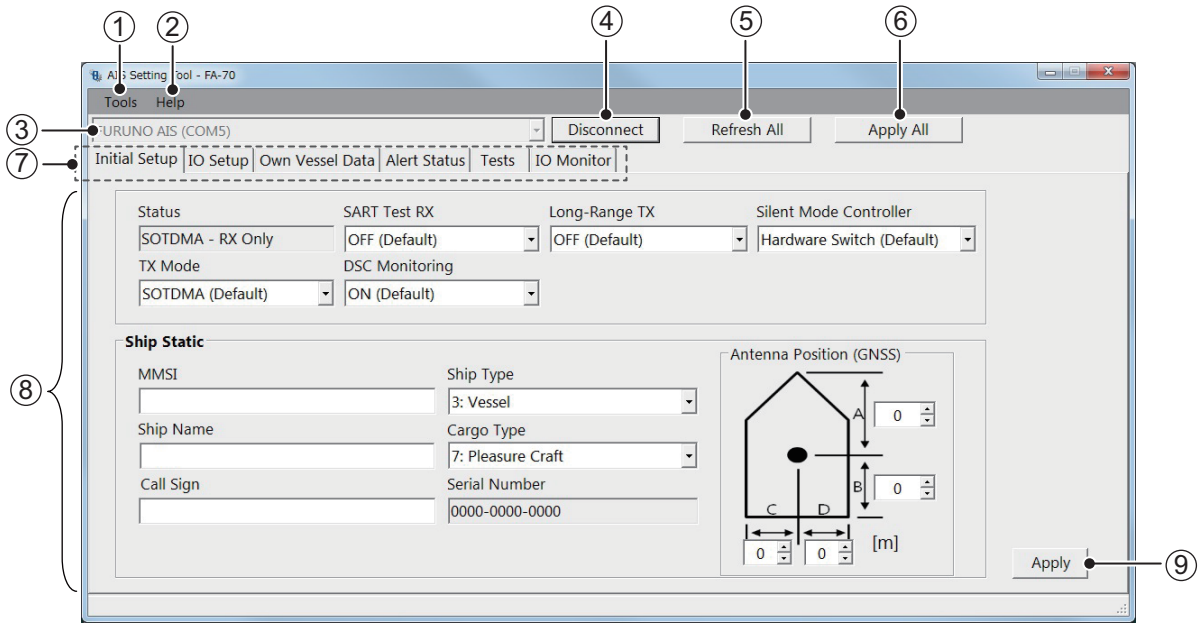
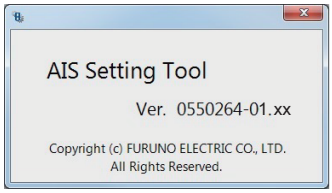
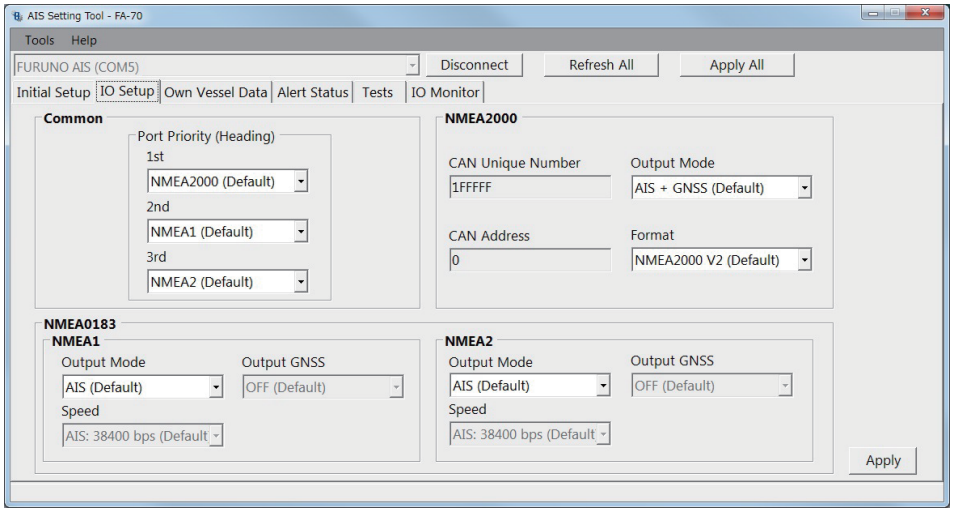
# 3.2 Overview of the AIS Setting Tool




| No. | Name | Description |
|---|---|---|
| 1 | [Tools] | • [Disconnect]: Disconnects from the FA-70.<br>• [Screenshot…]: Takes a screenshot. |
| 2 | [Help] | • [Usage Considerations]: Shows the precautions for use.<br>• [About]: Shows the program version number.<br>  <br>xx denotes minor modifications. |
| 3 | Port selection | Select the COM port to connect. |
| 4 | [Connect]/[Disconnect] | • [Connect]: Connects to the FA-70.<br>• [Disconnect]: Disconnects from the FA-70. |
| 5 | [Refresh All] | Obtains the latest data from the FA-70, and then updates all settings of all menu tabs. |
| 6 | [Apply All] | Saves all settings in all tab pages, and then transmits the data to the FA-70. |
| 7 | Menu tab | Opens each menu. |
| 8 | Setting/Display area | Shows the setting values, menu options, status, test results, and so on depend on the selected menu. |
| 9 | [Apply] | Saves all settings in the current tab page, and then transmits the data to the FA-70. |

# 3.3 IO setup (input/output port)

You can change the input/output settings from the [IO Setup] menu.




[CAN Unique Number], [CAN Address]: Display only.

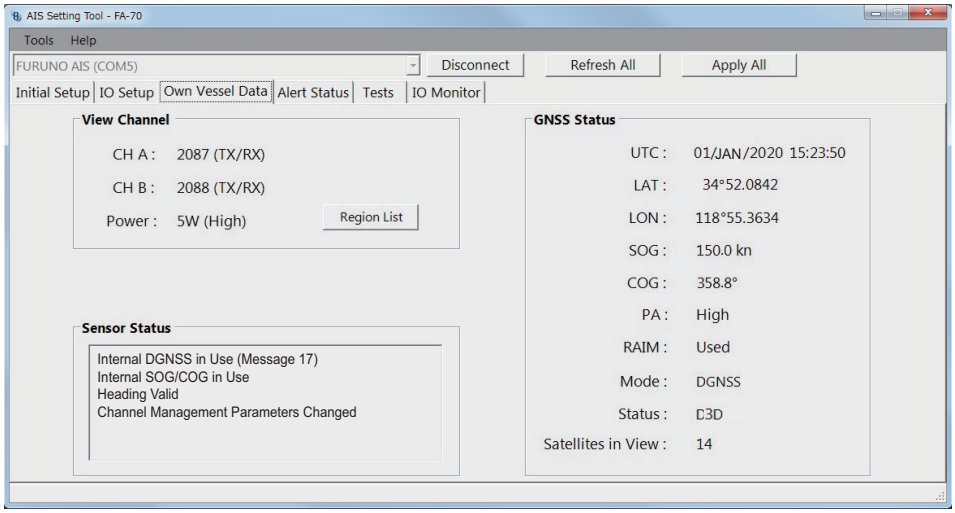
*[IO Setup] menu for PC*

| Menu item | Description |
|---|---|
| ***[Common]*** | |
| [Port Priority (Heading)]<br>[1st], [2nd], [3rd] | Set the input port priority for heading data. |
| ***[NMEA2000]*** | |
| [CAN Unique Number] | Shows the CAN unique number. |
| [CAN Address] | Shows the CAN address. |
| [Output Mode] | Select the output mode among [OFF], [AIS], [GNSS], or [AIS + GNSS].<br>[OFF]: Does not output AIS and GNSS data.<br>[AIS]: Outputs AIS data.<br>[GNSS]: Outputs GNSS data.<br>[AIS + GNSS]: Outputs both AIS and GNSS data. |
| [Format] | Select the output PGN format version from [NMEA2000 V2] or [NMEA2000 V1]. |
| ***[NMEA0183]*** | |
| [NMEA1 Output Mode],<br>[NMEA2 Output Mode] | Select the output mode among [OFF], [AIS], [GNSS], or [AIS + GNSS]. |
| [NMEA1 Speed],<br>[NMEA2 Speed] | When selecting [OFF] or [GNSS] in the [NMEA1/NMEA2 Output Mode] menu, select the baudrate for NMEA1/NMEA2 from [AIS: 38400 bps] or [Sensor: 4800 bps]. |
| [NMEA1 Output GNSS],<br>[NMEA2 Output GNSS] | When selecting [GNSS] or [AIS + GNSS] in the [NMEA1/NMEA2 Output Mode] menu, select the output GNSS sentence for NMEA1/NMEA2 among [OFF], [GGA + VTG (Sentences)], [GLL + VTG (Sentences)] or [RMC (Sentence)].<br>[OFF]: Does not output GGA, VTG, GLL and RMC sentences.<br>[GGA + VTG (Sentences)]: Outputs GGA and VTG sentences.<br>[GLL + VTG (Sentences)]: Outputs GLL and VTG sentences.<br>[RMC (Sentence)]: Outputs RMC sentence. |

For the PC, click [Apply] or [Apply All] to confirm the settings.

