NSR

USER MANUAL

AUTOMATIC IDENTIFICATION SYSTEM (AIS CLASS A)
NSI-1000

NSI-1000 UM.E 20180930-04

NOTICE TO USERS

- Thanks for your purchasing this product NSI-1000 AIS Class A.

- Please read this manual carefully to ensure proper use before installation and operation of the NSI-1000.

- NSR will assume no responsibility for the damage caused by improper use or modification of the product or claims of loss of profit by a third party.

- Software version in your product may be some different from that described as in this manual. Such difference will not affect the performance of the product. NSR reserves the right on continuous improvement of products both in software and hardware without any prior notice.

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- Please keep the manual for your future reference.

NOTICES FOR USE ON TANKERS

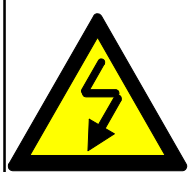
According to certain requirements, the transmitting power of AIS fitted on tankers should be reduced when the vessel is berthed.

The transmitting power of NSI-1000 will be reduced from 12.5W to 1W automatically if the below conditions are met:

- Ship's type has been set as TANKER.
- NAV STATUS in Voyage Setting has been set as MOORED.

You may check the TX power indication at the right upper of screen or in the 'VIEW OWN DATA".

SAFETY PRECAUTION

	**Warning** This unit contains electrostatic sensitive device. Observe precautions for handling.
	**Do not Disassemble the Equipment** Access to the interior of the NSI-1000 should only be by a NSR certified technician.
	**Dangerous Voltage** A dangerous voltage might be present, even though all power supplies to the system are switched off.

MODIFY RECORD

No.	Modify by	Date	Paragraph	Version	Reason
1	Q/A	2013/12/13		01	S/W revised
2	Q/A	2014/03/25		02	S/W revised
3	Q/A	2018/03/05		03	MKD upgraded
4	Q/A	2018/09/30		04	Generally modified

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1. General

1.1. What's AIS

The Automatic Identification System (AIS) is a Very High Frequency (VHF) radio broadcasting system that transfers packets of data over the VHF data link (VDL) and enables AIS equipped vessels and shore-based stations to exchange identification information and navigational data. Ships with AIS transponders continually transmit their ID, position, course, speed and other data to all nearby ships and shore stations.

Such information can aid greatly in situational awareness and provide a means to assist in collision avoidance.

AIS equipment is standardized by ITU, IEC, IALA and IMO and is subject to approval by a certification body.

The following AIS devices have been developed for variant applications.

AIS Class A:

mandated by the IMO for vessels of 300 gross tonnages and upwards engaged on international voyages, cargo ships of 500 gross tonnages and upwards, as well as passenger ships engaged on domestic voyages. Output power typically is 12.5W.

AIS Class B:

provides limited functionality and is intended for non-SOLAS commercial vessels and recreational vessels. Output power typically is 2W.

AIS Base Station:

is provided by aids-to-navigation authorities to enable the ship to shore / shore to ship transmission of information. Networked AIS Base Stations can assist in providing overall maritime domain awareness.

AIS AtoN (Aids to Navigation):

provides an opportunity to transmit position and status of buoys and lights through the same VDL, which can then show up on AIS-ready devices within the range.

AIS-SART:

Search and Rescue Transmitter using AIS can be used to assist in determining the location of a vessel in distress. It is typically used on life rafts.

AIS on Search and Rescue (SAR) Aircraft:

used on airplanes and helicopters to assist search and rescue operation.

1.2. Ship's Data

The below data is related to AIS class A.

- Static Data
  - Ship's Name and Call Sign (when available)
  - MMSI (Maritime Mobile Service Identification)
  - IMO Number (when available)
  - Length and Beam
  - Ship Type
- Dynamic Data
  - Ship's Position
  - UTC
  - Course Over Ground (COG)
  - Speed Over Ground (SOG)
  - Heading
  - Navigation Status
  - Rate of Turn (when available)
- Voyage Related Data
  - Draught
  - Dangerous Cargo (Type)
  - Destination and ETA
  - CPA (Closest Point of Approach)
  - TCPA (Time to Closest Point of Approach)
- Short Safety Related Message, Text Message

1.3. AIS target display

Different AIS targets will be displayed in different letter or icon as below:

Target	Target list display/Icon display
Own ship	
AIS Class A	
AIS Class B	
AIS base station	
AIS AtoN station	
AIS-SART	
AIS SAR	

1.4. Special Features

The NSI-1000 is an AIS Class A device.

It complies with IMO (International Maritime Organization) MSC74(69) Appendix 3, A.694, ITU-R M.1371-5, ITU-R M.825, IEC 61993-2(Type test standard) and IEC60945(EMC and environment condition).

NSI-1000 has below special features:

① Audible alarm when receiving AIS-SART, AIS-MOB targets;

② AIS-MOB list can be established for own ship;

③ Dangerous vessel list available based on CPA/TCPA calculation;

④ Transmitting power will be reduced to 1W for tanker while in state of berthing;

⑤ A special power supply board used in transponder with a wide range power input and isolated input/output from grounding;

⑥ A 7" color display is used as MKD, with touch-screen operation;

⑦ Special terminal block is used for easy and reliable connection.

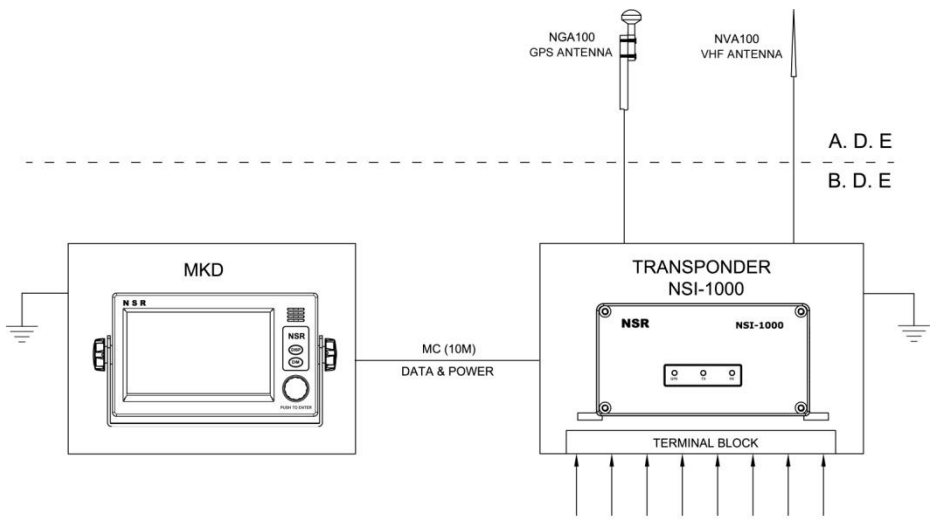
1.5. System Composition

NSI-1000 system consists of an AIS transponder, a display unit (MKD), VHF and GPS antennas and related accessories.

AIS transponder comprises a transmitter, two TDMA receivers, a DSC receiver, a communication processor, a built-in GPS receiver, and a DC / DC power supply module and interface circuits.

The display unit (MKD) includes an LCD module, the keyboard, processing circuits, and DC / DC power module.

The main structure of the system is as follows:



The equipment may be connected with the following external devices:

- Input from an external GPS receiver
- Input from Gyrocompass
- Output to ECS/ECDIS
- Output to Radar
- Output to VDR
- The remote communication terminal (such as INMARSAT)

1.6. Equipment List

In the package of NSI-1000, the below items are included:

Type	Description	Remarks
NSI-1000	AIS Transponder	
NSI-1000D	MKD	7’ color display with touch screen operation
NGA100	GPS antenna	Cable length=10m or 20m
	Mount pole for NGA100	
	Mount brackets for NGA100	
5-wire	Data cable	5m
2-wire	Power cable	2m
	Accessories	
	User’s Manual	
NVA100	VHF antenna	Optional
RG214	RF cable	Optional
NPP100	Pilot Plug	Optional
NFB700	Flush-mount brackets	

2. Specifications

2.1. VHF Transceiver

Item	Description
Frequency Range	156.025 ~ 162.025MHz (all channels)
Default Channel	CH2087, CH2088, CH70 (DSC)
Channel Bandwidth	25kHz
Modulation	GMSK/FM
Data Rate	9600 bps
Number of AIS transmitter	1
Number of AIS receiver	2
Number of DSC receiver	1
Output Power	12.5W/1W
Receiver sensitivity:	better than-107dBm @20% PER

2.2. DSC Receiver

Item	Description
Frequency	156.525MHz
Channel Bandwidth	25kHz
Modulation	FSK
Receiver sensitivity:	better than-107dBm @BER< 10^{-2}

2.3. GPS Receiver

Item	Specifications
Receiving Channel	50 channels (parallel)
Receiving Frequency / Receiving Code	1,575.42MHz, C/A code
Tracking & Navigation Sensitivity	≥-159dBm
Reacquisition Sensitivity	≥-159dBm
Horizontal Position	< 2.5m Autonomous < 2.0m SBAS
Receiving Type	SBAS: WAAS, EGNOS, MSAS, GAGAN

2.4. MKD

Item	Description
LCD Size	7’ color LCD, touch screen operation
Power Supply	DC24V

2.5. Sensor and Interface

Item	Specification
Sensor 1/2/3	IEC61162-1/ 61162-2 **Input:** DTM, GNS, GLL, GGA, RMC, VBW, VTG, OSD, HDT, GBS, ROT (GN>GP>GL>LC)
PC I/O， ECDIS，RADAR， DGNSS，L/R	IEC61162-1/61162-2 **Input:** VSD, SSD, ABM, BBM, ACA, ACK, AIR, DTM, GBS, GGA, GLL, GNS, HDT, LRF, LRI, OSD, RMC, ROT, VBW, VTG **Output:** VDM, VDO, ABK, ACA, ALR, TXT, LR1, LR2, LR3, LRF, LRI
Alarm	Normal Close Contact. The NSI-1000 requires that an alarm output (relay) be connected to an audible alarm device or the ship’s alarm system.
Data Interface:	RS422 output*3 (38400bps), RS422 Input*3 (4800bps)
RF connector:	PL259 (VHF antenna) TNC (GPS antenna)

2.6. Power Supply

Item	Specification
Operation Voltage	DC24V, range DC18 ~ 38V
Operation Current	1.0A (when receiving), 3.0A (when transmitting)

2.7. Environmental Condition

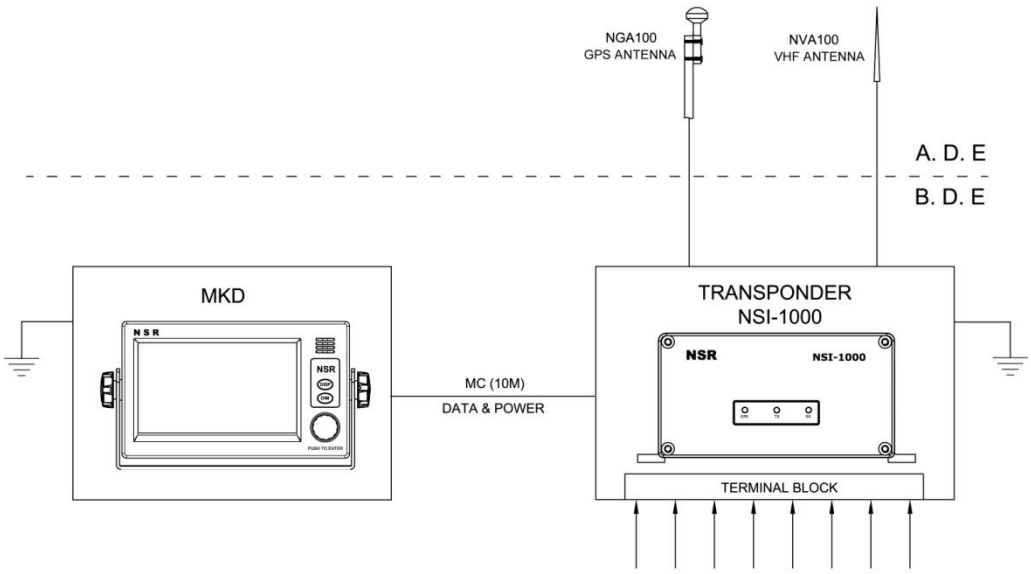
Item	Specification
Operation Temperature	- Outdoor (GPS and VHF Antenna): -30℃～+70℃ - Indoor (Transponder、MKD) : -15℃～+55℃
Relative Humidity	95% at 40℃
IP Grade	- Outdoor (GPS and VHF Antenna): IP66 - Indoor (Transponder、MKD) : IP22

2.8. Physical

Item	Specification
Size	81(H) × 174(W) × 266(D) mm Transponder 145(H) × 264(W) × 83(D) mm MKD (7')
Weight	2.3kg (Transponder), 1.25kg (MKD)

3. Installation

The following is the NSI-1000 system diagram.



3.1. GPS Antenna Installation

Refer to the attached diagram when installing the GPS antenna. The following instructions are helpful:

- Keep the antenna from the beam sector of radar transmission. The radar beam could damage the GPS antenna or affect the reception.
- Keep the antenna open in the directions to the sky. The obstacle such as mast can block the signal or prolong the searching time.
- Keep the antenna as high as possible. The sea water could affect the reception if iced.

The coaxial cable between the transponder and the GPS antenna will be supplied provided with 10-20m in length as standard. Watertight treatment is required for outdoor connecting.

3.2. VHF Antenna Installation

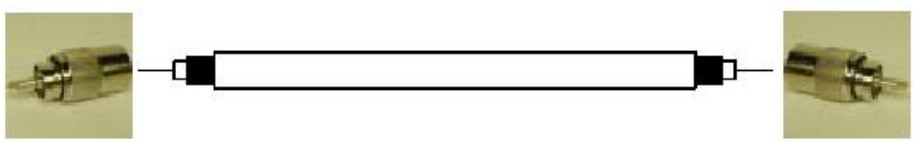
It's very important to choose a proper location for VHF antenna as an object close to the antenna could affect receiving sensitivity.

The following instructions are helpful:

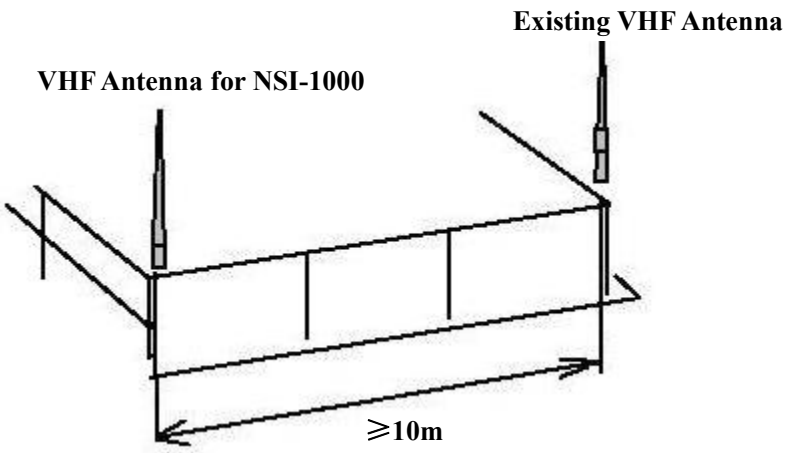
- The antenna should be kept at least 0.5m from a vertical object to avoid RF reflection.
- The antenna should be kept at least 3m from other high power radiator, such as radar antenna.
- Two VHF antennas should not be installed at the same height. The AIS VHF antenna can be installed either under or above the existing VHF antenna. The distance between should be more than 2.8m. If two antennas have to be installed at the same height, the distance between should be more than 10m.

For the cabling, please refer to below suggestions:

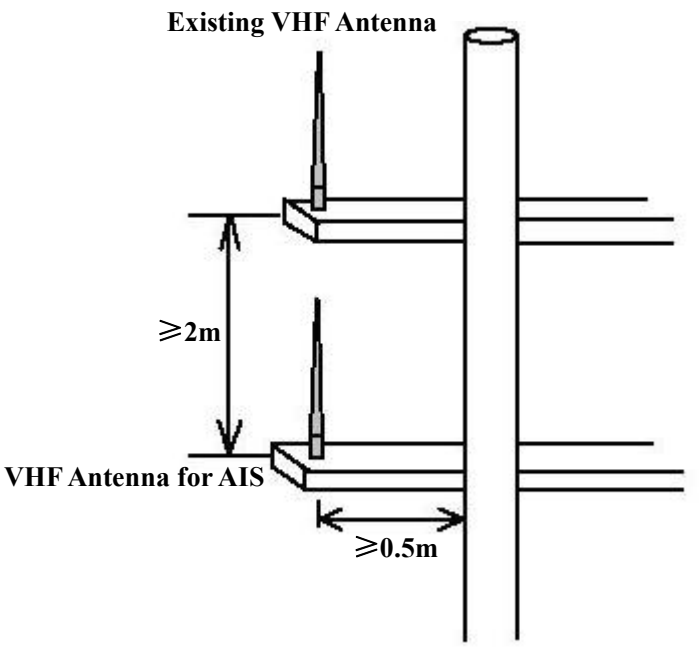
- The shorter the cable, the less the loss. The low-loss cable is recommended if the cable is longer than 10m.
- Watertight treatment is required for outdoor connecting.
- The RF cable should be kept at least 10cm from the power cable. The cable cross should be avoided.



① Two antennas are installed at the same height.



② Two antennas are installed in the same vertical line.



3.3. Transponder Installation

Four screws are supplied to mount the transponder. The transponder can be installed either on table or on wall.

Note:

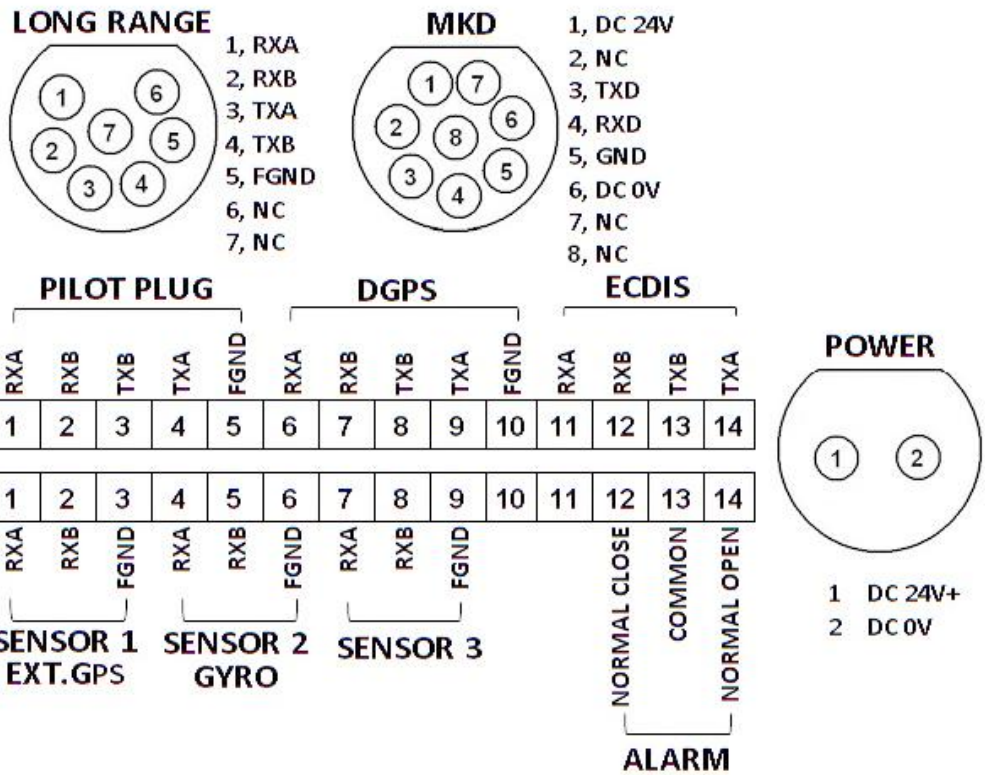
Care must be taken when mounting the transponder to ensure that there is sufficient space for cables and connectors. Especially, sharp bending of the RF cable must be avoided.

