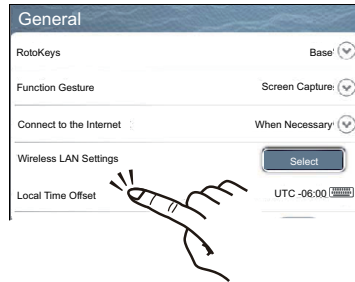
4. Select time difference between local time and UTC time, using the software keyboard, in 15-minute increments.

5. Select [Time Format].

6. Select 12 or 24 hour format. [Auto] automatically inserts AM or PM indication in the 24 hour clock, when the language is English.

7. Select [Language] to show its option window.
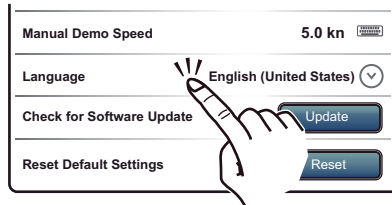
8. Select the language to use.

9. Drag the main menu to select [Units], and set the units to show on the display.
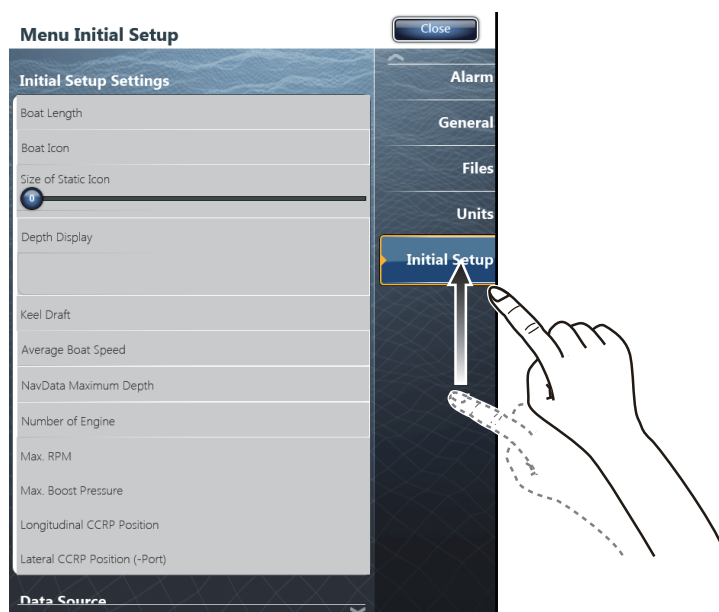
[Menu Units] sub menus

Menu item	Options	
[Bearing Display]	[True], [Magnetic]	
[True Wind Calculation Reference]	[Ground], [Surface]	
[Position Format]	[DDD°MM.mmmm'], [DDD°MM.mmm'], [DDD°MM.mm'], [DDD°MM'SS.ss"], [DDD.dddddd°], [Loran C], [MGRS]	
[Loran C Station & GRI]	[GRI]	Select GRI code.
	[Master]	-
	[First (Second) Slave]	X: Upolu Point, Y: Kure Island
	[Correction First (Second) Slave]	Enter a position offset to refine Loran C position.
[Range (Long)]	[Nautical Mile], [Kilometer], [Mile]	
[Range (Short)]	[Foot], [Meter], [Yard]	
[Short/Long Change Over]	Set the distance at which to change between short and long range. Set the long range here.	
[Depth]	[Foot], [Meter], [Fathom], [Passi Braza]	
[Height/Length]	[Foot], [Meter]	
[Temperature]	[Fahrenheit Degree], [Celsius Degree]	
[Boat Speed]	[Knot], [Kilometer per Hour], [Mile per Hour], [Meter per Second]	
[Wind Speed]	[Knot], [Kilometer per Hour], [Mile per Hour], [Meter per Second]	
[Atmospheric Pressure]	[HectoPascal], [Millibar], [Millimeter of Mercury], [Inch of Mercury]	
[Oil Pressure]	[KiloPascal], [Bar], [Pound per Square Inch]	
[Volume]	[Gallon] (Gallon & Gallon/hour), [Liter] (Liter & Liter/hour)	
[Reset Default Settings]	Restore default unit settings.	

3.2   Menu Initial Setup

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

Drag the main menu, then select the [Initial Setup] to show the [Menu Initial Setup] sub menus.

Menu Initial Setup

Menu item	Description	Options (setting range)
[Boat Length]	Set the length of your boat.	5.0 to 9,999 ft
[Longitudinal GPS Position] [Lateral GPS Position (-Port)]	Enter the GPS antenna positioning bow-stern (Longitudinal) and port-starboard (Lateral) position from the origin.	Origin
[Boat Icon]	Select the icon that best matches your boat.	[Sport Fishing], [Cruiser], [Sailboat], [Commercial]
[Size of Static Icon]	Set the size of static (such as own ship) icons.	50 to 150
[Depth Display]	Select the start point for depth measurement.	[Under Keel], [Under Sea Level]
[Keel Draft]	Set the keel draft.	0.0 to 99 ft
[Average Boat Speed]	Select your boat type to use for average speed calculation.	[Sailing], [Commercial], [Powerboat]
[Nav Data Maximum Depth]	Select the maximum depth for navigation data.	[Very Shallow] (under 10 m), [Shallow] (10 to 20 m), [Deep] (20 to 200 m), [Very Deep] (200 to 2000 m)

Menu Initial Setup (Engine)

Menu Item	Description	Options (setting range)
[Number of Engine]	Select the number of engines on your boat.	[1], [2], [3], [4]
[Max. RPM]	Set the maximum rpm of your engine to show on the RPM display.	1000 to 20,000 rpm
[Red Zone RPM]	Set the starting value for the red zone area of the tachometer.	0 to 20,000 rpm
[Red Zone Oil Pressure]	Set the starting value for the red zone area of the oil pressure meter.	0 to 999 kPa
[Red Zone Temperature]	Set the starting value for the red zone area of the engine temperature indicator.	0°F; to 999°
[NickName Engine 1 to 4]	Change the nickname for engine 1 to 4.	

Menu Initial Setup (Fuel)

Menu Item	Description	Options (setting range)
[Number of Tank]	Select the number of fuel tanks on your boat.	[1], [2], [3], [4]
[NickName Tank 1 to 4]	Change the nickname for fuel tank 1 to 4.	

Menu Initial Setup (Use Fuel Tank for calculations)

Menu Item	Description	Options (setting range)
[Tank 1 to 4]	Select the tanks to calculate the fuel consumption.	[ON], [OFF]

Menu Initial Setup (Data Acquisition)

Menu Item	Description	Options (setting range)
[GP330B WAAS Mode]	Select [ON] to use the WAAS mode for the corresponding GPS antenna.	[ON], [OFF]
[WS200 WAAS Mode]		
[Data Source]	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.	
[PGN Output]	Select [ON] for the PGNs (Parameter Group Number, CAN bus (NMEA2000) message) to output from the CAN bus port.	
[Sky View]	Show the condition of GPS and GEO (WAAS) satellites. Number, bearing and elevation angle of all GPS and GEO satellites (if applicable) in view of your receiver appear.	