# 3.4 Own Vessel Data Screen

The [Own Vessel Data] screen shows the information of AIS channel, sensor status, and GNSS status.

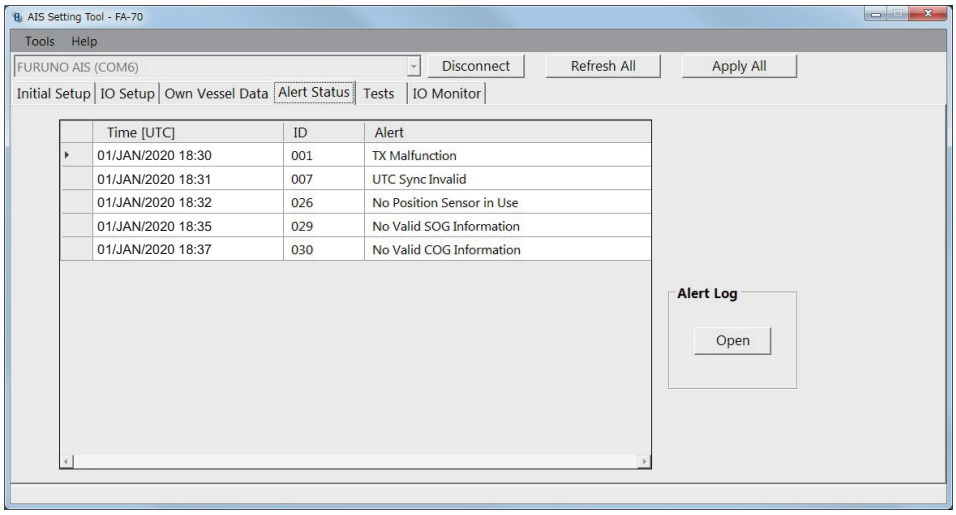



*[Own Vessel Data] screen for PC*

| Menu item | Description |
|---|---|
| ***[View Channel]*** | |
| [CH A] | Shows the channel number and TX/RX mode for channel A. |
| [CH B] | Shows the channel number and TX/RX mode for channel B. |
| [Power] | Shows the transmission power. |
| [Region List] (for the PC) | Shows the channel management information of local sea areas.<br>To take a screenshot, click [Screenshot] at the bottom right of the screen. |
| [Sensor Status] | Shows the information about the sensors connected to the FA-70.<br>• Internal DGNSS in Use: DGNSS currently in use.<br>• Internal GNSS in Use: GNSS currently in use.<br>• Internal SOG/COG in Use: SOG/COG currently in use.<br>• Heading Valid: Valid heading data.<br>• Channel Management Parameters Changed (for the PC): Channel parameters have been changed. |
| [GNSS Status] (for the PC) | Shows the GNSS information.<br>• [UTC]: Universal Time Coordinated<br>• [LAT]: Latitude<br>• [LON]: Longitude<br>• [SOG]: Speed over ground<br>• [COG]: Course over ground<br>• [PA]: Positioning accuracy<br>• [RAIM] (Receiver autonomous integrity monitoring): Whether to use RAIM or not.<br>• [Mode]*: Positioning mode<br>• [Status]*: Positioning status<br>• [Satellites in View]*: The number of satellites in view.<br>*: These items are not displayed when using the positioning data from the external sensor. |

# 3.5 Alert Status

The [Alert Status] screen shows the alerts currently occured.

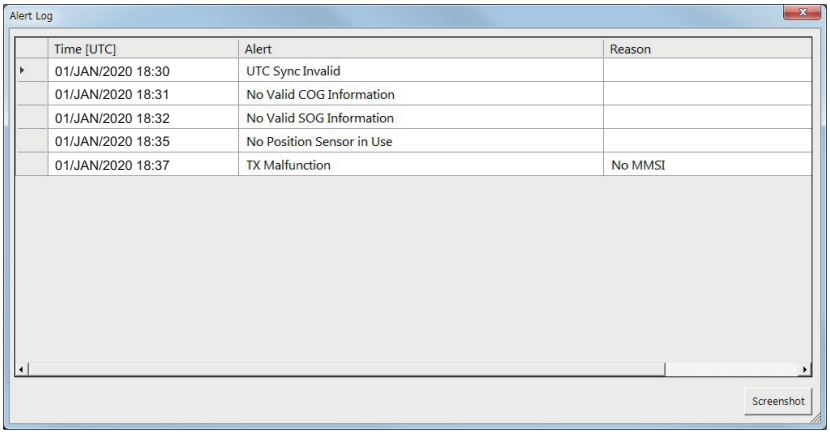



*[Alert Status] screen for PC*

- [Time [UTC]]: Shows the time and date when the alert occured.
- [ID]: Shows the alert number.
- [Alert]: Shows the alert message*.

*: For the external display, select the alert ID to display the alert message on the bottom of the screen.

For the PC, click [Open] of [Alert Log] to show the alerts occured in the past (max. 20 alerts).




- [Time [UTC]]: Shows the time and date when the alert occured.
- [Alert]: Shows the alert message.
- [Reason]: Shows the reason why the alert occured.

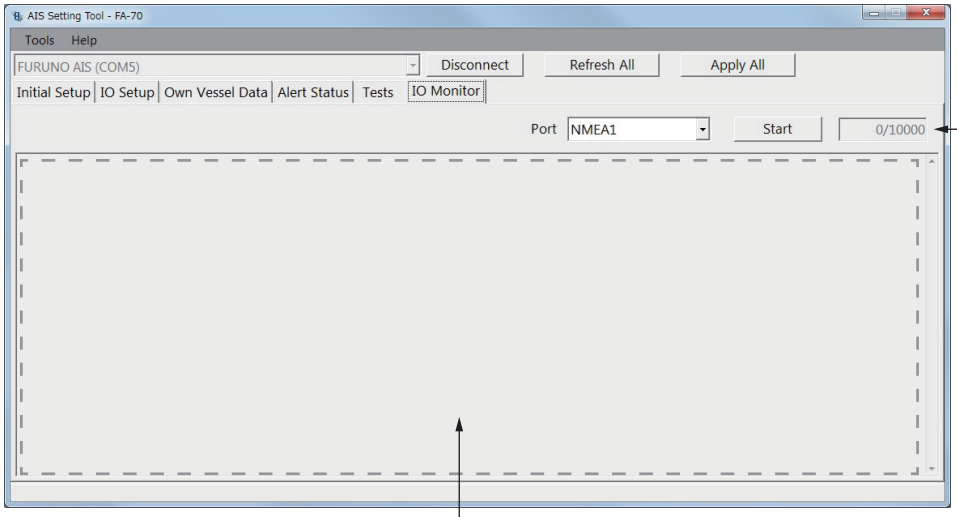
Click [Screenshot] to take a screenshot.

For the alert lists, see page AP-4.

# 3.6 IO Monitor

The data input from each port can be monitored.

**Note:** This menu appears only on the PC.




- [Port]: Select the port that displays the received data.
- [Start]: Click to start the receiving data display. The displayed characters are up to 10000 characters. The [Start] button changes to the [Stop] button.
- [Stop]: Click to stop the receiving data display. The [Stop] button changes to the [Start] button.

# 4. MAINTENANCE

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**
**Do not open the equipment.**

Only qualified personnel can work inside the equipment.

