

# **KODEN**

## **OPERATION MANUAL**

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### **TOTAL NAVIGATOR**

# **KTN-70A**

**This product is specifically designed to be installed on boats and other means of maritime transport. If your country forms part to the EU, please contact your dealer for advice before attempting to install elsewhere.**



**KTN-70A Operation Manual****Doc No:0093107002****Document Revision History**

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When part of the document needs to be revised, the document has advanced revision number.

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**Important Notice**


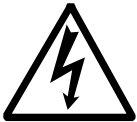


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## For Your Safe Operation



### Symbol used in this Operation Manual

The following pictograms are used in this manual. The meaning of each symbols shall be well understood and the maintenance and inspection shall be carried out.



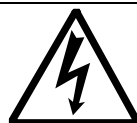




Symbol	Meaning
 <b>Warning</b>	<b>Mark for warning</b> This mark denotes that there is a risk of death or serious injury when dealt with incorrectly.
	<b>Mark for danger of high voltage</b> This mark denotes that there is a risk of death or serious injury due to electric shock when dealt with incorrectly.
 <b>Caution</b>	<b>Mark for caution</b> This mark denotes that there is a risk of slight injury or damages of devices when dealt with incorrectly.
	<b>Mark for prohibition</b> This mark denotes prohibition of specified conducts. Description of the prohibition is displayed near the mark.

### Caution items on equipment

	<b>Be careful of high voltage inside</b> High voltage, which may risk your life, is used. This high voltage may remain in the circuit even after the power is switched off. To prevent contact with the high voltage circuits accidentally, a protective cover or the label with this mark is provided on the high voltage circuit. When the inside is to be checked, ensure to switch off the power and to discharge the residual voltage for safety. An engineer authorized by Kodan shall carry out the inspection and maintenance works.
 <b>Warning</b>	<b>Power off in the boat</b> An accidental power-on during works may result in worker's electrification. To prevent such accident in advance, ensure that power in the boat and on the equipment are switched off. Furthermore, it is safer to hang a caution tag saying "Under work" near the power switch of equipment.
 <b>Warning</b>	<b>Be careful of dust</b> Inhaled dust may cause respiratory affection. At the time of cleaning the inside of equipment, be careful not to inhale dust. Wearing a safety mask is recommended.
 <b>Caution</b>	<b>Caution on location of installment</b> The equipment shall not be installed at locations which are excessively damp and suffers from water drops. Otherwise, dew condensation may occur inside the display screen, and corrosion may occur inside the unit box.

 <b>Caution</b>	<b>Measures against static electricity</b> Static electricity may be generated from the carpet on the floor in the cabin or clothes made of synthetic fiber, and it may destroy the electronic components on circuit boards. The circuit boards shall be handled with appropriate measures against static electricity.
 <b>Caution</b>	<b>Caution at installation of Transducer unit</b> Transducer unit shall be installed at locations where there is no effect by bubble and noise. Bubble and noise may seriously degrade the performance of this equipment.

### Cautions on handling

 <b>Warning</b>	No disassembly or modification of this equipment is allowed. It may lead to failure, firing, smoking or electric shock. In case of failure, please contact Kodon's dealers or Kodon.
 <b>Warning</b>	In case of smoking or firing, switch off the power in the boat and of this equipment. It may lead to firing, electric shock or damages.
	<b>Be careful of residual high voltage</b> High voltage may remain in capacitors for several minutes after switching off the power. Before inspection of the inside, please wait at least 5 minutes after switching off or discharge the residual electricity in an appropriate manner. Then, start the work.
 <b>Caution</b>	The information displayed on this equipment is not intended to use for your navigation. For your navigation, be sure to see the specified materials.
 <b>Caution</b>	Please use the specified fuses. If un-specified fuses are used, they may cause firing, smoking or damages.
 <b>Caution</b>	Be sure to submerge the Transducer unit in water before transmission. If not, it may be damaged.
 <b>Caution</b>	Press the power key at just 2 seconds, when putting the power on. If you press and hold it further, the countdown display may not appear at the end. There is no problem on the operation.

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## Introduction

- 7-inch 800X480 (WVGA) resolutions; LED-backlight, wide viewing angle, unlimited backlight adjustment, comfortable night usage mode.
- Wide range voltage designed; input voltage between 10.8-31.2 volts DC.
- Easy to upgrade via SD card. SD card can be SD(2GB) or SDHC( 4GB-32GB).
- Text-to-speech technology, voice prompts and supports.
- Can store up to 400,000 track points, 1000 other ship track, 50,000 waypoints, 200 routes, 50,000 markers, 10000 drawing nodes, 1000 beacons, 20 POB.
- Possess the function of AIS (Automatic Identification System).
- Detailed navigation information for major international ports, free charts and software upgraded regularly.

## Configuration of Equipment

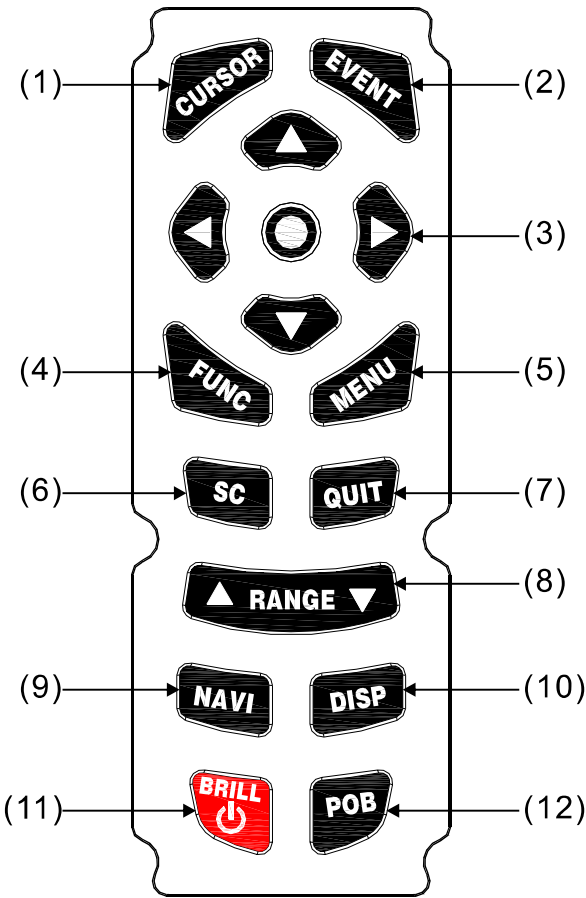
### Standard Equipment Configuration List



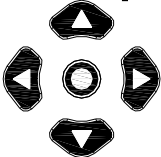

No	Name of item	Type	Remark	Weight/ Length	Qty
1	Display	KTN-70A	Built in AIS Receiver Include Stand	1425.6g	1
2	Cover	KTN-70ABSCV	Be fixed with front panel	133.8g	1
3	Stand	KTN-70ABSMS	Prop up the Display	273.6g	1
4	Knob	XNM8-30	Fix the Stand and Display	53.6g	2
5	Tapping Screw	ST5-20	Be used to fix on the embedded installation	11.8g	8
6	GPS Antenna	GP80-10M		451.8g	1
7	GPS Antenna Holder	GP-H-150		75g	1
8	Power Cable	CW-274-2M		102g/2M	1
9	6 Pin Connector	CW-108-A6		10.6g	1
10	Operation Manual	0093107002			1
11	Quick Manual	0093107004			1









Chapter 1 Preparation

1.1 To use keys

Operation unit of KTN-70A



No.	Key Name	Description
1	[CURSOR] 	To display or hide the cursor in the chart.
2	[EVENT] 	Use for add the mark.
3	[ARROW+ENTER] 	ARROW KEY: To move the cursor, to select the menu and input method. ENTER KEY: Use for input or confirm.
4	[FUNC] 	Use for the operation of main function menu.

5	[MENU] 	To display all menu.
6	[SC] 	Use for quick operation.
7	[QUIT] 	Use for exit or cancel the current operation.
8	[RANGE] 	ZOOM IN: Adjust chart scale to display a smaller area with more detail. ZOOM OUT: Adjust chart scale to display a large area with less detail.
9	[NAVI] 	1.This to call out 【Navigation】 . 2.Can select Waypoint, Forward invoke and Reverse invoke.
10	[DISP] 	1. Press once to view the page. 2. Long press to select the page.
11	[BRILL] 	1. Press once to adjust the volume and brightness. 2. Long press to shut down.
12	[POB] 	Use for add POB, to save the current ship position.

There are two types of pressing of keys, which are Press and Long-press.

1. Press: Press the key with a finger and release immediately.
2. Long press: Keep pressed until the screen display responds.


Normal operation is done with [Press].

When the relevant key is long-pressed, the menu box of the function defined for the key is displayed. Release the finger from the key, once the menu box is displayed.



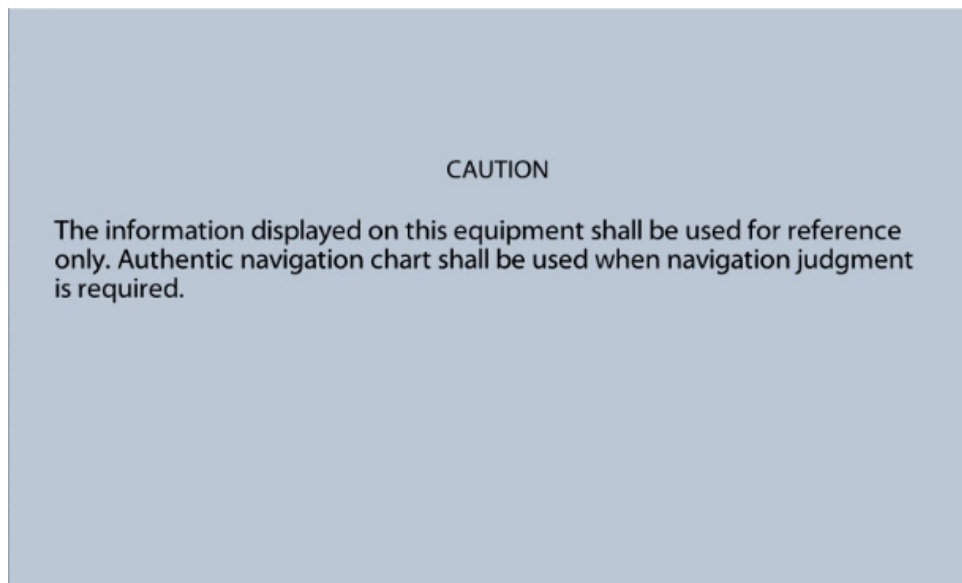
## 1.2 Power ON/OFF


### 1.2.1 Power ON


Long press  to boot, and then enter the boot screen, as shown below, it will stay 5 seconds.




And then enter the statement screen, as shown below, it will stay 10 seconds.



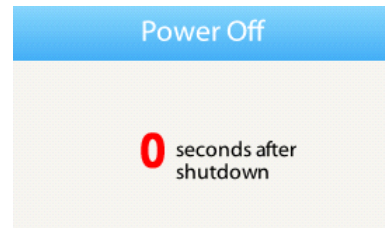
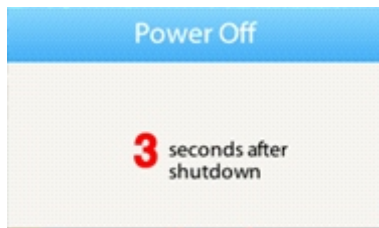
 **Caution:** Please wait until the screen is displayed after the power is turned on. It takes about 15 seconds.

 **Caution:** Press the power key at just 2 seconds, when putting the power on. If you press and hold it further, the countdown display may not appear at the end. There is no problem on the operation.

### 1.2.2 Power OFF



Long press , pop-up the window [Power Off], as shown below, and then appear “0”.

The system shutdown.



### 1.3 Chart Operation in Normal Navigation State

#### 1. Move the Chart

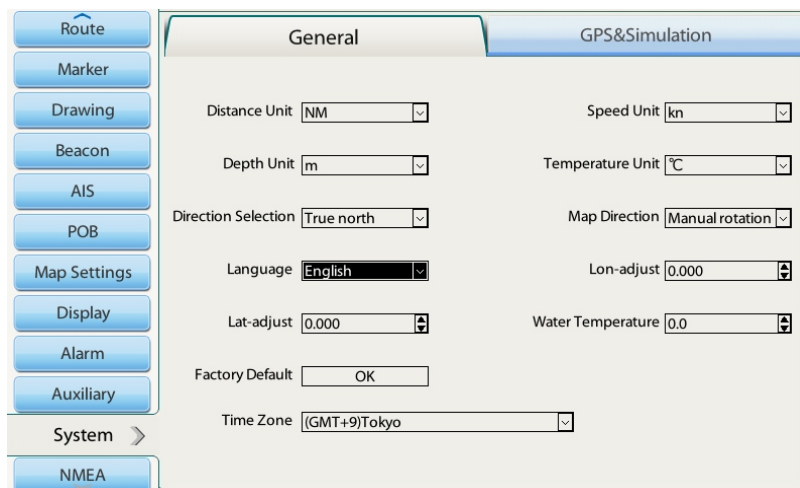
Move cursor through  to view the chart. When cursor moved to the edge of the page, the chart will refresh automatically. Press  to display your boat at the center of the chart.


#### 2. Zoom IN/OUT the Chart

Press  to enlarge the chart, and press  to zoom out the chart.

### 1.4 Language setting

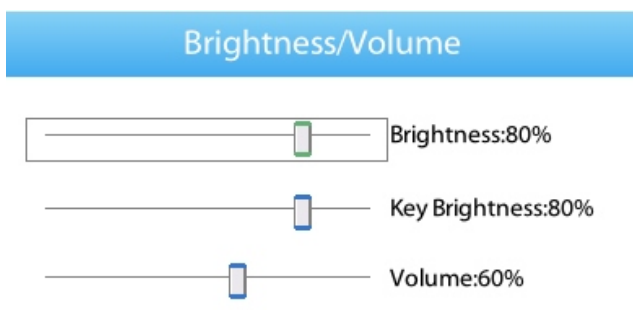
Press twice  →  to select 【System】 → press twice  →  to select the language.





1. Press arrow key to select the language.
2. After setting, press  to exit from the setting and turn to the chart page.





**Note:** It provides various languages for user to select.

## 1.5 Adjust Brightness/Volume











### 1.5.1 Adjust the screen brightness

When displays the 【Brightness/Volume】, the focus is on the 【Brightness】, use   to adjust the screen brightness.




Short press  → 【Brightness】 →   → 






### 1.5.2 Adjust the keypad brightness

When displays the 【Brightness/Volume】, push  key to choose 【Key Brightness】, use   to adjust the key brightness.



Short press  →  → 【Key Brightness】 →   → 

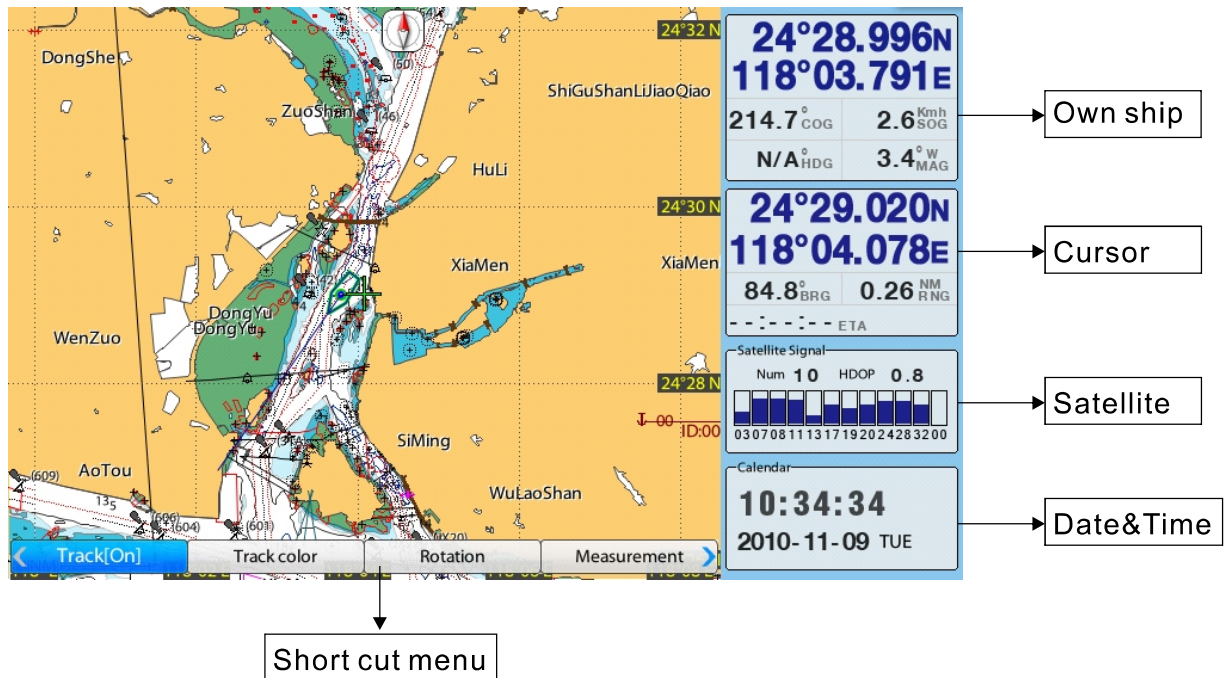
### 1.5.3 Adjust the volume

When displays the 【Brightness/Volume】, push  key to choose 【Volume】, use   to adjust the volume.

Short press  →  → 【Volume】 →   → 

## 1.6 Main page data

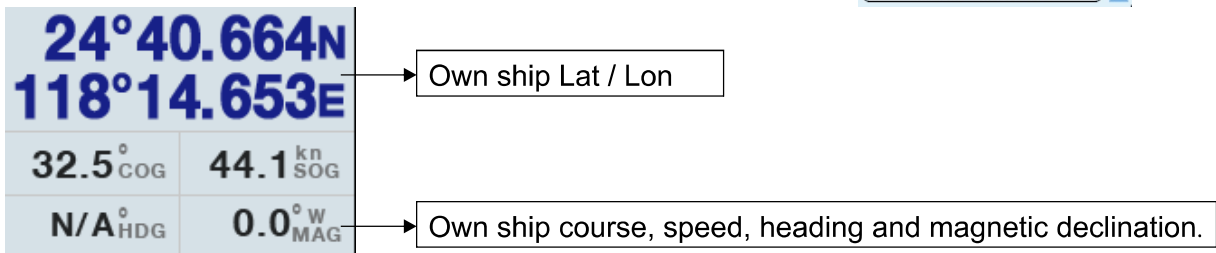
The main page displays the map, data information of own ship, cursor, satellite and time. If you press the  or , the menu will appear.