Menu Initial Setup (SC-30 Setup)

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

Menu Initial Setup (Calibration)

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

Menu Initial Setup (Data Damping)

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]		

Menu Initial Setup (Browser Installation)

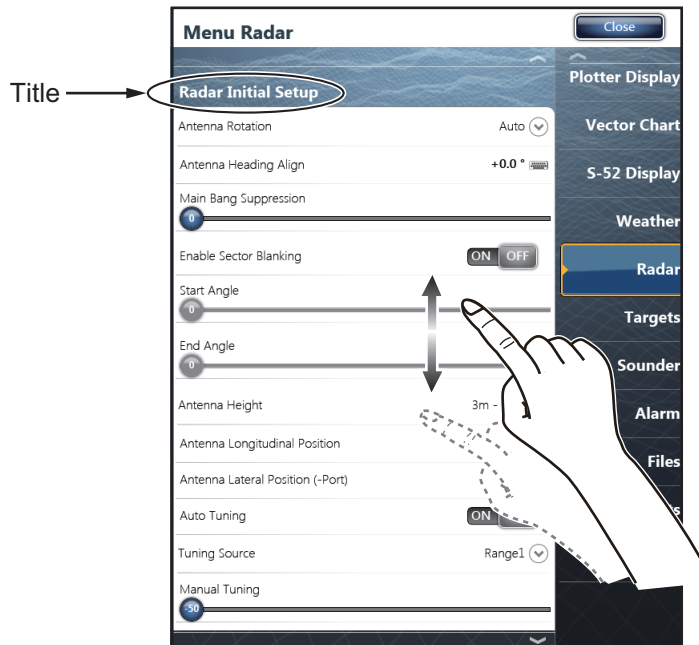| Menu item	Description	Option (setting range)
[FAX30 Browser]	Show the Facsimile Receiver FAX-30 display.	
[FA30 Browser]	Show the AIS Receiver FA-30 display.	
[FA50 Browser]	Show the AIS Receiver FA-50 display.	

3.3 How to Set up the Radar

If you have a radar sensor, set the sensor's characteristics on the [Radar] menu. Open the [Menu Radar] sub menus. Drag the main menu to select [Radar].

1. Select [Radar Source] on the [Menu Radar] sub menus, then select the radar type connected.
   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.
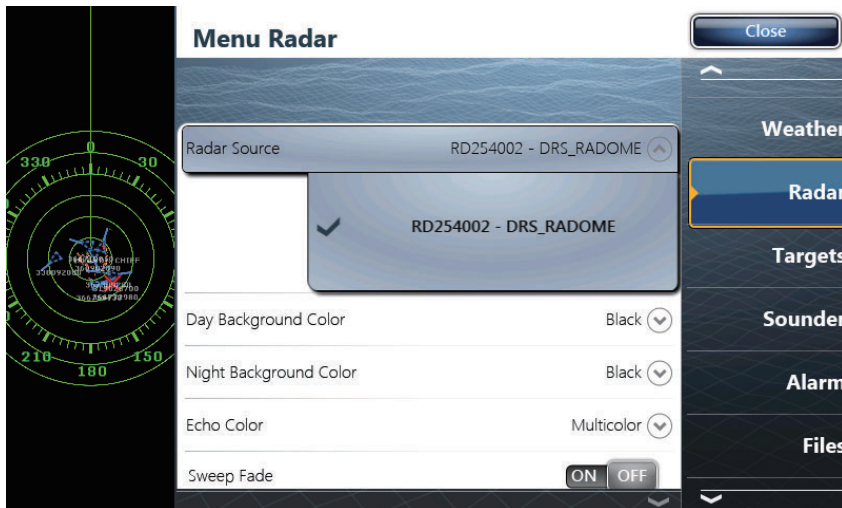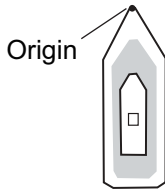

2. Drag the [Menu Radar] sub menus to find the menu item [Radar Initial Setup].

Menu Radar (Radar Initial Setup)

Menu item	Description	Options (setting range)
[Antenna Rotation]	Select the speed of antenna rotation.	[Auto], [24 RPM], [48 RPM]
[Antenna Heading Align]	See the topic of "How to align the antenna heading" shown on the next page.	-180° to +180°

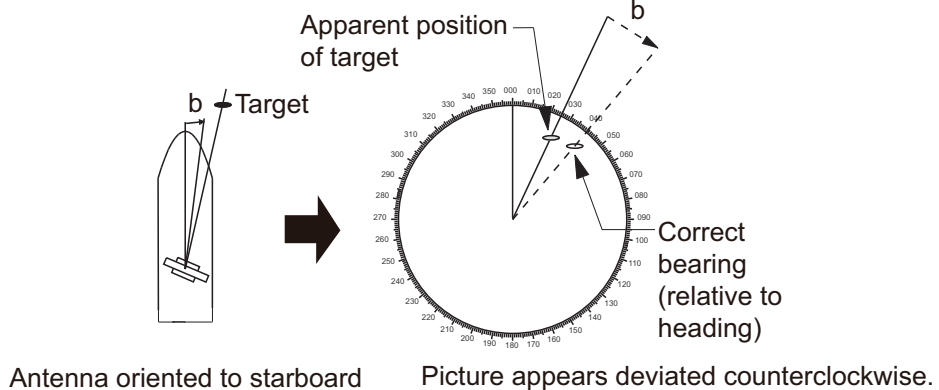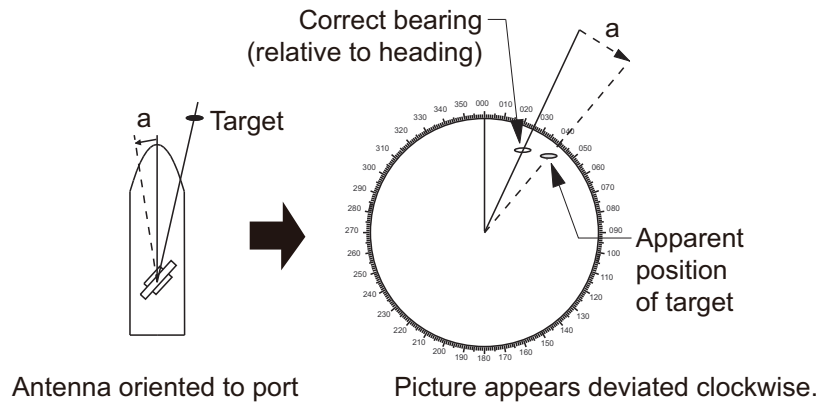| Menu item	Description	Options (setting range)
[Main Bang Suppression]	If main bang appears at the screen center, slide the circle icon so that the main bang disappears, while watching the radar echo at the left-hand side of the display.	0 to 100
[Enable Sector Blanking]	Up to two sectors may be selected 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]		[ON], [OFF]
[Antenna Height]	Select the height of the antenna above the waterline. This menu item is not available with the DRS4DL.	[5m], [7.5m], [10m], [15m], [20m], [25m], [30m], [35m], [40m], [45m], [50m]
[Antenna Longitudinal Position] [Antenna Later Position (-Port)]	Enter the antenna positioning bow-stern (Longitudinal) and port-starboard (lateral) position from the origin. Origin	
[Auto Tuning]	Enable/disable auto tuning for the connected radar. This menu item is not available with the DRS4D-NXT.	[ON], [OFF]
[Tuning Source]	For dual-range display, select the range to use as the manual tuning source.Not available with the DRS4DL or DRS4D-NXT.	[Range1], [Range2]
[Manual Tuning]	Manually tune the radar. Not available when [Auto Tuning] is enabled. Also not available with the DRS4D-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. For service technician only. Do not change these settings. Not available with the DRS4D-NXT. **Note:** Be sure to perform [Radar Optimization] after replacing the magnetron.	
[ARPA Advanced Settings]	For service technician only. Do not change these settings. This menu item is available when setting the radar in transmit. Not available with the DRS4DL.	
[TX Channel]	Select [1], [2] or [3], the channel where the interference is smallest. See the operator's manual for details. Only available with the DRS4D-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. Only available with the DRS4D-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. This menu item is only available with the DRS4D-NXT.	[ON], [OFF]