3.4. MKD Installation

The MKD may be mounted in flush-mount type or bulkhead type.

3.5. Cabling

Please refer to below diagram for wiring.



3.5.1. Power Connection

PIN NO	DESCRIPTION
1	DC 24V (+)
2	0V

The power cable with a rated capacity of 10A should be used. Pin definition for the connector is showed above. Normally, a cable of 2m will be supplied in the packing box.

3.5.2. MKD Connection

An 8-pin connector is used for the connection to a MKD (AIS display unit).

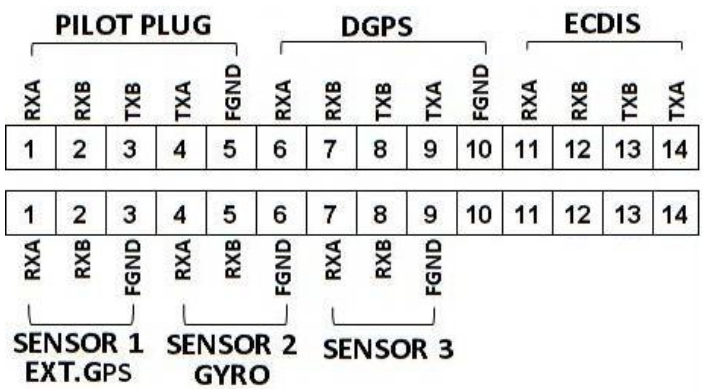
A shield cable should be used and the length should be less than 20m.

Normally, a cable of 5m will be supplied in the packing box.

PIN NO	DESCRIPTION
1	24V
2	NC
3	TX
4	RX
5	GND
6	0V
7	NC
8	NC

3.5.3. I/O Connection

There are two terminal blocks for I/O connection. Each block has 14 pins..



Pin terminals and back tubes are supplied for connecting.

3.5.3.1. Connection to Gyro Compass

Input of Gyro Compass can be connected to Sensor 2. If the digital HDT signal is not available from the gyro compass, a special gyro interface is needed to convert the analog signal into digital signal.

The default baud rate of this port is 4800bps.

3.5.3.2. Connection to External GPS

Input of External GPS can be connected to Sensor 1.

The default baud rate of this port is 4800bps.

3.5.3.3. Connection to Pilot Plug

An optional Pilot Plug NPP100 can be connected to the port as below.

NIS-1000 Transponder		NPP100 PILOT PLUG	
1	RXA	5	RXA
2	RXB	6	RXB
3	TXA	1	TXA
4	TXB	4	TXB
5	FGND		

This port can also be connected to ECDIS or Radar or VDR.

The default baud rate of this port is 38400bps.

3.5.3.4. Connection to ECDIS

This port can be connected to ECDIS or Radar or VDR.

The default baud rate of this port is 38400bps.

4. Basic Operation

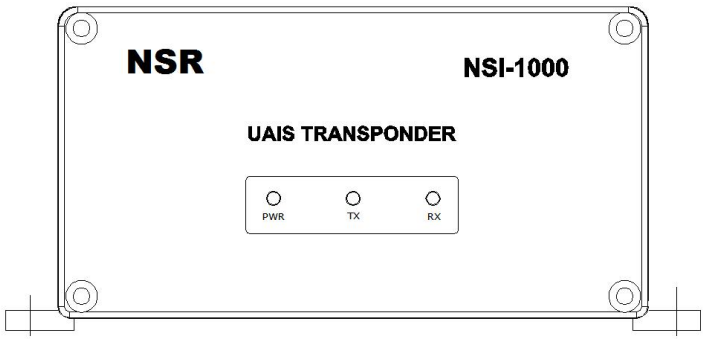
4.1. Power on the equipment

The power switch on rear panel of transponder can power off both transponder and MKD.

When an internal fault appears, turn off the transponder immediately.

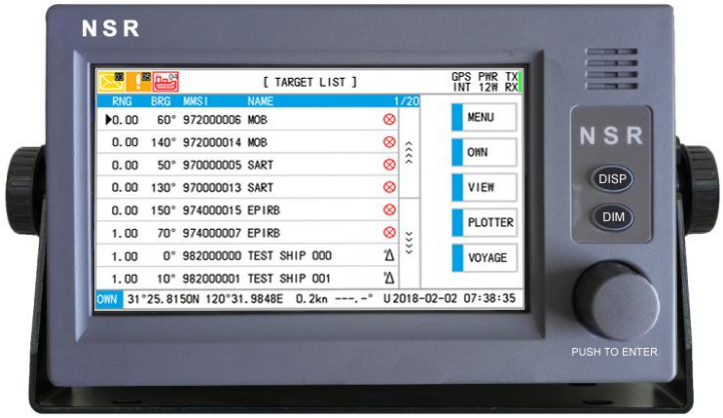
Causes should be identified prior to re-open the power switch.

4.2. Indicators on transponder panel

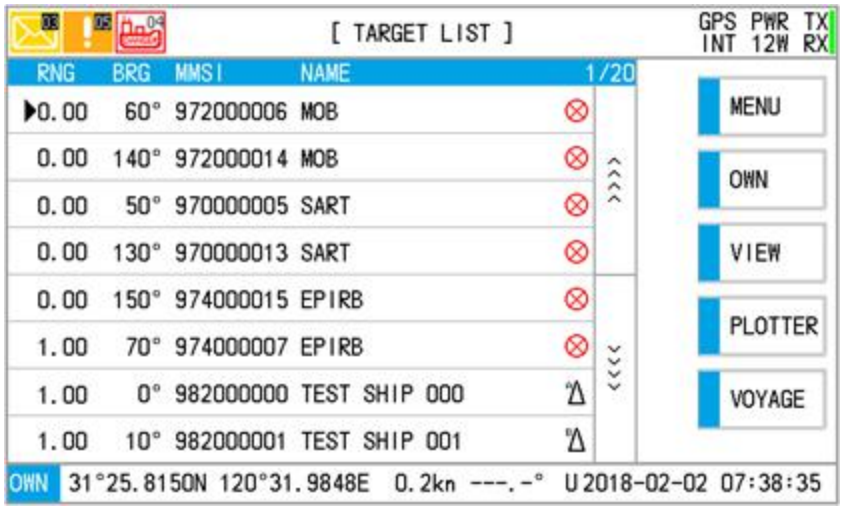


- **PWR**: The green light will be on when the transponder is powered on.
- **TX**: The red light will flash once when the transponder transmits once.
- **RX**: The green light will flash once when one AIS signal is received.

4.3. Key Description



Panel Button	Description
	Revolving around to select the channel, Press down to confirm the selection or input.
	Switch button. Switching between TARGET LIST and the PLOTTER; Quickly return to the main screen.
	Brightness key to control LCD brightness.
Touch-screen Button	**Description**
	Menu - Enter the Menu.
	Quickly view own ship data.
	View the details of the target in the TARGET LIST.
	Quickly enter plotter screen.
	View the TARGET LIST.
	VOYAGE SETTING.



The NSI-1000 should be kept powered on while underway or at anchor. However, the captain may decide Power Off when he estimates that the safety or security is threatened from AIS operation. The AIS should be restarted when the origin of danger has been excluded.

The equipment will be operational within 2 min after switching On and transmits own ship static data. These data are retransmitted every 6 min or whenever a data has been amended and on request. The static data provided by the AIS includes MMSI, IMO number, call sign & name, length and beam, type of ship.

In addition to static data, ship's dynamic data is also transmitted. The dynamic data provided by the AIS includes ship's position, Time in UTC, COG, SOG, heading, navigational status, and rate of turn. These data are transmitted dependent on speed and course alteration as below table.

The Reporting Rates for Dynamic Data on Autonomous Mode

Ship's Status	Reporting Interval
At anchor or moored and not moving faster than 3 kt	3 min
At anchor or moored and moving faster than 3 kt	10 s
A speed of between 0～14 kt	10 s
A speed of between 0～14 kt and changing course	3 1/3 s
A speed of between 14～23 kt	6 s
A speed of between 14～23 kt and changing course	2 s
A speed of greater than 23 kt	2 s
A speed of greater than 23 kt and changing course	2 s

The voyage related data such as ship's draught, hazardous cargo, destination and ETA is transmitted every 6 min.

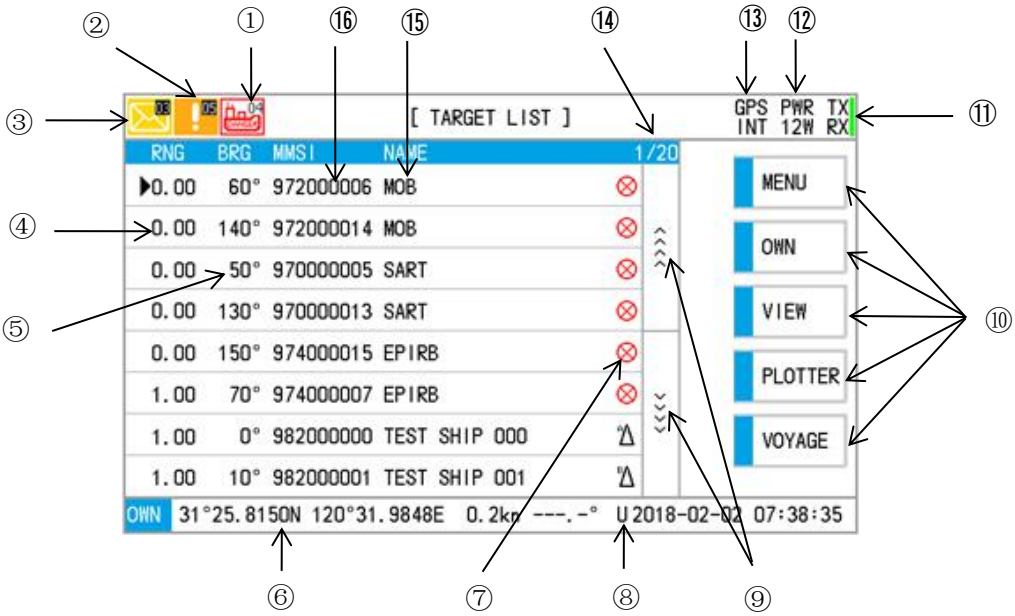
After switching on of transponder and MKD, the NSI-1000 starts receiving data from AIS-equipped ships and target data are appeared gradually on the plotter screen as soon as the data have been received for the first time.

Note:

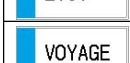
If no navigation sensor is installed or a sensor has failed, the AIS will transmit automatically with “Not available”.

4.4. Screen Components

① Target Data Screen

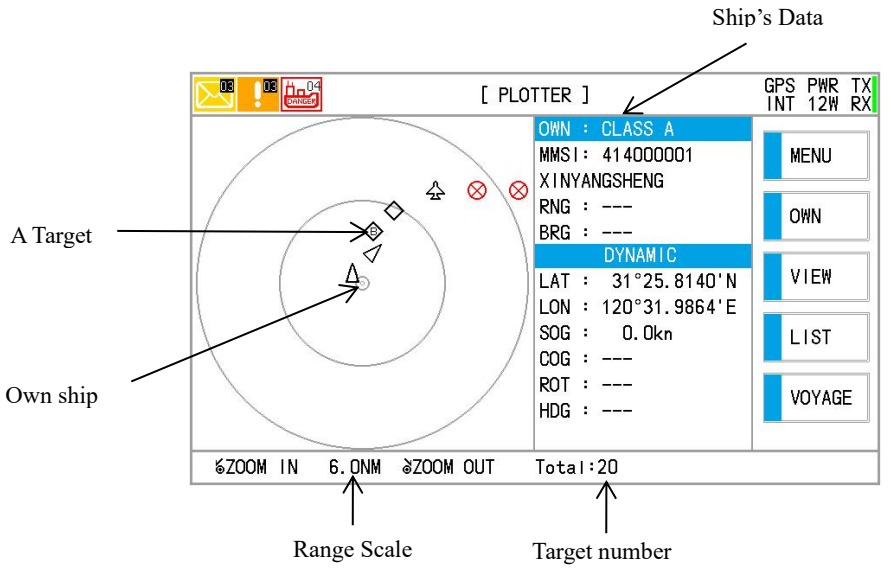


No.	Item	Symbol	Meaning
①	Dangerous target		The number of dangerous targets
②	Messages received		The number of messages received and unread
③	Alarms		The number of alarms
④	A distance from own ship	RNG	

⑤	Bearing in north up display mode	BRG	
⑥	Own ship data	OWN	Position, Speed, Heading
⑦	Target type		Class A shipborne AIS
			Class B shipborne AIS
			AIS base station
			AIS AtoN Station
			Search and rescue aircraft AIS
			AIS-SART, AIS MOB, AIS EPIRB
⑧	Time Mode	U	UTC time
		L	Local time
⑨	Page up/down		
⑩	Function buttons		Menu - Enter the Menu
			Quickly view own ship status
			View the details of the target of the
			Quickly enter PLOTTER
			View the TARGET LIST
			VOYAGE SETTING
⑪	TX/RX status		Green：TX normal, RX normal
			Blue：TX abnormal, RX normal
			Orange：TX abnormal, RX abnormal
⑫	TX power	12W/1W	Current output power
⑬	GPS Status	EXT GPS	The external GPS valid, regardless of internal GPS
		INT GPS	Only internal GPS valid, while external GPS invalid
		GPS ERR	Both GPS sources invalid

⑭	Target number		Total number of targets
⑮	Ship's name		Ship's name or target type
⑯	MMSI		Target MMSI

② Plotter Screen



4.5. Events Summary

The symbols () indicated on the upper left of the screen are described in the following table.

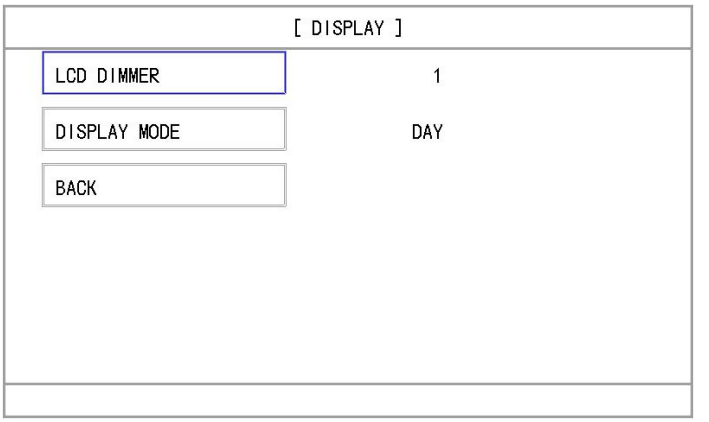
Symbol	Meaning
	The number of alarms generated
	The number of received unread messages
	The number of dangerous targets

4.6. Brightness and Display mode

There are two ways to adjust the brightness of the MKD LCD.

① Adjust the brightness in the **[SYSTEM SETTING]**.

Click **[LCD DIMMER]** or rotate the knob to adjust the brightness.



Display mode：There are day mode and night mode.

② Press the **DIM** button to adjust the brightness.

Note:

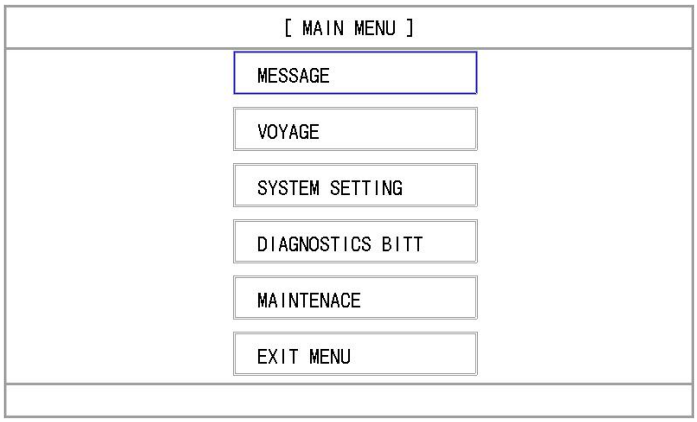
When the power is turned off, the last status of brightness and contrast is stored. Therefore when the power is turned on, the screen will display with the last brightness and contrast before powered off.

4.7. Basic Menu Operation

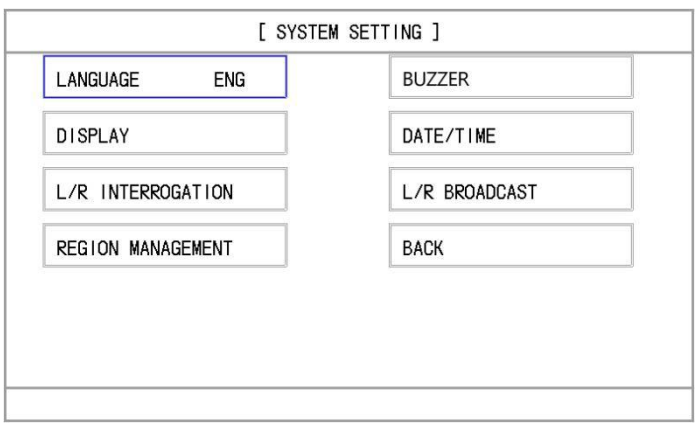
Refer to appendix for the menu tree.