**NOTICE**

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

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

## 4.1 Maintenance

Regular maintenance helps good performance. Check the items listed below monthly to keep your equipment in good working order.

| Item | Check point |
|---|---|
| Wiring | Check that each cable and wire are securely fastened. Refasten if necessary. |
| Ground | Check grounding for rust. Clean if necessary. |
| Antenna | Check antenna and its cabling for damage. Replace if necessary. |
| Cabinet | Dust and dirt should be removed from the cabinet with a soft, dry cloth. Do not use chemical-based cleaners; they can remove paint and markings. |

## 4.2 Replacement of Fuse

**⚠ WARNING**

**Use the correct fuse.**

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

The fuse (5A) in the cable protects it from overcurrent and equipment fault. If the unit cannot be powered, that is, the POWER LED is off, the fuse may have blown. If this happens, turn off the power to the FA-70, and check the fuse. If the fuse has blown, find out the reason before replacing it. If it blows again after replacement, contact your dealer for advice.

| Name | Type |
|---|---|
| Fuse (5A) | 250VAC, 5A |

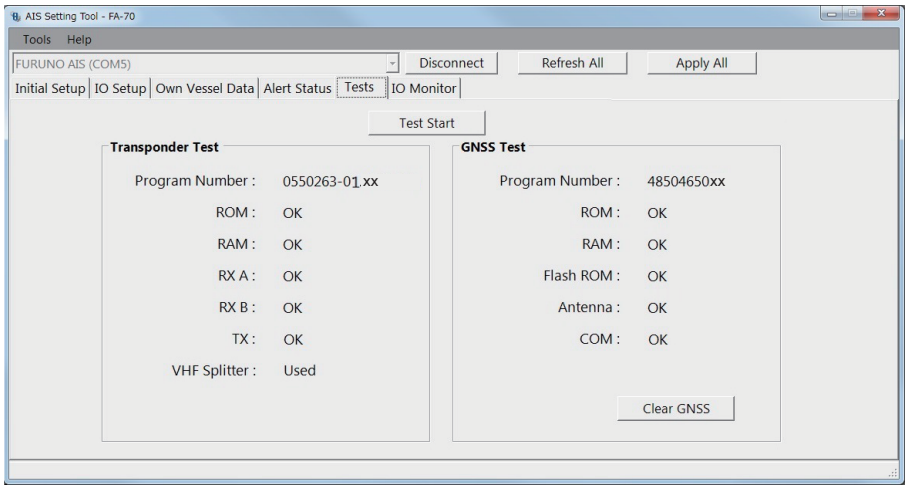
# 4.3 Troubleshooting

The troubleshooting table below provides typical operating problems and the means to restore normal operation. If you cannot restore normal operation, do not open the cover of the FA-70; there are no user serviceable parts inside the transponder.

| Symptom | Remedy |
|---|---|
| Cannot turn on the power. | • Check that the cable between the transponder and power for damage.<br>• Check the power supply.<br>• Check the fuse. |
| Cannot transmit/receive. | • Check that the VHF antenna cable is firmly connected.<br>• Check the VHF antenna and its cabling for damage.<br>• Confirm the channel setting. |
| The message is sent to a wrong ship. | Confirm the MMSI. |
| No position data. | • Check the GPS antenna.<br>• Check the GPS antenna cable and its connectors. |
| ERROR LED lights in red. | Contact your dealer. |
| ERROR LED lights in orange. | • Check that the GPS antenna is correctly connected.<br>• Check that the VHF antenna is correctly connected.<br>• Confirm the MMSI. |
| Cannot start the AIS Setting Tool, or cannot connect the PC to the transponder. | • Check that the USB cable between the transponder and the PC for damage.<br>• Do the followings:<br>1) Quit the AIS Setting Tool.<br>2) Disconnect the USB cable of the PC, and then connect the USB cable again.<br>3) Start the AIS Setting Tool. |

# 4.4 Diagnostics

The FA-70 provides diagnostic tests to check the transponder unit for proper operation.




*[Tests] screen for PC*

| Menu item | Description |
|---|---|
| [Test Start] (for the PC) | Click to start the test. |
| [Transponder Test] | The program version number appears on the first line. The RAM, ROM, two RX channels (A and B) and TX are checked for proper operation, and the results are displayed as "OK" or "NG" (No Good). For any NG, contact your dealer for advice. When the VHF spliter board is connected, "Used" appears, not connected, "Unused" appears on the last line. |
| [GNSS Test] | The program version number appears on the first line. The ROM, RAM, Flash ROM, the connection with antenna (including power line) and COM (communication) are checked for proper operation, and the results are displayed as [OK] or [NG] (No Good). For any NG, contact your dealer for advice. |
| [Clear GNSS] (for the PC) | Click to initialize the internal GNSS core. The confirmation message "Clear GNSS. Are you sure?" appears. Click [Yes] to initialize. |

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# APPENDIX 1 MENU TREE

## AIS Setting Tool (PC)

***Bold italic***: Default

- Initial Setup
  - Status (Shows the status for transmission and reception of AIS.)
  - TX Mode (***SOTDMA***, CSTDMA)
  - SART Test RX (***OFF***, ON)
  - DSC Monitoring (OFF, ***ON***)
  - Long-Range TX[*1] (***OFF***, ON)
  - Silent Mode Controller (***Hardware Switch***, Software Switch)
  - Silent Mode[*2] (***Normal (TX/RX)***, RX Only)
  - Ship Static
    - MMSI (Enter the MMSI number.)
    - Ship Name (Enter the ship's name.)
    - Call Sign (Enter the call sign.)
    - Ship Type (0: Not Available or No ship, 1: Reserved for Future Use, 2: WIG, ***3: Vessel***, 4: HSC, 5: Special Craft, 6: Passenger Ships, 7: Cargo Ships, 8: Tanker(s), 9: Other Types of Ship)
    - Cargo Type (Options are differ depending on the setting in [Ship Type].)
    - Serial Number (Shows the serial number for the equipment.)
    - Antenna Position (GNSS) (A/B: 0 to 511 m; ***0 m***, C/D: 0 to 63 m; ***0 m***)

[*1]: This menu item is displayed when [TX Mode ] is set to [SOTDMA].

[*2]: This menu item is displayed when [Silent Mode Controller] is set to [Software Switch].

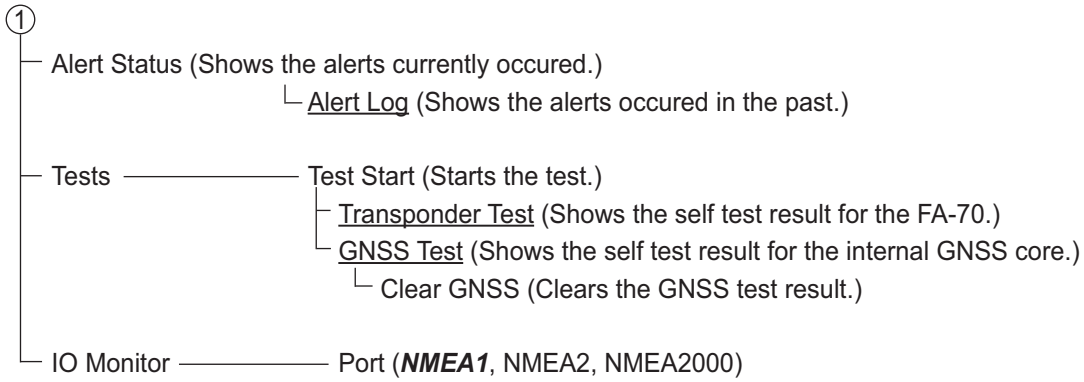
- IO Setup
  - Common
    - Port Priority (Heading)
      - 1st (***NMEA2000***, NMEA1, NMEA2)
      - 2nd (NMEA2000, ***NMEA1***, NMEA2)
      - 3rd (NMEA2000, NMEA1, ***NMEA2***)
  - NMEA2000
    - CAN Unique Number (Shows the CAN unique number.)
    - CAN Address (Shows the CAN address.)
    - Output Mode (OFF, AIS, GNSS, ***AIS + GNSS***)
    - Format (***NMEA2000 V2***, NMEA2000 V1)
  - NMEA0183
    - NMEA1 / NMEA2
      - Output Mode (OFF, ***AIS***, GNSS, AIS + GNSS)
      - Speed (***AIS: 38400 bps***, Sensor: 4800 bps)[*3]
      - Output GNSS (***OFF***, GGA + VTG Sentences, GLL + VTG Sentences, RMC Sentence)[*4]

[*3]: Fixed to [AIS: 38400 bps] when [Output Mode] is set to [AIS] or [AIS + GNSS].

[*4]: These options are selectabled when [Output Mode] is set to [GNSS] or [AIS + GNSS].

- Own Vessel Data
  - View Channel
    - CH A: (Shows the channel number and TX/RX mode for channel A.)
    - CH B: (Shows the channel number and TX/RX mode for channel B.)
    - Power (Shows the transmission power.)
    - Region List (Shows the channel management information of local sea areas.)
  - Sensor Status (Shows the sensor information.)
  - GNSS Status (Shows the GNSS information.)

①




## TZTL12F/15F, TZT12F/16F/19F

On the home screen, select [Settings] - [Initial Setup] - [NETWORK SENSOR SETUP] - [FA-70] in order to display the menus.