| Menu item	Description	Options (setting range)
[Hardware Factory Default]	Resets the radar selected at [Radar Source] to factory default.	[OK], [Cancel]
[Reset Default Settings]	Resets the [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).
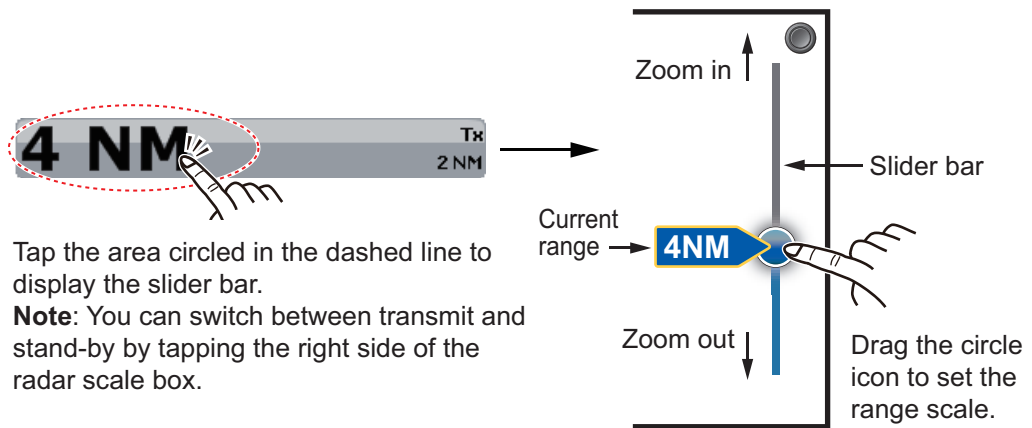
In practice, you will probably observe some small bearing error on the display because of the difficulty in achieving accurate initial positioning of the antenna unit. The following adjustment will compensate for the error.

Antenna oriented to port   Picture appears deviated clockwise.

Antenna oriented to starboard   Picture appears deviated counterclockwise.

1) Select a range between 0.125 and 0.25 nm and set the mode to "head up". You can select a range by a pinch action. The range and range ring interval appear at the bottom left of the screen.

Zoom in   Zoom out

Pinch action

Range   Range ring interval

1 NM

Range indications
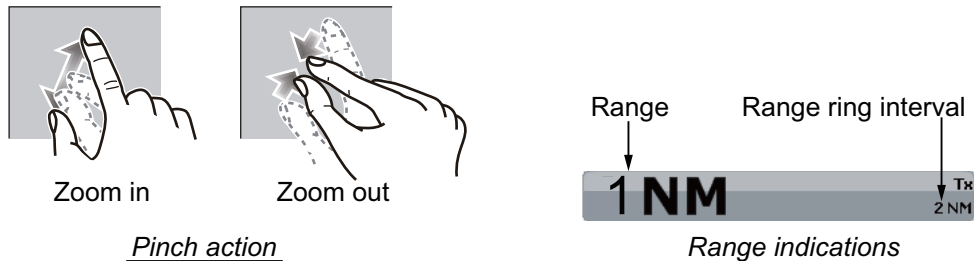
Or tap the radar scale box at the bottom left-hand corner of the screen to display the slider bar. Drag the circle icon to set the range scale.

Tap the area circled in the dashed line to display the slider bar.
Note: You can switch between transmit and stand-by by tapping the right side of the radar scale box.

2) Turn the vessel's bow toward a target.

3) Tap the **Home** icon, then select [Menu] icon, [Radar], and [Antenna Heading Align] in that order to show the numeric software keyboard.

4) Key in the offset value so that the target is at the very top of the screen (setting range: +/- 0° to 180°, +: clockwise direction, -: counterclockwise direction), then tap [Save].

5) Confirm that the target echo is displayed at correct bearing on the screen.

3.4   How to Set up the Sounder

If you have a sounder (BBDS or DFF series), set up the sounder as shown in this section. Drag the main menu to select [Sounder]. You can confirm the actual sounder display on the left-hand side of the screen while setting up.

Drag the [Menu Sounder] sub menus to select [Sounder Initial Setup].

Menu item	Description	Options (setting range)
[Zero line Rejection]	Turn off the zero line (transmission line) to erase it and 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].	[ON], [OFF]
[Zero line Range]	When [ON] is selected at [Zero line Rejection], set the effective area.	1.4 to 2.5 m
[Transducer Draft]	Set the distance between the transducer and the draft line to show the distance from the sea surface.	0.0 to 99.9 ft
[Salt Water]	Select [ON] if the equipment is to be used in salt water.	[ON], [OFF]
[Fish Finder Source]	Select the sounder used, among DFF1, DFF3, DFF1-UHD, BBDS1 and FCV-1150.	
[Transducer Setup]	Select the method to setup the transducer, manually or by selecting the model number. **Manual:** Enter high/low frequencies and TX power. **Model Number:** Select the type of the transducer connected.	[Manual], [Model Number]

Motion sensor setup (requires Satellite Compass SC-30/50/110)

If the satellite compass SC-30/50/110 is connected, set the distance between the antenna unit (or sensor) of the satellite compass and transducer (high and low if connected), on the [Motion Sensor] sub menu, referring to the descriptions below. Tap [Transducer Setup] and the [Motion Sensor] sub menu appears beneath the [Transducer Setup] menu.