① Click the 

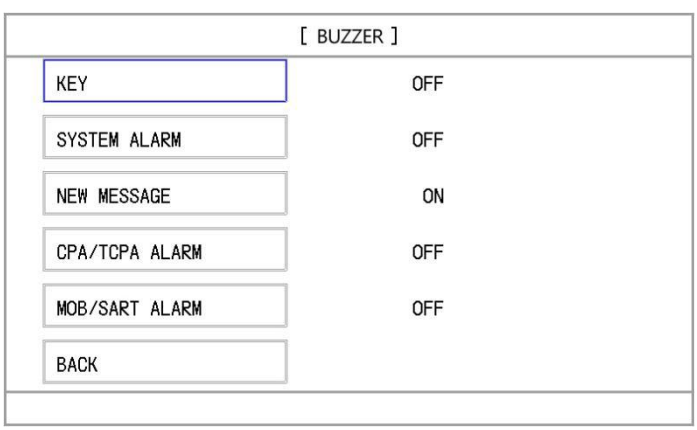
to enter the main menu.



② To select a desired sub menu, click the desired item or rotate the knob to select a desired item. The following screen is in case that [**SYSTEMSETTING]** has been selected to set system configuration from the main menu.



③ Click [**BUZZER]** directly or rotate the knob then push to enter the desired item. The following screen is in case that **[KEY]** has been selected to set the key beep from the system setting menu.



Choose an appropriate item by rotating the knob. The cursor "[ ]" shows a current selection. And then push the knob to alternate from a current setting. Also push the knob once more to return to a previous status.

④ Depending on the sub menu selected, the knob key is used to move the cursor to enter the data and push the knob to alternate from a current setting such as "ON/OFF", "South/North", "East/West", "Yes/No", etc.

⑤ Click [BACK] or press (DISP) key to return to a higher level menu or the main menu from a current sub menu.

4.8. Enter Characters

Click an appropriate key consecutively until a number or a letter or a symbol is got.

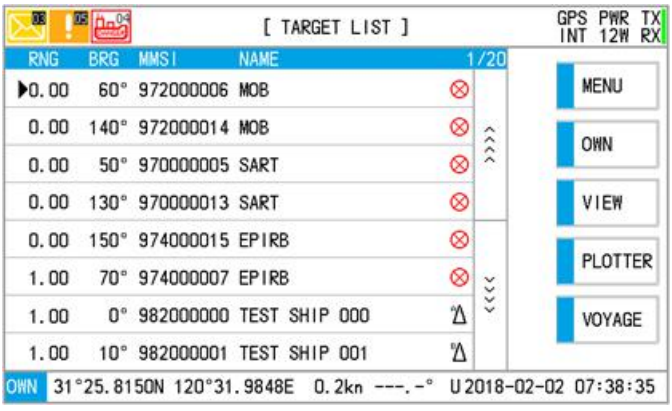
Note:

To delete a specific character, move the cursor to an appropriate position and then press [DEL] *key.*

4.9. Multi pages

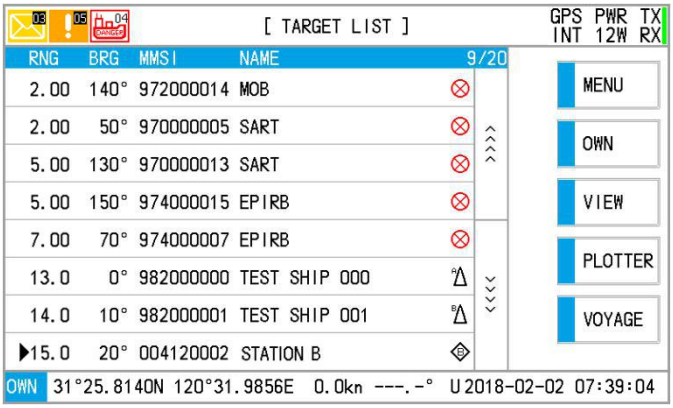
Some of sub menus can be more than 1 page. In this case, it is indicated with ⌃⌃⌃ , ⌄⌄⌄ marks the screen to prompt the existence of a previous or next page.

Click ⌃⌃⌃ , ⌄⌄⌄ to move to an appropriate page.



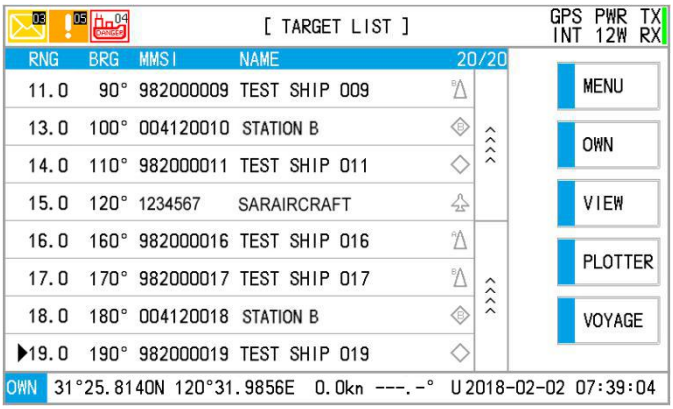
First page

Click ⌄⌄⌄ to move to a next page.



Middle page

Click ⌄⌄⌄ / ⌃⌃⌃ or rotate the knob to move to next page or a previous page. Click the target item or push the knob key to check the ship's information.



Last page

4.10. Save a Setting

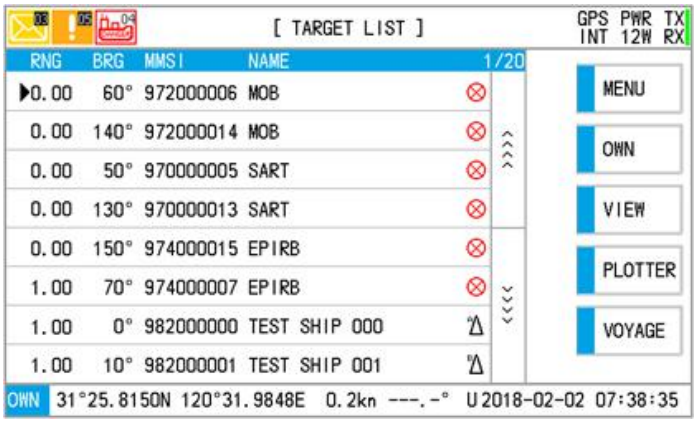
If any keys are pressed, before **SAVE** key being clicked in advance, after any data was amended in a sub-menu, no any amendment may be saved.

If a change is to be saved, it is necessary to click **SAVE** key to register the change to save the change, then escape from the menu.

5. AIS Target Display

5.1. Target List

As an initial screen upon the power On, the target list is displayed to show vessels presented nearby own ship and equipped with AIS equipment.



On this screen, all targets are displayed with their data received via AIS and the ships can be listed in the order of ship name or RNG or BRG.

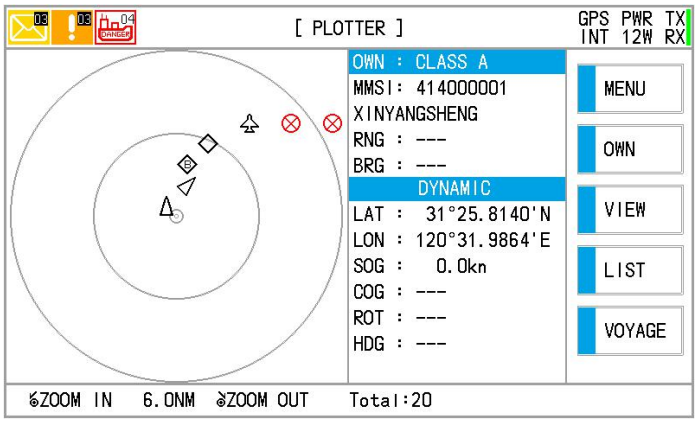
To get more detailed data for a specified target, select an appropriate target on the target data screen by click the target item.

Here a symbol marked on the right of the MMSI indicates the target's type and it's classified as follows.

Type	Meaning
	Class A shipborne AIS
	Class B shipborne AIS
	AIS base station
	AIS AtoN Station
	Search and rescue aircraft AIS
	AIS-SART

5.2. Plotter Display

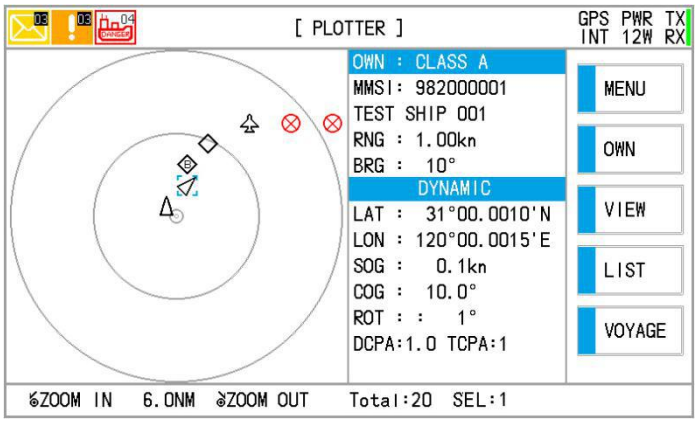
By clicking PLOTTER or pressing DISP , the plotter screen is displayed to show targets with heading direction and relative position to own ship as follows.



The targets in the north up plotter screen appear at the correct positions as sharply pointed triangles. The own ship symbol is always situated at the center of the plotter screen.
Unless any ship or a menu is being selected, the data for own ship such as the MMSI number, ship's position, SOG, COG, ROT, heading are shown on the screen.

① Rotate the knob to change the display range of whose value corresponds to the radius of the outer range ring. The available ranges are 0.25, 0.5, 0.75, 1.5, 3, 6, 12, 24 and 32nm in nautical mile.

② Click a target on the plotter screen, the target closest to own ship is toggled with an additional square and the data of the target are shown on the screen as following figure. The target data may include MMSI number, ship's position, SOG, COG, ROT, heading.



③ Select a next ship on the plotter screen, repeat the procedure ②.

④ To return to main menu, click DISP key or to change over to the target list screen.

6. Message Send/Receive

When selecting the 1st item from the main menu, it is to select a sub-menu for sending or acknowledging a message. It consists of sub-menus.

① **NEW MESSAGE**

The function is to create a message by selecting method (Broadcast or Addressed), type (Text, Safety) and channel (Ch-A, Ch-B, Ch-A&B, Auto).

② **OUTBOX MESSAGE**

The function is to check the transmitted messages with the transmitted time and date, message type, casting type, MMSI number and show the message content when a specific message selected.

③ **INBOX MESSAGE**

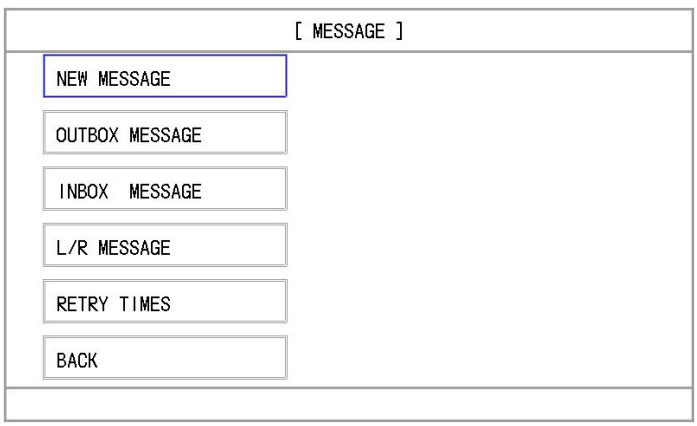
The function is to check the received messages with the received time and date, message type, casting type, MMSI number and show the message content when a specific message selected.

④ **L/R MESSAGE**

The function is to check and reply a request by a long range message.

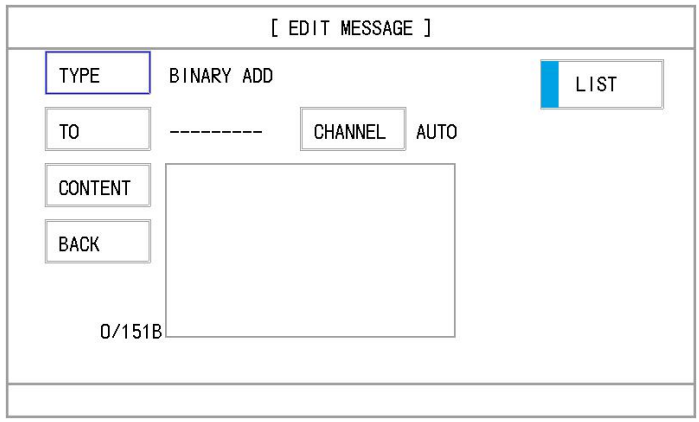
⑤ **RETRY TIMES**

The function is to set the retry times when sending a message.

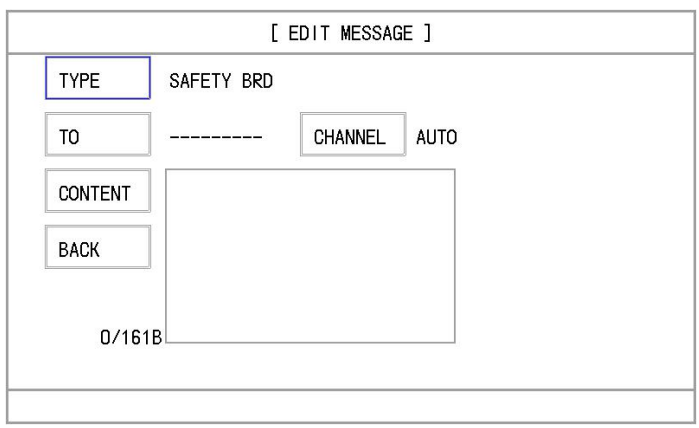


6.1. NEW MESSAGE

① Select the **[NEW MESSAGE]** to create a new message.



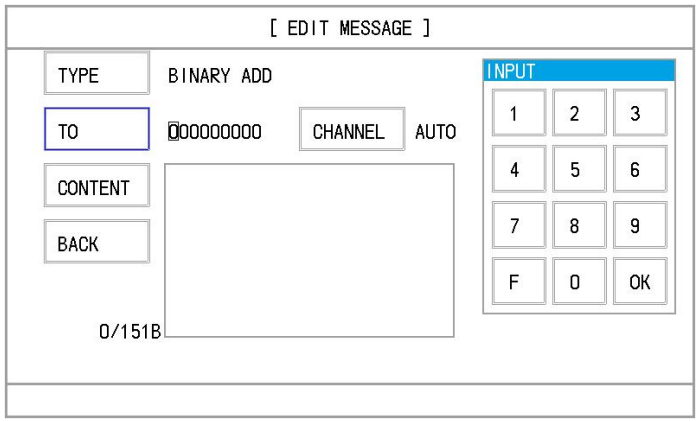
② Move the cursor to the "***TYPE***" by pushing to enter or clicking TYPE directly.



③ Click until a desired one type has appeared. Totally there are four types as below:

Message Type	**Description**
BINARY BRD	Binary Broadcast
BINARY ADD	Binary Addressed
SAFETY BRD	Safety Broadcast
SAFETY ADD	Safety Addressed

④ When **BINARY ADD** or **SAFETY ADD** is chosen, MMSI may be selected from target list or entered on soft keypad.



⑤ After selected, the assigned MMSI number will appear.

⑥ To select for using channels, move the cursor to the *"**CHANNEL**"* by rotating the knob and then push to enter until a desired one among "***A***", "***B***", "***A&B***" and "***AUTO***" has appeared.

⑦ To create or edit a message, move the cursor to the text area of *"**CONTENT**"* by rotating the knob and then push to enter or click *"**CONTENT**"* directly.

⑧ Enter the characters by keypad.

⑨ When ready, click SEND to send the message.

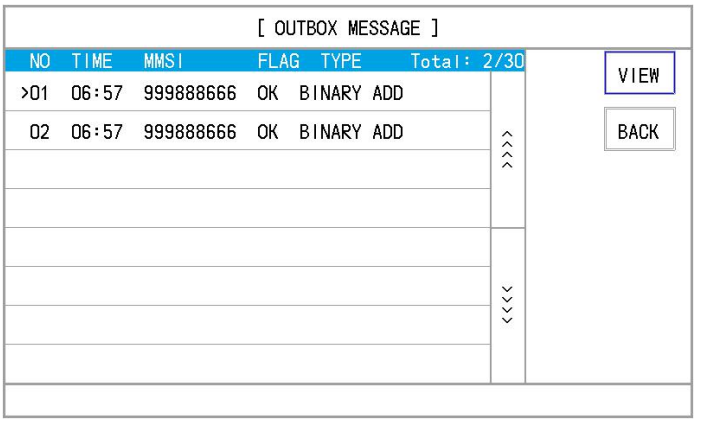
Hereupon the screen will return to MESSAGE menu.

Maximum Number of Characters for a Single Message

Message Type	Max. Character
BINARY BRD	158
BINARY ADD	153
SAFETY BRD	161
SAFETY ADD	156

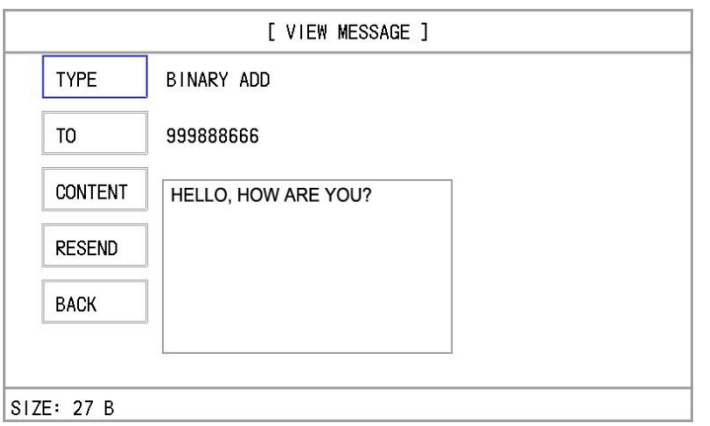
6.2. SENT MESSAGE

① Select **[OUTBOX MESSAGE]** to view the sent messages.



A list of sent messages is displayed.

② Move the cursor to a message to be checked by rotating the knob and then push to enter. The following screen will be displayed.

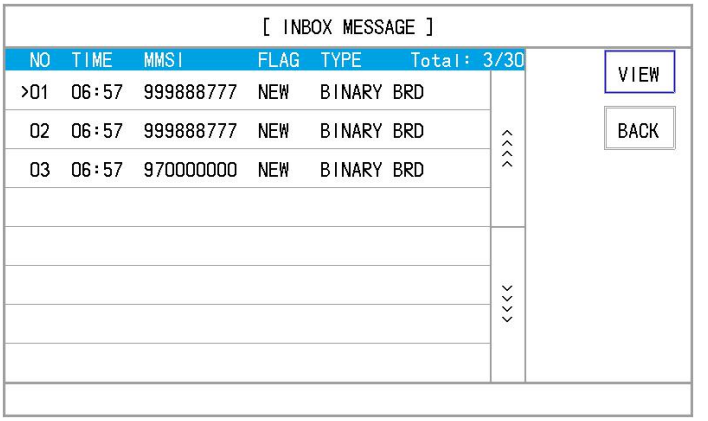


③ If you click RESEND, you can edit the transmitted message, in order to retransmit a new message.