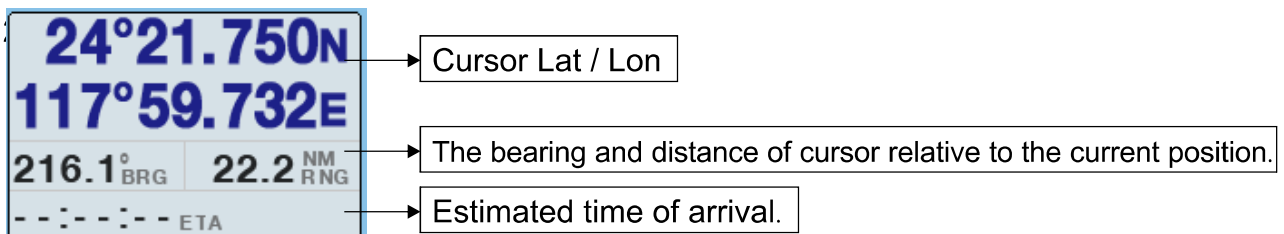
**Note:** The chart is subject to the actual display.

Press  → **【Custom Panel】** → press twice  → 

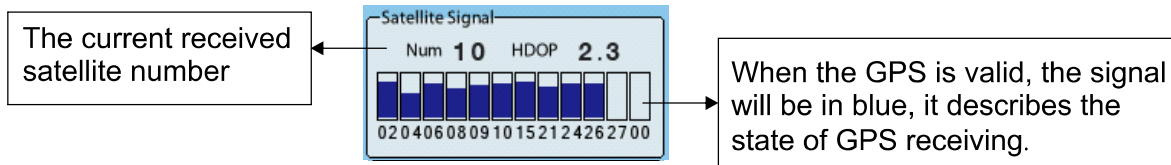
### 1. Own ship position data window



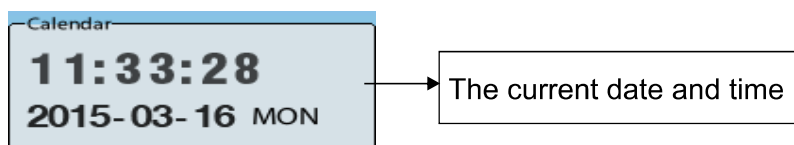
**Note:** The window describes the state of GPS receiving. When the GPS is valid, longitude and latitude will be in blue, and when GPS is invalid, it will be in gray.



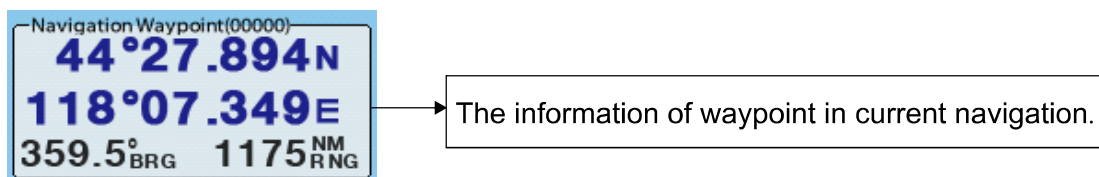
### 3. Satellite Signal window



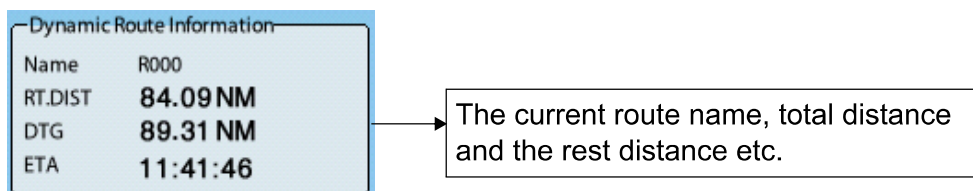
### 4. Calendar window



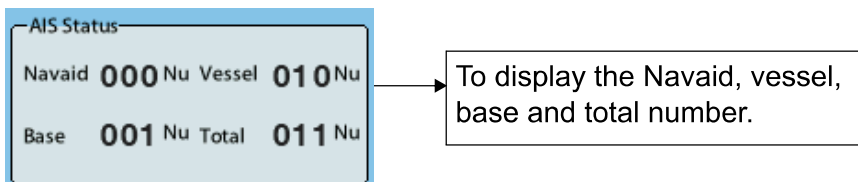
### 5. Navigation Waypoint window



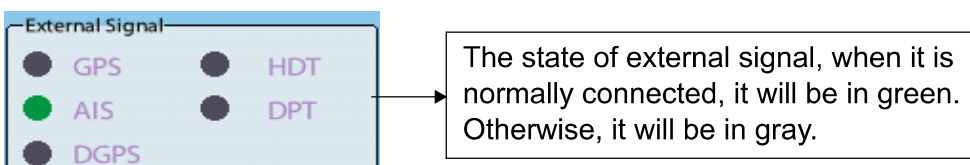
### 6. Dynamic Route Information window



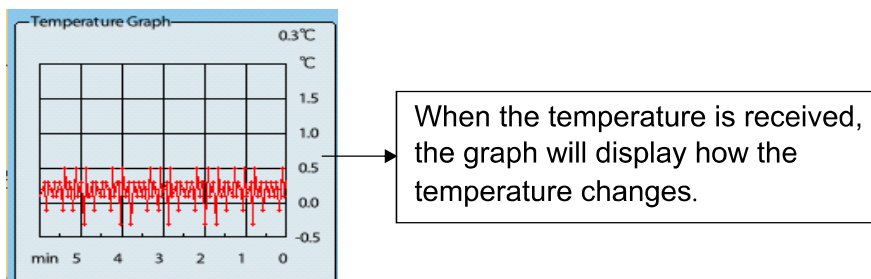
### 7. AIS window



### 8. External Signal window

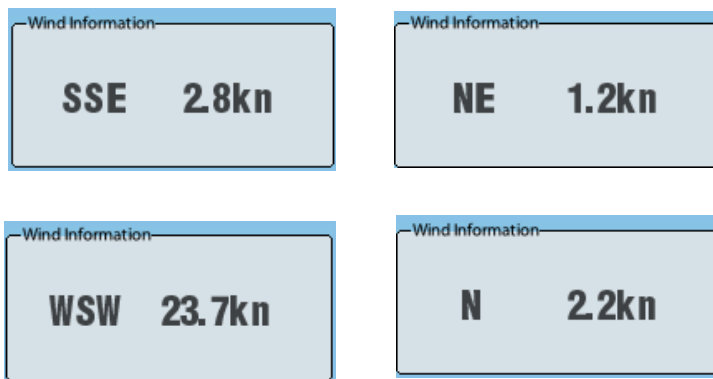


### 9. Temperature Graph window



## 10. Wind Information window

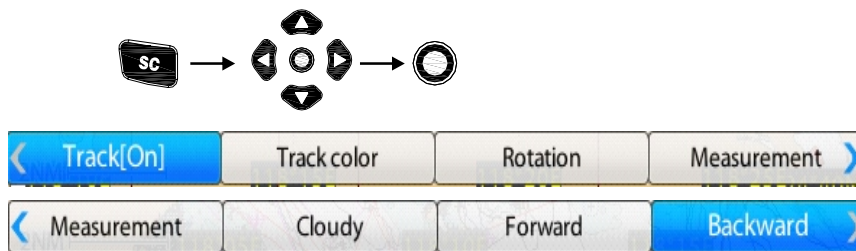
The data of wind direction and wind speed get from NMEA0183, they display as follow.



The value for the wind is converted into the alphabet and it displays as follows.

Value for wind (°)	Mark	Value for wind (°)	Mark
348.75 to 11.25	N	168.75 to 191.25	S
11.25 to 33.75	NNE	191.25 to 213.75	SSW
33.75 to 56.25	NE	213.75 to 236.25	SW
56.25 to 78.25	ENE	236.25 to 258.75	WSW
78.25 to 101.25	E	258.75 to 281.25	W
101.25 to 123.75	ESE	281.25 to 303.75	WNW
123.75 to 146.25	SE	303.75 to 326.25	NW
146.25 to 168.75	SSE	326.25 to 348.75	NNW

## 11. Short Cut Menu



It includes Track (on), Track color, Rotation, Measurement, Display Mode, Forward and Backward.

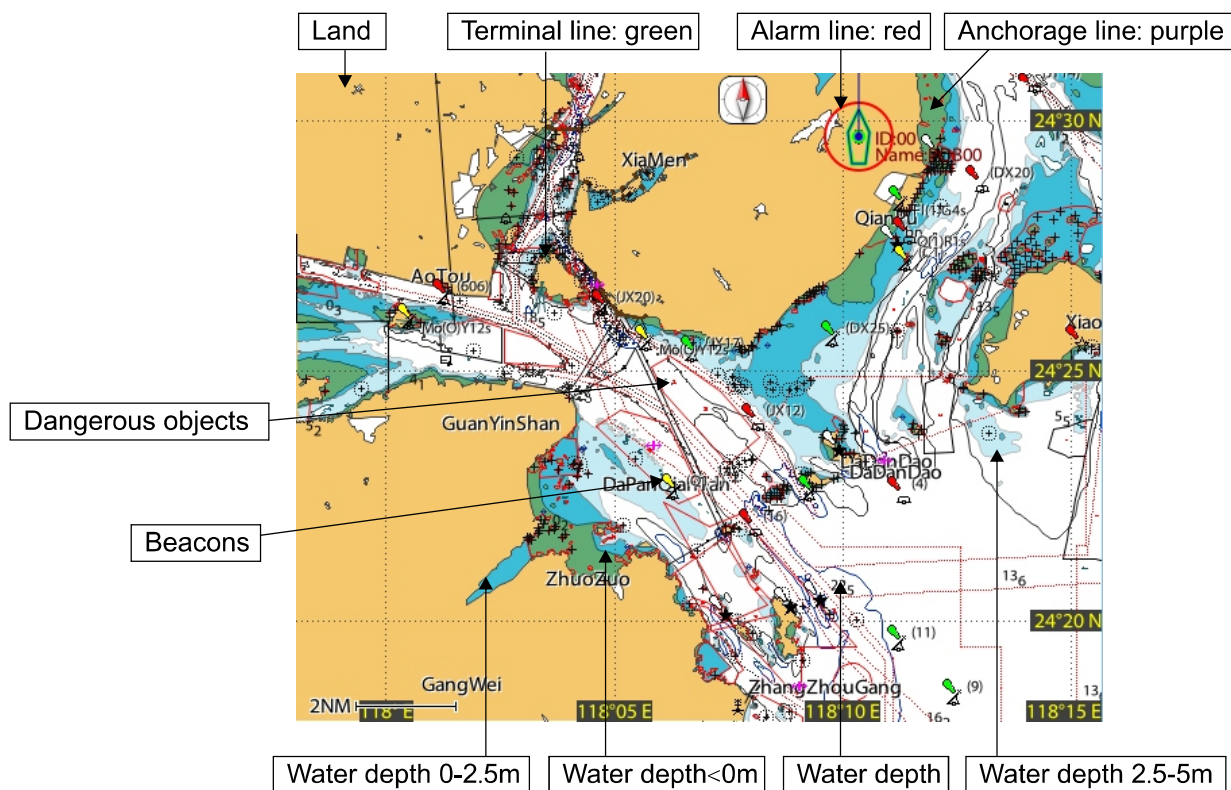
**Note:** Press “SC”, and it will pop-up the shortcut menu only in chart page. No Operate for 5 seconds or press “QUIT”, and the shortcut menu will disappear.



## 1.7 Map Data

Here makes a description about the map data.

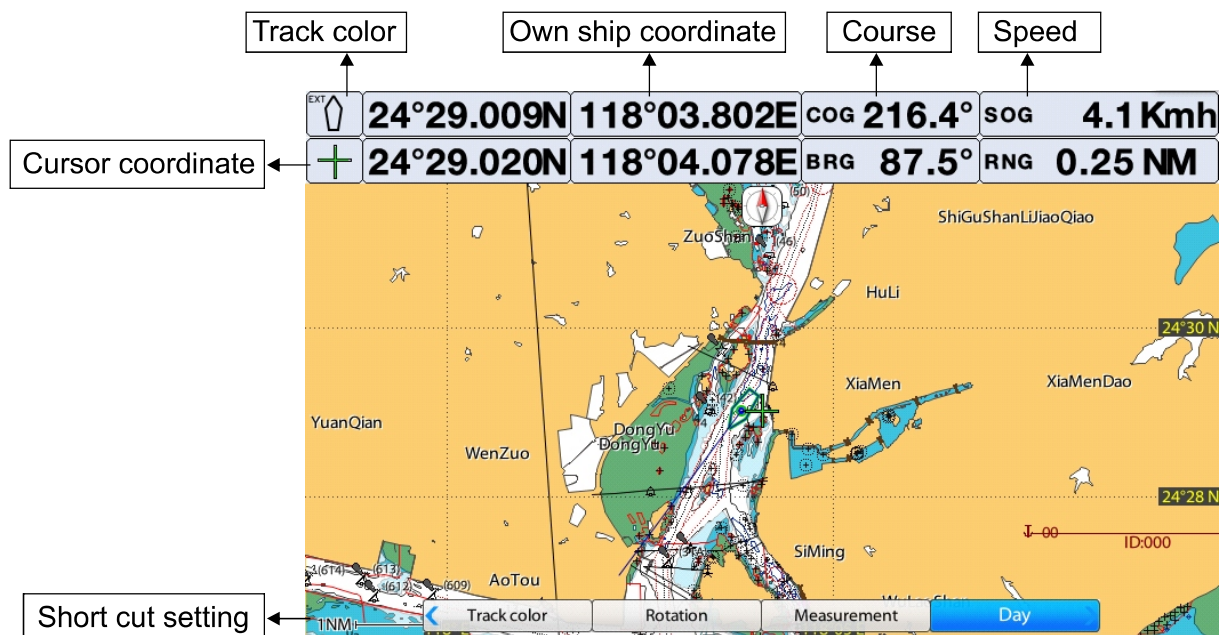
As shown below:



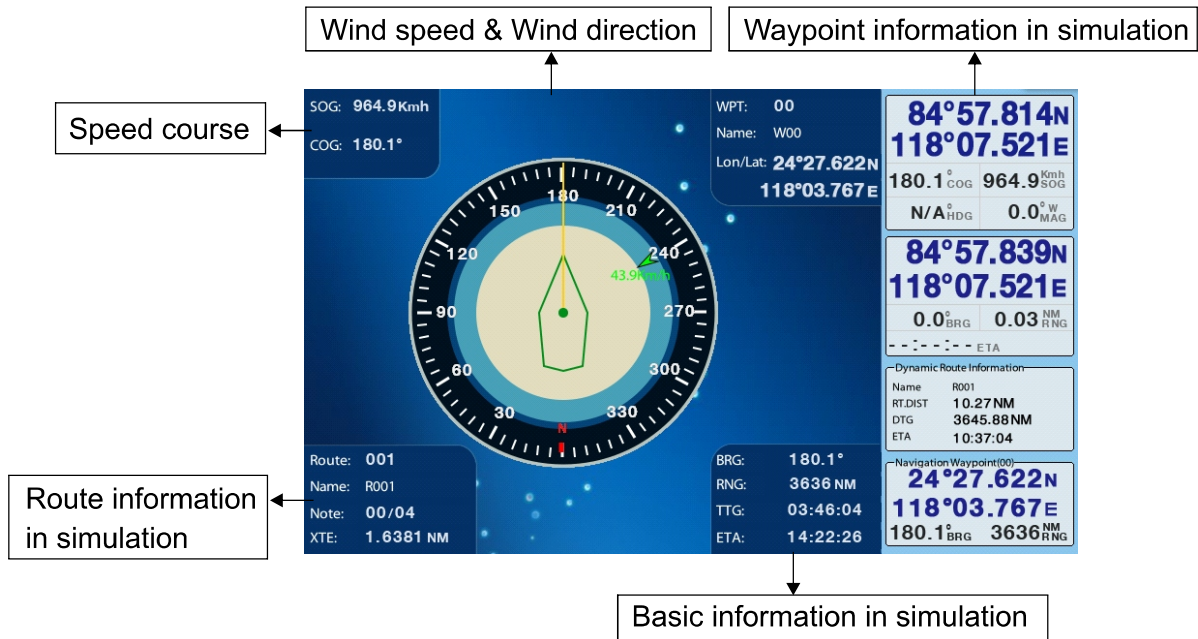
## 1.8 Main Page Introduction

Press **DISP** to switch the page.