- **Motion Sensor Type:** Select [SC30] or [SC50-SC110] depending on the sensor connected.
- **Motion Sensor Antenna Position Bow/Stern HF (LF):** Set the distance from the antenna unit to the transducer in the bow-stern direction.
- **Motion Sensor Antenna Position Up/Down HF (LF):** Set the distance from the transducer to the antenna unit in the vertical direction.
- **Motion Sensor 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.
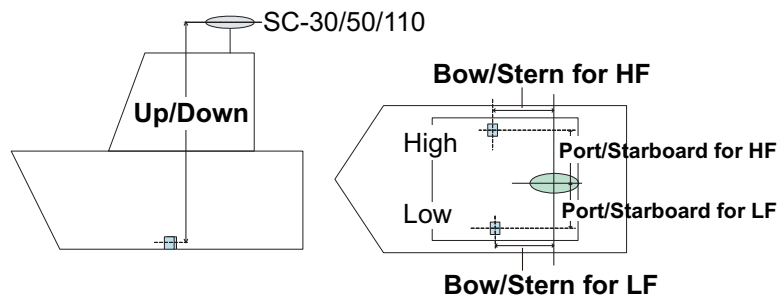
3.5   Wireless LAN Setting

Note: Some TZTBBs are not equipped with the wireless LAN.

The TZTBB can be configured to create a wireless network ("Ad Hoc") or to connect to an existing wireless network. Connecting to an existing wireless network is very useful if you already have an Access Point setup on your boat, especially if you have Internet available. Simply connect the TZTBB and your smartphone or tablet to the existing wireless network. Since the TZTBB and smartphone/tablet will be on the same network, you will be able to share data (using the "NavNet Viewer" App) as well as access the internet (for Weather downloads). Please note that in this configuration, the "NavNet Remote" App performance is inferior due to a larger amount of data being exchanged between the smartphone/tablet device and the MFD (through the access point). The "NavNet Viewer" App performance will not be affected in this mode, as the bandwidth usage is very low. If you do not have an existing wireless access point on your boat or if you want to achieve the best performance with the "NavNet Remote" App, we recommended you establish a "point-to-point" connection. This can be accomplished by configuring the MFD to create a wireless LAN network (Ad Hoc network). In this mode, the MFD becomes an Access Point (you can setup the network name and password) to which the smartphone/tablet can connect directly.

Create a wireless LAN network to use the application on your smartphone or tablet with the wireless LAN signal. Select [Wireless LAN Settings] on the [Menu General] sub menus.

Wireless LAN Settings sub menus

How to create a new Wireless LAN network

1. Select [ON] at [Wireless].

2. Select [Create local network] at [Wireless Mode].

3. Set items as shown below.

Item	Description	Options
[SSID]	Enter SSID (Service Set Identifier) to use.	Maximum 32 characters
[Authentification]	Select the Authentification.	[Open], [WEP], [WPA2-PSK]
[Password]	Enter the password for connection to the LAN.	The number of characters available depends on the selection at [Authentification].
[Network Status]	Select [ON] to connect with your tablet/smartphone over wireless LAN network.	[ON], [OFF]

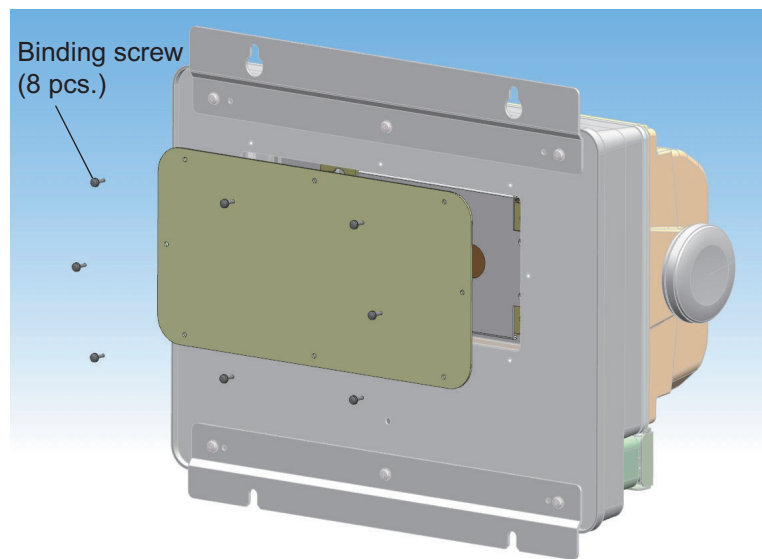This page is intentionally left blank.

4.   HOW TO INSTALL THE HDD
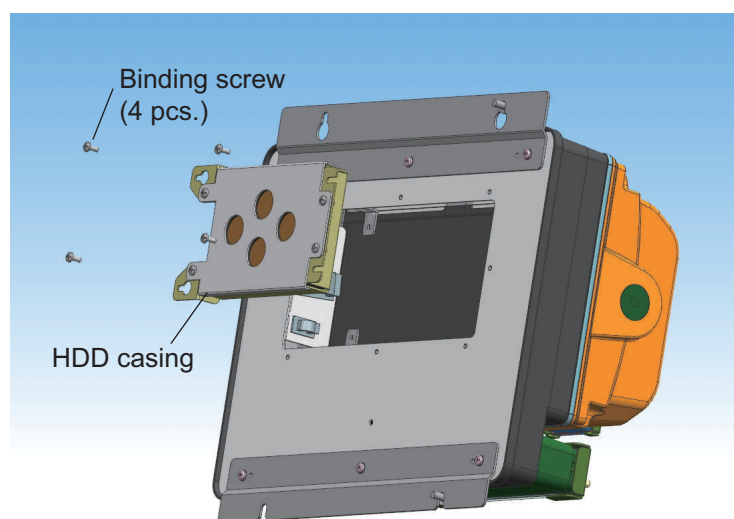
4.1   Hard Disk Drive (HDD)

An HDD (local supply) can be installed inside the processor unit. The usable HDD size is 90 x 134 x 20 mm. Install the HDD inside the processor unit as follows.