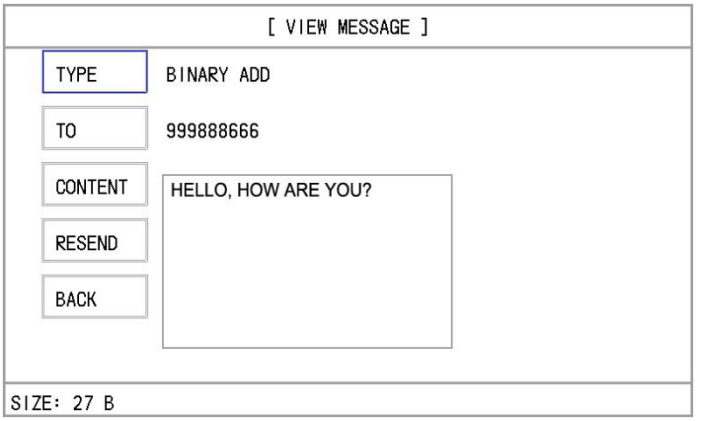
④ Click BACK to return to a higher or the main menu.

6.3. RECEIVED MESSAGE

① Select **[INBOX MESSAGE]** to view the received messages.



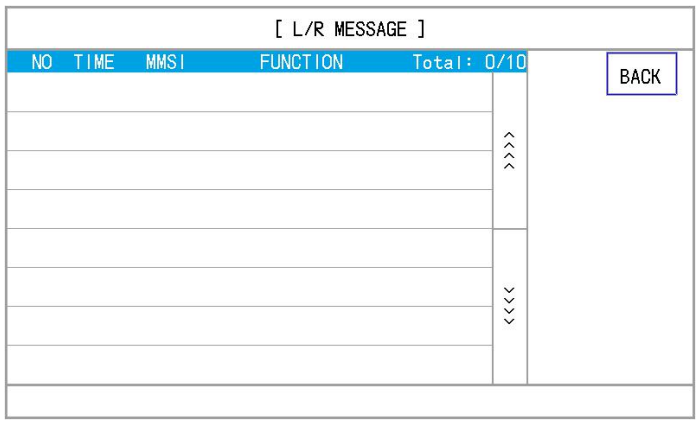
② Move the cursor to a message to be checked by rotating the knob and then push to enter. The following screen will be displayed.



③ If you click CONTENT, you can edit the transmitted message, in order to transmit a new message.

④ Click BACK to return to a higher or the main menu.

6.4. L/R MESSAGE



When the transponder is connected to a long range communication system via the long range communication port then long range interrogations may be received. These are requests for information from a distant base station beyond normal AIS operation range. **L/R MESSAGE** holds all received Long Range Interrogation messages.

① Select **[l/R MESSAGE]** to view the long-range messages.

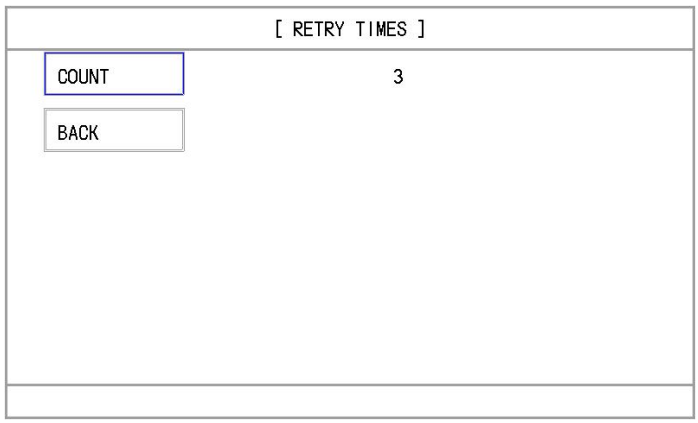
② Push the knob to acknowledge a long range message.

If you want to know details in an interrogation received from the long range mode, choose a long range message by rotating the knob and then push to enter.

In the following screen, the requester and requested item are displayed.

Please refer to ***9.5 L/R INTERGORATION*** for how to set the L/R mode and information.

6.5. RETRY TIMES



In order to send Message 6/12/8/4 and acknowledgement Message 7/13, you can set how many times you want the system to repeat the messages.

The options are 0 (no repeat), 1 (repeat one time), 2 (repeat 2 times) or 3 (repeat 3times).

Message No Table

Message Type	Send by Message No	Acknowledged by Message No
BINARY BRD	Message 8	--
BINARY ADD	Message 6	Message 7
SAFETY BRD	Message 14	--
SAFETY ADD	Message 12	Message 13

The default value of **RETRY TIMES** is 3 (repeat 3 times).

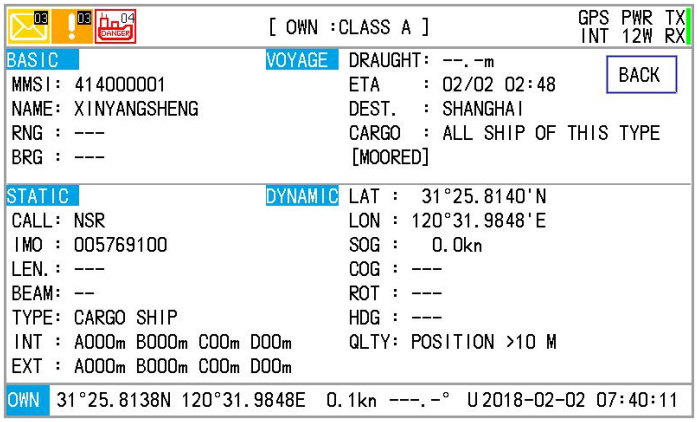
7. View Own Data

You may click 

in main menu to read the all data of own vessel. The own data include basic data, voyage data, static data and dynamic data.

Or you may view own data when the target list is displayed.

The following screen will appear:



Note:

1: If internal GPS and external GPS are available simultaneously, the dynamic data from external GPS is prior to internal GPS.

2 : If internal GPS is available only, the dynamic data will be displayed by internal GPS.

8. VOYAGE SETTING

There are mainly five items in this menu:

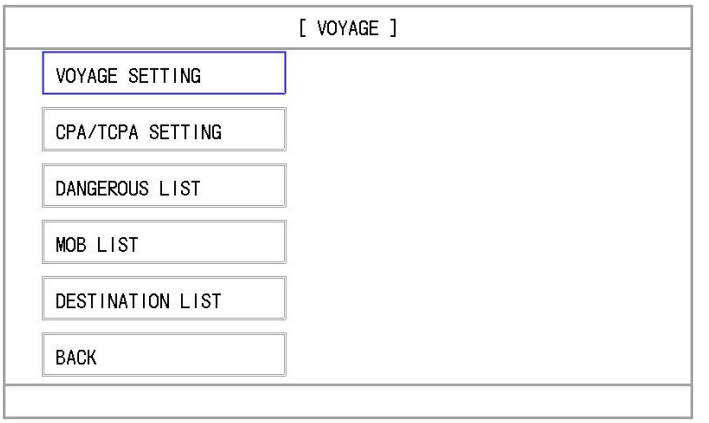
① VOYAGE SETTING

② CPA/TCPA SETTING

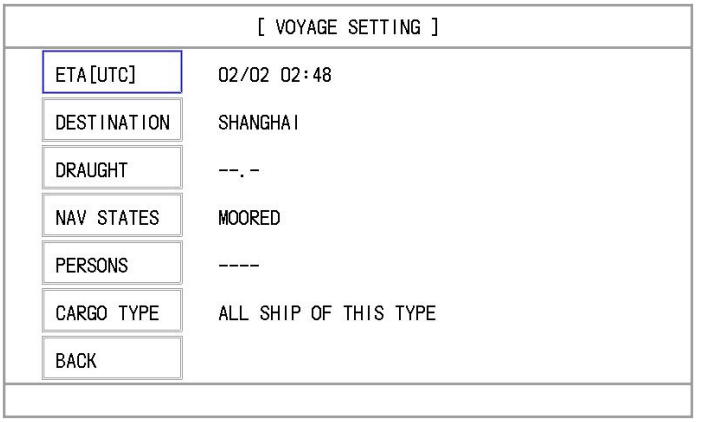
③ DAGEROUS LIST

④ MOB LIST

⑤ DESTINATION LIST



8.1. VOYAGE SETTING



8.1.1. ETA [UTC]

Set the estimated date and time of arrival on the destination. The time should be in UTC, regardless of the current time mode.

8.1.2. DESTINATION

Set the name of next port. You may also load from the destination list.

8.1.3. DRAUGHT

Set the draught of the current voyage.

8.1.4. NAV STATUS

Set the navigation status. You may select the code from the blow list.

No	Navigation Status
00	UNDER WAY USING ENGINE
01	AT ANCHOR
02	NOT UNDER COMMAND
03	RESTRICTED MANOEUVRABILITY
04	CONSTRAINED BY DRAUGHT
05	MOORED
06	AGROUND
07	ENGAGED IN FISHING
08	UNDER WAY SAILING
09	RESERVED FOR HSC
10	RESERVED FOR WIG
11	Power driven vessel rowing astern(regional use)
12	Power driven vessel pushing ahead or rowing alongside (regional use)
13	Reserved for future use
14	AIs-SART(active), MOB -AIS, EPIRB-AIS
15	Undefined=default (also used by AIS-SART, MOB-AIS and EPIRB-AIS under test)

8.1.5. PERSONS

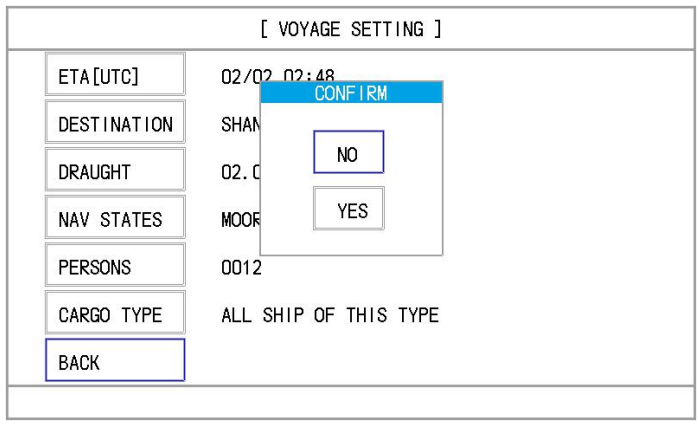
Set the persons onboard. The number of persons may be entered between 0001 to 9999.

8.1.6. CARGO TYPE

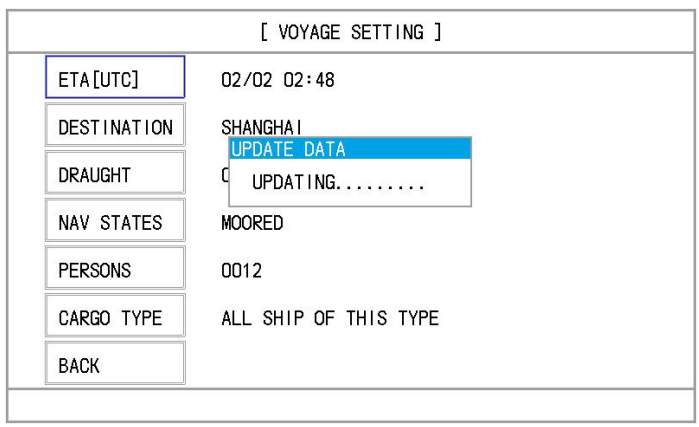
Set the cargo type only when the ship carries hazardous cargo such as dangerous goods (DG), harmful substances (HS) or marine pollutants (MP).

8.1.7. SAVE THE SETTINGS

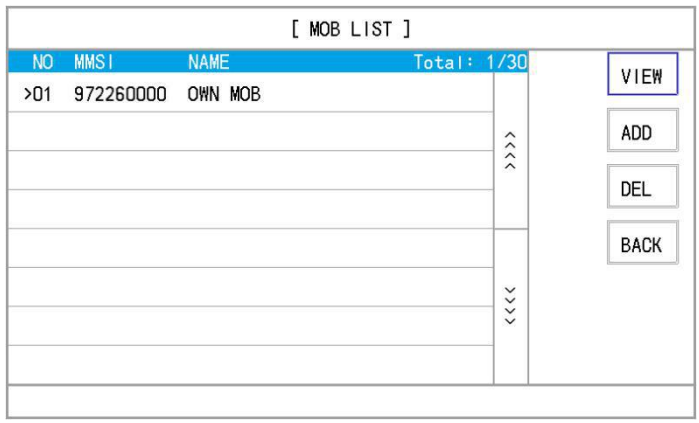
After setting is completed, click BACK to save the settings. The below screen will appear.



After confirming YES, updating will be finished.



8.2. CPA/TCPA SETTING

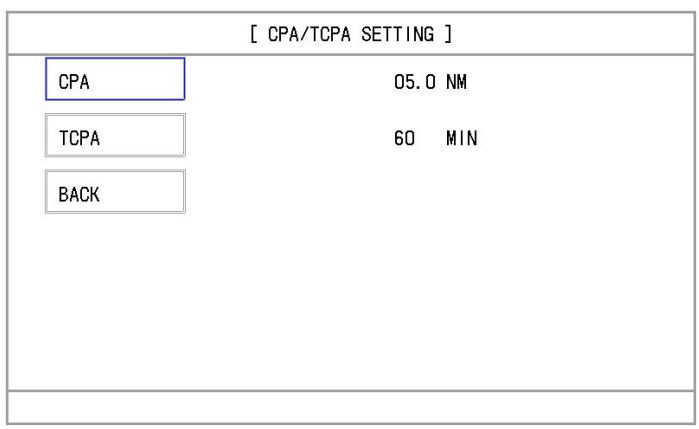


CPA: Closest Point of Approach

TCPA: Time to close of Approach

Set the CPA/TCPA value according to captain's judgment.

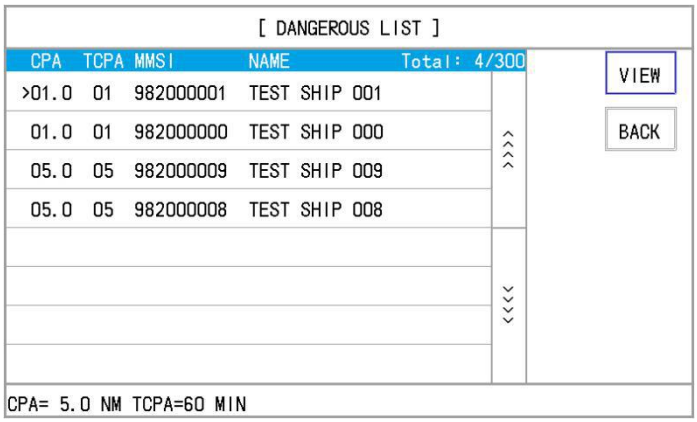
When a calculating CPA/TCPA with a target vessel is falling into the setting value, an audible alarm will be activated on the MKD and the vessel will be appear in the **[DANGEROUS TARGET LIST]**.



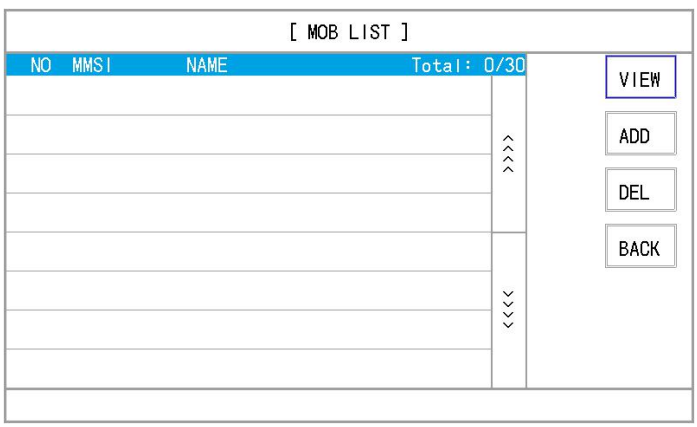
8.3. DANGEROUS LIST

CPA/TCPA is calculated for each target vessel with own ship. If a target is falling into the preset CPA/TCPA value, it will be regarded as a DANGEROUS TARGET.

The dangerous targets can be listed by MMSI or NAME.

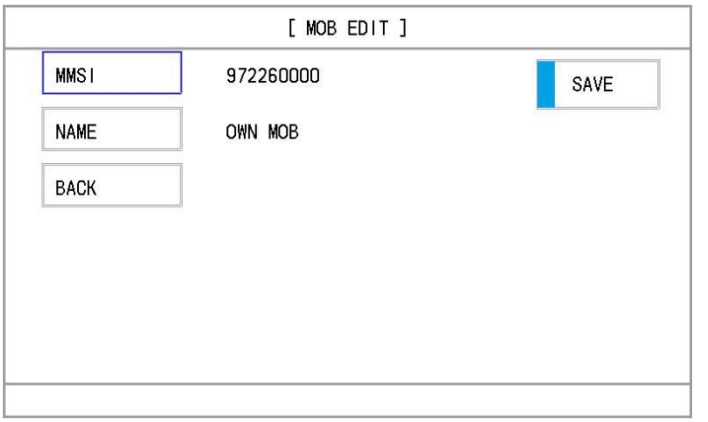


8.4. MOB LIST



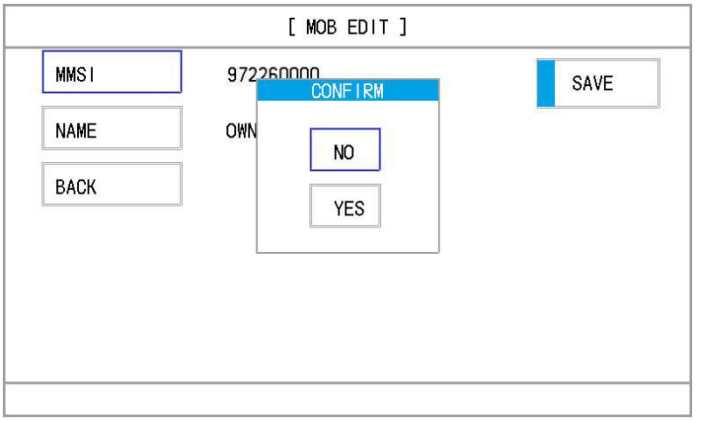
If all crew on board have been equipped with personal AIS-MOBs, a MOB LIST shall be established so that the name of a person who carries a MOB will be immediately displayed when the MOB is activated. It can help to identify a person in distress in short time.

You may click MMSI or NAME to create a new MOB or delete an existing MOB.



Click  to save the setting.

Click  return to **MOB LIST**.