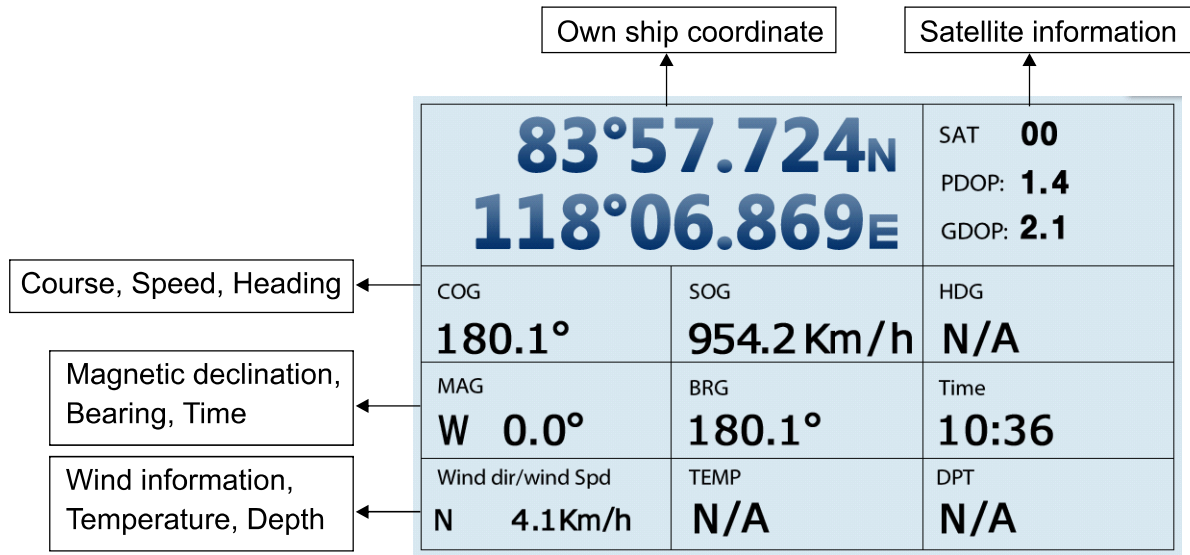
1. Chart Page (full screen)



2. Compass Page



3.Data Page





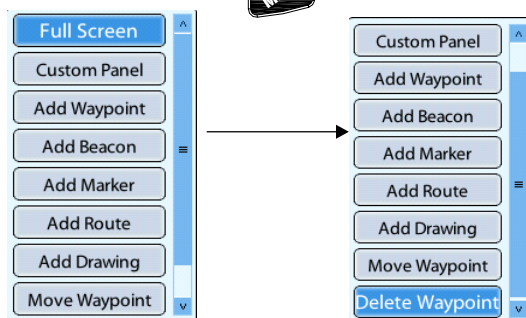


Display	Cursor Line (ON/OFF) Destination Line (ON/OFF) Grid (ON/OFF) Map Direction Pointer (ON/OFF) Length Of Course Line (OFF/Short/Medium/Long) Width Of Course Line (Thin/Medium/Thick) OWNSHP Style (Traditional/Ship shape) Map's Font (Small/Medium/Large) Mode Of Map Moving (Center/Drag) Destline Width (Thin/Thick) Setting Of Map Area (China/Vietnam/Indonesia/Myanmar/Malaysia/ India/Bangladesh/Thailand/Pakistan/Turkey)	ON ON ON ON Medium Thin Ship shape Large Center Thick Malaysia
Alarm Alarm1	Anchor Watch Alarm (ON/OFF) XTE Alarm (ON/OFF) Arrival Alarm (ON/OFF) Over speed Alarm (ON/OFF) AIS(CPA) Alarm (ON/OFF) AIS(TCPA) Alarm (ON/OFF) Lower Depth Alarm (ON/OFF) Higher Depth Alarm (ON/OFF) Drawing Alarm (ON/OFF) Distance To Turn Waypoint (ON/OFF) Water Temperature Alarm (OFF/On-inside range/On-out of range ) Lower Temperature (-5~+44.9) Higher Temperature (-4.9~45.0)	OFF, 0.01NM ON, 0.01NM ON, 0.03NM OFF, 10.00kn ON, 2.00NM ON, 10min OFF, 1.00m OFF, 50.00m OFF, 0.03NM ON, 0.01NM OFF 15.0 20.0
Alarm2		
System General	Distance Unit (km/NM) Temperature Unit (°C/°F) Depth Unit (m/fm/l.fm/ft) Speed Unit (km/h/kn) Water Temperature (-10.0~10.0) Map Direction (Manual rotation/Auto rotation) Direction Selection (True north/Magnetic north) Language (English/Chinese/...) Lon-adjust (-59.999~+99.999) Lat-adjust (-59.999~+99.999) Time Zone (-12~12) SOG Filtering (ON/OFF、2~59) COG Filtering (ON/OFF、2~59) MAG (Auto/Manual、W/E、0.0~359.9) Execute (Navigate/Custom、Start/Stop)	NM °C m kn 0.0 Manual rotation True north English 0.000 0.000 (GMT+9)Tokyo ON, 5 ON, 10 Auto, E, 0.0 Navigate
GPS & Simulation		

NMEA1/NMEA2 Output	Start Position	Own Ship's Lat&Lon
	SOG (0~27kn) Rudder Angle (-90°~+90°) COG (0°~359°) Checksum (ON/OFF) RMC (ON/OFF) GGA (ON/OFF) VTG (ON/OFF) GLL (ON/OFF) HDT (ON/OFF) DPT (ON/OFF) RMA (ON/OFF) RMB (ON/OFF) ZDA (ON/OFF) XTE (ON/OFF) APB (ON/OFF) BOD (ON/OFF) BWC (ON/OFF) MTW (ON/OFF) MWD (ON/OFF) MWV (ON/OFF) TLL (ON/OFF) RTE (ON/OFF) RTE(K) (ON/OFF)	3kn 1° 0° ON ON ON ON ON OFF OFF OFF OFF ON ON ON OFF OFF OFF OFF OFF OFF OFF OFF OFF
Input Baud Rate	Input (GPS/AIS/NMEA1/NMEA2) NMEA1 (4800, 9600, 19200, 38400) NMEA2 (4800, 9600, 19200, 38400)	GPS 4800 4800
SYSTEM Display	Scenario Mode (Auto/Standard/Day/Night/Cloudy) Temperature Width (6min/12min/30min/60min) Temperature Range (2/5/10) Chart (OFF/ON)	Auto  6min 2 °C OFF

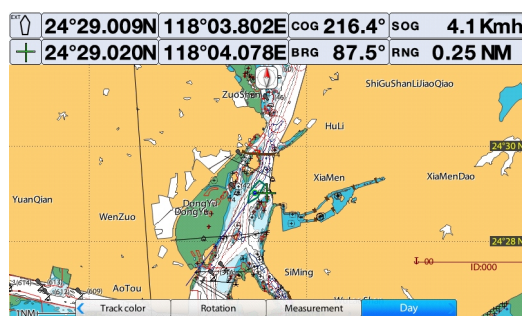
## 2.2 First Menu

When the cursor is on, press , pop-up the menu, as shown below.



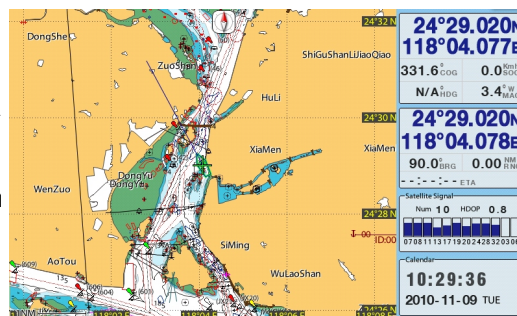
### 2.2.1 Open full screen/Close full screen

In the chart page, press  select **【Full Screen】** / **【Exit Full Screen】** → 



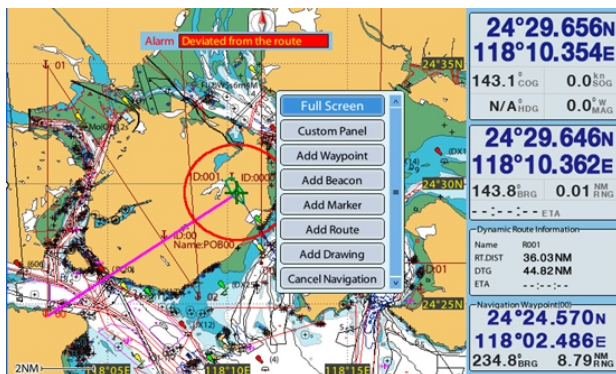
Full screen →

← Exit Full Screen








### 2.2.2 Custom Panel

In the chart page and exit full screen, press  →  → **【Custom Panel】** → 

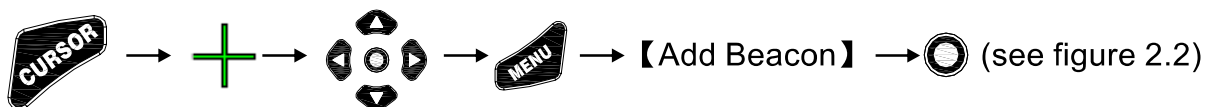


**Note:** As shown above, the Satellite Signal window and Calendar window are for custom setting, but the own ship data window and cursor data window can't be changed.

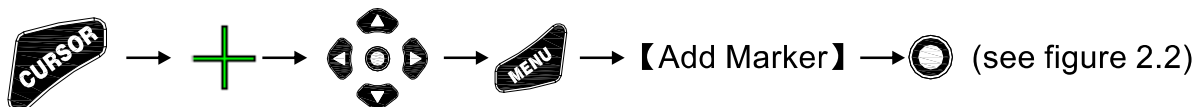
### 2.2.3 Add Waypoint

 →  →  →  → **【Add Waypoint】** →  (see figure 2.2)

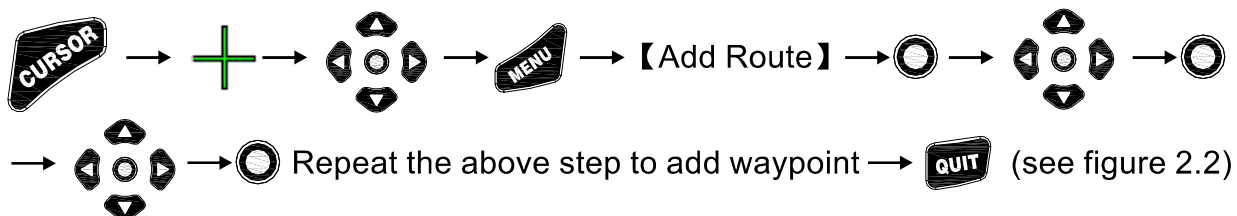
### 2.2.4 Add Beacon



### 2.2.5 Add Marker



### 2.2.6 Add Route



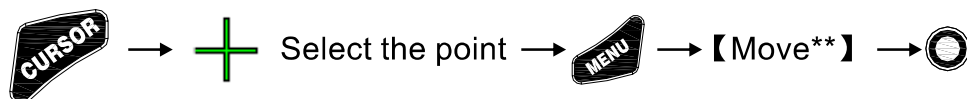
**Note:** A route consists of two waypoints at least.

### 2.2.7 Add Drawing



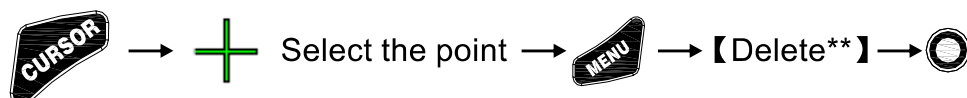
**Note:** A drawing consists of two nodes at least. The 【Save Drawing】 window will not pop-up if there have only two nodes.

### 2.2.8 Move the point



**Note:** The following points are allowed to be moved includes waypoint, beacon, marker, drawing node and POB.

### 2.2.9 Delete the point



**Note:** The following points are allowed to be deleted includes waypoint, beacon, marker, drawing node, POB and route.



2.2.10 User data on the map

The user data displays on the map, shown as below.

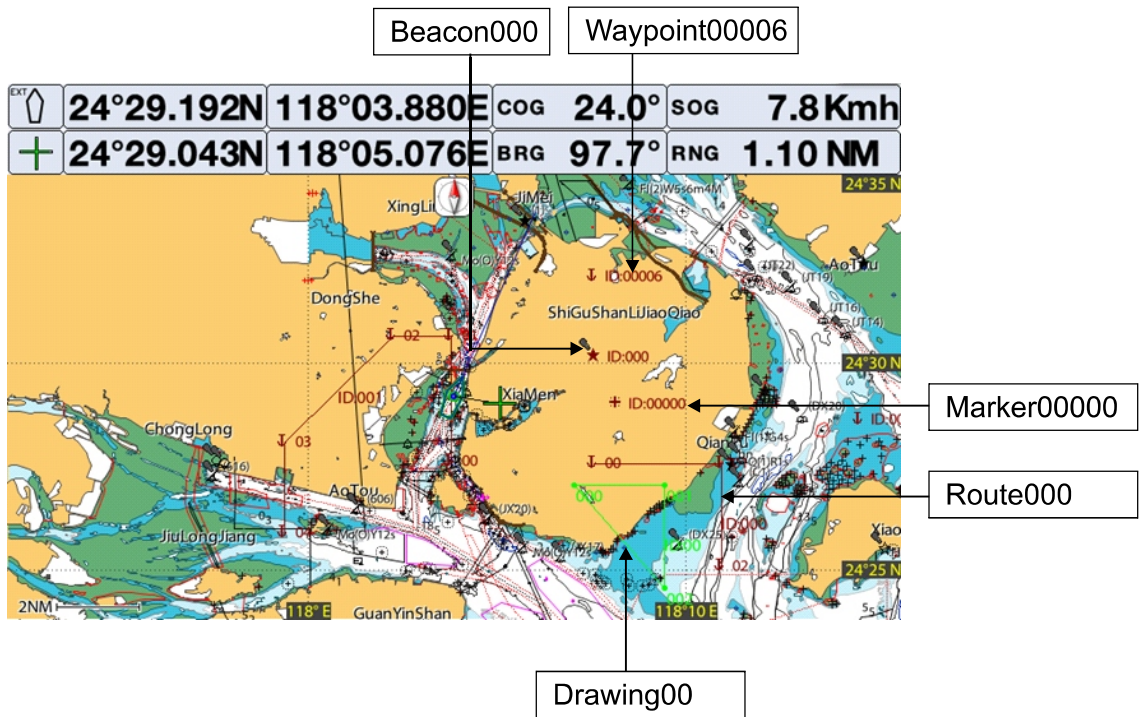


Figure 2.2

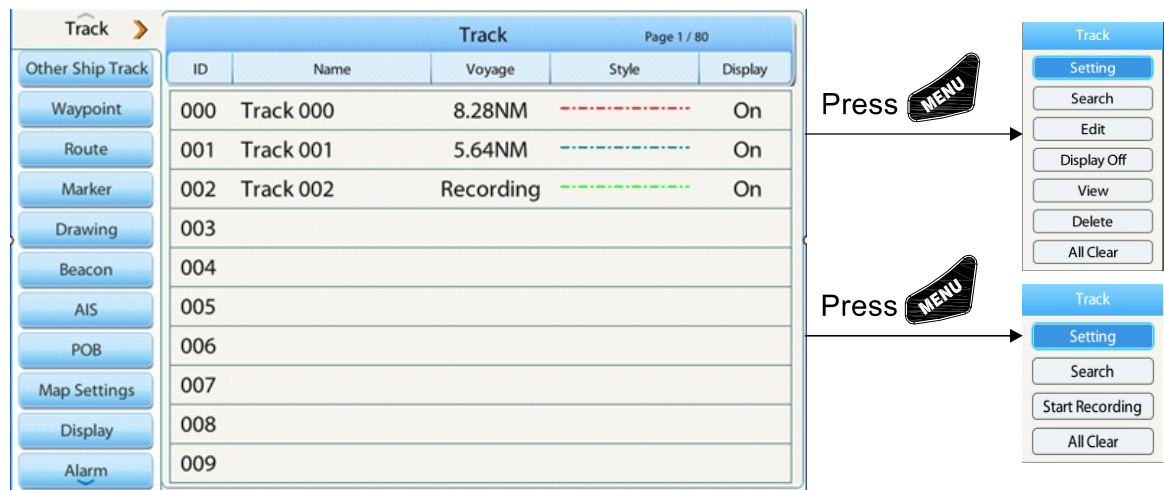
2.3 Secondary Menu (Main Menu)

2.3.1 Track

It is used to record the own ship's track, totals are 800 records. Each record max can accommodate 20000 points.

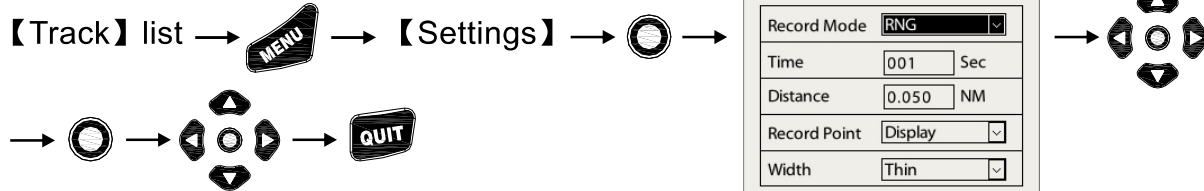
Users can do the operations of Setting, Edit, Display On/Off, View, Delete and All Clear.

Press twice → 【Track】→ enter to 【Track】 list .

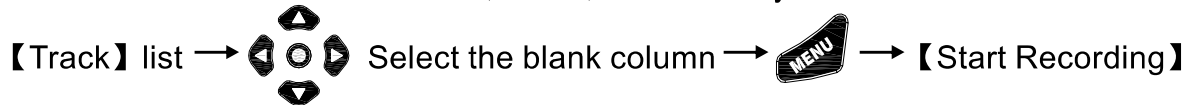


## 1. Settings

Method 1: To set the record mode.

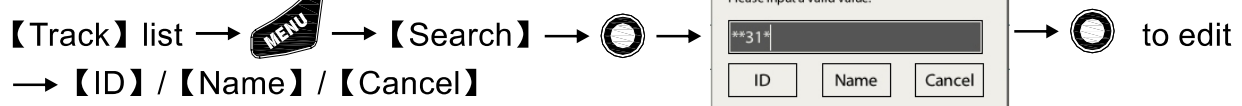


Method 2: To set the record mode, name, color and style.



**Note:** If you do the settings through method 2, the name, color and type are effective to the only track. The record mode, time and distance are effective to all tracks.

## 2. Search

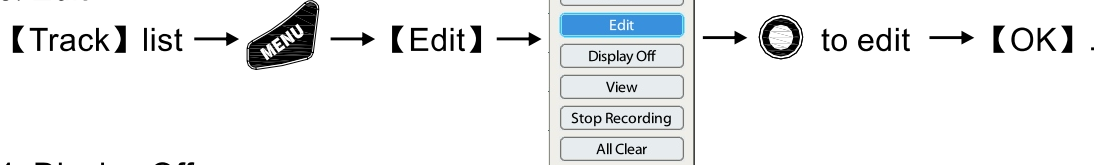


**Note:** The search functions in this chapter are all intelligent.

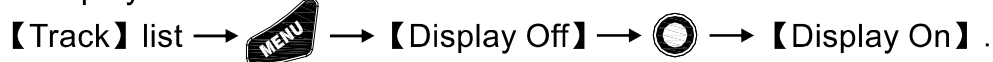
(1) ID search: You need to input the character not less than the ID digit number. And the character can be consisted of \* and digital. For example, when input \*10\*1, you will find that all IDs (the second character is 1, the third character is 0 and the fifth character is 1) are selected. Search since the second times.