Procedure

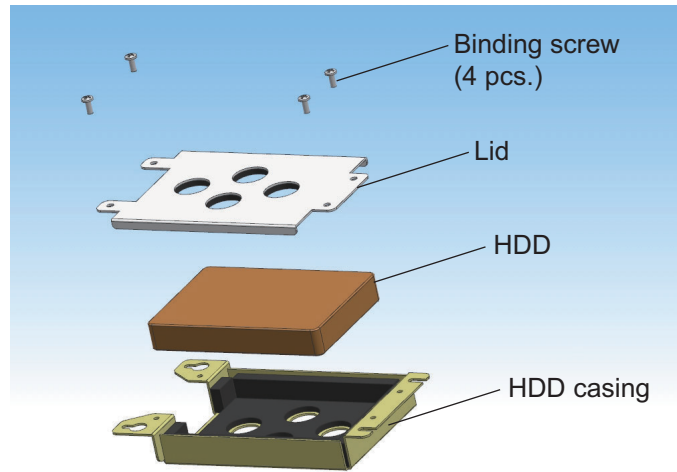1.   Unfasten the binding screws (M3x10, 8 pcs.) to remove the cover from the rear panel.

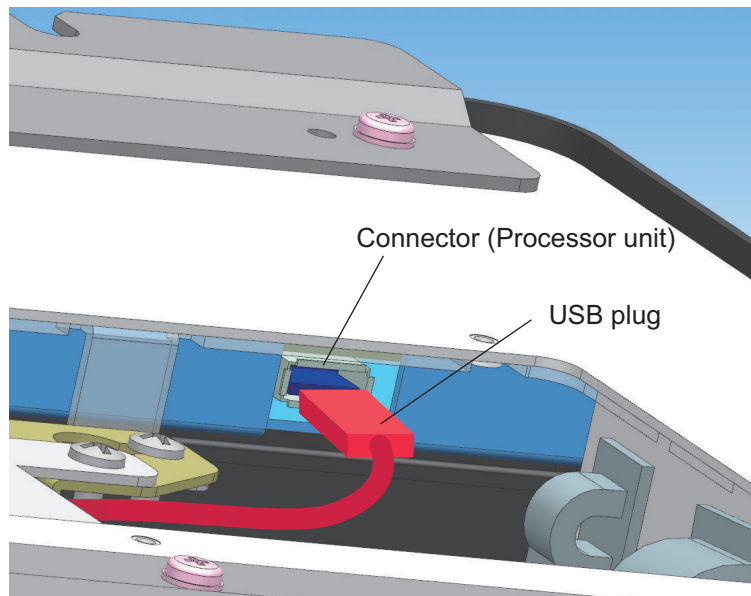2.   Unfasten the binding screws (M4x8, 4 pcs.) to remove the HDD casing.

3. Unfasten the binding screws (M4x8, 4 pcs.) to remove the lid of the HDD casing.
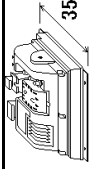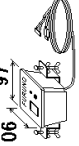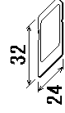
4. Set the HDD into the casing with correct orientation.
5. Fasten the lid to the HDD casing with four binding screws.
6. Connect the USB plug to the port of the processor unit with the HDD cable.

7. Set the HDD casing into the processor unit and fasten it with four binding screws.
8. Fasten the cover to the processor unit with eight binding screws

PACKING LIST　MPU-002/PSD-002

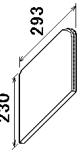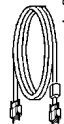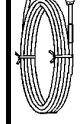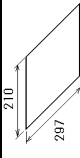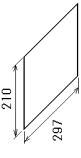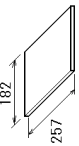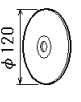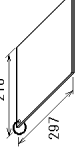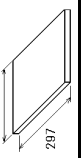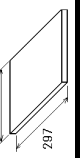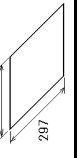| NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット　UNIT			
制御部 PROCESSOR UNIT	350 / 97 / 106	MPU-002-* 000-022-525-00 **	1
スイッチボックス SWITCH BOX		PSD-002-* 000-022-528-00 **	1
予備品　SPARE PARTS			
予備品 SPARE PARTS		SP19-01401 001-205-630-00	1
付属品　ACCESSORIES			
SDカード書込み品 SD MEMORY CARD	32 / 24	1950188- 001-494-250-00	1 (*1)
WIFI_ARIBステッカー WIFI_ARIB STICKER	96 / 64	19-031-1563-0 100-375-230-10	1 (*1)
書類ケース(NAV4) DOCUMENTS CASE	230 / 293	L293XW230XH18 000-176-350-1*	1
付属品 ACCESSORIES		FP19-01801 001-205-650-00	1
工事材料　INSTALLATION MATERIALS			
ケーブル(クミヒン) CABLE ASSEMBLY	L=0.5M	DVI-D/D S-LINK 0.5M 000-177-282-11	1
ケーブル(クミヒン)LAN LAN CABLE ASSEMBLY	L=3M	MOD-WPAS0001-030+ 000-164-609-10	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ケーブル組品 CABLE ASSEMBLY	L=2M	FRUDD-18AFFM-L180 000-164-608-10	1
ケーブル組品MJ CABLE ASSY.	L=5M	MJ-A3SPF0017-050ZC 000-157-995-10	1
工事材料 INSTALLATION MATERIALS		CP19-01701 001-205-640-00	1
図書　DOCUMENT			
ヒューズ変更のお願い NOTIFICATION DOCUMENT	210 / 297	C42-01206-* 000-177-242-1*	1
フラッシュマウント型紙 FLUSH MOUNTING TEMPLATE	210 / 297	C42-01207-* 000-177-243-1*	1
ユーザーハンドブック USER'S HANDBOOK	182 / 257	*42-01107-* 000-176-084-1*	1
取扱説明CD OPERATOR'S MANUAL CD	φ120	NAVNET4 O/M *CD-ROM* 000-191-476-1*	1
操作要領書(多言語) OPERATOR'S GUIDE (MLG)	210 / 297	MLG-44720-* 000-177-348-1*	1
装備操作ガイド INST/OPS GUIDE	210 / 297	J42-01303-* 000-177-771-1*	1 (*1)
装備要領書 INSTALLATION MANUAL	210 / 297	IM*-44720-* 000-177-239-1*	1
注意書き NOTIFICATION	210 / 297	E42-01212-* 000-177-318-1*	1 (*2)
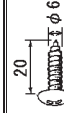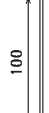
1.コード番号末尾の[**]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL
2.付属品及び一部の図書は、書類ケースに収められています。
ACCESSORIES AND A PART OF THE DOCUMENTS IS PUT IN THE DOCUMENTS CASE.

3.(*1)は和文仕様用です。
*1: FOR JAPANESE SET.
4.(*2)は中文仕様用です。
*2:FOR CHINESE SET.