**Menu**

***Bold italic***: Default

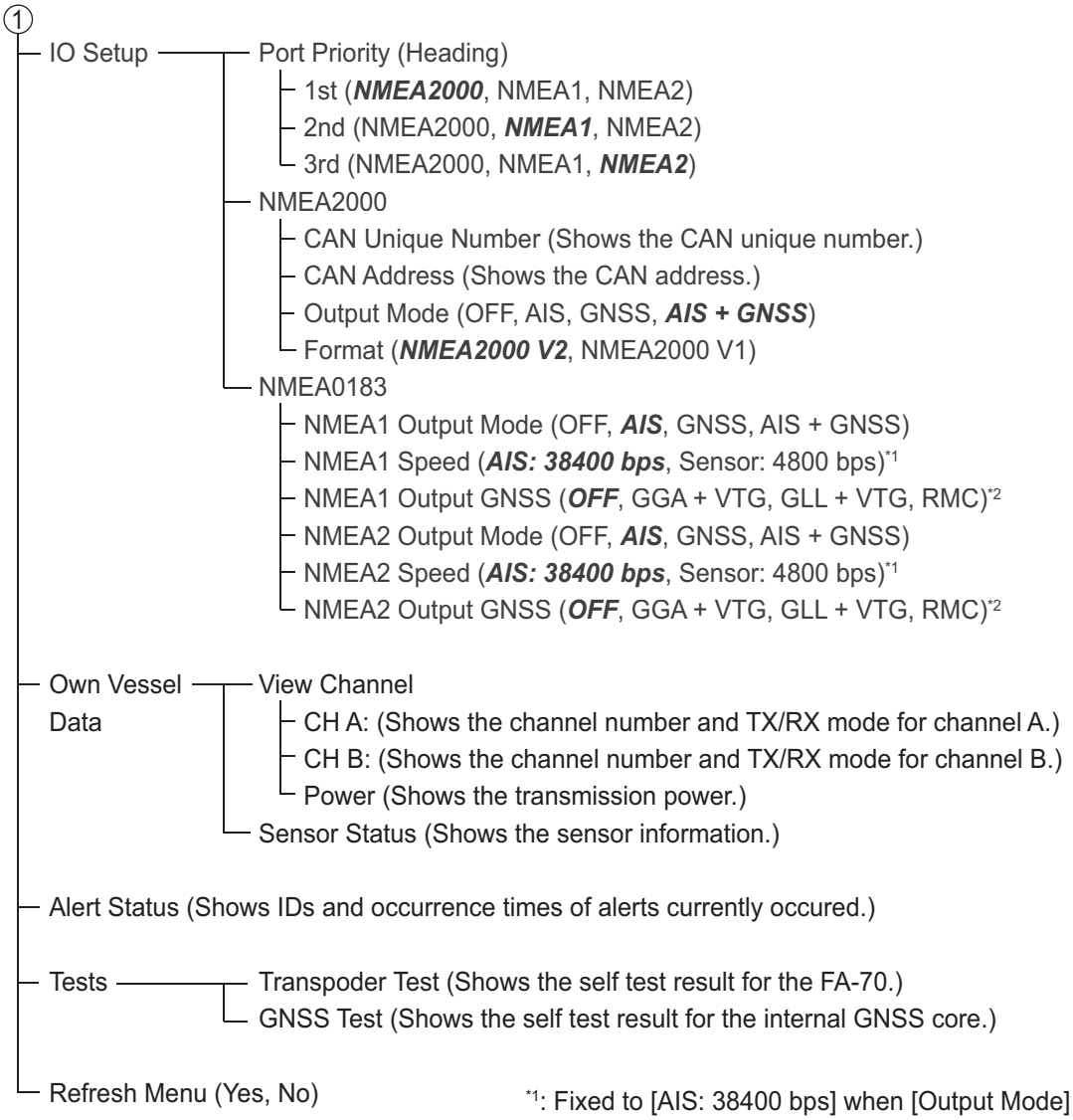
- AIS Status (Shows the status for transmission and reception of AIS.)
- Initial Setup
  - Ship Static
    - MMSI*1
    - Ship Name (Enter the ship's name.)
    - Call Sign (Enter the call sign.)
    - Ship Type (0: Not Available or No ship, 1: Reserved for Future Use, 2: WIG, ***3: Vessel***, 4: HSC, 5: Special Craft, 6: Passenger Ships, 7: Cargo Ships, 8: Tanker(s), 9: Other Types of Ship)
    - Cargo Type (Options are differ depending on the setting in [Ship Type].)
    - Serial Number (Shows the serial number for the equipment.)
    - Antenna Position (GNSS) (A/B: 0 to 511 m; ***0 m***, C/D: 0 to 63 m; ***0 m***)
  - TX Mode (***SOTDMA***, CSTDMA)
  - SART Test RX (***OFF***, ON)
  - DSC Monitoring (OFF, ***ON***)
  - Long-Range TX*2 (***OFF***, ON)
  - Silent Mode Controller (***Hardware Switch***, Software Switch)
  - Silent Mode*3 (***Normal (TX/RX)***, RX Only)

①

*1: You can enter the MMSI only once. After entering the MMSI, only the number is displayed.

*2: This menu item is displayed when [TX Mode ] is set to [SOTDMA].

*3: This menu item is displayed when [Silent Mode Controller] is set to [Software Switch].




*1: Fixed to [AIS: 38400 bps] when [Output Mode] is set to [AIS] or [AIS + GNSS].

*2: These options are selectabled when [Output Mode] is set to [GNSS] or [AIS + GNSS].

# APPENDIX 2 ALERT LISTS

The table below shows the alert ID, text, meaning and remedy for each alert.

| ID | Text | Meaning | Remedy |
|---|---|---|---|
| 001 | TX Malfunction | Transmission stopped due to a failure. (The ERROR LED lights in red.) | Reasons: RF AMP Too Hot, Regulator For RF AMP Too Hot, VSWR Exceeds Limit, Current to RF AMP Regulated<br>Check the VHF antenna and FA-70 connections.<br>Reason: TX PLL Error<br>Contact your dealer.<br>Reason: No MMSI<br>Check that the own ship MMSI is set.<br>Reason: Noise Level Too High<br>Check noise sources near the antenna. |
| 002 | Antenna VSWR Exceeds Limit | High VSWR for the AIS antenna detected. (Continued operation possible.) | Check the VHF antenna. If the problem is not rectified, contact your dealer. |
| 003 | RX Channel 1 Malfunction | RX1 hardware trouble. Transmission stopped on corresponding TX channel. (The ERROR LED lights in red.) | Circuit board may be damaged. Contact your dealer. |
| 004 | RX Channel 2 Malfunction | RX2 hardware trouble. Transmission stopped on corresponding TX channel. (The ERROR LED lights in red.) | |
| 007 | UTC Sync Invalid | Internal GPS has no fix. (Continued operation possible using indirect or semaphore synchronization.) | Check the GPS antenna connection. If the error appears frequently, contact your dealer. |
| 026 | No Position Sensor in Use | No L/L data. (Continued operation possible.) | |
| 029 | No Valid SOG Information | Invalid SOG data. (Continued operation possible.) | |
| 030 | No Valid COG Information | Invalid COG data. (Continued operation possible.) | |

# APPENDIX 3 NMEA2000/0183 INPUT/ OUTPUT DATA

CAN bus (NMEA2000) input/output

*Input PGN*

| PGN | Description |
|---|---|
| 059392 | ISO Acknowledgment |
| 059904 | ISO Request |
| 060160 | ISO Transport Protocol, Data Transfer |
| 060416 | ISO Transport Protocol, Connection Management - BAM Group Function |
| 060928 | ISO Address Claim |
| 065240 | ISO Commanded Address |
| 126208 | NMEA - Request Group Function |
| | NMEA - Command Group Function |
| 127250 | Vessel Heading |

*Output PGN*

| PGN | Description | Output cycle*1 (ms) |
|---|---|---|
| 059392 | ISO Acknowledgment | |
| 059904 | ISO Request | |
| 060928 | ISO Address Claim | |
| 126208 | NMEA - Acknowledge Group Function | |
| 126464 | PGN List - Transmit PGN's Group Function | *2 |
| | PGN List - Received PGN's Group Function | |
| 126992 | System Time | 1,000 |
| 126993 | Heartbeat | 60,000 |
| 126996 | Product Information | *2 |
| 126998 | Configuration Information | *2 |
| 127258 | Magnetic Variation | 1,000 |
| 129025 | Position, Rapid Update | 100 |
| 129026 | COG & SOG, Rapid Update | 250 |
| 129029 | GNSS Position Data | 1,000 |
| 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 | |
| 129540 | GNSS Sats in View | 1,000 |
| 129792 | AIS DGNSS Broadcast Binary Message | |
| 129793 | AIS UTC and Date Report | |
| 129794 | AIS Class A Static and Voyage Related Data | |
| 129795 | AIS Addressed Binary Message | *3 |
| 129796 | AIS Acknowledge | |
| 129797 | AIS Binary Broadcast Message | |
| 129798 | AIS SAR Aircraft Position Report | |

| PGN | Description | Output cycle*1 (ms) |
|---|---|---|
| 129801 | AIS Addressed Safety Related Message | |
| 129802 | AIS Safety Related Broadcast Message | |
| 129803 | AIS Interrogation | |
| 129804 | AIS Assignment Mode Command | *3 |
| 129805 | AIS Data Link Management Message | |
| 129806 | AIS Channel Management | |
| 129807 | AIS Group Assignment | |
| 129809 | AIS Class B “CS” Static Data Report, Part A | |
| 129810 | AIS Class B "CS" Static Data Report, Part B | |
| 129811 | AIS Single Slot Binary Message | |
| 129812 | AIS Multi Slot Binary Message | *3 |
| 129813 | AIS Long - Range Broadcast Message | *3 |

*1: Output cycle for an AIS related PGN depends on vessel traffic conditions.