(2) Name search: You need to input the string not less than 2 characters but not more than 16 characters. And the character can be consisted of \*, digital and letter. For example, when input \*Xi\*o you will find that all Names (the second character is X the third character is l and the fifth character is o) are selected. Search since the second times.

## 3. Edit



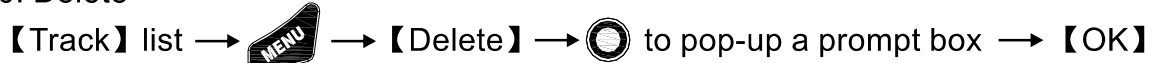
## 4. Display Off





## 5. View



## 6. Delete




## 7. All Clear

【Track】list →  → 【All Clear】 →  to pop-up a prompt box → 【OK】 to delete all data.

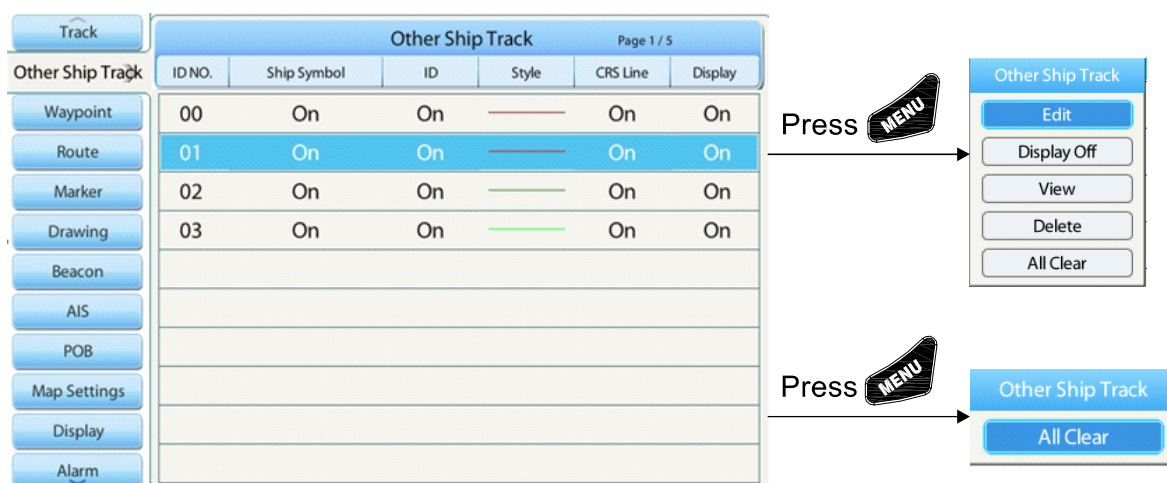
## 2.3.2 Other Ship Track

It is used to show other ships' track, totals are 50 records. Each record max can accommodate 1000 points.



Users can do the operations Edit, Display On/Off, View, Delete and All Clear.

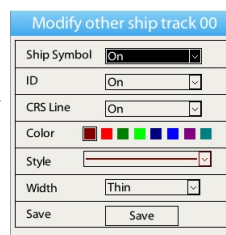
Press twice  →  → to select 【Other Ship Track】 →  enter to 【Other Ship Track】 list.

**Note:** The other ship track can't be saved after restart.



## 1. Edit

【Other Ship Track】list →  → 【Edit】 →  to edit → 【Save】.





## 2. Display Off

【Other Ship Track】list →  → 【Display Off】 →  → 【Display On】.

## 3. View

【Other Ship Track】list →  → 【View】 →  The system will view the track in the chart automatically.

## 4. Delete

【Other Ship Track】list →  → 【Delete】 →  to pop-up a prompt box → 【OK】

## 5. All Clear

【Other Ship Track】list →  → 【All Clear】 →  to pop-up a prompt box → 【OK】 to delete all data.

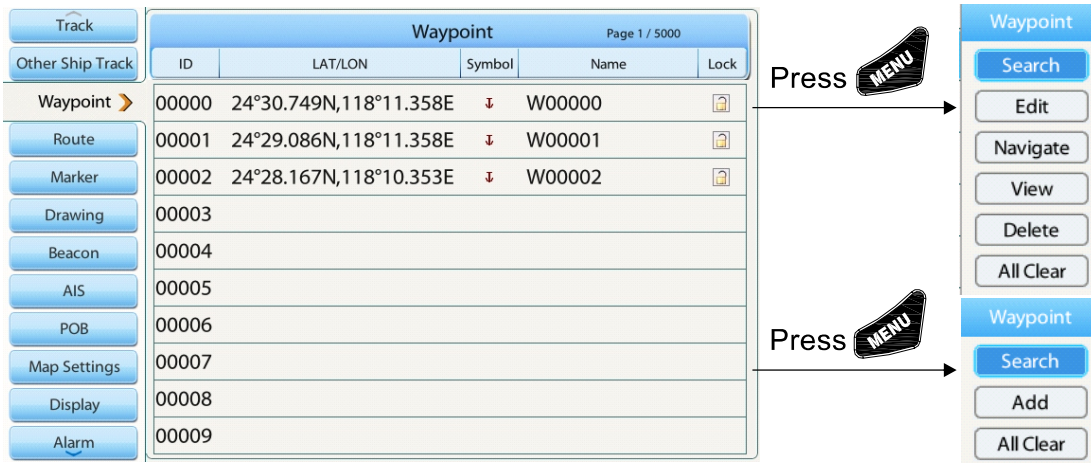


### 2.3.3 Waypoint



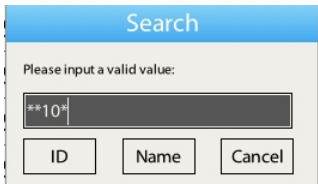
It is used to store waypoints, totals are 50000 points.

Users can do the operations of Search, Edit, Navigate, View, Add, Delete and All Clear.


Press twice  →  to select **【Waypoint】** →  enter to **【Waypoint】** list.

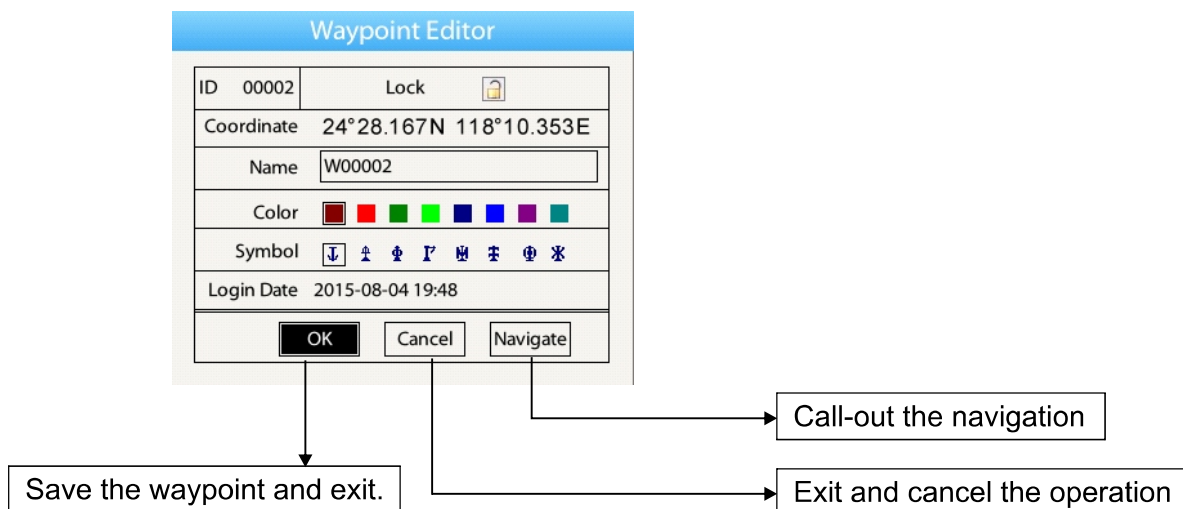





#### 1. Search

**【Waypoint】** list →  → **【Search】** →  →  to edit → **【ID/Name】**




#### 2. Add

Method 1: **【Waypoint】** list →  to select blank column →  → **【Add】** →  to edit.






Method 2: 【Waypoint】 list →  to select blank column →  to edit → 

As shown below,




Track	Waypoint <span>Page 1 / 5000</span>				
Other Ship Track	ID	LAT/LON	Symbol	Name	Lock
Waypoint >	00000	24°30.749N,118°11.358E	↓	W00000	
Route	00001	24°29.086N,118°11.358E	↓	W00001	
Marker	00002	24° 28.167N 118° 10.353E	↓	W00002	
Drawing	00003				
Beacon	00004				
AIS	00005				
POB	00006				
Map Settings	00007				
Display	00008				
Alarm	00009				

### 3. Edit




【Waypoint】 list →  → 【Edit】 →  →  to edit → 【OK】

**Note:** The screen similar to Add is displayed.



### 4. Navigate

【Waypoint】 list →  to select a desired one →  → 【Navigate】 →  to start to navigate in the chart .



### 5. View

【Waypoint】 list →  to select a desired one →  → 【View】 →  The system will view the waypoint in the chart automatically.

### 6. Delete

【Waypoint】 list →  → 【Delete】 →  to pop-up a prompt box → 【OK】

### 7. All Clear

【Waypoint】 list →  → 【All Clear】 →  to pop-up a prompt box → 【OK】 to delete all data.

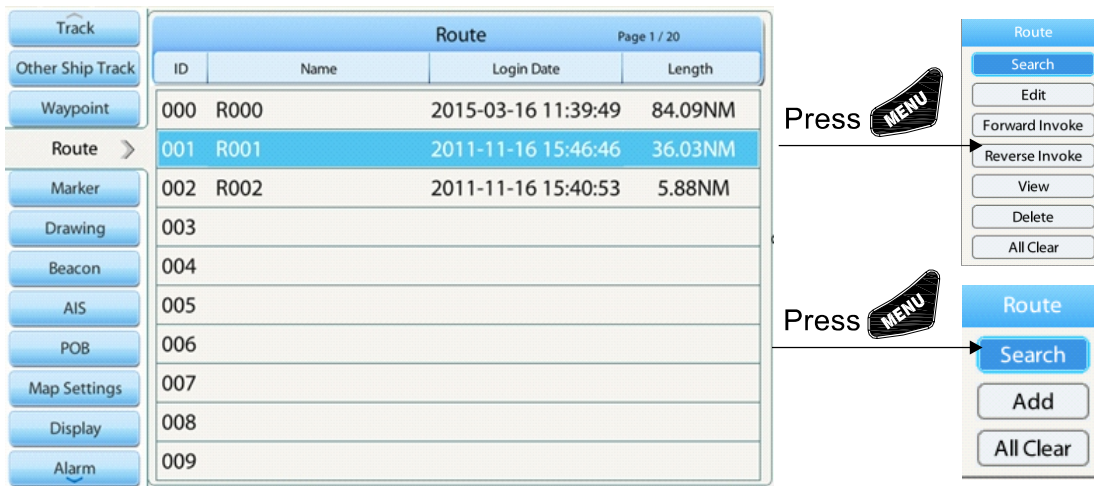
**Note:** The waypoint in navigation or locked can't be deleted.

### 2.3.4 Route




It is used to store routes, totals are 200 records. Each record max can accommodate 48 waypoints.

Users can do the operations of Search, Edit, Forward Invoke, Reverse Invoke, View, Add, Delete and All Clear.

Press twice  →  to select **【Route】** →  enter to **【Route】** list.








#### 1. Search

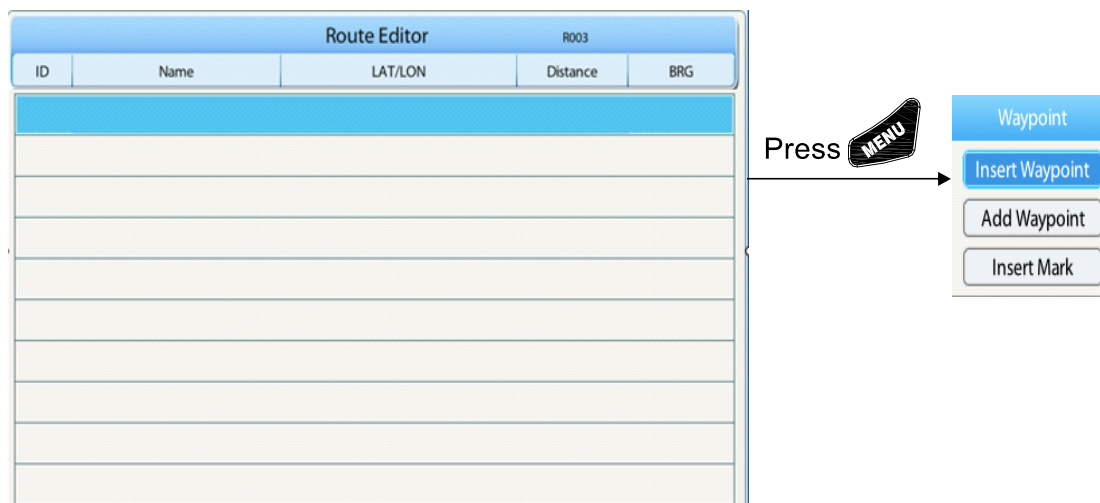
**【Route】** list →  → **【Search】** →  →  to edit → **【ID/Name】**







#### 2. Add

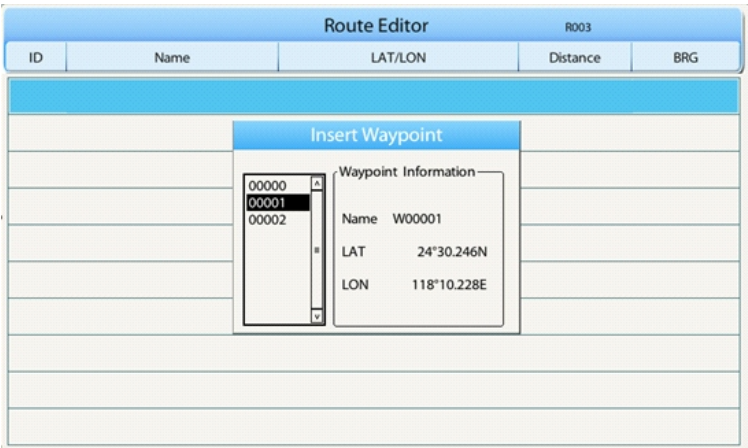
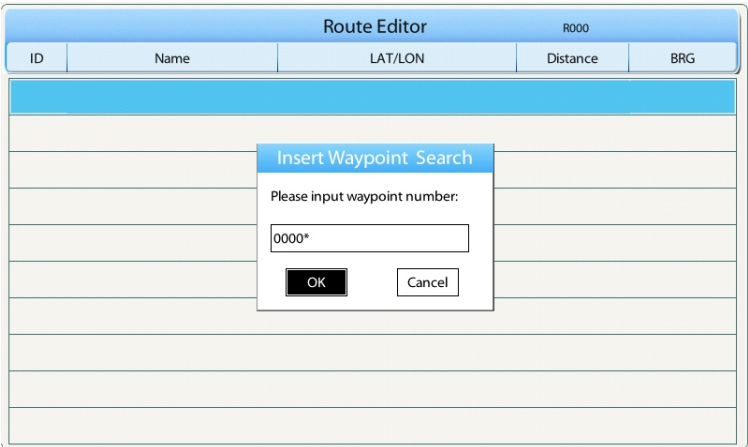
**【Route】** list →  to select blank column →  → **【Add】** →  →  → **【Insert Waypoint】 / 【Add Waypoint】 / 【Insert Mark】** →  to edit.