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

FURUNO

付属品表
ACCESSORIES

		CODE NO.	001-205-650-00	19BD-X-9501-0
		TYPE	FP19-01801	1/1

番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 Q'TY	用途/備考 REMARKS
1	ハンガーワッシャー HANGER WASHER	φ26 ↕7	05-029-0132-1 ROHS CODE NO. 100-087-911-10	2	
2	ブラインドシールM2N2.5 BLIND SEAL 2 N2.5	φ30	05-104-6604-0 CODE NO. 100-373-480-10	2	
3	ノブ(N2.5) KNOB(N2.5)	44 φ73	19-028-2073-1 CODE NO. 100-340-481-10	2	
4	ヒューズハリマーク FUSE LABEL	60 50	19-031-1561-0 CODE NO. 100-372-600-10	1	

型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。) DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

C4472-F01-A

FURUNO

工事材料表
INSTALLATION MATERIALS

		CODE NO.	001-205-640-00	19BD-X-9401-1
		TYPE	CP19-01701	1/1

番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 Q'TY	用途/備考 REMARKS
1	チューブスペーサ TUBE SPACER	60	19-031-4031-0 CODE NO. 100-379-740-10	3	
2	+トラスタッピンネジ 1シュ SELF-TAPPING SCREW	20 φ6	6X20 SUS304 CODE NO. 000-162-613-10	4	
3	コンベックス CABLE TIE	100	CV-100N CODE NO. 000-162-167-10	40	
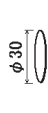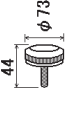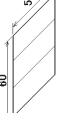
型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT.
QUALITY IS THE SAME.
(略図の寸法は、参考値です。) DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO ., LTD.

C4472-M01-B

FURUNO

SPARE PARTS LIST FOR

PROCESSOR UNIT

MPU-002

	CODE NO.	001-205-630-00	19BD-X-9301-1	1/1
	TYPE	SP19-01401	BOX NO.	P

SHIP NO.   U S E   SETS PER VESSEL

ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY			REMARKS/CODE NO.
				WORKING		SPARE	
				PER SET	PER VES		
1	ヒューズ FUSE GLASS TUBE TYPE	30 ↕φ6	FGB0-A 125V 4A PBF	0	0	2	000-155-851-10
2	ヒューズ GLASS TUBE FUSE	30 ↕φ6	FGB0-A 125V 10A PBF	1	1	2	000-155-826-10

MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	C4472-P01-B	1/1

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

FURUNO

FURUNO ELECTRIC CO., LTD.

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

R8
R4
2

取付穴詳細（尺度：1／2）
DETAIL FOR FIXING (SCALE: 1/2)

2-取付穴
FIXING HOLES

型式銘板
NAMEPLATE

信号コネクタ
SIGNAL CONNECTOR

電源
SOURCE

底面（壁掛装備時）
BOTTOM (BULKHEAD MOUNT)

アース端子
GND TERMINAL

2-取付用切欠
FIXING NOTCH

取手用ノブ（左右2個）
KNOB (BOTH SIDE)

無線LANモジュール
WIRELESS LAN MODULE
(NOT EQUIPPED IN SOME REGIONS)

信号コネクタ
SIGNAL CONNECTOR
(423)

信号コネクタ
SIGNAL CONNECTOR

信号コネクタ
SIGNAL CONNECTOR

信号コネクタ
SIGNAL CONNECTOR

395
240±1
300
30
10
330±1
8

#100
209
#100

#750
550
350
#100
#100

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空間寸法とする。
3) 取付用ネジはトラスタッピンネジ呼び径6×20を使用のこと。
4) 壁掛装備は底面が必ず下方を向くように設置すること。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø6x20 FOR FIXING THE UNIT.
4. FOR BULKHEAD MOUNT, THE BOTTOM SIDE SHOULD BE ORIENTED DOWNWARD.

DRAWN	25/Dec/2012	T.YAMASAKI		
CHECKED	25/Dec/2012	H.MAKI		
APPROVED	25/Dec/2012	Y. N SH YAVA	TZTBB	
SCALE	1/5	MASS	8.0	±10% kg
DWG.No.	C4472-G01- C		REF.No.	19-031-401G-3
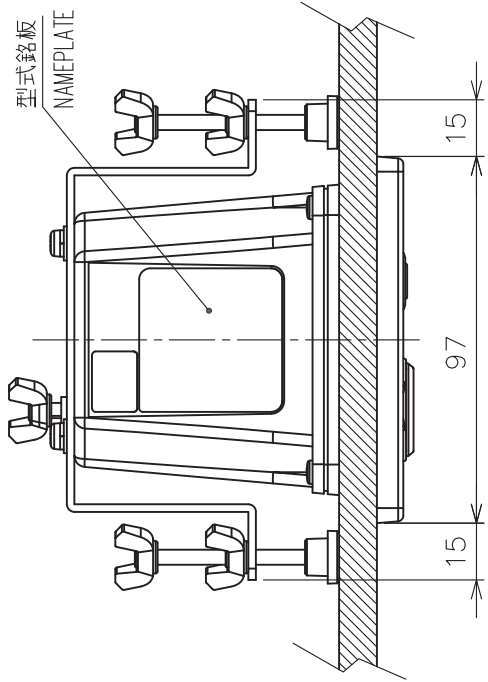
TITLE MPU-002