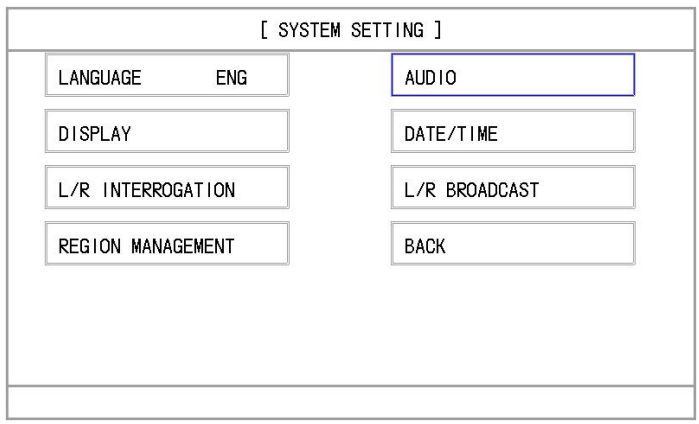


8.5. DESTINATION LIST

You may create a **[DESTINATION LIST]** to store frequently visited ports. When voyage setting, you may load the destination from the list.

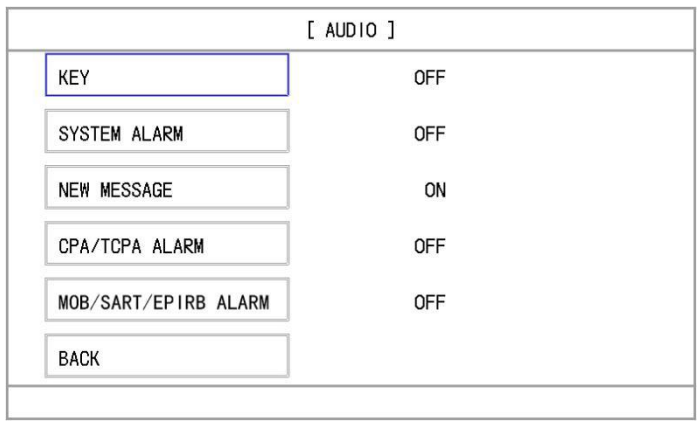
9. System Setting

When selecting the 3rd item in the main menu, **[SYSTEM SETTING]** menu appears. Seven sub-menus are included in this menu.



9.1. BUZZER

By buzzer setting, alarm that sounds against system faults and message receiving may be enabled or disabled.



There are total 5 kinds of buzzer sound to be set. The meaning of the sounds is as below:

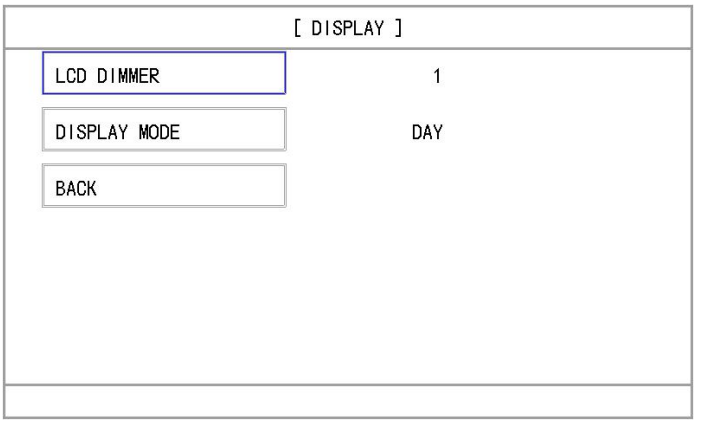
- KEY: when a key is pressed.
- SYSTEM ALARM: when a system failure appears.
- NEW MESSAGE: when an incoming message is received.
- CPA/TCPA ALARM: when a CPA/TCPA for a target is falling into the set value.
- MOB/SART/EPIRB ALARM: when a MOB/SART/EPIRB AIS activation message is received.

Note:

*If SYSTEM ALARM is set to OFF, the buzzer sound of CPA/TCPA ALARM or MOB/SART/*EPIRB *ALARM will be automatically muted regardless of whether CPA/TCPA ALARM or MOB/SART ALARM is set ON or OFF.*

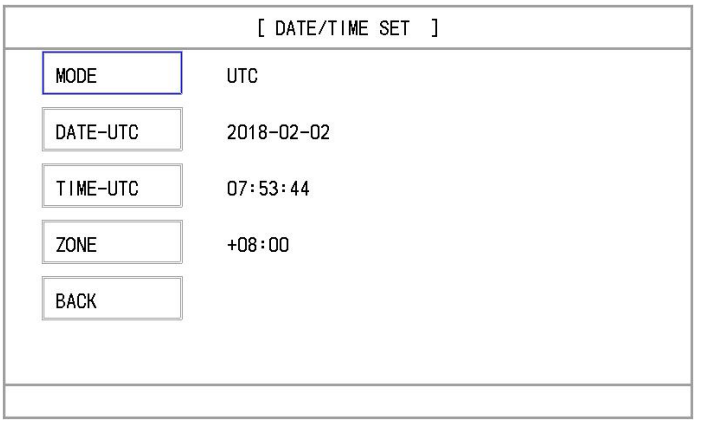
9.2. DISPLAY

The brightness can be adjusted by pressing the **DIM** key or clicking **[LCD DIMMER]** in the **[SYSTEM SETTING]**.



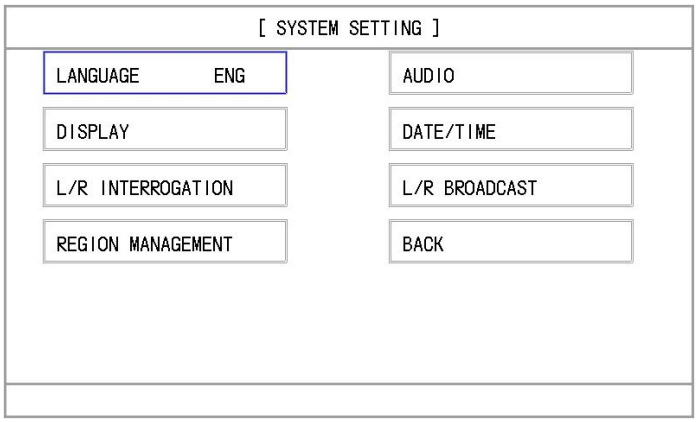
9.3. DATE & TIME

By setting the [DATE/TIME SET], set the current date and time.



9.4. MENU LANGUAGE

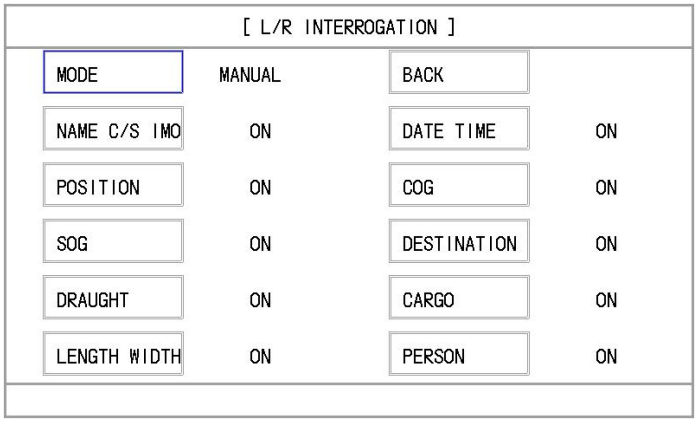
The menu language can be set as English or Chinese.



9.5. L/R INTERROGATION

The long range mode is to allow being set by the user to respond automatically or manually to long range interrogation from such as Inmarsat-C ship earth station. The NSI-1000 UAIS provides a two-way interface for equipment which provides for long-range communication.

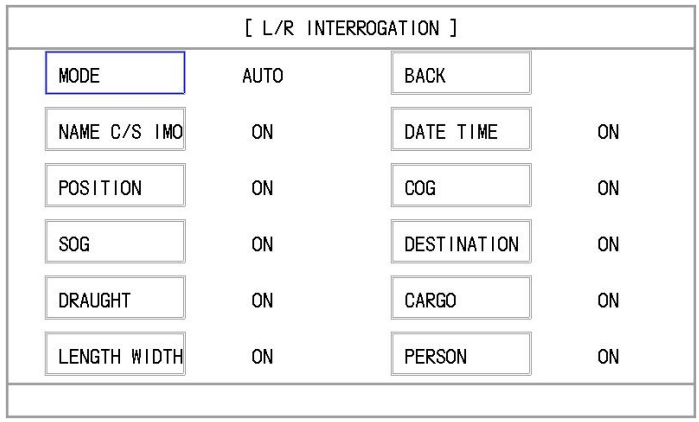
① Enter **[L/R INTERROGATION]**.



② To select a desired one between the auto and manual, push the knob to enter or click the current menu. In case of automatic reply, the response is transmitted with long range data type derived from the AIS system automatically.

③ To select manual reply to long range interrogations, push the knob to enter or click the current menu again.

The following screen will be displayed.



In case of manual reply, the operator has to manually reply the interrogation or cancel the reply.

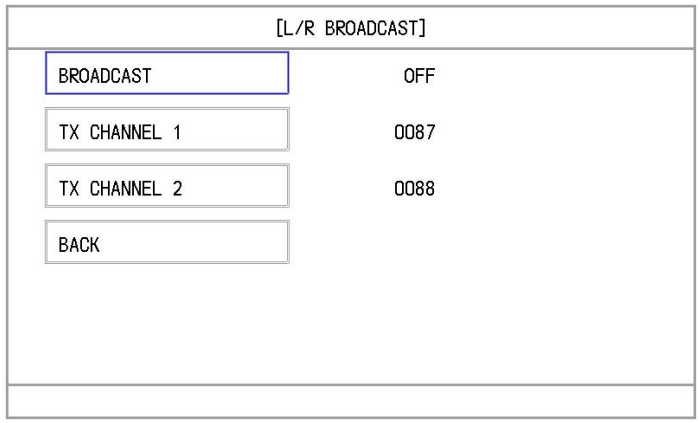
Please refer to **6.*4 L/R MESSAGE***.

④ The information of NAME……DRAUGHT can be set ON or OFF.

⑤ Click BACK to return to a higher menu or the main menu.

9.6. L/R BROADCAST

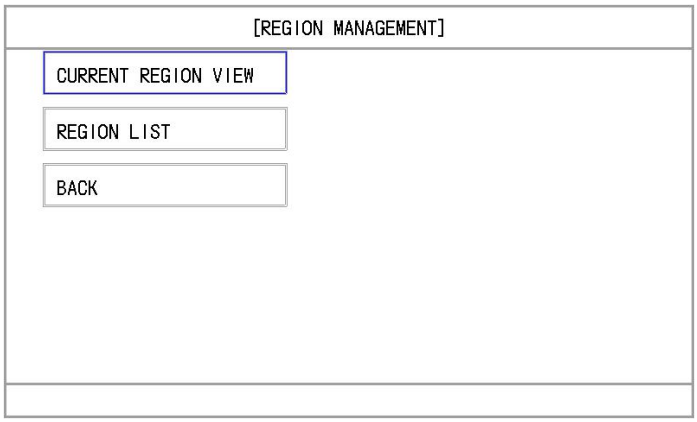
Class A transmits Message 27 every 3 minutes through the channels alternately. Provided here are the options to enable or disable Long Range Broadcast and the transmitting channel for Message 27.



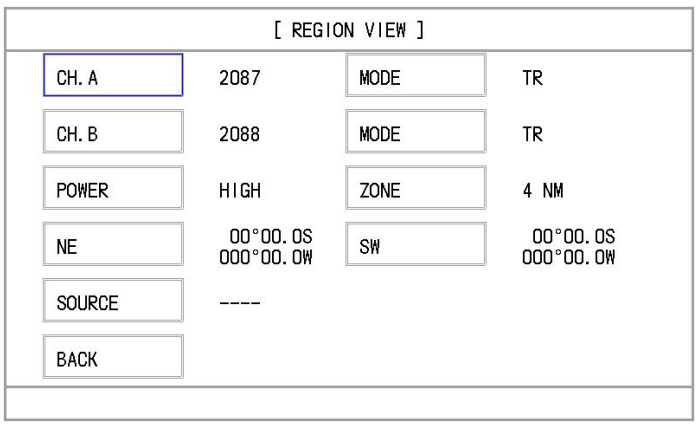
Only AIS channel numbers can be entered for TX channel. Channel 2078, 2088, and the current channel used in the region cannot be used.

9.7. REGION MANAGEMENT

① Enter region management. The following screen will be displayed.



② Open CURRENT REGION VIEW：



③ There are no any items to be allowed for setting in this menu and it is only to check output level, channel number and Tx/Rx mode for each channel of current setting.

In the screen, you can check the status of a regional operating area currently registered in the equipment or enabling a new setting for the area. It can be registered up to 8 areas by AIS message from a coast station, DSC message, manual setting or command from ECDIS or PC.

Note:

About these registered areas:

1: The status registered by AIS and DSC message within last 2 hours can't be edited.

2: If two or more areas are overlapped, the older data will be deleted.

3: The data older than 5 weeks will be deleted.

4: A regional data far away more than 500 mile will be deleted.

④ Rotate the knob to select the number of a specified area.

Note:

About these registered areas:

In sequence of distance from own ship, the area number from 1 up to 8 can be assigned.

⑤ To edit the channel status for a specified area, push the knob to enter.

⑥ Move the cursor to the "***CH.A***" or "***CH.B***" by rotating the knob to alterate the channels for a selected area and then push the knob to enter. The channel number and the frequencies for each channel can be referred at Appendix 3.

The alteration of channel can be performed by rotating the knob.

⑦ Move the cursor to "***MODE***" followed by each channel by rotating the knob to alterate each channel mode for a selected area and then push the knob to enter continuously until a desired mode is displayed. The mode can be selected to either "***TR***", "***RX***" or "***OFF***".

⑧ Move the cursor to the "***SW***" followed by each channel by rotating the knob to alterate the bandwidth of each channel for a selected area and then push the knob to enter continuously until a desired bandwidth is displayed. The bandwidth can be selected to either "***0***"or ***"1***".

Note:

The bandwidth, "0" and "1" means:

0 : Frequency bandwidth assigned depending on the channel.

1 : 12.5 kHz.

⑨ Move the cursor to "***POWER***" by rotating the knob to alternate the output power for a selected area and then push the knob continuously until a desired power is displayed.

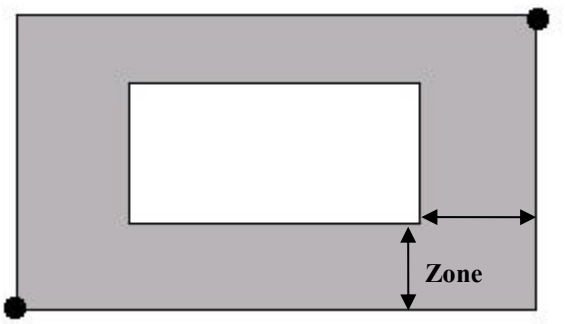
The output power can be selected to either "***HIGH***" or "***LOW***".

⑩ Move the cursor to "***ZONE***" followed by each channel by rotating the knob to change the zone size for a selected area and then push the knob continuously until a desired size is displayed. The zone size can be selected from 1 up to 8.

Note:

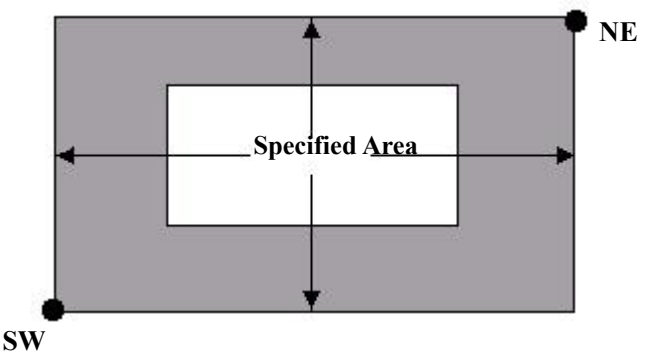
The zone size is entered with a distance represented by the NM.

It can be selected from 1 NM to 8 NM.



⑪ Move the cursor to " AREA NE " or "AREA SW " to fix the position for a selected area by rotating the knob and then push the knob. The position can be entered with north-east coordinates and south-west coordinates.

Enter desired coordinates by clicking the numbers.



Move the cursor to the symbol represented by East, West, South and North by rotating the knob to specify the latitude and longitude and push the knob continuously until a desired symbol is displayed.

Note:

1 : The permitted ranges of a specified area are between 20 NM and 200 NM for each of horizontal, vertical direction.

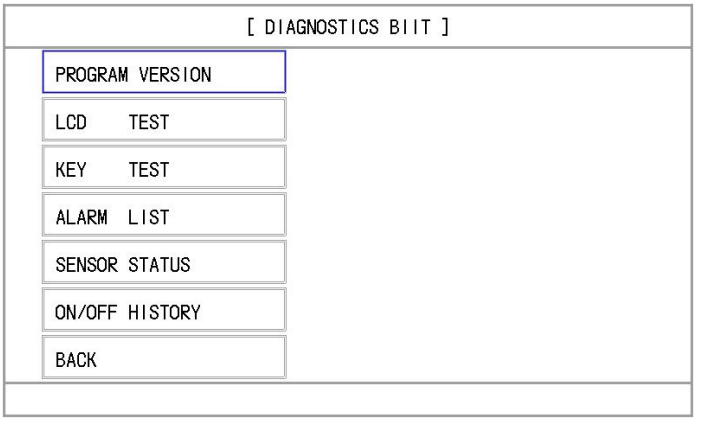
2 : If two or more areas are overlapped, the older data will be deleted.

⑫ You can ensure that it is suitable to the area setting by pushing the knob as appeared at the bottom of the screen.

If it is unsuitable, an appropriate error message will be shown and if it is suitable, you can exit from the screen to set a channel status by clicking 

.

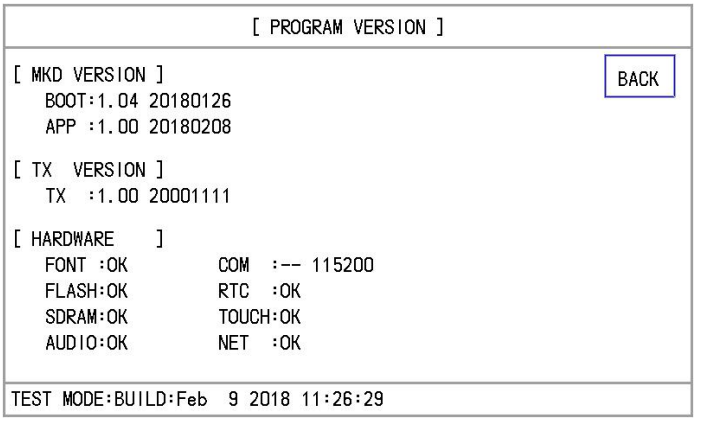
10. DIAGNOSTICS



10.1. PROGRAM VERSION

It is to check the software versions at **[DIAGOSTICS]** menu.