As shown below,



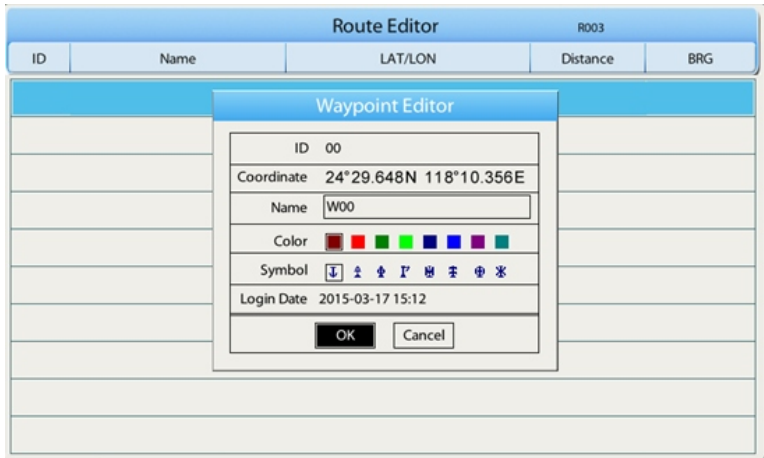
【Insert Waypoint】→  to pop-up input box →  to edit →  to select → 





As shown below,



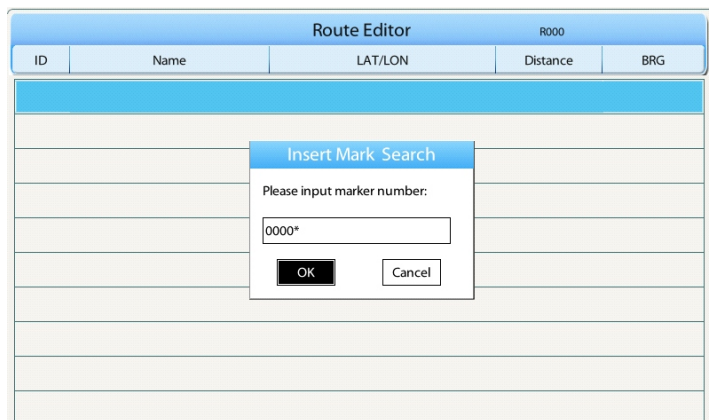
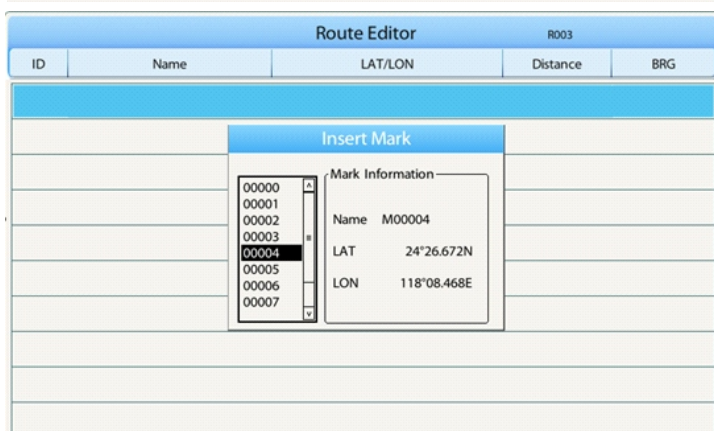
【Add Waypoint】→  to pop-up input box →  to select →  → 

As shown below,








【Insert Mark】→  to pop-up input box →  to edit →  to select → 

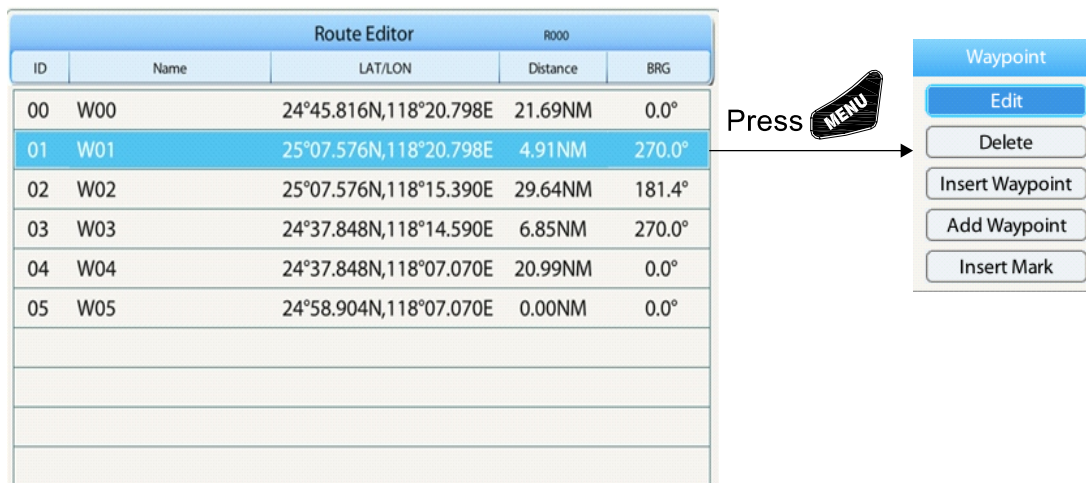
As shown below,

### 3. Edit

【Route】list →  to select a desired one →  → 【Edit】→  →  → 【Insert Waypoint】 / 【Add Waypoint】 / 【Insert Mark】 / 【Edit】 / 【Delete】 →  to edit.




As shown below,



ID	Name	LAT/LON	Distance	BRG
00	W00	24°45.816N,118°20.798E	21.69NM	0.0°
01	W01	25°07.576N,118°20.798E	4.91NM	270.0°
02	W02	25°07.576N,118°15.390E	29.64NM	181.4°
03	W03	24°37.848N,118°14.590E	6.85NM	270.0°
04	W04	24°37.848N,118°07.070E	20.99NM	0.0°
05	W05	24°58.904N,118°07.070E	0.00NM	0.0°




**Note:** The above step is to edit the waypoint, and then you can do the operation according to the step to add route.






【Route】list →  to select blank column →  to edit →   
As shown below,

Route				
Page 1 / 20				
ID	Name	Login Date	Length	
000	R000	2015-03-16 11:39:49	84.09NM	
001	R001	2011-11-16 15:46:46	36.03NM	
002	R002	2011-11-16 15:40:53	5.88NM	
003				
004				
005				
006				
007				
008				
009				




#### 4. Forward Invoke

【Route】list →  to select a desired one →  → 【Forward Invoke】→   
to start to navigate in the chart .




#### 5. Reverse Invoke

【Route】list →  to select a desired one →  → 【Reverse Invoke】→   
to start to navigate in the chart .



#### 6. View

【Route】list →  to select a desired one →  → 【View】→   
The system will view the route in the chart automatically .

#### 7. Delete

【Route】list →  to select a desired one →  → 【Delete】→   
pop-up a prompt box → 【OK】 .

#### 8. All Clear

【Route】list →  【All Clear】→  to pop-up a prompt box → 【Ok】 to delete all data.

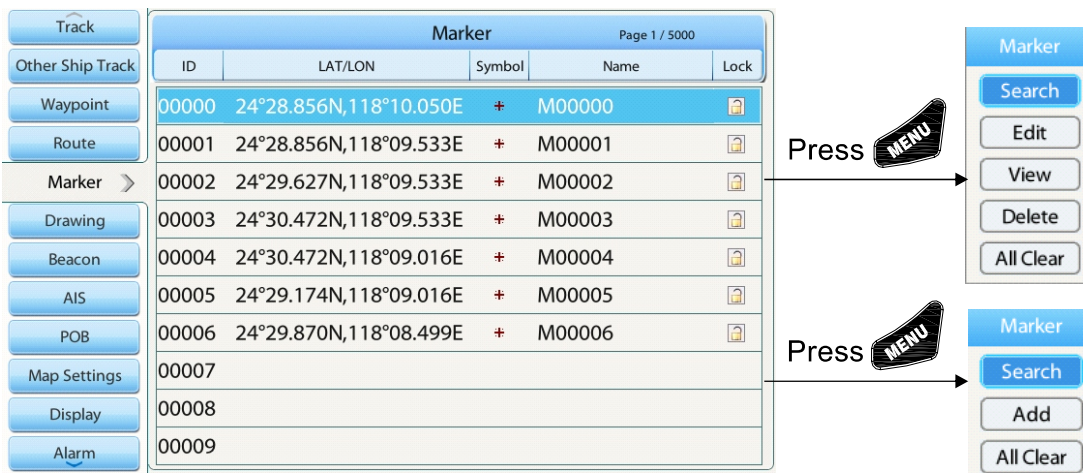
**Note:** The route in navigation can't be deleted.

### 2.3.5 Marker



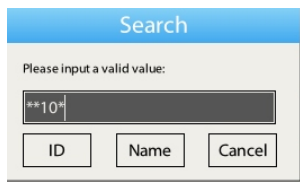

It is used to store markers, totals are 50000 points.

Users can do the operations of Search, Edit, View, Add, Delete and All Clear.




Press twice  →  to select **【Marker】** →  enter to **【Marker】** list.



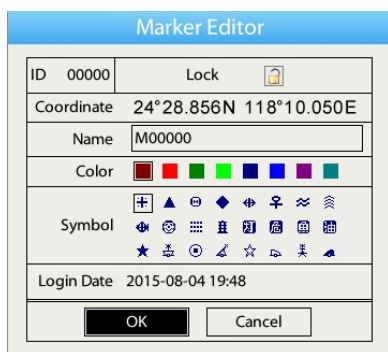
#### 1. Search




**【Marker】** list →  → **【Search】** →  →  →  to edit  
→ **【ID/Name】**

#### 2. Add


Method 1: **【Marker】** list →  to select blank column →  → **【Add】** →  to edit.

As shown below,






Method 2: 【Marker】 list →  to select blank column →  to edit → 




As shown below,

Track	Marker <span>Page 1 / 5000</span>				
Other Ship Track	ID	LAT/LON	Symbol	Name	Lock
Waypoint	00000	24°28.856N,118°10.050E	+	M00000	
Route	00001	24°28.856N,118°09.533E	+	M00001	
Marker >	00002	24°29.627N,118°09.533E	+	M00002	
Drawing	00003	24°30.472N,118°09.533E	+	M00003	
Beacon	00004	24°30.472N 118°09.016E	+	M00004	
AIS	00005	24°29.174N,118°09.016E	+	M00005	
POB	00006	24°29.870N,118°08.499E	+	M00006	
Map Settings	00007				
Display	00008				
Alarm	00009				

### 3. Edit




【Marker】 list →  → 【Edit】 →  →  → to edit → 【OK】

### 4. View

【Marker】 list →  to select a desired one →  → 【View】 → 



The system will view the marker in the chart automatically.

### 5. Delete

【Marker】 list →  to select a desired one →  → 【Delete】 →  to pop-up a prompt box → 【OK】 .

**Note:** It will pop-up a prompt box when the marker locked is to be deleted.

### 6. All Clear

【Marker】 list →  → 【All Clear】 →  to pop-up a prompt box → 【Ok】 to delete all data

**Note:** The marker locked can't be deleted.

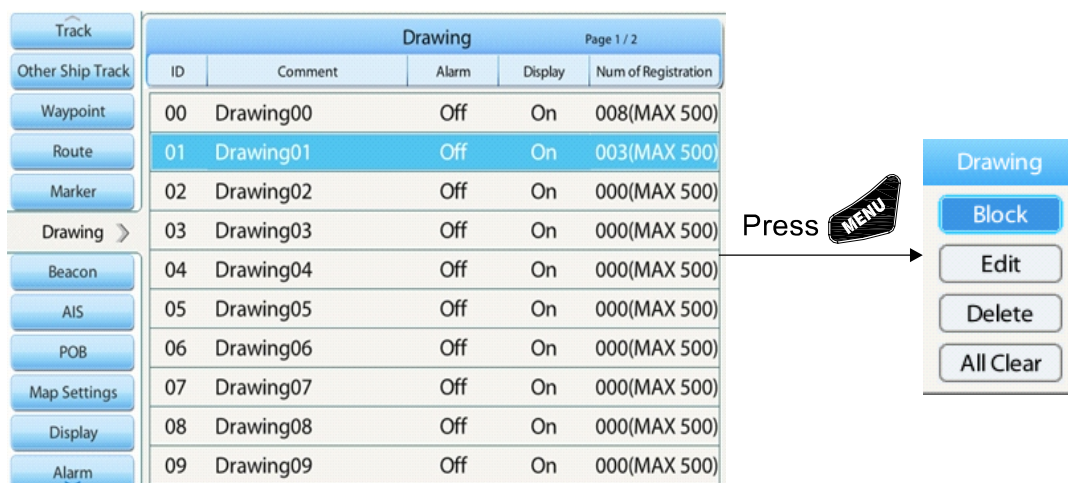
## 2.3.6 Drawing

It is used to store drawings, totals are 20 records. Each record max can accommodate 500 nodes. It can be consisted by multiple lines or polygons.

Users can do the operations of Block, Edit, Delete and All Clear.



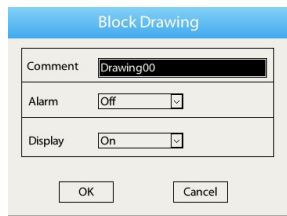



Press twice  →  to select **【Drawing】** →  enter to **【Drawing】** list.







ID	Comment	Alarm	Display	Num of Registration
00	Drawing00	Off	On	008(MAX 500)
01	Drawing01	Off	On	003(MAX 500)
02	Drawing02	Off	On	000(MAX 500)
03	Drawing03	Off	On	000(MAX 500)
04	Drawing04	Off	On	000(MAX 500)
05	Drawing05	Off	On	000(MAX 500)
06	Drawing06	Off	On	000(MAX 500)
07	Drawing07	Off	On	000(MAX 500)
08	Drawing08	Off	On	000(MAX 500)
09	Drawing09	Off	On	000(MAX 500)

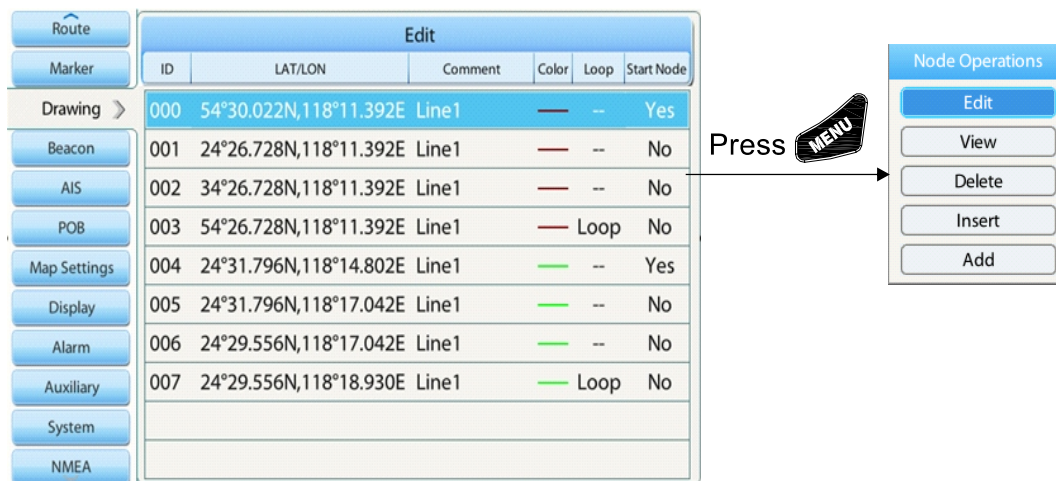
### 1. Block Drawing

**【Drawing】** list →  → **【Block】** →  →  →  to edit  
→ **【OK】**

### 2. Edit

**【Drawing】** list →  → **【Edit】** →  → **【Edit】** list →  → **【Edit】** / **【View】** / **【Delete】** / **【Insert】** / **【Add】** →  to edit.

As shown below,





ID	LAT/LON	Comment	Color	Loop	Start Node
000	54°30.022N,118°11.392E	Line1	—	--	Yes
001	24°26.728N,118°11.392E	Line1	—	--	No
002	34°26.728N,118°11.392E	Line1	—	--	No
003	54°26.728N,118°11.392E	Line1	—	Loop	No
004	24°31.796N,118°14.802E	Line1	—	--	Yes
005	24°31.796N,118°17.042E	Line1	—	--	No
006	24°29.556N,118°17.042E	Line1	—	--	No
007	24°29.556N,118°18.930E	Line1	—	Loop	No

### (1) Edit Node




**【Edit】** list →  → **【Edit】** →  →  →  to edit  
→ **【OK】**

## (2) View Node



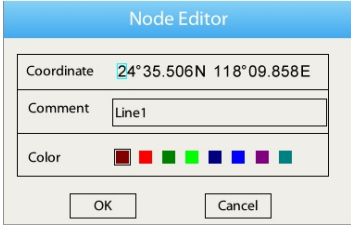

【Edit】list →  to select a desired one →  → 【View】 → 

The system will view the node in the chart automatically


## (3) Delete Node

【Edit】list →  to select a desired one →  → 【Delete】 →  to pop-up a prompt box → 【OK】

## (4) Insert Node



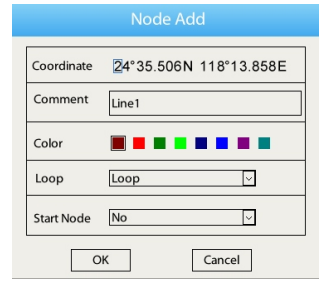

【Edit】list →  → 【Insert】 →  →  →  to edit → 【OK】

Node Editor


Coordinate	24°35.506N 118°09.858E
Comment	Line1
Color	
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

**Note:** The node inserted will be located under the selected column.

## (5) Add Node

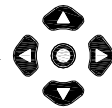


【Edit】list →  → 【Add】 →  →  →  to edit → 【OK】

Node Add

Coordinate	24°35.506N 118°13.858E
Comment	Line1
Color	
Loop	Loop <input type="checkbox"/>
Start Node	No <input type="checkbox"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	




**Note:** The node added will be located at the final column.

## 3. Delete

【Drawing】list →  to select a desired one →  → 【Delete】 →  to pop-up a prompt box → 【OK】

**Note:** The comment, alarm and display condition will restore to initial settings when the block is deleted.

## 4. All Clear

【Drawing】list →  to select a desired one →  → 【All Clear】 →  to pop-up a prompt box → 【OK】 to delete all data.

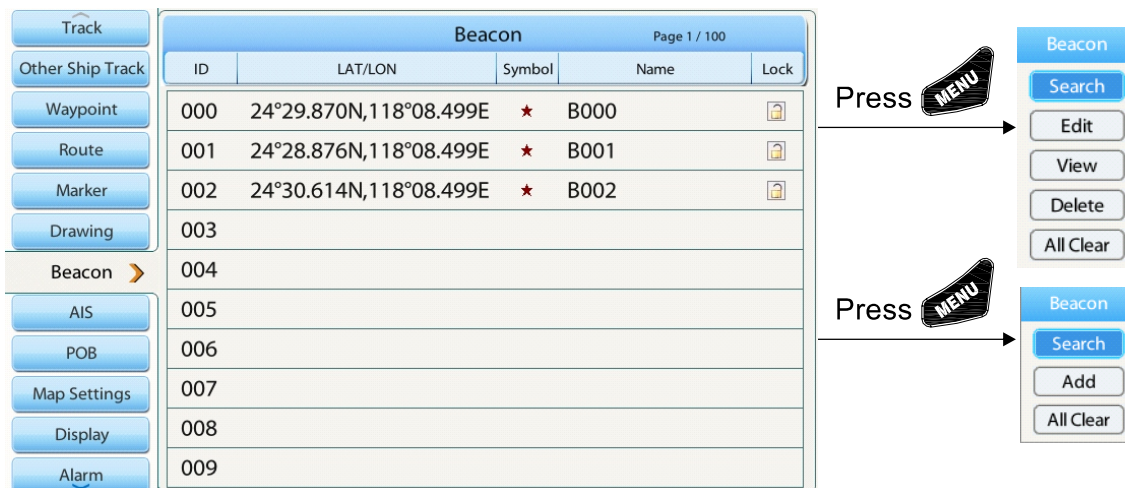
**Note:** The comment, alarm and display condition will restore to initial settings when the blocks are all cleared.

### 2.3.7 Beacon



It is used to store beacons, totals are 1000 points.