名称　制御部（壁掛・卓上装備）
外寸図

NAME PROCESSOR UNIT (BULKHEAD/TABLETOP MOUNT)
OUTLINE DRAWING

FURUNO

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

86±1

95±1

R10

取付穴寸法
CUTOUT DIMENSIONS

アース端子
GND TERMINAL

電源・信号ケーブル
POWER/SIGNAL CABLE

#60

80

7

97

9.7

A

型式銘板
NAMEPLATE

15

97

15

106
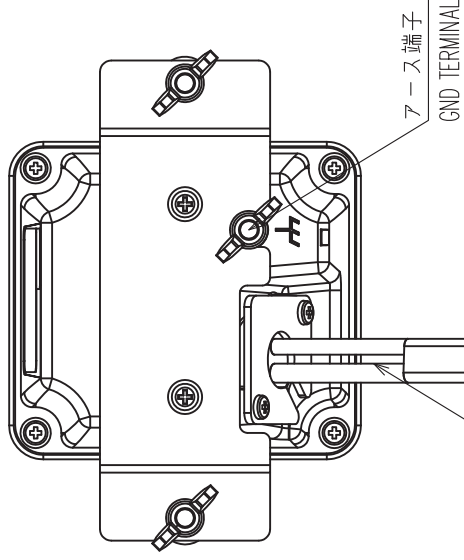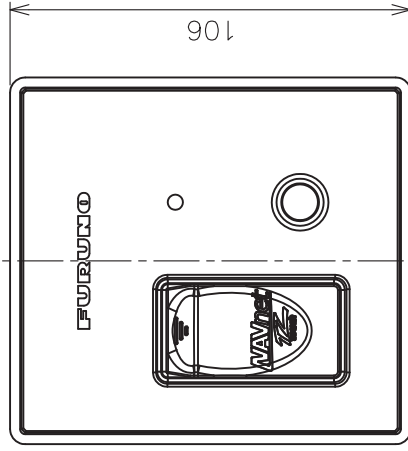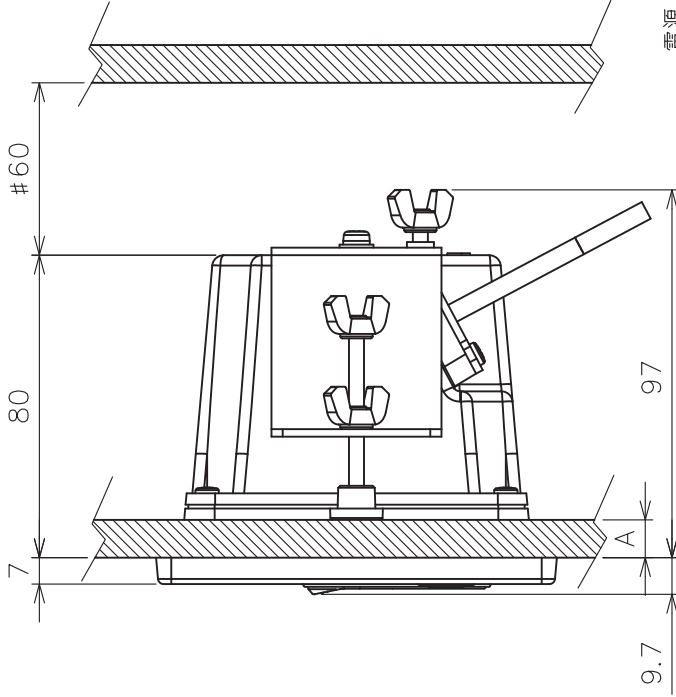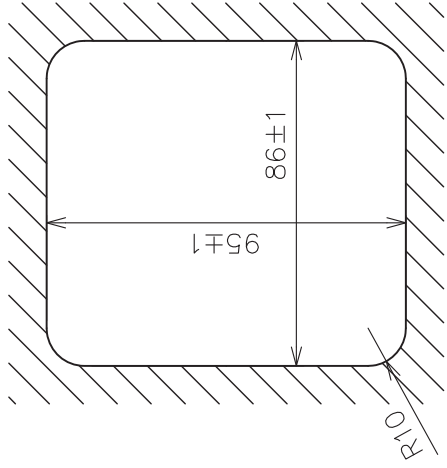
注　記
1) 指定外の寸法公差は表1による。
2) #印寸法は最小サービス空間寸法とする。
3) 壁の厚さ（A）は最小5、最大20とする。
NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS (A): 5≦A≦20.

DRAWN	19/Dec/2012	T.YAMASAKI		
CHECKED	19/Dec/2012	H.MAKI		
APPROVED	21/Dec/2012	Y.N SH YANA	I7BB	
SCALE	1/2	MASS	0.75 kg	質量はケーブルを含みます。 ±10% MASS DOES NOT INCLUDE CABLE.
DWG.No.	C4472-G02- B	REF.No.	19-031-500G-3	

TITLE PSD-002
名称 スイッチボックス（埋込装備）
外寸図
NAME SWITCH BOX (FLUSH MOUNT)
OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

ケーブル接続時の防水用防水カバー取付手順
防水を確保するため、以下の手順をお守りください。

手順1
1) DVIケーブルに防水用チューブを取り付ける。
ケーブルの端に接するように取り付け、両端をコンベックスで固定する。
2) DVI OUT0、AUDIO、VIDEOポートにケーブルを接続する。
3) ブーツカバーに防水パッキンを取り付け、ケーブルを通す。
4) バインドネジ（4本）でブーツカバーをパネルに固定する。
5) 固定板、ケーブルダウン、シールの順にブーツカバーに取り付ける。固定金具のシールは使う部分のみ剥がす。
6) ケーブル固定金具をバインドネジ（2本）で固定する。
7) コンベックス（2本）でケーブルをケーブルクランプに固定する。（※）
防水用チューブの根元はコンベックスで固定する。

手順2
1) DVIケーブルをコネクタカバー外側から通し、DVI INポートにつなぐ。
2) DVI OUT1、USB1ポートに外部モニター用ケーブルを接続する。USB1、PWR SWポートにつなぐなど。
3) スイッチボックスのケーブルをコネクタカバーを通して、USB1、PWR SWポートにつなぐなど。
4) 必要に応じてDVI OUT2、USB3ポートに外部モニターを、USB4ポートに外部USB機器をつなぐ。
5) バインドネジ（6本）でコネクタカバー、固定板1をパネルに固定する。
6) 固定板1、ケーブルダウン、固定金具、固定板2をコネクタカバーに挿入する。
ケーブルダウンの切れ込みは、下を向くようにケーブルにはめ込む。
固定板2のシールは使う部分のみ剥がす。
7) ケーブル固定金具をバインドネジ（3本）で固定する。
8) コンベックス（2本）でケーブルをケーブルクランプに固定する。（※）
防水用チューブの根元はコンベックスで固定すること、コンベックスで
固定しないと防水性が確保できません。

（※）防水用のコンベックスは必ず取り付けること。コンベックスを取り付けないと防水性が確保できません。

PROCEDURE FOR CABLE CONNECTION (WATERPROOFING COVER)

PROCEDURE 1
1. ATTACH WATERPROOFING TUBES TO THE DVI CABLES.
ATTACH SUPPLIED CABLE TIES AT EACH END OF THE TUBE.
2. ATTACH THE DVI-D, VIDEO COMPOSITE AND AUDIO CABLE CONNECTORS TO THEIR RESPECTIVE PORTS.
3. SET THE WATERPROOFING GASKET TO THE BOOT COVER THEN PASS THE CABLES THROUGH THE BOOT COVER.
4. FASTEN THE BOOT COVER WITH FOUR BINDING SCREWS.
5. ATTACH THE FIXING PLATE, GASKET AND FIXING METAL TO THE BOOT COVER. PEEL OFF THE SEAL FROM THE SLOTS TO BE USED.
6. FASTEN THE FIXING METAL TO THE BOOT COVER WITH TWO BINDING SCREWS.
7. FIX THE CABLES TO THE CABLE CLAMP WITH TWO CABLE TIES EACH. ATTACH A CABLE TIE AT THE BASE OF THE WATERPROOFING TUBE. (※)

PROCEDURE 2
1. PASS THE DVI CABLE THROUGH THE OUTSIDE ENTRANCE OF THE CONNECTOR COVER AND CONNECT THE DVI-PLUG TO THE DVI-IN PORT.