*2: Outputs when receiving output request.

*3: SOTDMA mode only

## NMEA0183 input/output

| Sentence | Description | Input | Output |
|---|---|---|---|
| ABM | AIS Addressed and Binary Broadcast Acknowledgement | * | |
| ABK | AIS Addressed and Binary Broadcast Acknowledgement | | ✓ |
| ACA | AIS Regional Channel Assignment Message | | ✓ |
| ACK | Acknowledge Alarm | ✓ | |
| ACS | AIS Channel Management Information Source | | ✓ |
| AIQ | Query Sentence | ✓ | |
| ALR | Set Alarm State | | ✓ |
| BBM | AIS Broadcast Binary Message | * | |
| GGA | Global Positioning System Fix Data | | ✓ |
| GLL | Geographic Position - Latitude/Longitude | | ✓ |
| HDT | Heading, True | ✓ | |
| RMC | Recommended Minimum Specific GNSS Data | | ✓ |
| SSD | AIS Ship Static Data | ✓ | ✓ |
| THS | True Heading and Status | ✓ | |
| TXT | Text Transmission | | ✓ |
| VDM | AIS VHF Data-Link Message | | ✓ |
| VDO | AIS VHF Data-Link Own-Vessel Report | | ✓ |
| VER | Version | | ✓ |
| VSD | AIS Voyage Static Data | ✓ | ✓ |
| VTG | Course Over Ground & Ground Speed | | ✓ |

*: SOTDMA mode only

# APPENDIX 4 RADIO REGULATORY INFORMATION

## USA-Federal Communications Commission (FCC)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

***Caution: Exposure to Radio Frequency Radiation***
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65.
- This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body.
- This device must not be co-located or operating in conjunction with any other antenna or transmitter.

## Innovation, Science and Economic Development Canada (ISED)

***Caution: Exposure to Radio Frequency Radiation***
This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body.

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contr êolé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'ISED. Cet équipement doit etre installé et utilise en gardant une distance de 20 cm ou plus entre le dispositif rayonnant et le corps.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

# SPECIFICATIONS OF CLASS B AIS TRANSPONDER
# FA-70

## 1 GENERAL

| | | |
|---|---|---|
| 1.1 | Type | Class B AIS Transponder |
| 1.2 | RX capacity | 2250 report/minute, 1 channel<br>4500 report/minute, 2 channel |
| 1.3 | RX system | SOTDMA or CSTDMA (user select),<br>dual wave simultaneous reception |
| 1.4 | Synchronous framing | UTC direct or UTC indirect (SOTDMA)<br>UTC direct (CSTDMA) |
| 1.5 | Operating mode | Autonomous, Assigned, polled/interrogation response |
| 1.6 | Frequency switching | Automatic |
| 1.7 | DSC receiving | Time sharing system |
| 1.8 | Initialization | Within 2 minutes after power-on |
| 1.9 | Prevention of abnormal TX | Auto-suspended for detecting TX more than 1 second |
| 1.10 | Regulations | IEC 62287-1/2 |

## 2 TRANSMITTER

| | | |
|---|---|---|
| 2.1 | Frequency range | 156.025 MHz to 162.025 MHz (F1D) |
| 2.2 | Output power | 5 W or 1W (SOTDMA), 2 W (CSTDMA) |
| 2.3 | Modulation | GMSK |
| 2.4 | Channel interval | 25 kHz |
| 2.5 | Frequency deviation | ±500 Hz |
| 2.6 | Spurious emission | 9 kHz to 1 GHz, -36 dBm or less<br>1 GHz to 4 GHz, -30 dBm or less |
| 2.7 | Transmission interval | |
| | SOTDMA | 5 s (SOG>23 kn), 15 s (14<SOG≤23 kn), 30 s (2<SOG≤14 kn),<br>3 min. (SOG≤2 kn) |
| | CSTDMA | 30 s (SOG>2 kn), 3 min. (SOG≤2 kn) |

## 3 AIS RECEIVER

| | | |
|---|---|---|
| 3.1 | Frequency range | 156.025 MHz to 162.025 MHz (F1D) |
| 3.2 | Oscillator frequency | 1st local oscillator: f+ (46.35/58.05 MHz),<br>2nd local oscillator: 45.9/57.6 MHz |
| 3.3 | Intermediate frequency | 1st: 46.35/58.05 MHz, 2nd: 450 kHz |
| 3.4 | Receiving method | Double super heterodyne |
| 3.5 | Sensitivity | -107 dBm or less (PER20% or less) |
| 3.6 | Error at high input level | -77 dBm (PER2% or less), -7 dBm (PER10% or less) |
| 3.7 | Co-channel rejection | -10 dB or more |
| 3.8 | Adjacent channel selectivity | 70 dB or more |
| 3.9 | Spurious response | 70 dB or more |
| 3.10 | Inter-modulation | 65 dB or more |

## 4 DSC RECEIVER (TIMESHARING SYSTEM)

| | | |
|---|---|---|
| 4.1 | Frequency | 156.525 MHz (CH70) |
| 4.2 | Sensitivity | -107 dBm (BER1% or less) |

| | | |
|---|---|---|
| 4.3 | Error at high input level | -7 dBm (PER10% or less) |
| 4.4 | Co-channel rejection | -10 dB or more |
| 4.5 | Adjacent channel selectivity | 70 dB or more |
| 4.6 | Spurious response | 70 dB or more |
| 4.7 | Inter-modulation | 65 dB or more |
| 4.8 | Sensitivity suppression | 84 dB |

## 5 VHF SPLITTER

| | | |
|---|---|---|
| 5.1 | Rx function | |
| | Frequency range | 155 MHz to 164 MHz |
| | Insertion loss | 0 dB typical |
| 5.2 | Tx function | |
| | Frequency range | 155 MHz to 164 MHz |
| | Insertion loss | 1 dB or less |
| | Input power | 25 W max. |
| | Power detection | 0.1 W or more |

## 6 GPS RECEIVER

| | | |
|---|---|---|
| 6.1 | Number of channel | GPS: 12 channels parallel, SBAS: 2 channels, 14 satellites |
| 6.2 | Receiving frequency | 1575.42 MHz, C/A code |
| 6.3 | Position fixing method | All in view, 8-state Kalman filter |
| 6.4 | Position accuracy | GPS: 13 m approx. (2drms, HDOP≤4) |
| 6.5 | Tracking velocity | 1000 kn |
| 6.6 | Position fixing time | 90 s approx. |
| 6.7 | Update interval | 1 s |
| 6.8 | DGPS data correcting | By AIS information |

## 7 INTERFACE

| | | |
|---|---|---|
| 7.1 | Number of port | |
| | Serial | 2 ports, IEC61162-1, 4800/38400 bps |
| | NMEA2000 | 1 port, External power required 12-24VDC (9-32VDC), LEN=1@9V |
| | USB | 1 port, USB2.0, Full speed, for maintenance |
| | Contact closure | 1 port, for silent switch |
| 7.2 | Data sentence | |
| | Input | ABM, ACK, AIR, AIQ, BBM, HDT, SSD, THS, VSD |
| | Output | ABK, ACA, ACS, ALR, GGA, GLL, RMC, SSD, TXT, VDM, VDO, VER, VSD, VTG |
| 7.3 | Output P sentence | |
| | PFEC | pidat |
| 7.4 | NMEA2000 PGN | |
| | Input | 059392/904, 060160/416/928, 061184, 065240, 126208/720, 127250 |
| | Output | 059392/904, 060928, 061184, 126208/464/720/992/993/996/998, 127258, 129025/026/029/038/039/040/041/540, 129792/793/794/795*/796/797/798, 129801/802/803/804*/805/806/807/809/810/811/812*/813*, 130822/823<br>*: SOTDMA only |