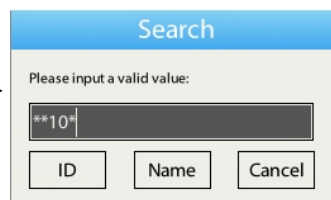
Users can do the operations of Search, Edit, View, Add, Delete and All Clear.

Press twice  →  to select **【Beacon】** →  enter to **【Beacon】** list



#### 1. Search




**【Beacon】** list →  → **【Search】** →  → **【ID/Name】**



Search dialog box with the text: "Please input a valid value:". It contains a text input field with "10" and three buttons: ID, Name, and Cancel.

→  to edit

#### 2. Add

Method 1: **【Beacon】** list →  to select blank column →  → **【Add】** →  to edit.




As shown below,






Beacon Editor screen showing fields for ID (000), Lock, Coordinate (24°29.870N 118°08.499E), Name (B000), Attribute, Color (selected red), Symbol (selected star), and Login Date (2015-08-04 19:48). It includes OK and Cancel buttons.

Method 2: 【Beacon】 list →  to select blank column →  to edit → 

As shown below,




Track	Beacon <span>Page 1 / 100</span>				
Other Ship Track	ID	LAT/LON	Symbol	Name	Lock
Waypoint	000	24°29.870N,118°08.499E	★	B000	
Route	001	24°28.876N,118°08.499E	★	B001	
Marker	002	24°30.614N 118°08.499E	★	B002	
Drawing	003				
Beacon >	004				
AIS	005				
POB	006				
Map Settings	007				
Display	008				
Alarm	009				

### 3. Edit

【Beacon】 list →  → 【Edit】 →  →  to edit → 【OK】




**Note:** The ID and Login Date can't be edited.

### 4. View

【Beacon】 list →  to select a desired one →  → 【View】 → 



The system will view the beacon in the chart automatically.

### 5. Delete

【Beacon】 list →  to select a desired one →  → 【Delete】 →  to pop-up a prompt box → 【OK】

**Note:** It will pop-up a prompt box when the beacon locked is to be deleted.







### 6. All Clear

【Beacon】 list →  → 【All Clear】 →  to pop-up a prompt box → 【OK】 to delete all data.

**Note:** The beacon locked can't be deleted.

## 2.3.8 AIS

The navigator is convenient to be connected with AIS equipment, dynamically display AIS targets on the map. It provides the relevant information about the ship nearby for collision avoidance and navigation, including the ship's coordinate, course, speed, MMSI, call sign, ship's name, ship's size and etc.

Press twice  →  to select **【AIS】** →  enter to **【AIS】** list →    
to select **【Vessel Information】** / **【Display】** → 

Track

Other Ship Track

Waypoint

Route

Marker

Drawing

Beacon

AIS

POB

Map Settings

Display

Alarm

Vessel Information

Display

Total 68 vessels, turn the joy dial to select

ID	[..MMSI..]	RNG	SOG	BRG
0000	000000001	6.45NM	0.1kn	314°
0001	001193046	6.50NM	2.6kn	254°
0002	004122700	7.79NM	0.0kn	254°
0003	004132807	7.79NM	0.0kn	254°
0004	211755000	N/A	0.0kn	N/A
0005	211779000	54.87NM	20.9kn	93°
0006	211831000	23.36NM	19.7kn	118°
0007	271000403	5.26NM	0.0kn	290°
0008	351097000	6.63NM	12.2kn	228°

### 1. Vessel Information

It is used to show the simple AIS targets information. Maximum displayed vessels' information is 400. Users can customize the order of list.

**【AIS】** list →  → **【Vessel Information】** →  → 

Track

Other Ship Track

Waypoint

Route

Marker

Drawing

Beacon

AIS

POB

Map Settings

Display

Alarm

Vessel Information

Display

Total 165 vessels, turn the joy dial to select

ID	[..MMSI..]	RNG	SOG	BRG
0161	636013457	5.25NM	0.0kn	286°
0162	636091220	8.29NM	0.1kn	248°
0163	636091266	5.25NM	0.0kn	284°
0164	636091449	59.22NM	21.6kn	85°
0165				
0166				
0167				
0168				
0169				

Press

MENU

AIS

View

Sort





Press

MENU

AIS

Sort

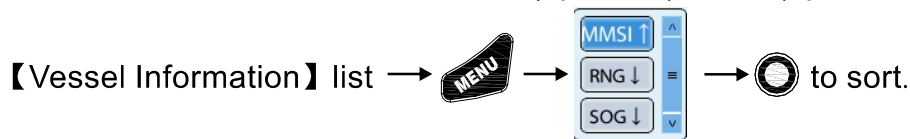
### (1) View


**【Vessel Information】** list →   to select a desired one →  → **【View】**  
→  The system will view the vessel in the chart automatically.



## (2) Sort

The order of list can be set as MMSI (up/down), RNG (up/down) and SOG (up/down).



Track	Vessel Information					Display
Other Ship Track	Total 181 vessels, turn the joy dial to select					
Waypoint	ID	[..MMSI..]	RNG	SOG	BRG	
Route	0161	477241400	50.65NM	14.4kn	99°	
Marker	0162	477270000	35.25NM	14.2kn	142°	
Drawing	0163	477400900		11.2kn	215°	
Beacon	0164	477503000		16.0kn	178°	
AIS >	0165	477722000		16.0kn	177°	
POB	0166	477940000	44.88NM	22.0kn	105°	
Map Settings	0167	477995100	N/A	102.3kn	N/A	
Display	0168	515667000	18.76NM	0.0kn	259°	
Alarm	0169	525003026	42.78NM	18.0kn	160°	

a. The vessel information can be ascending or descending sorted by MMSI, RNG and SOG.

b. As shown below, press , the vessel information will be sorted descending by MMSI.



c. As shown below, press , the vessel information will be sorted ascending by MMSI.



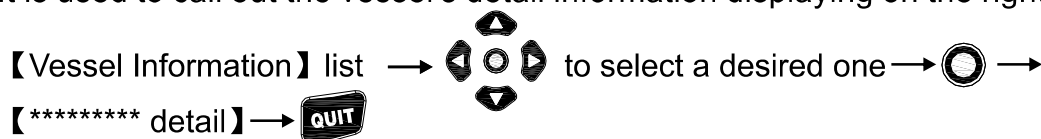
d. The sorting of RNG and SOG is same with MMSI sorting.

RNG: the distance from own ship to the target ship, its unit is NM.


BRG: the bearing relative to the target ship.

## (3) View the detail information

It is used to call out the vessel's detail information displaying on the right of list.







As shown below,

Vessel Information			Display	
Total 164 vessels, turn the joy dial to select			636013457 detail	
ID	[..MMSI..]	RNG	 Liberia	
0000	636091449	59.22NM	Name: APL AUSTRIA	
0001	636091266	5.25NM	Device: Class A	
0002	636091220	8.29NM	Channel: [B]	
0003	636013457	5.25NM	Ship Type: Cargo	
0004	576297000	8.50NM	Callign: A8NC5	
0005	565696000	52.67NM	IMO: 09444285	
0006	565452000	7.52NM	HDT: 16'	
0007	563382000	5.25NM	Draft: 10.8m	
0008	538002890	N/A	Coordinate: 24°31.056N	
			118°04.808E	
			COG: 122°	
			Rate Of Turn: 0°/min	
			Status: Berthing	
			Destination: HONGKONG	
			Arrival Time: 04-27 09:00	

## 2. Display

It is not only can be used to switch the display on/off of the AIS parameters, also can be used to do the personalized settings of AIS vessels.

【AIS】list →  →  → 【Display】 →  →  to edit.

Track	Vessel Information	Display
Other Ship Track	Display Switch	
Waypoint	Vessel <input type="text" value="On"/>	
Route	MMSI <input type="text" value="On"/>	
Marker	Flag <input type="text" value="On"/>	
Drawing	Nation <input type="text" value="On"/>	
Beacon	Name <input type="text" value="On"/>	
AIS >	Voyage Status <input type="text" value="On"/>	
POB	Personalization	
Map Settings	Ship Size <input type="text" value="Medium"/>	Scale Range <input type="text" value="Large"/>
Display	Ship Shape <input type="text" value="Triangle"/>	AIS Direction <input type="text" value="HDG &amp; COG"/>
Alarm	Direction Type <input type="text" value="COG"/>	AIS Vector <input type="text" value="1min"/>

### (1) Ship Size

Users can select the ship size from small, medium or large.

### (2) Ship Shape

Users can select the ship shape from ship shape or triangle.

### (3) Direction Type

Users can select the direction type of AIS vessels' information from BRG or COG.

### (4) Scale Range

Users can select the initial displaying scale of AIS vessels from small (less 10NM), medium (less 2NM) or large (less 0.5NM).

### (5) AIS Direction

Users can select the display of AIS vessels' heading according to Course or HDG&COG.

### (6) AIS Vector

The AIS vessels' voyage of this period time will be displayed on the map. Users also can set it as off.

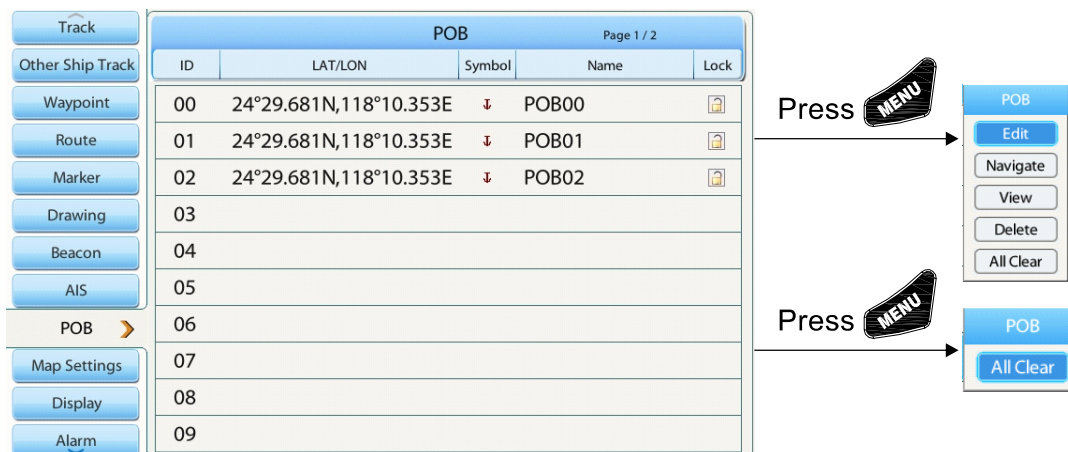



### 2.3.9 POB

It is used to store emergency points, totals are 20 points.







Users can do the operations of Edit, Navigate, View, Delete and All Clear.

Press twice  →  to select **【POB】** →  enter to **【POB】** list.









**Note:** When in navigation, press , the current coordinate will be saved. You can view, edit, delete and navigate in the POB list.







#### 1. Edit

**【POB】** list →  → **【Edit】** →     →  to edit → **【OK】**

#### 2. Navigate



**【POB】** list →     to select a desired one →  → **【Navigate】** →  to start to navigate in the chart.

#### 3. View



**【POB】** list →     to select a desired one →  → **【View】** → 

The system will view the POB in the chart automatically.

#### 4. Delete







**【POB】** list →  → **【Delete】** →  to pop-up a prompt box → **【OK】**

#### 5. All Clear

**【POB】** list →  → **【All Clear】** →  to pop-up a prompt box → **【OK】** to delete all data.

**Note:** The POB in navigation or locked can't be all cleared.

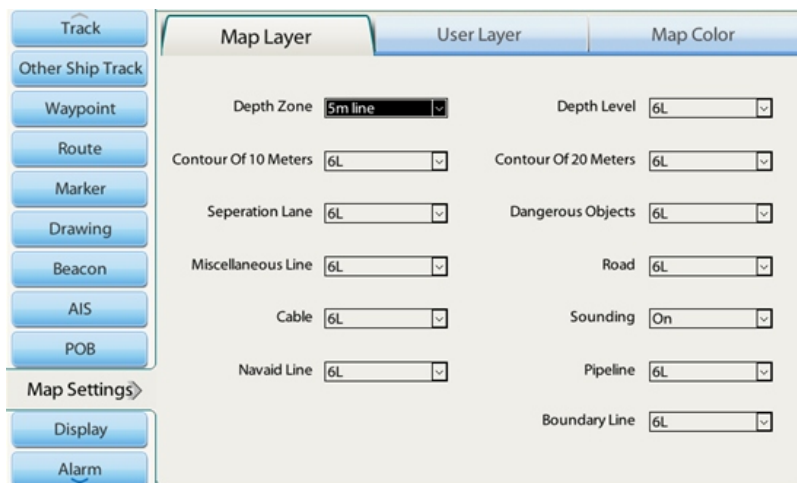
### 2.3.10 Map Settings

Press twice  →  to select **【Map Settings】** →  enter to **【Map Settings】** list →   to select **【Map Layer】** / **【User Layer】** / **【Map Color】** →  to edit.

#### 1. Map Layer






It is used to set the display levels of map layer elements.

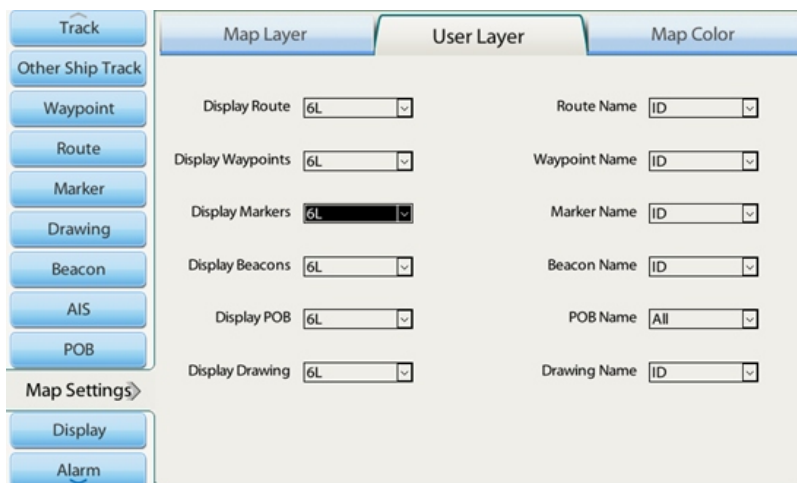
**【Map Settings】** list →  → **【Map Layer】** →  →  to edit.



#### 2. User Layer






It is used to set the display levels and contents of user data.

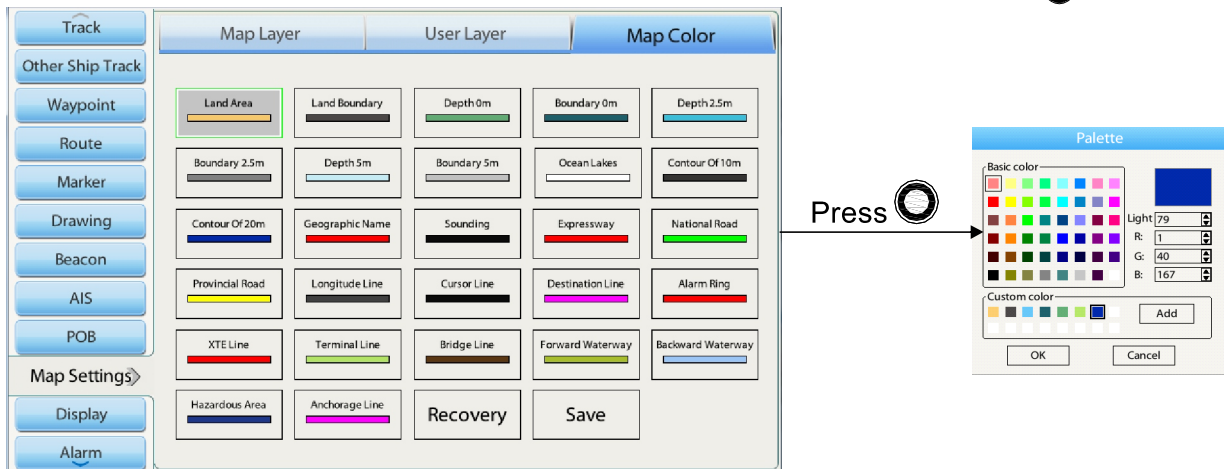
**【Map Settings】** list →  →   → **【User Layer】** →  →  to edit.



### 3. Map Color

It is used to custom the map layers' color.

【Map Settings】list →  →   → 【Map Color】→  →  to edit.





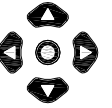
**Note:** The color setting is separate for each display mode (day, night, cloudy, auto, standard)

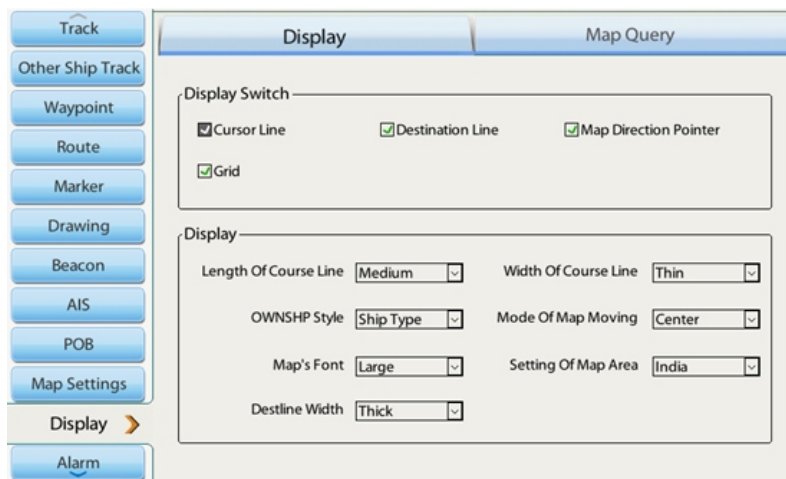
#### 2.3.11 Diaply

Press twice  →  to select 【Display】→  enter to 【Display】list →   to select 【Display】 / 【Map Query】 →  to edit.

##### 1. Display





It is not only can be used to switch the on/off of course line, destination line, map direction pointer and grid, also can be used to set the display style of course line, destination line, own ship style and map's font. The map moving mode and map area also can be set here.

【Display】list →  → 【Display】→  →  to edit.