2. CONNECT THE DVI AND USB CABLE FOR THE EXTERNAL MONITOR TO DVI OUT1 AND USB2 PORT.
3. PASS THE PLUGS FROM THE SWITCH BOX THROUGH THE CONNECTOR COVER THEN CONNECT THEM TO THE PWR SW PORT AND THE USB1 PORT, RESPECTIVELY.
4. CONNECT THE CABLES FOR THE SECOND MONITOR TO DVI OUT2 AND USB3 PORT, AND ANOTHER USB EQUIPMENT CABLE TO THE UNIT WITH USB4 PORT IF NECESSARY.
5. FASTEN THE CONNECTOR COVER TO THE UNIT WITH SIX BINDING SCREWS.
6. ATTACH THE FIXING PLATE, GASKET AND FIXING PLATE2 TO THE CONNECTOR COVER. INSERT THE GASKET SO THE SLOTS IN THE HOLES FACE DOWNWARD. PEEL OFF THE SEAL FROM THE SLOTS TO BE USED ON THE FIXING PLATE2.
7. FASTEN THE FIXING METAL TO THE CONNECTOR COVER WITH THREE BINDING SCREWS.
8. FIX THE CABLES TO THE CABLE CLAMP WITH TWO CABLE TIES EACH. ATTACH A CABLE TIE AT THE BASE OF THE WATERPROOFING TUBE. (※)

※) CABLE TIES ARE NECESSARY FOR WATERPROOFING. DO NOT FAIL TO ATTACH THEM.

手順1
PROCEDURE 1

防水パッキン
WATERPROOFING GASKET

ブーツカバー
BOOT COVER

固定板
FIXING PLATE

バインドネジ（4本）
BINDING SCREWS (4 pcs.)

ケーブル固定金具
FIXING METAL

バインドネジ（2本）
BINDING SCREWS (2 pcs.)

ケーブルダウン
GASKET

手順2
PROCEDURE 2

コネクタカバー
CONNECTOR COVER

バインドネジ（6本）
BINDING SCREWS (6 pcs.)

固定板1
FIXING PLATE 1

固定板2
FIXING PLATE 2

ケーブルダウン
GASKET

ケーブル固定金具
FIXING METAL

バインドネジ（2本）
BINDING SCREWS (2 pcs.)

スイッチボックスへ
TO SWITCH BOX

防水用コンベックスを取り付ける（※）
ATTACH CABLE TIE FOR WATERPROOFING (※)

ケーブルは2箇所で固定する
FIX CABLE WITH TWO CABLE TIES.

防水用チューブ
WATERPROOFING TUBE

DRAWN	28/Jan/2013 T.YAMASAKI	
CHECKED	28/Jan/2013 H.MAKI	
APPROVED	29/Jan/2013 Y.NISHIYAMA	TZTBB
SCALE	MASS 単位 kg	

TITLE MPU-002
名称 制御部防水カバー
装備要領
NAME PROCESSOR UNIT WATERPROOFING COVER
INSTALLATION PROCEDURE

DWG.No. C4472-Y01- A
REF.No.

FURUNO ELECTRIC CO.,LTD.

FURUNO

制御部
PROCESSOR UNIT
MPU-002

タッチモニター
TOUCH MONITOR *1

同上
DITTO

リモコン
REMOTE CONTROL UNIT
MCU-002/004 *2
リモコン または USB DEVICE

スイッチボックス
SWITCH BOX
PSD-002 *1

ネットワーク魚探
NETWORK SOUNDER
DFF1/3, BBDS1, DFF1-UHD, DFF3D

AIS受信機
AIS RECEIVER
FA-30/50

レーダーセンサー
RADAR SENSOR
DRS SERIES

その他、ファクシミリ受信機、IPカメラ など
(接続は個別の資料を確認のこと)
FACSIMILE RECEIVER, IP CAMERA, ETC.
FAX-30, OTHERS
(REFER TO INDIVIDUAL INSTRUCTIONS FOR CONNECTION)

スイッチングハブ
SWITCHING HUB
HUB-101 *3

接続箱
JUNCTION BOX
TL-CAT-012

ネットワーク機器
NETWORK EQUIPMENT

J6 DVI-OUT0   DVI-D/D S-LINK, 0.5m
J14 DVI-IN
J15 DVI-OUT1   DVI-D/D S-LINK *2 5m, φ6 (10m, φ9)
J18 USB2   USB CABLE *1
J16 DVI-OUT2   DVI-D/D S-LINK, 5/10m *2
J19 USB3   USB CABLE *1
J20 USB4
J17 USB1   A TYPE
J23(BHP) PWRSW
J11 NETWORK   RJ45   MOD-WPAS0001-030+, 3m STRAIGHT
J12 RJ45   MOD-WPAS0001-030+, 3m, STRAIGHT *2
J13 RJ45   同上 DITTO

DVI-OUT1はDVI-OUT2に優先す。
DVI-OUT1 IS PRIOR TO DVI-OUT2.

ポータブルHDD
PORTABLE HDD *1
J22 USB6

無線LAN
WIRELESS LAN *4
J21 USB6

J1 POWER
J8 LINE OUT
J2 CANbus
J3 MULTI
J4 USB A TYPE
J9 VIDEO1
J10 VIDEO2

SPEAKER PLUG φ3.5

データ変換器
DATA CONVERTER
IF-NMEA2K2 *2
IF-NMEA2K1 *2
(CABLE W/MINI PLUG: 0.3m)
または JUNCTION BOX
FI-5002

整流器
RECTIFIER *2
RU-3423
RU-1746B-2

12/24VDC
100/110/
220/230VAC
1φ, 50/60Hz

EVENT SWITCH
BUZZER OP03-136
PATRICK SYSTEM
+15VDC (FOR CANbus I/F)

USB DEVICE
(FOR MAINTENANCE)
USB CABLE *1

VIDEO EQUIPMENT
COAX. CABLE (75Ω) *1
COAX. CABLE (75Ω) *1

注記
*1) 造船所手配。
*2) オプション。
*3) 最大3台まで接続可。
*4) 一部仕様では無線LANモジュール非搭載。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: MAXIMUM 3 SETS AVAILABLE.
*4: SOME SPECIFICATION SETS ARE NOT EQUIPPED WITH THE WIRELESS LAN MODULE.

TITLE TZTBB
名称 マルチファンクションディスプレイ
相互結線図
NAME MULTI FUNCTION DISPLAY
INTERCONNECTION DIAGRAM

DRAWN   27/May/2019 T. YAMASAKI
CHECKED 27/May/2019 H. MAKI
APPROVED 27/May/2019 H.MAKI
SCALE   MASS   kg
DWG No. C4472-C01- H   REF. No. 19-031-7800-0

FURUNO ELECTRIC CO., LTD.

ECF

(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

FURUNO ELECTRIC CO., LTD.

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・FURUNO Authorized Distributor/Dealer

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(GREG) TZTBB

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