The following screen will be displayed.

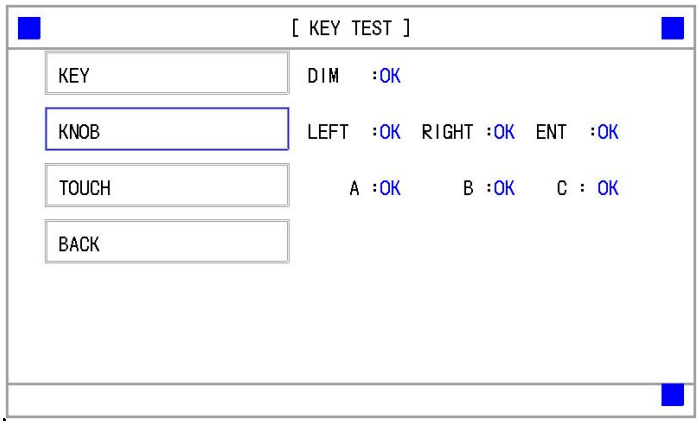


10.2. KEY CHECK

When any key is clicked, the box corresponding to the key will be filled with blue color.

Click 

to return to a higher menu or the main menu.



10.3. LCD CHECK

Press the DIM button to test the display brightness.

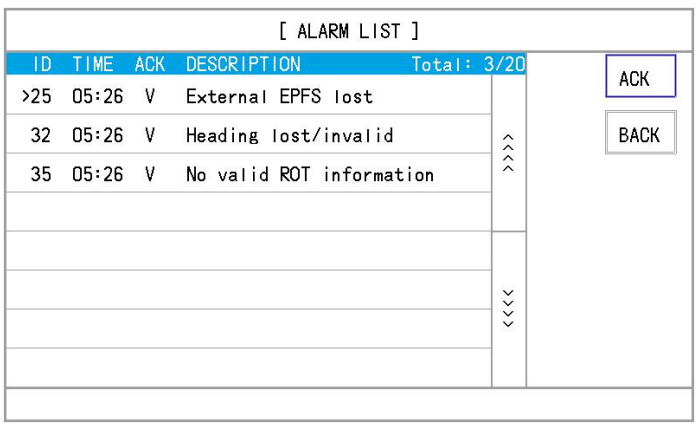
10.4. ALARM LIST

Select **[ALARM LIST]** item at **[DIAGNOSTIC]**.

The alarm messages are listed with the time generated, whether acknowledged or not, and alarm contents.

Move the cursor to an alarm by rotating the knob and then push to enter to acknowledge it.

The acknowledged alarm event will be marked with √ on that column. It will take approximately 3 seconds.



Note:

If a new alarm event is not acknowledged, a built-in buzzer will sound with 30 sec interval continuously. The buzzer starts to sound as soon as a new alarm occurs.

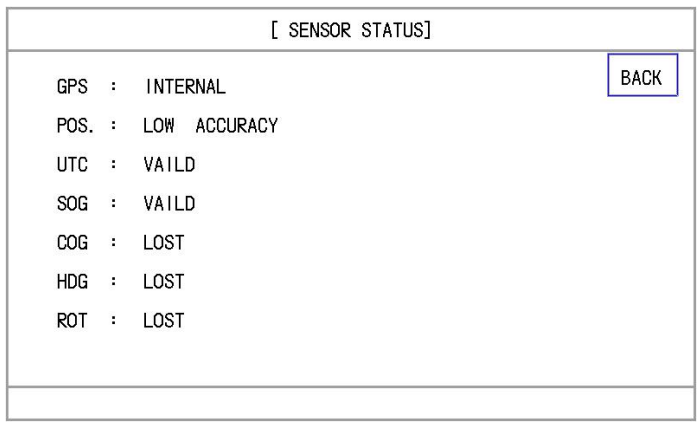
You can view more alarm messages by clicking ⌄⌄⌄ to next page or clicking ⌃⌃⌃ to previous page, in case that the alarm events can not be displayed within one screen.

For description of the alarm codes, please refer to ***[Appendix 5: Alarm Codes].***

Click BACK to return to a higher menu or the main menu.

10.5. SENSOR STATUS

Select **[SENSOR STATUS]** item at **[DIAGNOSTIC]**.



GPS: “INVALID”, “EXTERNAL”, “INTERNAL”.

POS (POSITION): LOW ACCURACY, HIGH ACCURACY.

UTC: “VALID”, “LOST ”.

SOG: “INVALID”, “VALID”.

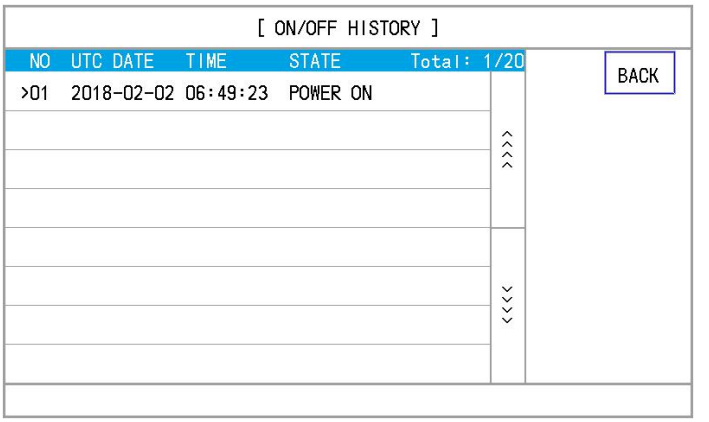
COG: “INVALID”, “VALID”.

HDG (HEADING): “INVALID”, “VALID”.

ROT: “INVALID”, “VALID”, “OTHER SENSOR”.

10.6. ON/OFF HISTORY

It’s to check the history of the power ON/OFF of NSI-1000.

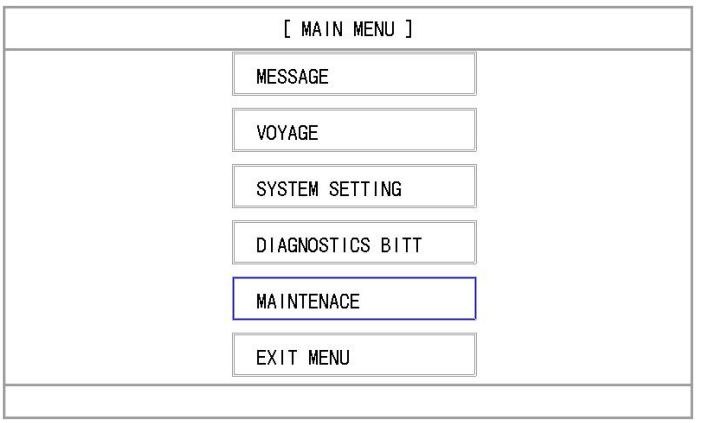


Note:

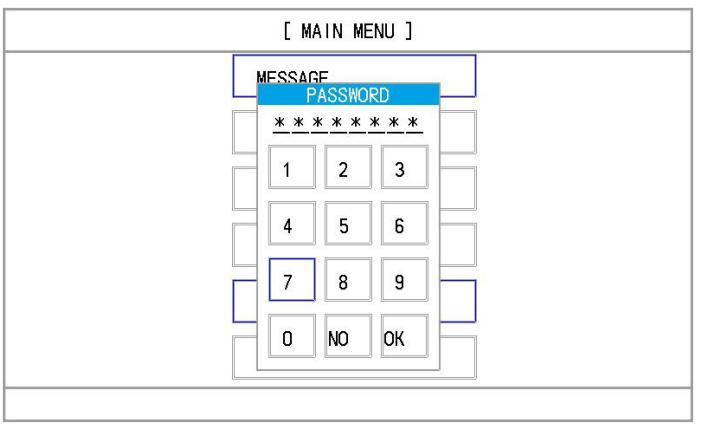
The date/time is based on UTC time basically.

11. Maintenance

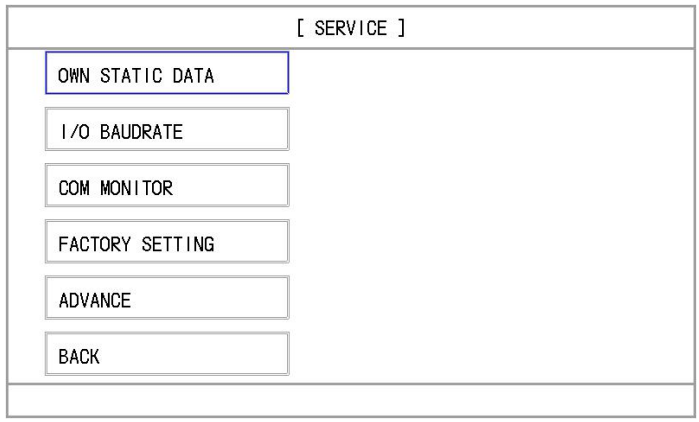
It's only used for technician when the equipment is installed.

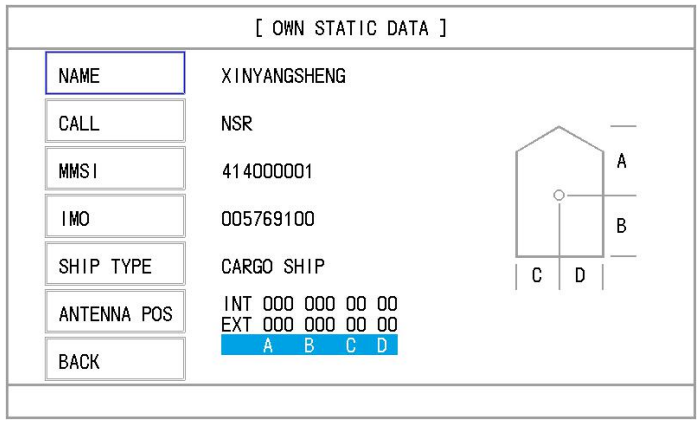


Password is required to access the submenu.



11.1. SET OWN STATIC DATA



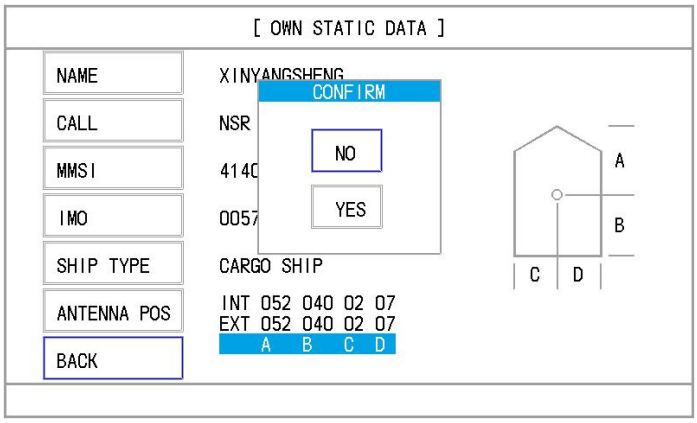


Own ship static data include **SHIP NAME, CALL SIGN, MMSI, IMO NO** etc.

Click OK to save the setting while finishing the entering of all static data or exit the current setting item.

Note:

For SHIP TYPE, please refer to ***[Appendix 1: List of Ship Type]****.*



Click to YES confirm the saving.

SET GPS ANTENNA POSITION

GPS antenna position for both internal GPS and external GPS should be entered after installation.

① Select the column for internal GPS or external GNSS antenna.

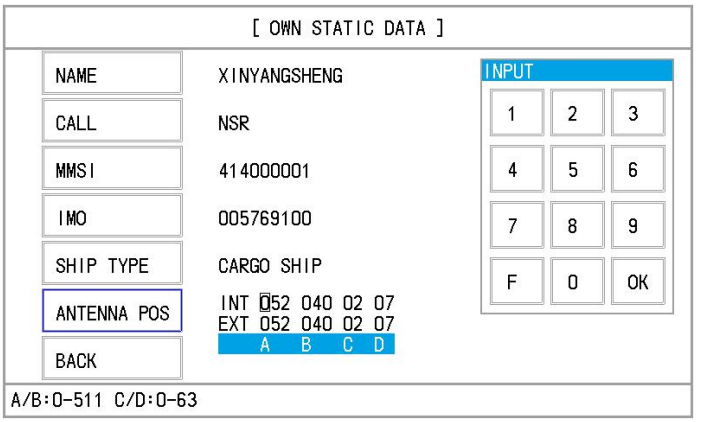
② After selecting the column for internal GPS antenna, move the cursor to either "***A***" or "***B***" or "***C***" or "***D***" on the right side of the subject of "INT" by rotating the knob to set the distance and then push the knob.

You can refer each distance for A、B、C、D to the left drawing on the screen.

③ After selecting the column for external GNSS antenna by rotating the knob, move the cursor to either "***A***" or "***B***" or "***C***" or "***D***" on the right side of the subject of "EXT" by rotating the knob to set the distance and then push the knob.

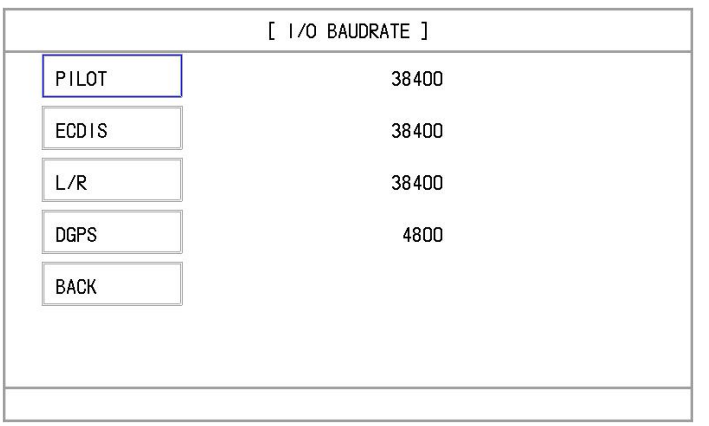
④ Click BACK to return to a higher menu or the main menu.

Return to a higher menu after the following message is shown shortly.



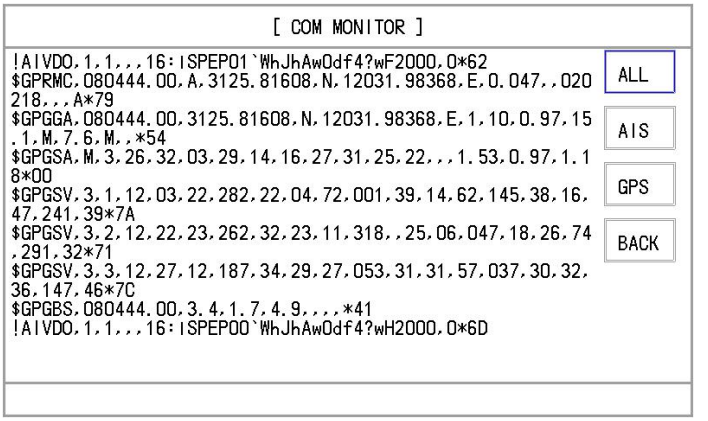
11.2. SET I/O BAUDRATE

The baud rate for each sensor and output (PILOT/ ECDIS/ L/R/ DGPS) can be chosen as 4800/9600/129600/38400bps.



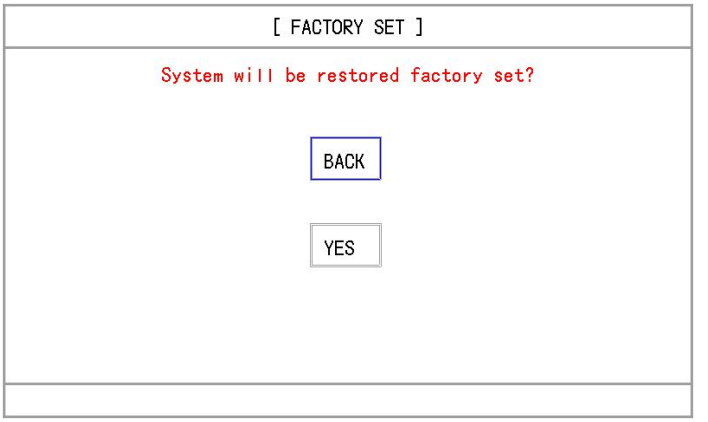
11.3. AIS/GPS COMMUNICATION MONITOR

It's to check the communication sentences on the I/O ports.



11.4. RESTORE FACTORY SETTING

It's to restore the system setting as factory settings.



Please remember all settings will be cleared if this function is executed.

11.5. ADVANCE

Only used by manufacturer.

12. Check &Troubleshooting

12.1. Periodical Check

The periodical check is necessary to maintain the performance. Monthly maintenance program should be established and includes minimum items as shown in the below table.

Item	Check Point
Connector	Inspect that all connectors on the rear panel of the transponder unit are firmly fitted.
Cable	Inspect the cables. Replace if damaged.
Ground Terminal	Inspect the ground terminal being in rust. If necessary, clean.
Ground Wire	Ensure that the ground wire is firmly fastened.
Transponder Unit	Dirt and dust should be removed from the transponder unit with a piece of soft dry cloth. Wipe the LCD carefully to prevent scratching by using tissue paper and a LCD cleaner so as to dissolve the dirt and salt. Change paper frequently so the salt or dirt will not scratch the LCD. Do not use solvents such as thinner, acetone or benzene for cleaning. These can remove paint and marks and deform the equipment.

12.2. Troubleshooting

The below troubleshooting table provides common symptoms of troubles and means to rectify them. Even it is impossible to restore with normal operation, don't attempt to check inside the equipment. Any repairing should be done by a qualified technician.

Symptom	Correction
Power	
Can't turn on the power	● Inspect that the power connector is firmly fitted. ● Inspect whether the power switch on the rear panel of the transponder has projected. ● Even it is impossible to restore with normal operation, don't attempt to check inside the equipment. ● Inspect power supply. ● Inspect fuses.
Transmission and Reception	
Can't transmit or receive	● Inspect that the VHF antenna cable is firmly fastened. ● Inspect the VHF antenna. ● Check MMSI. Can't transmit if MMSI is 000000000.
Position Data	
No Position Data	● Inspect the GNSS antenna. ● Inspect the GNSS antenna cable and connectors.