## 8 POWER SUPPLY

12-24 VDC (9.6-31.2 VDC): 1.8-0.9 A (TX), 0.3-0.2 A (RX)

## 9 ENVIRONMENTAL CONDITIONS

| | | |
|---|---|---|
| 9.1 | Ambient temperature | |
| | Antenna unit | -25°C to +70°C |
| | Transponder | -15°C to +55°C |
| 9.2 | Relative humidity | 93% or less at +40°C |
| 9.3 | Degree of protection | |
| | Antenna unit | IP56 |
| | Transponder | IP55 |
| 9.4 | Vibration | IEC 60945 Ed.4 |

## 10 UNIT COLOR

| | | |
|---|---|---|
| 10.1 | Antenna unit | N9.5 |
| 10.2 | Transponder | N1.0 |

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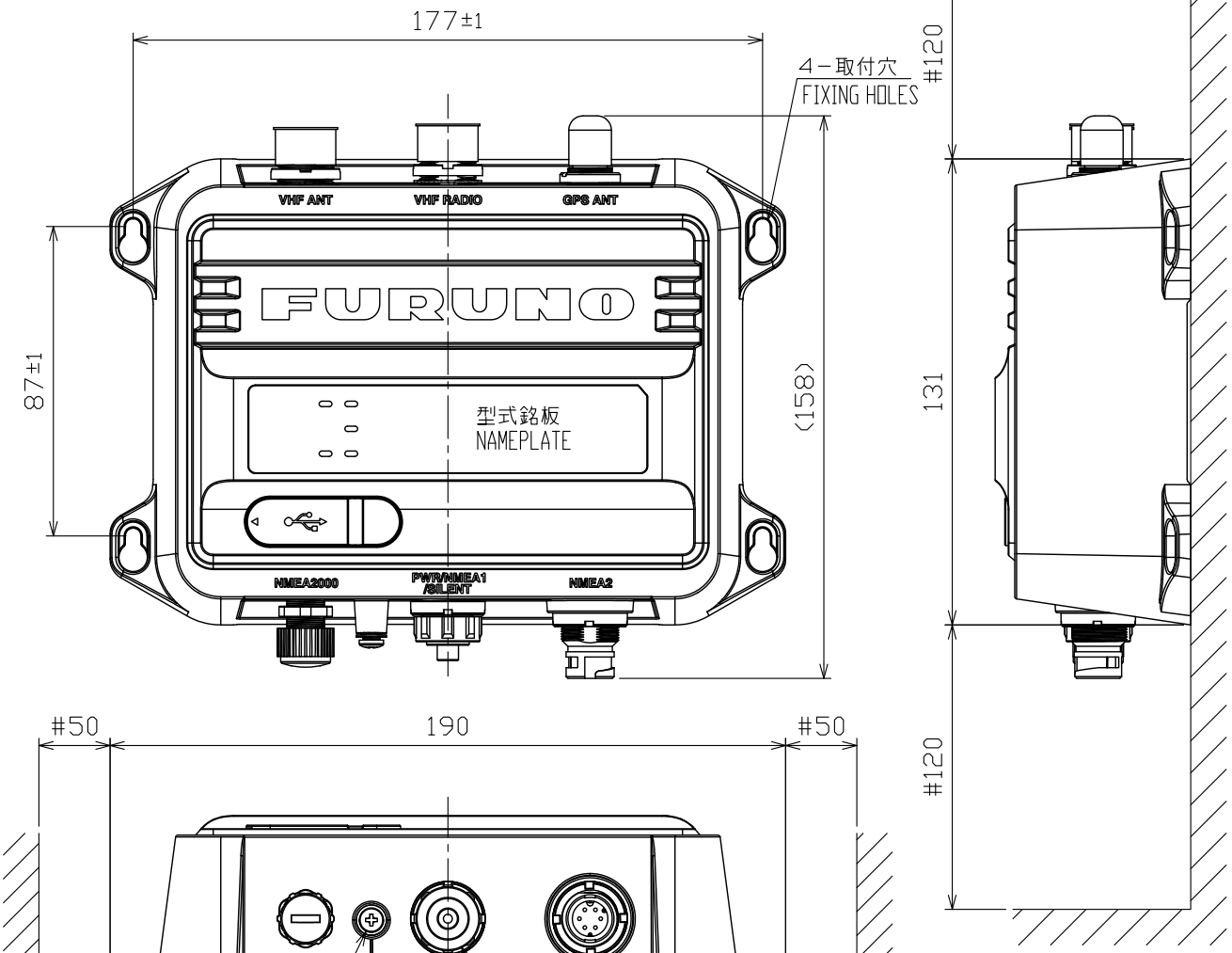


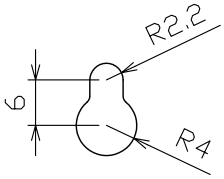


取付穴詳細（尺度：１／１）
DETAIL FOR FIXING (SCALE: 1/1)

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）取付用ねじはトラスタッピンネジ呼び径3.5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 Ø3.5 FOR FIXING THE UNIT.

表1 TABLE 1

| 寸法区分(mm) DIMENSION | 公差(mm) TOLERANCE |
|---|---|
| 0 < L ≤ 50 | ±1.5 |
| 50 < L ≤ 100 | ±2.5 |
| 100 < L ≤ 500 | ±3 |

| | | | |
|---|---|---|---|
| DRAWN 17/Oct/2019 T.YAMASAKI | | TITLE | FA-70 |
| CHECKED 17/Oct/2019 H.MAKI | | 名称 | 簡易型船舶自動識別装置（壁掛・卓上装備） |
| APPROVED 18/Oct/2019 H.MAKI | | | 外寸図 |
| SCALE 1/2 | MASS 0.52 ±10% kg | 質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE. | NAME CLASS B AIS TRANSPONDER (BULKHEAD/TABLETOP MOUNT) |
| DWG. No. C4515-G01- C | | REF. No. | OUTLINE DRAWING |

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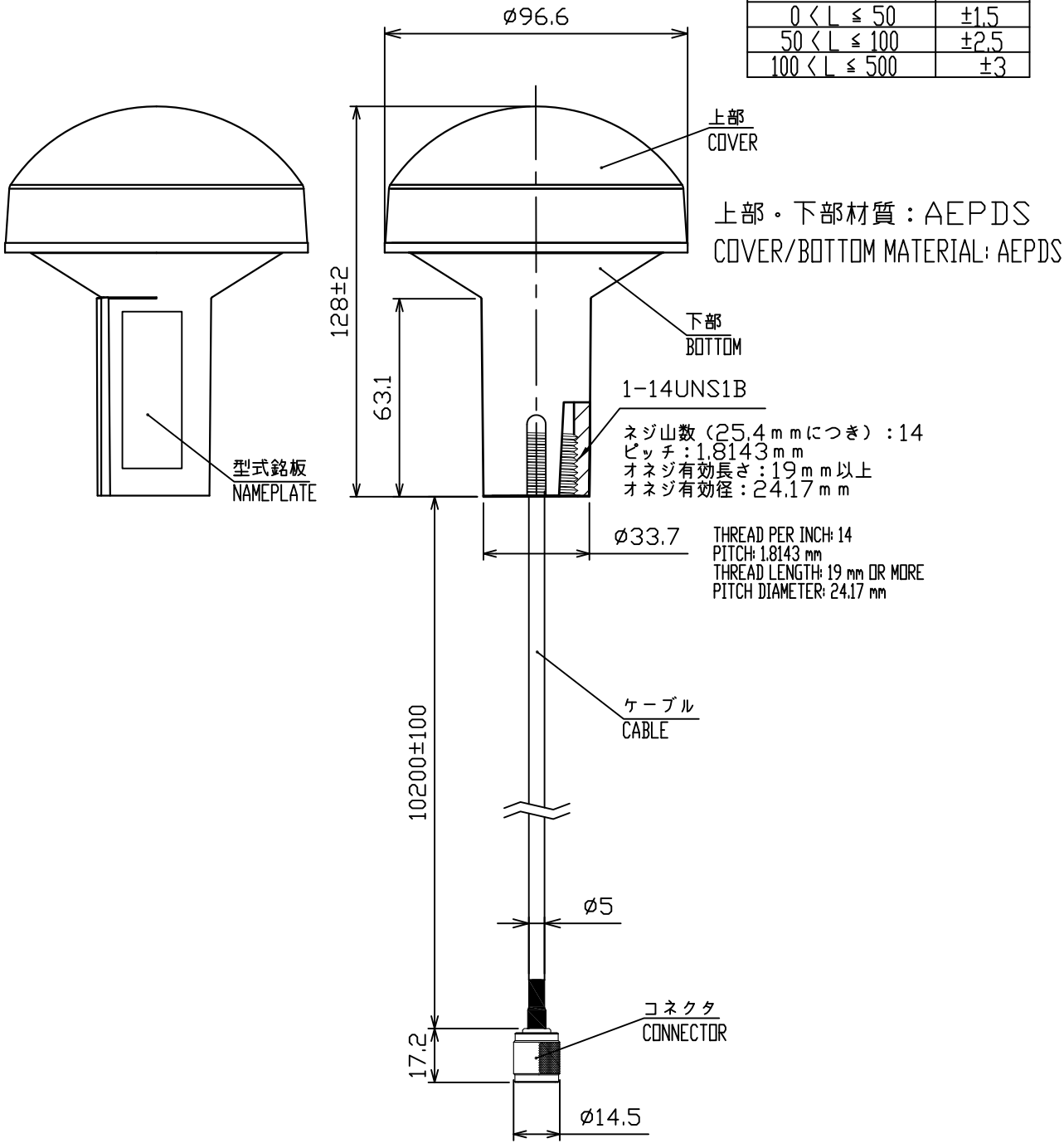
表1 TABLE 1