## 2. Map Query




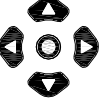
It is related to the Setting of Map Area, the Map Query displays the cities of map area setting.

【Display】list →  →  → 【Map Query】→  →  to edit.

	Display		Map Query	
	City(India)	LAT	LON	
Route	Bhatpara	22°52.197N	088°24.592E	
Marker	Calcutta	22°34.421N	088°21.788E	
Drawing	Baleshwar	21°29.681N	086°56.554E	
Beacon	Paradwip	20°18.979N	086°36.673E	
AIS	Puri	19°48.791N	085°49.887E	
POB	Brahmapur	19°18.897N	084°47.638E	
Map Settings	Srikakulam	18°17.797N	083°53.806E	
Display >	Vishakhapatnam	17°41.225N	083°13.120E	
Alarm	Kakinada	16°59.341N	082°14.847E	
Auxiliary	Machilipatnam	16°10.207N	081°07.801E	
System				
NMEA				

**Note:** The country displayed on the chart can be set through 【Setting of Map Area】 in the 【Display】 list.

### 2.3.12 Alarm



Press twice  →  to select 【Alarm】 →  enter to 【Alarm】 list →  to edit.

	Alarm1	Alarm2
Track	<input checked="" type="checkbox"/> CPA	TCPA
Other Ship Track	2.00NM	10min
Waypoint	<input type="checkbox"/> Anchor Watch Alarm	<input checked="" type="checkbox"/> XTE Alarm
Route	0.01NM	0.01NM
Marker	<input checked="" type="checkbox"/> Arrival Alarm	<input type="checkbox"/> Lower Depth Alarm
Drawing	0.03NM	1.00m
Beacon	<input type="checkbox"/> Overspeed Alarm	<input type="checkbox"/> Higher Depth Alarm
AIS	10.00kn	50.00m
POB	<input type="checkbox"/> Drawing Alarm	<input checked="" type="checkbox"/> Distance To Turn Waypoint
Map Settings	0.03NM	0.01NM
Display		
Alarm >		

#### 2.3.12.1 Alarm1

1. CPA: The distance between own ship and the target ship.
2. TCPA: The estimated time before own ship and the target ship pass each other.
3. Anchor Watch Alarm: This alarm is to trigger the alarm when the vessel is moving away from the present anchored location by more than the preset range.
4. XTE Alarm: This alarm is to trigger the alarm when the vessel is deviating from the intended course by more than the preset cross-track error (XTE) limit.

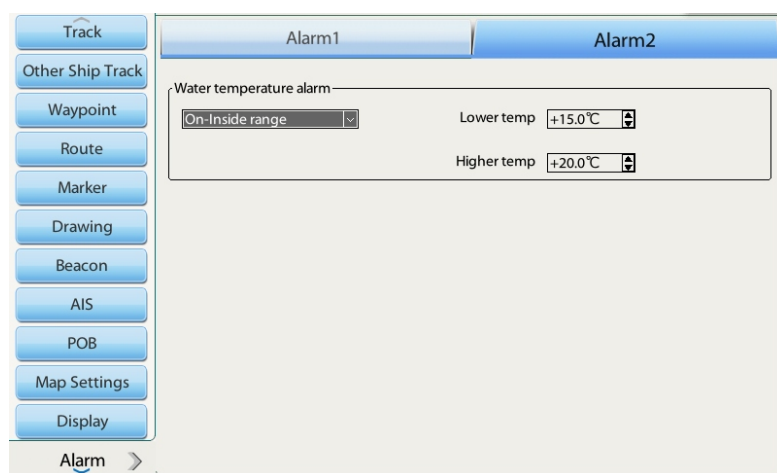
5. Arrival Alarm: This alarm is to trigger the alarm when the vessel is arriving at a specific distance from the destination.
6. Lower Depth Alarm: This alarm is to trigger the alarm when the area is lower than the preset range.
7. Higher Depth Alarm: This alarm is to trigger the alarm when the area is deeper than the preset range.
8. Over speed Alarm: This alarm is to trigger the alarm when the speed is out of the preset range.
9. Drawing Alarm: This alarm is to trigger the alarm when the vessel is deviating from the safety zone by more than the preset limit.
10. Distance to Turn Waypoint: This alarm is to trigger the alarm when the vessel is arriving at a specific distance to turn to next waypoint.

**Note:** When the important alarm is triggered, press , the alarm will appear again after 20 seconds if the other alarm isn't triggered. If the other alarm is triggered in 20 seconds, they will appear together. When the standard alarm is triggered, press , the alarm will appear again after 5 minutes if the other alarm isn't triggered. If the other alarm is triggered in 5 minutes, they will appear together.

Important Alarm: XTE Alarm, CPA, TCPA, Lower Depth Alarm, Higher Depth Alarm, Drawing Alarm (20 seconds)

Standard Alarm: Anchor Watch Alarm, Arrival Alarm, Over speed Alarm, Distance To Turn Waypoint (5 minutes)






### 2.3.12.2 Alarm2



1. Water temperature alarm: The system is to trigger the alarm when the water temperature Data is beyond the preset range.





**Note:** The alarm has three options: (1) Off (2) On-Inside range (3) On-Out of range And it has Lower temperature setting and Higher temperature setting. The alarm is important alarm. The alarm interval is 20 seconds.

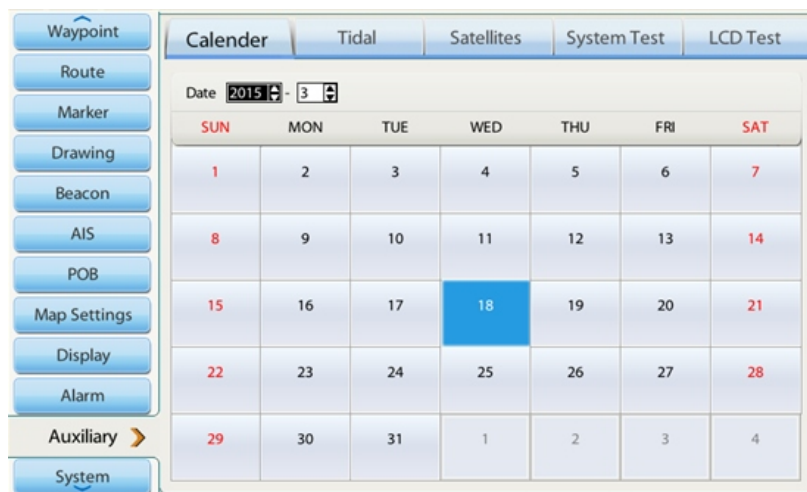
### 2.3.13 Auxiliary

Press twice  →  to select **【Auxiliary】** →  →  to select **【Calendar】** / **【Tidal】** / **【Satellites】** / **【System Test】** / **【LCD Test】** →  to edit

#### 1. Calendar





It is used to show the current date, also can view the calendar from the year of 1999 to 2100.

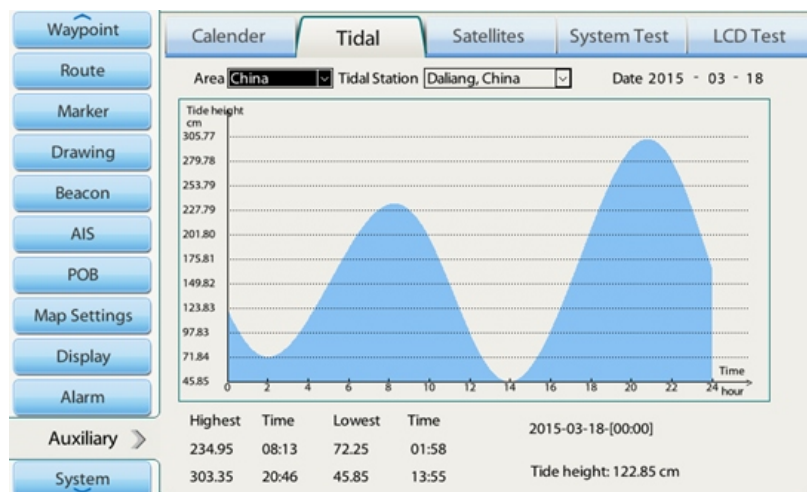
**【Auxiliary】** list →  → **【Calendar】** →  →   to edit.



#### 2. Tidal

It is used to show current date's tide data of different port. Users can select the tidal station on the list according to their requirement.

**【Auxiliary】** list →  → **【Tidal】** →  →   to edit.

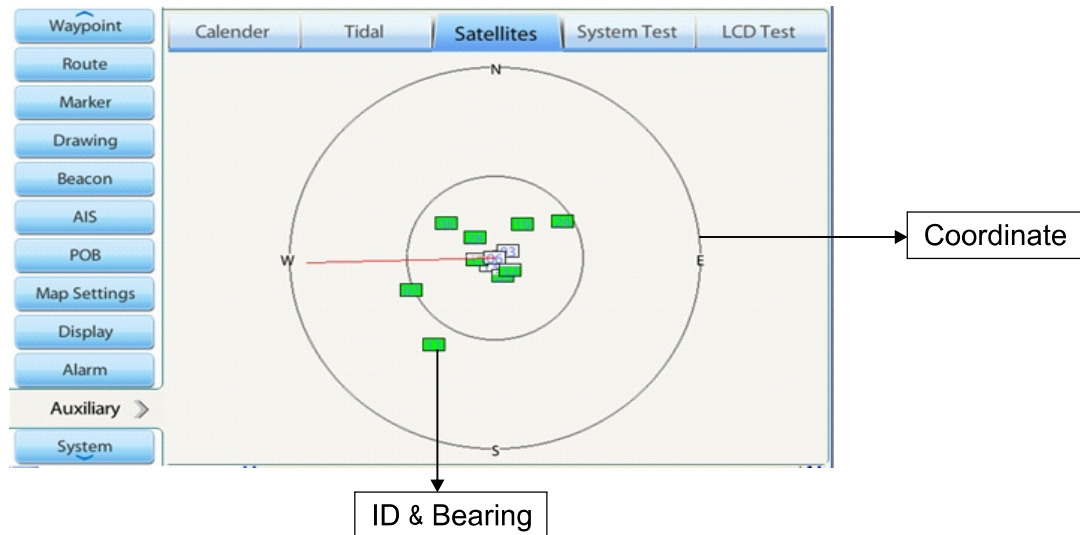




### 3. Satellites



It is used to show the satellites received and their signal strength.

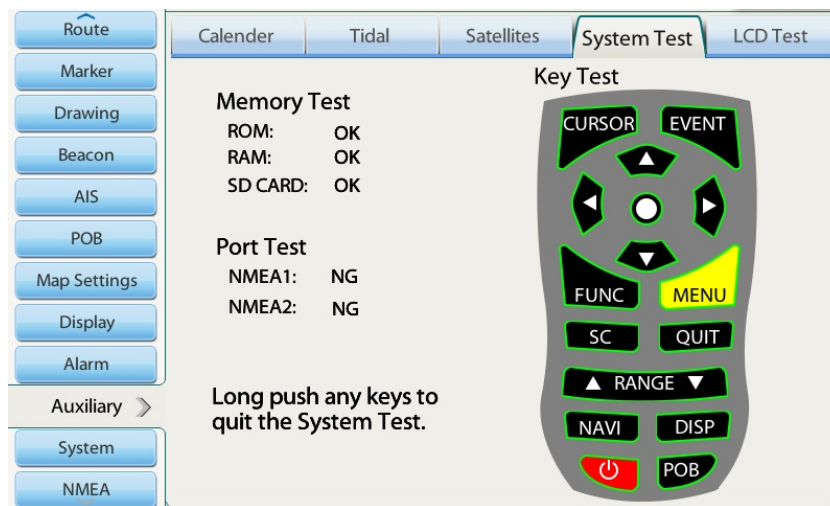
【Auxiliary】 list →  → 【Satellites】 →  →  to view.



### 4. System Test

It is used to check the Memory, Port and Key can normally work or not.

【Auxiliary】 list →  → 【System Test】 → 



**Note:** When doing the key test, press key randomly on the keypad, the key on the screen turns yellow, as shown above.



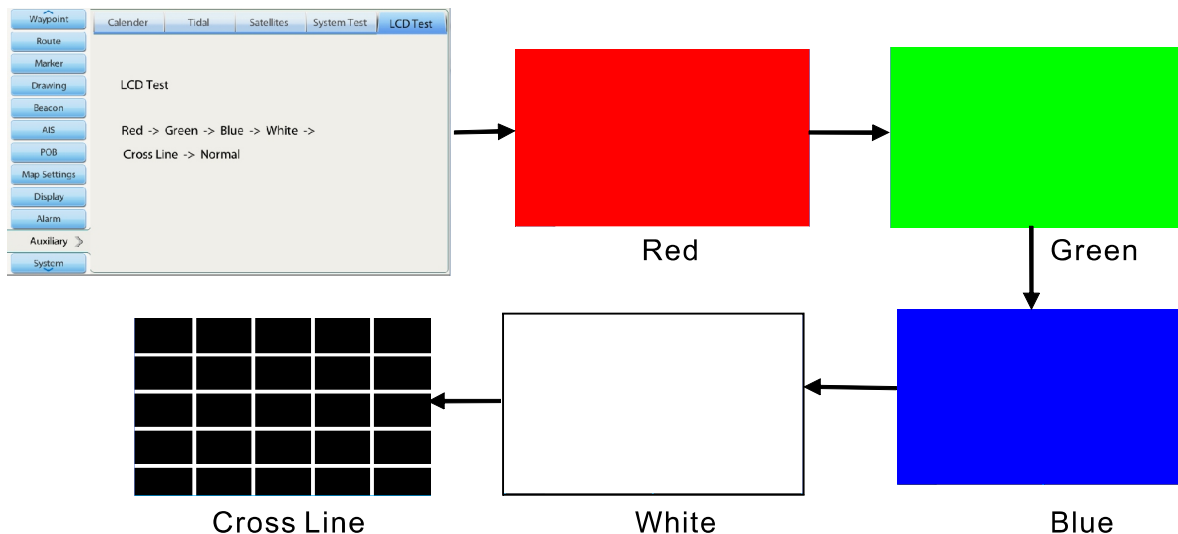
## 5. LCD Test

It is used to check the LCD can normally work or not by changing different colors.







【Auxiliary】list →  → 【LCD Test】

Press  continuously, the page will switch as follow.

Red--Green--Blue--White--Cross Line--Normal

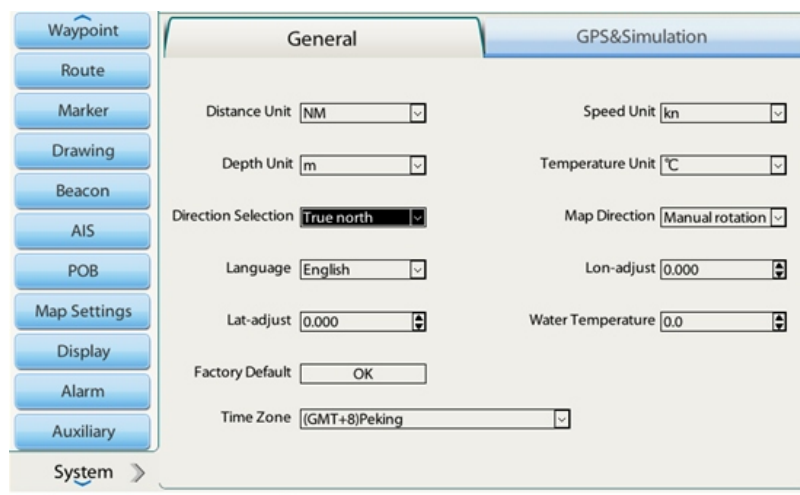


### 2.3.14 System

Press twice  →  to select 【System】 →  →   to select 【General】 / 【GPS & Simulation】 →  to edit.

#### 1. General

【System】list →  → 【General】 →  to edit .



#### (1) Distance Unit/Speed Unit/Depth Unit/Temperature Unit

Users can select the distance unit according to their daily usage habits.

#### (2) Direction Selection

Users can select the direction reference from the true north or magnetic north.

## (3) Map Direction

Users can select the map direction from the manual rotation or automatic rotation.

## (4) Language

There are various language for selection, users can select their local language as the system language.

## (5) Lon-adjust / Lat-adjust

The map correct according to the setting value of Lon-adjust / Lat-adjust.

## (6) Water Temperature

Users can set the correction value of water temperature.

## (7) Factory Default

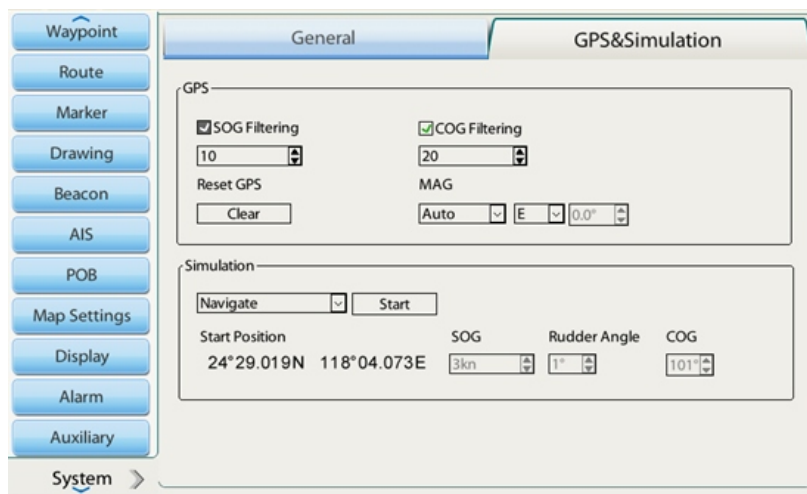
Users can reset to defaults of menu setting.

## (8) Time Zone

Users can set the time zone according to their position.

## 2. GPS &amp; Simulation

【System】list →  → 【GPS & Simulation】→  to edit.



## (1) SOG Filtering/COG Filtering

It is used to make the SOG/COG output being automatic smoothing.

## (2) Reset GPS

It is used to reset the GPS module parameter.

## (3) MAG






To set the MAG output manual or automatic.

## (4) Simulation

To set the navigation on or off in the normal navigation mode.