Appendix 1: List of Ship Type

20	WIG: ALL SHIPS OF THIS TYPE
30	FISHING VESSEL
31	TOWING VESSEL
32	LENGTH OF THE TOW EXCEEDS 200M OR BREADTH EXCEEDS 25M
33	VESSEL ENGAGED IN DREDGING OR UNDERWATER OPERATIONS
34	VESSEL ENGAGED IN DIVING OPERATIONS
35	VESSEL ENGAGED IN MILITARY OPERATIONS
36	VESSEL SAILING
37	PLEASURE CRAFT
40	HSC
50	PILOT VESSEL
51	SEARCH AND RESCUE VESSELS
52	TUGS
53	PORT TENDERS
54	VESSELS WITH ANTI-POLLUTION FACILITIES OR EQUIPMENT
55	LAW ENFORCEMENT VESSELS
58	MEDICAL TRANSPORTS
59	SHIPS ACCORDING TO RESOLUTION NO 18 (MOB-83)
60	PASSENGER SHIP
70	CARGO SHIP
80	TANKER
90	OTHER TYPE OF SHIP

NOTE: WIG: Wing-in-Ground Craft

Appendix 2: Abbreviations

ACK	Acknowledge
ADD	Addressed
AIS	Automatic Identification System
ALM	Alarm
ANT	Antenna
ATON	Aid to Navigation
AUTO	Automatic
AUX	Auxiliary
BRD	Broadcast
BRG	Bearing
CH	Channel
CLR	Clear
COG	Course over Ground
CPA	Closest Point of Approach
DEL	Delete
DG	Dangerous Goods
DGPS	Differential Global Positioning System
DIFF	Differential
DSC	Digit Selective Calling
DTE	Data Terminal Equipment
ECS	Electronic Chart System
ECDIS	Electronic Chart Display & Information System
EGNOS	European Geo-stationary Navigational Overlay System
EMC	Electro Magnetic Compatibility
ENG	English
ENT	Enter
ESC	Escape
ETA	Estimated Time of Arrival
EXT	External
FM	Frequency Modulation
FSK	Frequency Shift Keying
GAGAN	GPS-aided geo-augmented navigation
GND	Ground
GLONASS	Global Orbiting Navigation and Safety System
GMSK	Gaussian Minimum Shift Keying
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GYRO	Gyro Compass
HDG	Heading
HS	Harmful Substances
IALA	International Association of Lighthouse Authorities
IEC	International Electrotechnical Commission

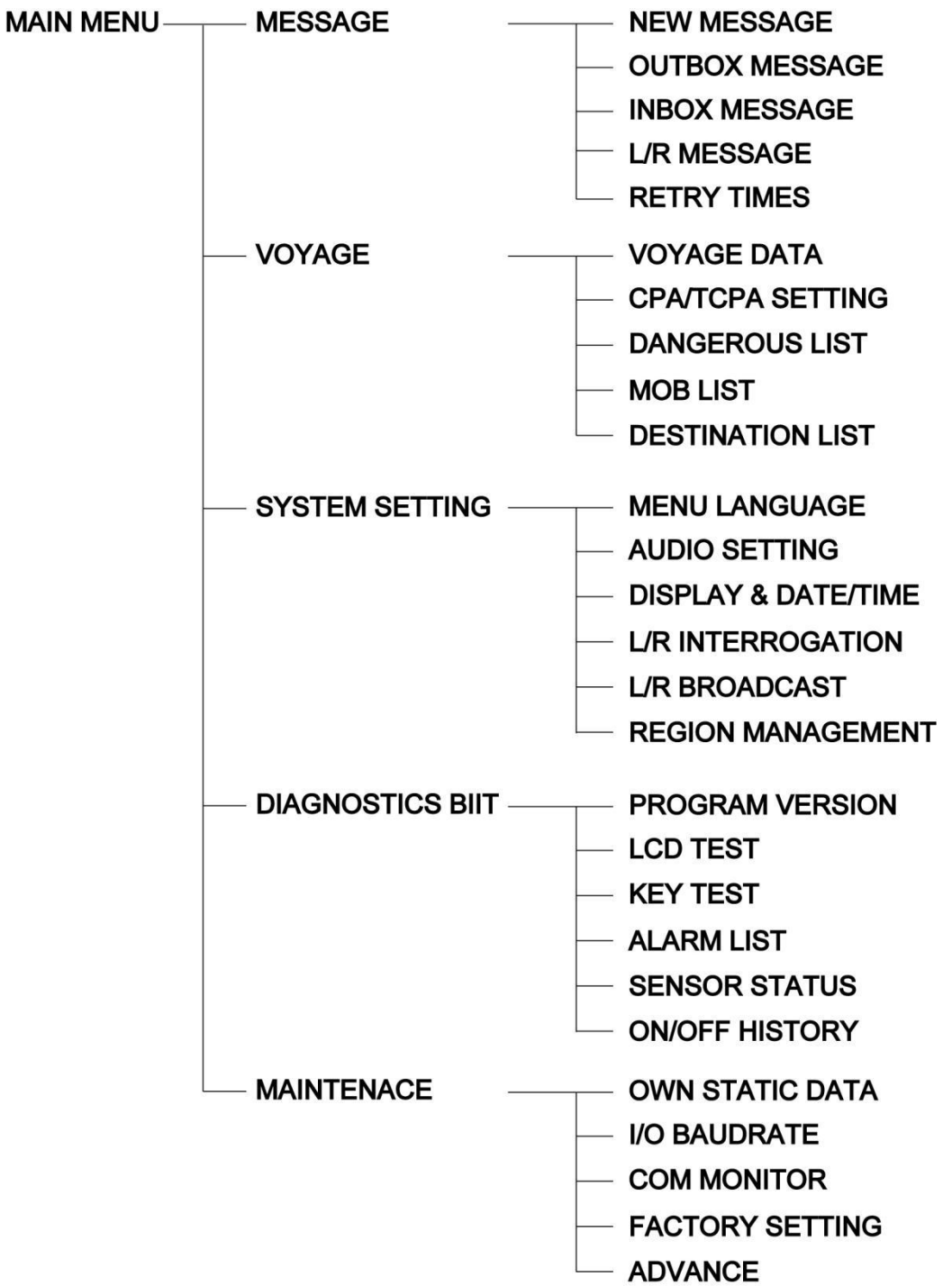
IMO	International Maritime Organization
INMARSAT	International Maritime Satellite Organization
INT	Internal
I/O	Input/Output
ITU	International Telecom Union
KN	Knots
LAN	Latitude
LCD	Liquid Crystal Display
LON	Longitude
L/R	Long Range
LRM	Long-range Message
LT	Local Time
MIN	Minute
MKD	Minimum Keyboard and Display
MMSI	Maritime Mobile Service Identity
MOB	Man Overboard
MSAS	Multi-functional Satellite Augmentation System
MSC	Maritime Safety Committee
MSG	Message
NAV	Navigation
NUM	Number
NM	Nautical Mile
NMEA	National Marine Electronics Association
PI	Presentation Interface
POS	Position
PWR	Power
RNG	Range
ROT	Rate of Turn
RTCM	Radio Technical Commission for Maritime services
RX	Receiving (Receiver)
RXD	Received/Receiving Data
S	Second
SAR	Search and Rescue
SART	Search and Rescue Transponder
SBAS	Satellite Based Augmentation System
SOG	Speed over Ground
SOLAS	International Convention for Life and Safety at Sea
TCPA	Time to Closest Point of Approach
TDMA	Time Division Multiple Access
TX	Transmitting (Transmitter)
TXD	Transmitted/Transmitting Data
UTC	Coordinated Universal Time
VHF	Very High Frequency
WAAS	Wide Area Augmentation System

Appendix 3: VHF Frequency Table

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1001	156.0500	1208	156.4125	2002	160.7000	2206	160.9125
1003	156.1500	1209	156.4625	2003	160.7500	2207	160.9625
1005	156.2500	1210	156.5125	2004	160.8000	2218	161.5125
1006	156.3000	1211	156.5625	2005	160.8500	2219	161.5625
1007	156.3500	1212	156.6125	2006	156.3000	2220	161.6125
1018	156.9000	1213	156.6625	2007	160.9500	2221	161.6625
1019	156.9500	1214	156.7125	2008	156.4000	2222	161.7125
1020	157.0000	1215	156.7625	2009	156.4500	2223	161.7625
1021	157.0500	1216	156.8125	2010	156.5000	2224	161.8125
1022	157.1000	1217	156.8625	2011	156.5500	2225	161.8625
1023	157.1500	1218	156.9125	2012	156.6000	2226	161.9250
1024	157.2000	1219	156.9625	2013	156.6500	2227	161.9750
1025	157.2500	1220	157.0125	2014	156.7000	2228	162.0125
1026	157.3000	1221	157.0625	2015	156.7500	2260	160.6375
1027	157.3500	1222	157.1125	2016	156.8000	2261	160.6875
1028	157.4000	1223	157.1625	2017	156.8500	2262	160.7375
1061	156.0750	1224	157.2125	2018	161.5000	2263	160.7875
1063	156.1750	1225	157.2625	2019	161.5500	2264	160.8375
1064	156.2250	1226	157.3125	2020	161.6000	2265	160.8875
1065	156.2750	1227	157.3625	2021	161.6500	2266	160.9375
1066	156.3250	1228	157.4125	2022	161.7000	2278	161.5375
1067	156.3750	1260	156.0375	2023	161.7500	2280	161.6375
1068	156.4250	1261	156.0875	2024	161.8000	2281	161.6875
1069	156.4750	1262	156.1375	2025	161.8500	2282	161.7375
1070	156.5250	1263	156.1875	2026	161.9125	2283	161.7875
1071	156.5750	1264	156.2375	2027	161.9625	2284	161.8375
1072	156.6250	1265	156.2875	2028	162.0000	2285	161.8875
1073	156.6750	1266	156.3375	2060	160.6250	2286	161.9375
1074	156.7250	1267	156.3875	2061	160.6750	2287	161.9625
1075	156.7750	1268	156.4375	2062	160.7250	2288	162.0125
1076	156.8250	1269	156.4875	2063	160.7750		
1077	156.8750	1270	156.5375	2064	160.8250		
1078	156.9250	1271	156.5875	2065	160.8750		
1079	156.9750	1272	156.6375	2066	160.9250		
1080	157.0250	1273	156.6875	2078	161.5250		
1081	157.0750	1274	156.7375	2079	161.5750		
1082	157.1250	1275	156.7875	2080	161.6250		
1083	157.1750	1276	156.8375	2081	161.6750		
1084	157.2250	1277	156.8875	2082	161.7250		
1085	157.2750	1278	156.9375	2083	161.7750		
1086	157.3250	1280	157.0375	2084	161.8250		
1087	157.3750	1281	157.0875	2085	161.8750		
1088	157.4250	1282	157.1375	2086	161.9250		
1201	156.0625	1283	157.1875	2087	161.9750		
1202	156.1125	1284	157.2375	2088	162.0250		
1203	156.1625	1285	157.2875	2201	160.6625		
1204	156.2125	1286	157.3375	2202	160.7125		
1205	156.2625	1287	157.3875	2203	160.7625		
1206	156.3125	1288	157.4125	2204	160.8125		
1207	156.3625	2001	160.6500	2205	160.8625		

Frequency in MHz

Appendix 4: Menu Tree



Appendix 5: Alarm Codes

5.1 Monitoring of System Functions and Integrity

In case a failure is detected in one or more of the following functions or data, an alarm will be triggered and displayed on the menu-tree under Alarm Message, and the system (transponder) will react as described in the following table.

Alarm Text	Alarm ID	Reaction of the System
AIS: Tx malfunction	001	Stop transmission
AIS: Antenna VSWR exceeds limit	002	Continue operation
AIS: Rx channel 1 malfunction	003	Stop transmission on affected channel
AIS: Rx channel 2 malfunction	004	Stop transmission on affected channel
AIS: Rx channel 70 malfunction	005	Continue operation
AIS: general failure	006	Stop transmission
AIS: UTC sync invalid	007	Continue operation using indirect or semaphore synchronization
AIS: MKD connection lost	008	Continue operation
AIS: internal / external GNSS position mismatch	009	Continue operation
AIS: NavStatus incorrect	010	Continue operation
Heading sensor offset	011	Continue operation
AIS: active AIS SART	014	Continue operation
AIS: external EPFS lost	025	Continue operation
AIS: no sensor position in use	026	Continue operation
AIS: no valid SOG information	029	Continue operation using default data
AIS: no valid COG information	030	Continue operation using default data
AIS: Heading lost/invalid	032	Continue operation using default data
AIS: no valid ROT information	035	Continue operation using default data

5.2 Antenna VSWR Exceeds Limit

There is a built-in RF output power detector, which is used to monitor the VSWR of VHF antenna port. If the antenna VSWR exceeds limit, an alarm will be reported while the unit operates continuously. The system will output an ALR 002 at related PI port.

5.3 Detection of TX Malfunction

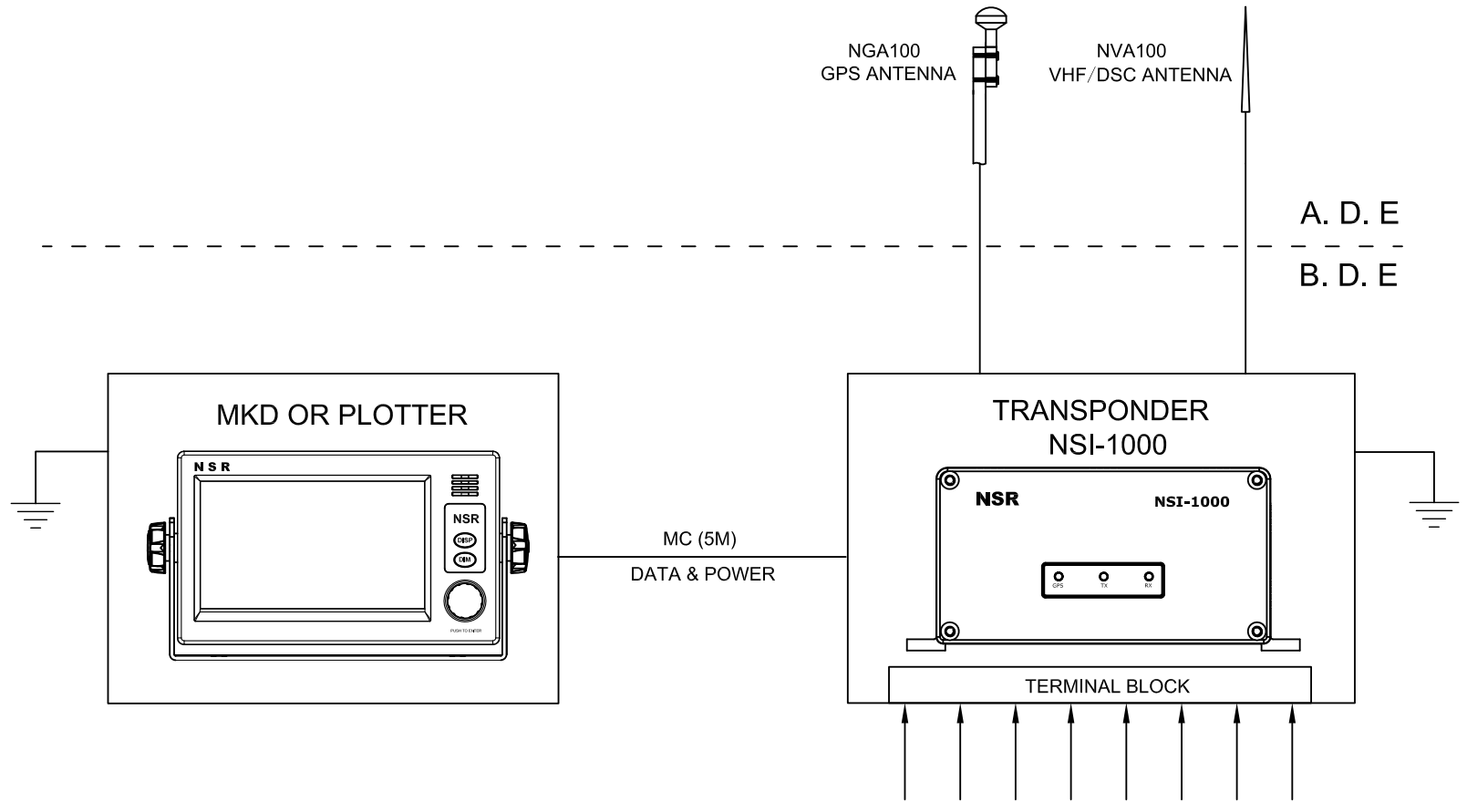
A built-in lock detector (high active) is used to monitor the local oscillator (PLL circuit) of the transmitter. If the operation of PLL circuit becomes abnormal, a logic low (TX malfunction) will be sent from the lock detector to notify the system. At the same time, system will also output an ALR 001 at the related PI port.

5.4 Detection of RX Malfunction

The NSI-1000 also has 3 built-in lock detectors (high active) to monitor each local oscillator (PLL circuit)of receiver channel 1, channel 2, and channel 70 respectively. If the operation of PLL circuit becomes abnormal, a logic low level will be sent from the lock detector to notify the system. At the same time, the system will output ALR 003 or ALR 004 or ALR 005 at the related PI port to indicate the CH1 or CH2 or CH70RX malfunctions respectively.