| 寸法区分(mm) DIMENSION | 公差(mm) TOLERANCE |
|---|---|
| 0 < L ≦ 50 | ±1.5 |
| 50 < L ≦ 100 | ±2.5 |
| 100 < L ≦ 500 | ±3 |




注記

1）指定なき寸法公差は表1による。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

| | | | |
|---|---|---|---|
| DRAWN 7/Apr/2017 T.YAMASAKI | | TITLE | GPA-C01 |
| CHECKED 7/Apr/2017 H.MAKI | | 名称 | 空中線部 |
| APPROVED 7/Apr/2017 H.MAKI | GP-39 | | 外寸図 |
| SCALE 1/2 MASS 0.53 ±10% kg | 質量はケーブル（10m）を含む。 MASS INCLUDES 10m CABLE. | NAME | ANTENNA UNIT |
| DWG. No. C4494-G04- B | REF. No. | | OUTLINE DRAWING |

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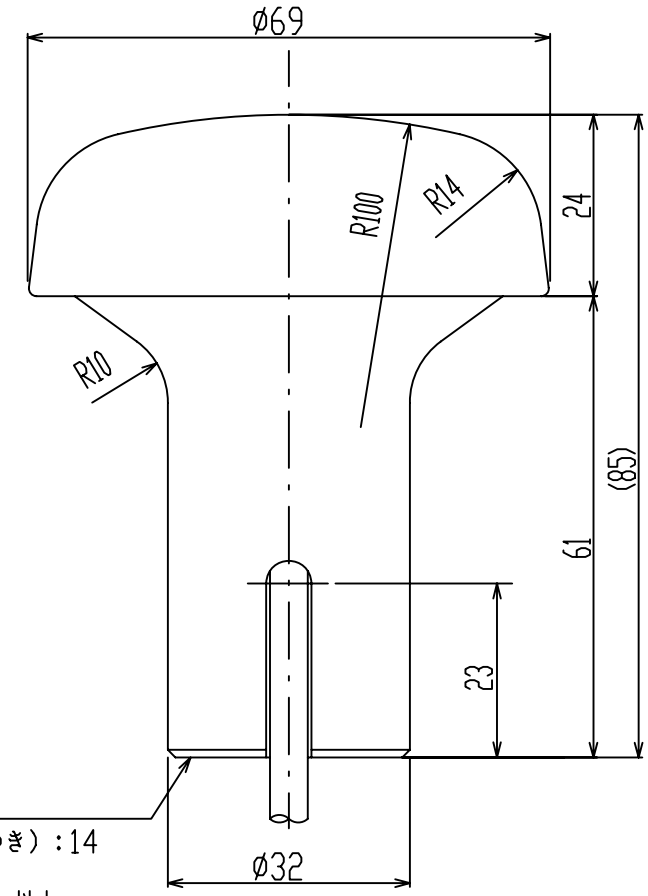


表1 TABLE 1

| 寸法区分(mm) DIMENSION | 公差(mm) TOLERANCE |
|---|---|
| L ≦ 50 | ±1.5 |
| 50 < L ≦ 100 | ±2.5 |
| 100 < L ≦ 500 | ±3 |

1-14UNS1B
ねじ山数(25.4mmにつき):14
ピッチ: 1.8143 mm
オネジ有効長さ:19 mm以上
オネジ有効径:24.17mm

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 19 mm OR MORE
PITCH DIAMETER: 24.17mm

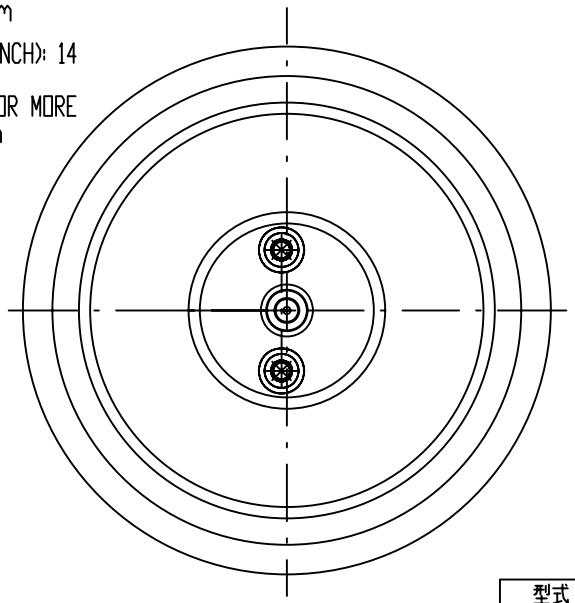

表2 TABLE 2

| 型式 TYPE | ケーブル長(m) CABLE LENGTH | プラグ PLAG | 質量(kg±10%) MASS |
|---|---|---|---|
| GPA-017 | 10 | TNC-P-3 | 0.6 |
| GPA-017S | 0.2 | TNC-J-3 | 0.15 |

注記
指定外の寸法公差は表1による。

NOTE
TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

| | | | |
|---|---|---|---|
| DRAWN Mar. 27 '07 T.YAMASAKI | | TITLE | GPA-017/017S |
| CHECKED Mar. 27 '07 T.TAKENO | | 名称 | 空中線部 |
| APPROVED Mar.27'07 R.Esumi | | | 外寸図 |
| SCALE 1/1 MASS TABLE 2 表2参照 | | NAME | ANTENNA UNIT |
| DWG.No. C4384-G04- L | | | OUTLINE DRAWING |

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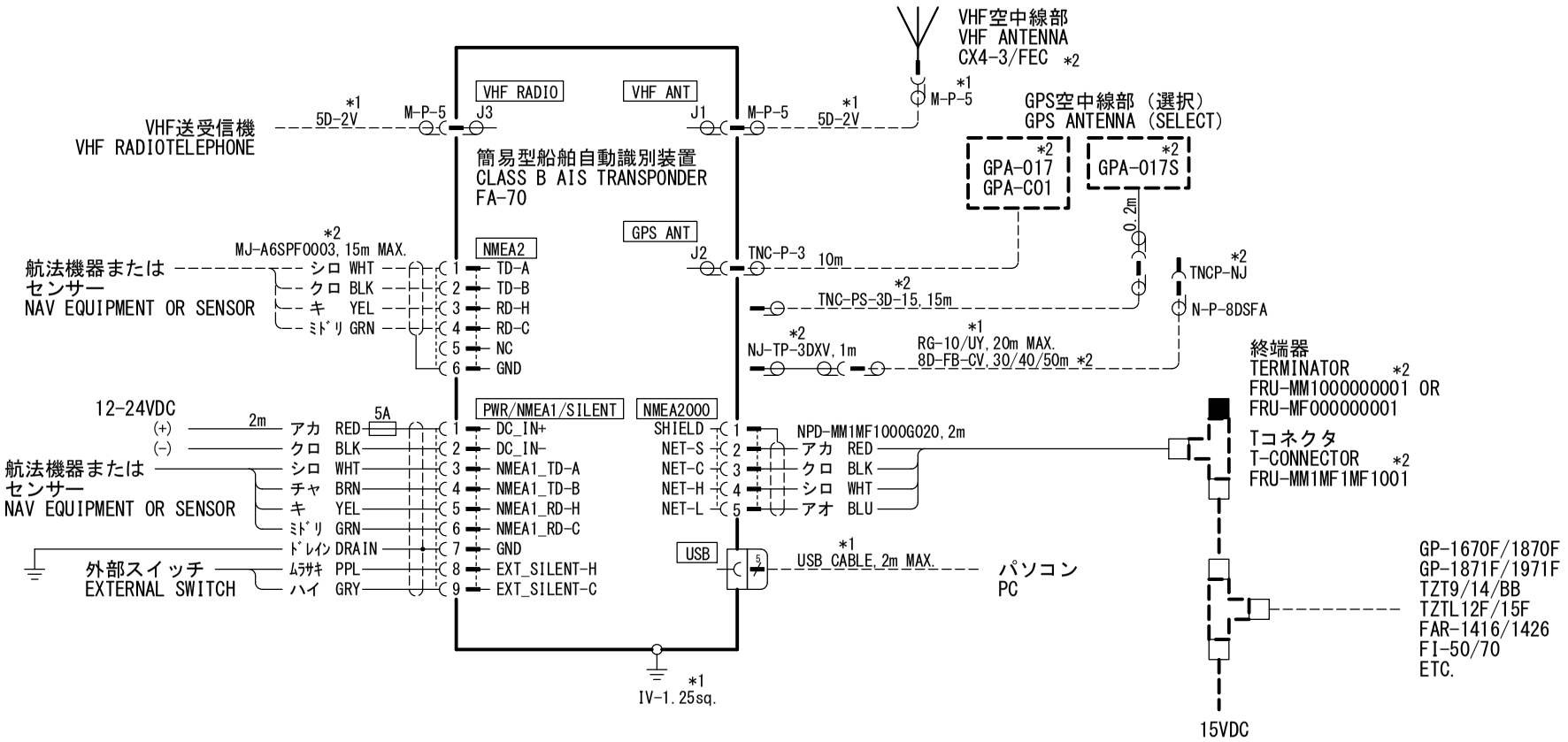


注記
＊１）造船所手配。
＊２）オプション。

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

| | | | |
|---|---|---|---|
| DRAWN 2/Oct/2019 T. YAMASAKI | | TITLE | FA-70 |
| CHECKED 2/Oct/2019 H. MAKI | | 名称 | 簡易型船舶自動識別装置 |
| APPROVED 23/Oct/2019 H.MAKI | | | 相互結線図 |
| SCALE / MASS kg | | NAME | CLASS B AIS TRANSPONDER |
| DWG. No. C4515-C01- A | REF. No. | | INTERCONNECTION DIAGRAM |



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## Declaration of Conformity

## [FA-70]

| | |
|---|---|
| Bulgarian (BG) | С настоящото Furuno Electric Co., Ltd. декларира, че гореспоменат тип радиосъоръжение е в съответствие с Директива 2014/53/ЕС.<br>Цялостният текст на ЕС декларацията за съответствие може да се намери на следния интернет адрес: |
| Spanish (ES) | Por la presente, Furuno Electric Co., Ltd. declara que el tipo de equipo radioeléctrico arriba mencionado es conforme con la Directiva 2014/53/UE.<br>El texto completo de la declaración UE de conformidad está disponible en la dirección Internet siguiente: |
| Czech (CS) | Tímto Furuno Electric Co., Ltd. prohlašuje, že výše zmíněné typ rádiového zařízení je v souladu se směrnicí 2014/53/EU.<br>Úplné znění EU prohlášení o shodě je k dispozici na této internetové adrese: |
| Danish (DA) | Hermed erklærer Furuno Electric Co., Ltd., at ovennævnte radioudstyr er i overensstemmelse med direktiv 2014/53/EU.<br>EU-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse: |
| German (DE) | Hiermit erklärt die Furuno Electric Co., Ltd., dass der oben genannte Funkanlagentyp der Richtlinie 2014/53/EU entspricht.<br>Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar: |
| Estonian (ET) | Käesolevaga deklareerib Furuno Electric Co., Ltd., et ülalmainitud raadioseadme tüüp vastab direktiivi 2014/53/EL nõuetele.<br>ELi vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil: |
| Greek (EL) | Με την παρούσα η Furuno Electric Co., Ltd., δηλώνει ότι ο προαναφερθέντας ραδιοεξοπλισμός πληροί την οδηγία 2014/53/ΕΕ.<br>Το πλήρες κείμενο της δήλωσης συμμόρφωσης ΕΕ διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο: |
| English (EN) | Hereby, Furuno Electric Co., Ltd. declares that the above-mentioned radio equipment type is in compliance with Directive 2014/53/EU.<br>The full text of the EU declaration of conformity is available at the following internet address: |
| French (FR) | Le soussigné, Furuno Electric Co., Ltd., déclare que l'équipement radioélectrique du type mentionné ci-dessus est conforme à la directive 2014/53/UE.<br>Le texte complet de la déclaration UE de conformité est disponible à l'adresse internet suivante: |
| Croatian (HR) | Furuno Electric Co., Ltd. ovime izjavljuje da je gore rečeno radijska oprema tipa u skladu s Direktivom 2014/53/EU.<br>Cjeloviti tekst EU izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi: |
| Italian (IT) | Il fabbricante, Furuno Electric Co., Ltd., dichiara che il tipo di apparecchiatura radio menzionato sopra è conforme alla direttiva 2014/53/UE.<br>Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo Internet: |
| Latvian (LV) | Ar šo Furuno Electric Co., Ltd. deklarē, ka augstāk minēts radioiekārta atbilst Direktīvai 2014/53/ES.<br>Pilns ES atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē: |

| | |
|---|---|
| Lithuanian (LT) | Aš, Furuno Electric Co., Ltd., patvirtinu, kad pirmiau minėta radijo įrenginių tipas atitinka Direktyvą 2014/53/ES.<br>Visas ES atitikties deklaracijos tekstas prieinamas šiuo interneto adresu: |
| Hungarian (HU) | Furuno Electric Co., Ltd. igazolja, hogy fent említett típusú rádióberendezés megfelel a 2014/53/EU irányelvnek.<br>Az EU-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen: |
| Maltese (MT) | B'dan, Furuno Electric Co., Ltd., niddikjara li msemmija hawn fuq-tip ta' tagħmir tar-radju huwa konformi mad-Direttiva 2014/53/UE.<br>It-test kollu tad-dikjarazzjoni ta' konformità tal-UE huwa disponibbli f'dan l-indirizz tal-Internet li ġej: |
| Dutch (NL) | Hierbij verklaar ik, Furuno Electric Co., Ltd., dat het hierboven genoemde type radioapparatuur conform is met Richtlijn 2014/53/EU.<br>De volledige tekst van de EU-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres: |
| Polish (PL) | Furuno Electric Co., Ltd. niniejszym oświadcza, że wyżej wymieniony typ urządzenia radiowego jest zgodny z dyrektywą 2014/53/UE.<br>Pełny tekst deklaracji zgodności UE jest dostępny pod następującym adresem internetowym: |
| Portuguese (PT) | O(a) abaixo assinado(a) Furuno Electric Co., Ltd. declara que o mencionado acima tipo de equipamento de rádio está em conformidade com a Diretiva 2014/53/UE.<br>O texto integral da declaração de conformidade está disponível no seguinte endereço de Internet: |
| Romanian (RO) | Prin prezenta, Furuno Electric Co., Ltd. declară că menționat mai sus tipul de echipamente radio este în conformitate cu Directiva 2014/53/UE.<br>Textul integral al declarației UE de conformitate este disponibil la următoarea adresă internet: |
| Slovak (SK) | Furuno Electric Co., Ltd. týmto vyhlasuje, že vyššie spomínané rádiové zariadenie typu je v súlade so smernicou 2014/53/EÚ.<br>Úplné EÚ vyhlásenie o zhode je k dispozícii na tejto internetovej adrese: |
| Slovenian (SL) | Furuno Electric Co., Ltd. potrjuje, da je zgoraj omenjeno tip radijske opreme skladen z Direktivo 2014/53/EU.<br>Celotno besedilo izjave EU o skladnosti je na voljo na naslednjem spletnem naslovu: |
| Finnish (FI) | Furuno Electric Co., Ltd. vakuuttaa, että yllä mainittu radiolaitetyyppi on direktiivin 2014/53/EU mukainen.<br>EU-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa: |
| Swedish (SV) | Härmed försäkrar Furuno Electric Co., Ltd. att ovan nämnda typ av radioutrustning överensstämmer med direktiv 2014/53/EU.<br>Den fullständiga texten till EU-försäkran om överensstämmelse finns på följande webbadress: |

## Online Resource

http://www.furuno.com/en/support/red_doc