Appendix 6: Installation Drawings

NO.	DATE	REVISION & DESCRIPTION	REVIEWED	CHECKED
⚠			SIGNATURE	



APPLICATION	NSI-1000 AIS SYSTEM DIAGRAM				
DATE	2018-1-10	ITEM	NSI-1000 NSR AIS	SIZE	A4
APPROVAL		SCALE	N/S	UNIT	mm
CHECKED					
DRAWING		NEW SUNRISE CO., LTD.			
DWG NO.	NSI1000-DW-000				

NO.	DATE	REVISION & DESCRIPTION	REVIEWED	CHECKED SIGNATURE
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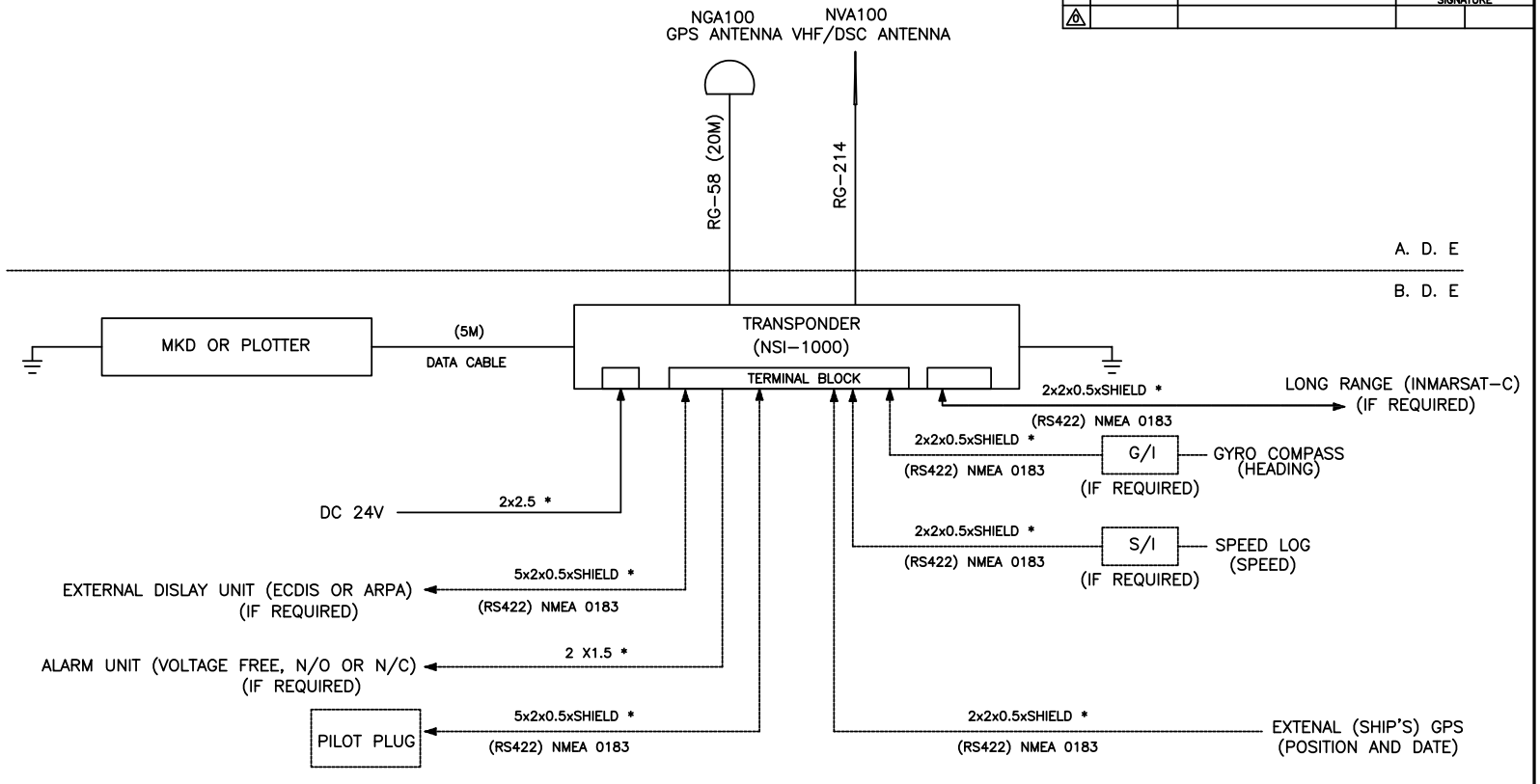
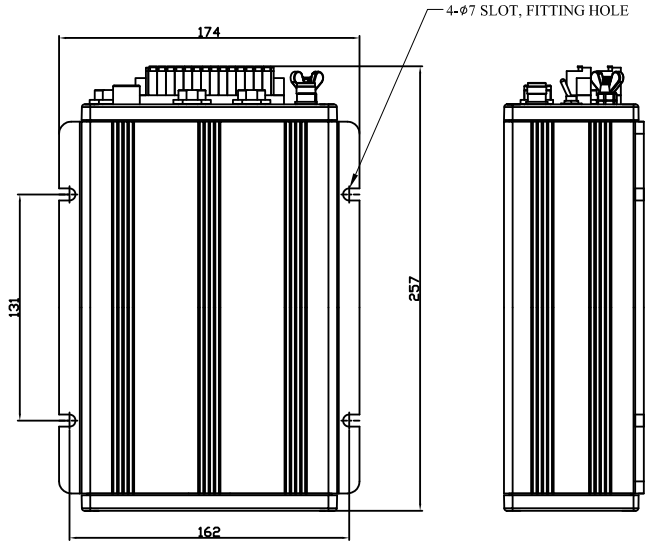


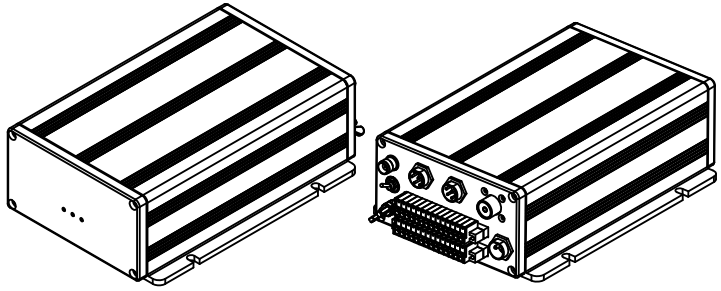
NOTE.

1. The alarm output will be activated when :
   a. There is no GPS lock.
   b. There is a faulty module.
   c. There is a faulty antenna.
   d. There is a power failure.
   e. There is loss of sensor data.
2. The External Display units are ECDIS or ARPA radar.
   This maker should be prepared appropricate unit for interface with UAIS NSI-1000,
3. G/I : GYRO INTERFACE UNIT (NMEA Convertor for Heading)
4. S/I : SYNCHRO INTERFACE UNIT (NMEA Convertor for Speed)
5. "*" marked cables to be supplied by customer.

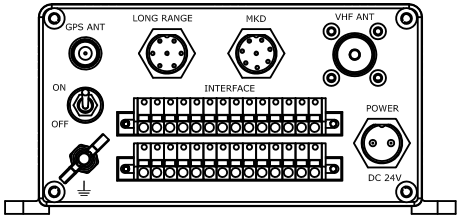
APPLICATION	CONNECTION DRAWING FOR NSI-1000 AIS SYSTEM		
DATE	Sept. 29TH 2011	ITEM	NSI-1000 NSR AIS SIZE A4
APPROVAL		SCALE N/S UNIT mm PROJECTION	▽▽▽▽0.8S ▽▽▽6.3S ▽▽12S ▽100S
CHECKED		NSR	NEW SUNRISE CO., LTD.
DRAWING			
DWG NO.	NSI1000-DW-001		

NO.	DATE	REVISION & DESCRIPTION	REVIEWED / CHECKED SIGNATURE
1			





ISO VIEW



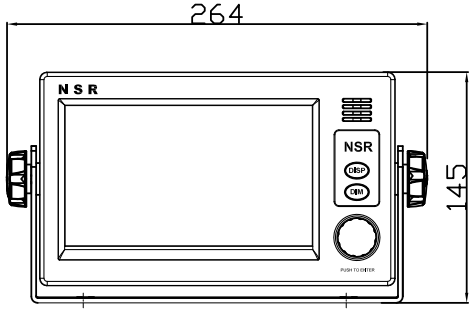
NOTE

*1. FITTING HOLE SIZE= 162*140−7ø SLOT HOLE*

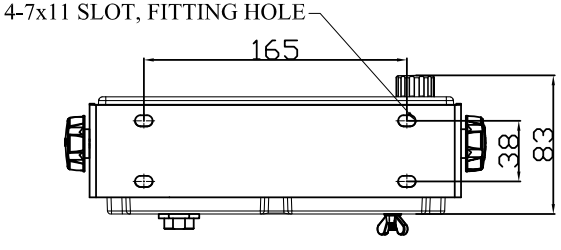
安装固定孔位置/尺寸：162X140mm，ø7狭长孔

APPLICATION	NSI-1000 MAIN UNIT DIMENSION DRAWING		
DATE	Sept. 29TH 2013	ITEM	NSI-1000 NSR AIS / SIZE A4
APPROVAL		SCALE N/S / UNIT mm / PROJECTION	▽▽▽0.8S ▽▽6.3S ▽12S ▽100S
CHECKED		NSR	NEW SUNRISE CO., LTD.
DRAWING			
DWG NO.	NSI1000-DW-002		

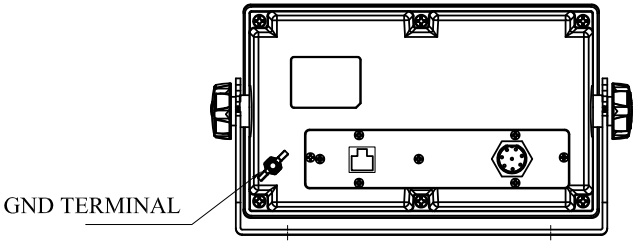
NO.	DATE	REVISION & DESCRIPTION	REVIEWED	CHECKED
⚠			SIGNATURE	



FRONT VIEW



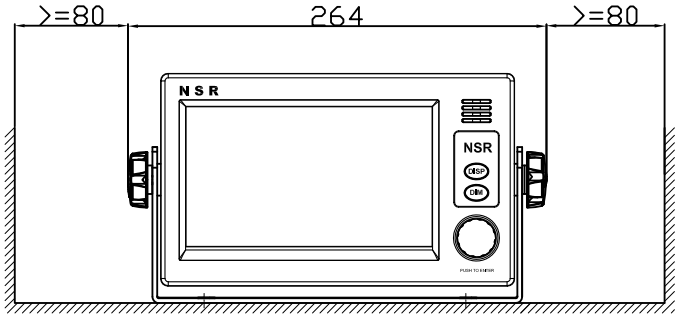
BOTTOM VIEW



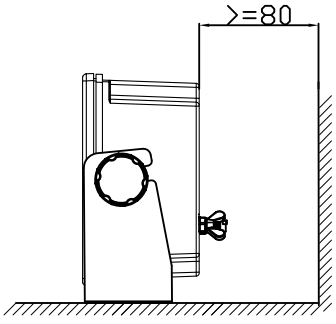
REAR VIEW

APPLICATION	NSI-1000 DISPLAY UNIT (MKD) SIZE DIAGRAM										
DATE	2018-1-10	ITEM	NSI-1000 NSR AIS							SIZE	A4
APPROVAL		SCALE	N/S	UNIT	mm	PRO-JECTION		▽▽▽▽0.8S	▽▽▽6.3S	▽▽12S	▽100S
CHECKED		NEW SUNRISE CO., LTD.									
DRAWING											
DWG NO.	NSI1000-DW-003										

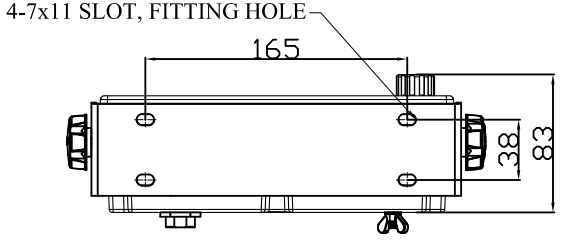
NO.	DATE	REVISION & DESCRIPTION	REVIEWED	CHECKED
⚠			SIGNATURE	



FRONT VIEW



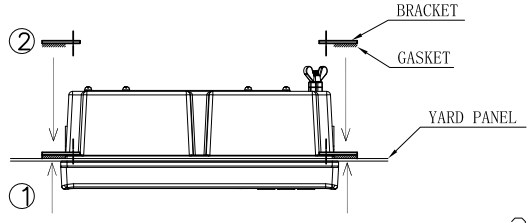
SIDE VIEW

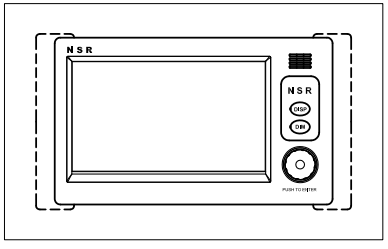


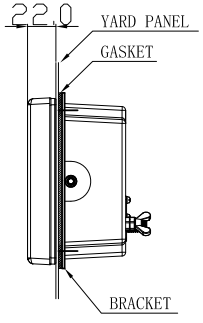
NOTE: TABLE TYPE
1.USE SELF-TAPPING SCREWS M5X20 FOR FIXING THE UNIT
2.80MM IS MINIMUM SPACE FOR OPERATION AND CABLING

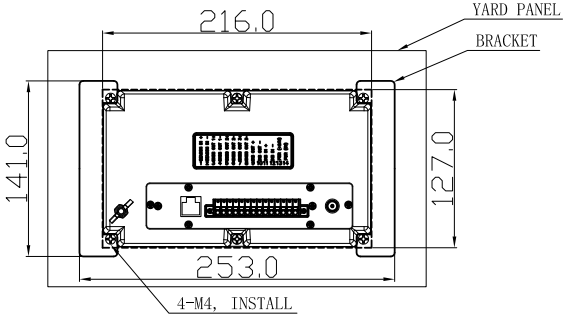
APPLICATION	NSI-1000 DISPLAY UNIT (MKD) MOUNT DIAGRAM (TABLE TYPE)								
DATE	2018-1-10	ITEM	NSI-1000 NSR AIS					SIZE	A4
APPROVAL		SCALE	N/S	UNIT	mm	PROJECTION			
CHECKED		NEW SUNRISE CO., LTD.							
DRAWING									
DWG NO.	NSI1000-DW-004								

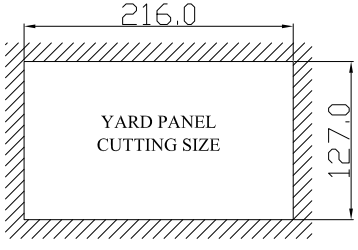
NO.	DATE	REVISION & DESCRIPTION	REVIEWED	CHECKED
⚠			SIGNATURE	

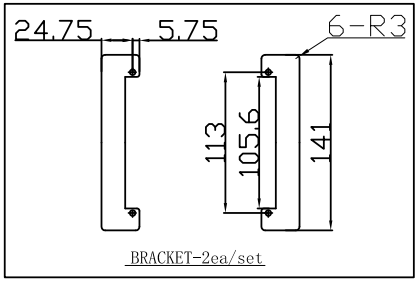








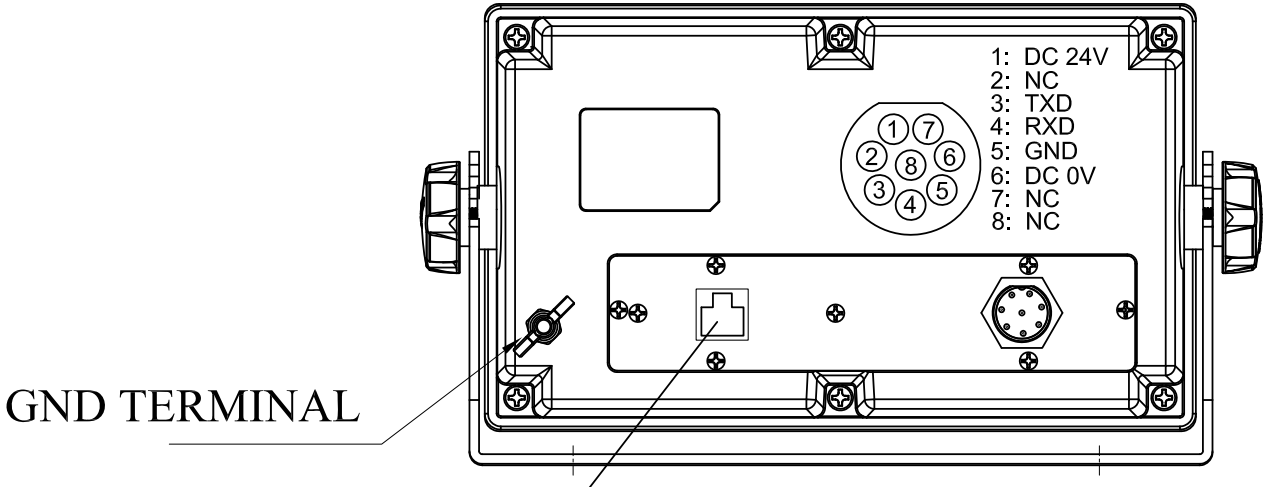




NOTE:
FLUSH MOUNT TYPE

APPLICATION	NSI-1000 DISPLAY UNIT (MKD) MOUNT DIAGRAM (FLUSH TYPE)				
DATE	2018-1-10	ITEM	NSI-1000 NSR AIS	SIZE	A4
APPROVAL		SCALE	N/S	UNIT	mm
CHECKED		NEW SUNRISE CO., LTD.			
DRAWING					
DWG NO.	NSI1000-DW-005				

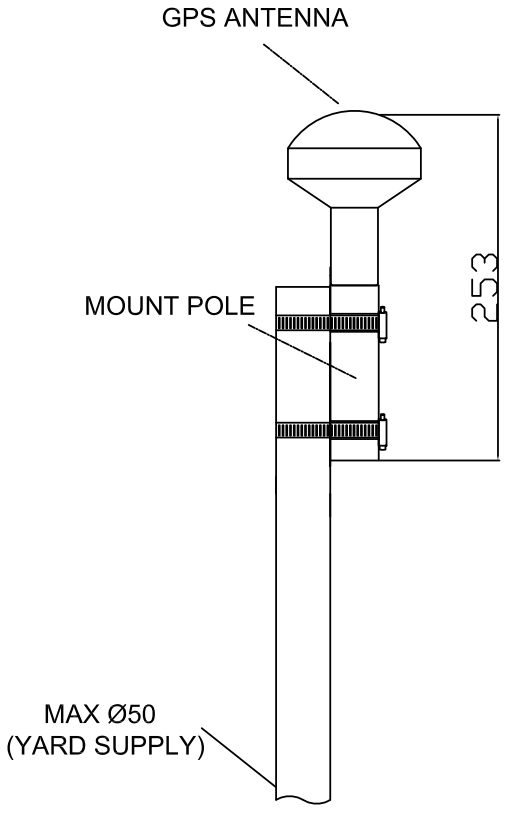
NO.	DATE	REVISION & DESCRIPTION	REVIEWED	CHECKED
⚠			SIGNATURE	

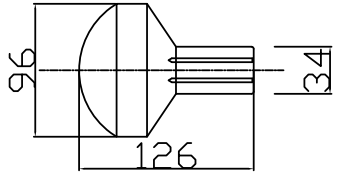


REAR VIEW

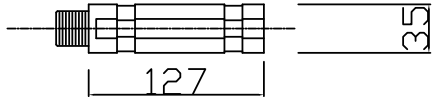
APPLICATION	NSI-1000 DISPLAY UNIT (MKD) INTERFACE										
DATE	2018-1-10	ITEM	NSI-1000 NSR AIS							SIZE	A4
APPROVAL		SCALE	N/S	UNIT	mm	PRO-JECTION		▽▽▽▽0.8S	▽▽▽6.3S	▽▽12S	▽100S
CHECKED		NEW SUNRISE CO., LTD.									
DRAWING											
DWG NO.	NSI1000-DW-006										

NO.	DATE	REVISION & DESCRIPTION	REVIEWED	CHECKED
⚠			SIGNATURE	





GPS ANTENNA



MOUNT POLE

APPLICATION	GPS ANTENNA MOUNT DIAGRAM												
DATE	2018-1-10	ITEM	NSI-1000 NSR AIS									SIZE	A4
APPROVAL		SCALE	N/S	UNIT	mm	PRO-JECTION		▽▽▽▽0.8S	▽▽▽6.3S	▽▽12S	▽100S		
CHECKED		NEW SUNRISE CO., LTD.											
DRAWING													
DWG NO.	NSI1000-DW-007												

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September, 2018