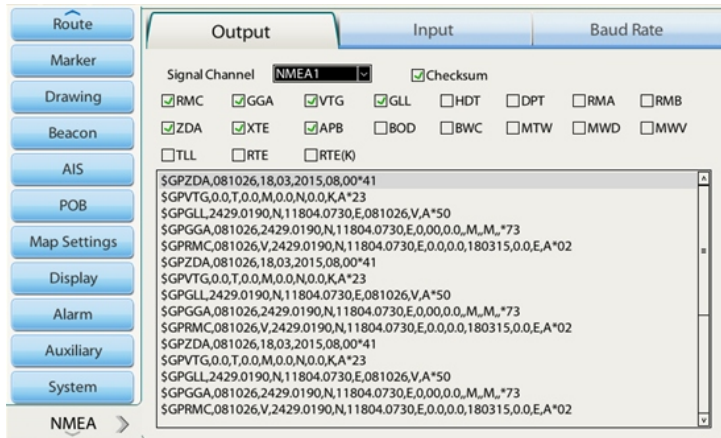
In the custom mode, the navigation SOG/Rudder Angle/COG will depend on the user's setting. The start position depends on the GPS input or not. GPS input, the start position is the own ship position, GPS disconnect, the start position can be custom made.

### 2.3.15 NMEA

Press twice  →  to select **【NMEA】** →  →  to select **【Output】** / **【Input】** / **【Baud Rate】** →  to edit.

#### 1. Output

**【NMEA】** list →  → **【Output】** →  →  to edit.



The system will output NMEA0183 sentence selected, and the printed information will display on the screen.

(1) NMEA1 sentence output or input, select the data port with seven cores at rear panel.

1, 2 pin is power port, 3 pin is ground wire, 4, 5 pin is for 0183 output, 6, 7 pin is for 0183 input.

(2) NMEA2 sentence output or input, select the data port with six cores at rear panel.

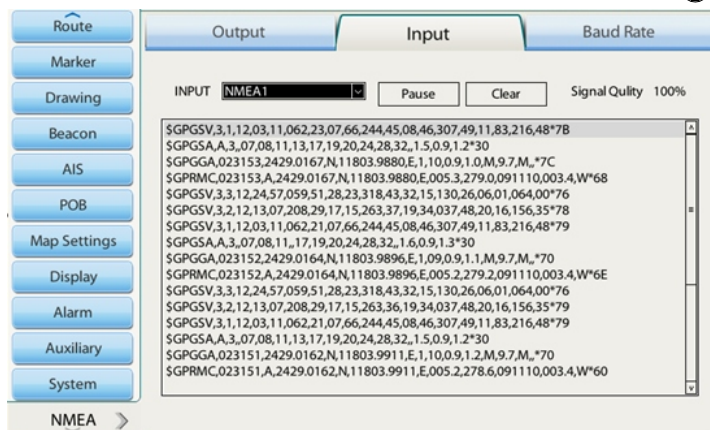
1 pin is ground wire, 2, 3 pin is for 0183 output, 4, 5 pin is for 0183 input, 6 pin is NC.

For the detailed information of data interface definitions, please see in Chapter 4.

**Note:** RMC, GGA, VTG, GLL sentence are all normally open. If you want to view the other signal output, please select the ones in Signal Channel.

#### 2. Input




**【NMEA】** list →  → **【Input】** →  →  to edit.

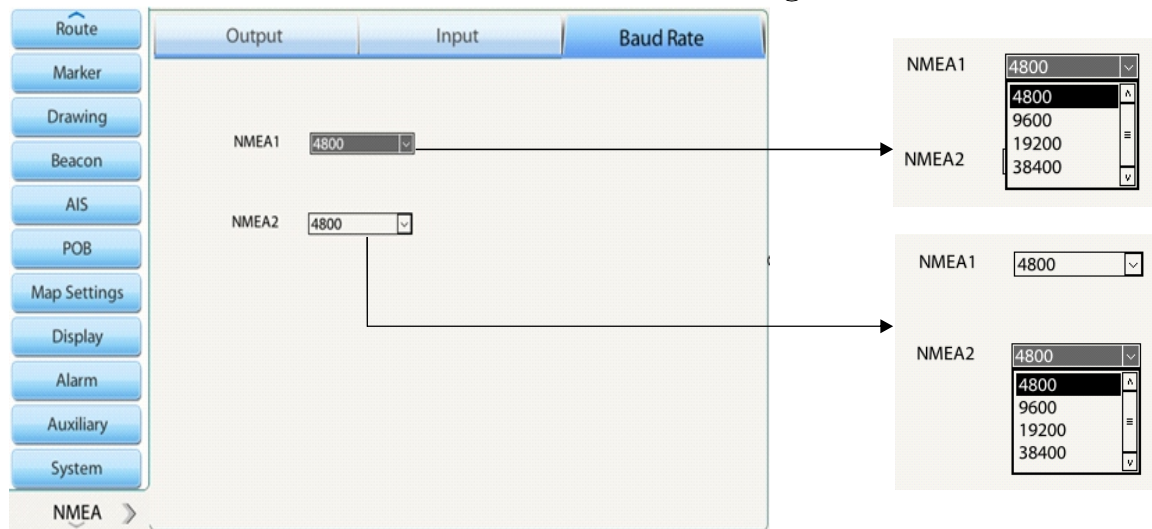


**Note:** Can show the NMEA sentences the unit received.






### 3. Baud Rate

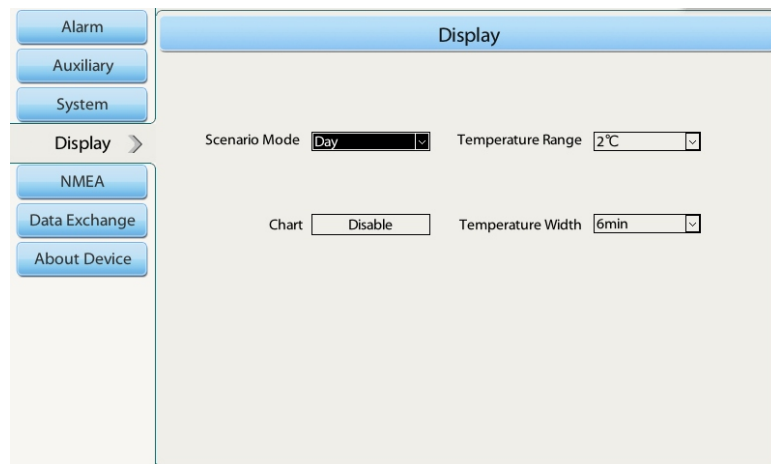
It is used to select the baud rate of NMEA1 and NMEA2.

【NMEA】list →  → 【Baud Rate】 →  →  to edit.



#### 2.3.16 Display Setting in SYSTEM Menu

Press twice  →  →  to select 【Display】 →  →  to edit.



(1) Scenario Mode:

It is used to set the scenario mode of current map display.

(2) Chart












It is used to set the chart disable / enable, no matter the chart disable / enable, the grid always displays.

(3) Temperature Range / Width

It is used to set the range and width of temperature graph.

**Note:** The Alarm setting, Auxiliary setting, System setting and NMEA setting in FUNC Menu is same as operation in Main Menu. To display chart, please input the password: 3300300.

### 2.3.17 Data Exchange

Press twice  →  →  to select **【Data Exchange】** →  →   to select **【Data Export】 / 【Data Import】 / 【Data Save】 / 【Data Load】** →  →    to select → 

Alarm	Data Export	Data Import	Data Save	Data Load
Auxiliary	ID	Type		
System	0	Track		
Display	1	Other Ship Track		
NMEA	2	Waypoint		
Data Exchange	3	Marker		
About Device	4	Beacon		
	5	Route		
	6	Drawing		
	7	All		

Without SD card

Prompt

Data will be overwritten! Continue?

SD card inserted

Prompt

Data will be overwritten! Continue?

Press **【OK】**

Please wait...

(1) Data Export

To copy data in the unit to the SD card.

(2) Data Import

To copy data in the SD to the unit.

(3) Data Save

To save data as Original format.

(4) Data Load

To load data as Original format.

**Note:**





The SD cards that can be used are as follows.

SD: 2 GB

SDHC: 4 to 32 GB

### 2.3.18 About Device

It is used to show the detail information about the device.

Press twice  →  →  to select **【About Device】** →  to view.

Alarm	About Device
Auxiliary	
System	
Display	
NMEA	
Data Exchange	
About Device	

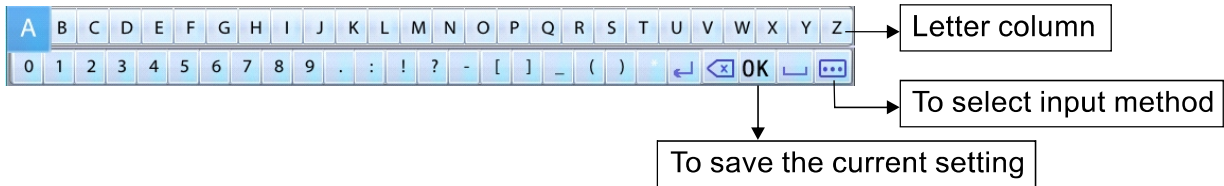
Product Model	KTN-70A
Software Version	V1.0.2(9261-1503121141)
Map Version	2014-08-26
Map Range	ASIA 65°E~180°E,56°S~46.666°N
	WGS-84
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Chapter 3 Soft Keyboard Introduction

3.1 Introduction


The window is for letter and symbol input, as shown below:





Symbol	Function
	Enter Key
	Delete Key
	To exit and save the current setting
	Space Key
	To switch input method, 1, A B C 2, a b c

3.2 Operation Method


1. To call out virtual keyboard:


Move the cursor to the input box, press  , to pop-up the virtual keyboard.

2. How to operate:

Press  to select letter or number. And then press  to confirm.

Select  on the virtual keyboard to save the current parameters.

Press  to cancel the operation.

Note: The system provides only two input methods. You can press  to switch. It includes upper and lower case letters.



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## Chapter 4 Installation

### 4.1 Installation Considerations

Qualified service technicians should perform the installation of KTN-70 that comprises of the following operations:

1. Unpacking each component of the system.
2. Inspection of the exterior of each component unit and accessory.
3. Checking the ship's mains voltage and current capacity.
4. Determining the Display unit.
5. Installing the Display unit.
6. Mounting the accessories.
7. Planning the cable routing and connections.
8. Adjustment and setups.

### 4.2 Checking of The Items

Unpack your package and check if all of the items stated in the packing list are contained in the package. If not, report this to an insurance agent for tracing missing goods or refund.

### 4.3 Inspection of The Equipment

Carefully check the exterior of each component unit for dents, damage and etc. In particular, the LCD is vulnerable to physical damage. During transportation, the LCD is liable to breakage despite its protective packing.

### 4.4 Proper Location for Setup

To achieve best operational performance, the following factors must be considered.

1. The display unit should be positioned in the location where the external situation can be viewed.
2. This unit should be positioned where the navigator or operator can easily see the screen.
3. Select a position safe and free from dampness, water spray, rain and direct sunlight.
4. Provide enough space for servicing. Consider access to the rear panel for connecting various cables.
5. Position the display unit as far away as possible away from other radio equipment.

### 4.5 Cable Routing and Connections

1. The transducer cables should be securely fastened to the display using cable clamps and run separately away from other cables such as, radio antenna feeder, power cables and etc. Under no circumstances should it be in parallel arrangement with other cables. These precautions are essential to avoid radio interference to/from other equipment

installed on the ship. If this arrangement is not possible, either cable set should be screened with a metal conduit or another form of shielding.

2. The display unit should be grounded to the hull with a wire cut as short as possible. We recommend using a wide and heavy copper braid or plate to be connected to a grounding stud at the of the display unit.
3. The power supply cable should be connected directly to the ship's battery to avoid RF noise conducted from other equipment on board.

## 4.6 Display Installation

The display unit is designed for table mount and flush mount. Refer to the following description for installation. (Refer to Figure 4.1 to 4.4)

### 4.6.1 Table mounting

1. Remove the two knurled fixing knobs that the fix the display unit to the mounding bracket.
2. Remove the display unit from the bracket and place it on a flat and safe area.
3. Place the mounting bracket to the place where the display unit is to be installed, and fix the bracket with four (4) M5 tapping screws. Provide enough space for servicing. (Refer to Figure 4.2)
4. Reset the display unit on to the bracket and fix using the two knobs that were removed in step (1).

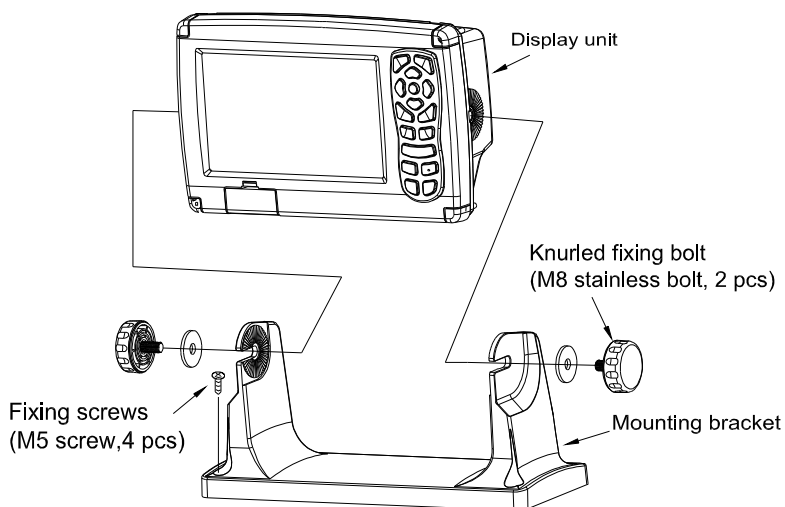


Figure 4.1 Fitting detail

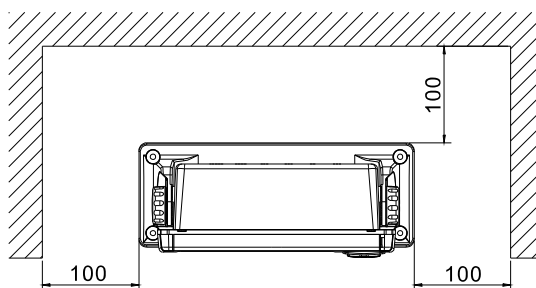


Figure 4.2 Servicing Access space required

Unit: mm

### 4.6.2 Flush mounting

1. Cut a rectangle opening. (Refer to Figure 4.4)
2. Loosen two (2) fixing bolts that fasten the display unit on to the mounting bracket.
3. Remove four (4) plastic screw covers, with are fitted on each corner of the display front face. (Pull up and out for easy removal.) Do not lose these screw covers.
4. Put the display on the opening and fix with four (4) tapping screws. In case you use M3 screws to fix the display, select an appropriate screw length that best suits fixing the unit to the panel thickness.
5. Refit the covers removed in step (3).

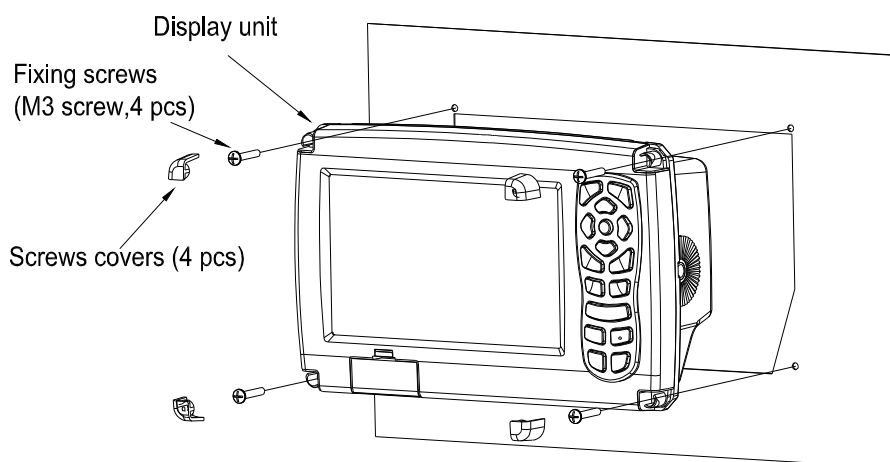


Figure 4.3 Flush mounting

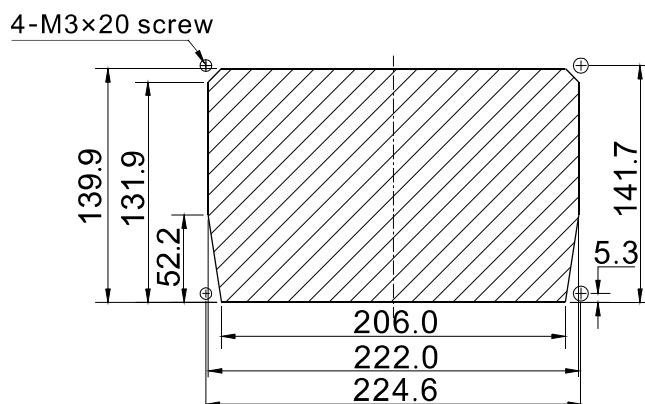


Figure 4.4 Dimensions of opening and fixing holes for flush mounting

Unit: mm

## 4.7 GPS Antenna unit installation

### 1. Selecting the best site of GPS antenna

Make sure to install the antenna unit at a location where nothing shades the antenna of a view above the horizon. Objects placed above the antenna unit or too close to the antenna unit may cause signal to noise ratio to degrade and shorten measuring time.

- (1) As far away from any metallic objects as possible.
- (2) At least 4 meters (13.2 feet) away from the MF/HF reversed L-type TX antenna, VHF or HF whip antenna.
- (3) At least 1.5 meter (4.9 feet) above the MF/HF reversed L-type TX antenna.
- (4) At least 1 meter (3.3 feet) away from the receiving antenna.
- (5) Outside radar transmitting beam ( $30^{\circ}$  to  $40^{\circ}$ ).
- (6) At least 1 meter (3.3 feet) away from the radar antenna.
- (7) At least 5 meters (16.5 feet) away from the Inmarsat antenna.
- (8) At least 3 meters (9.8 feet) away from the loop antenna.
- (9) At least 0.5 meters (1.6 feet) above the large metal surface.

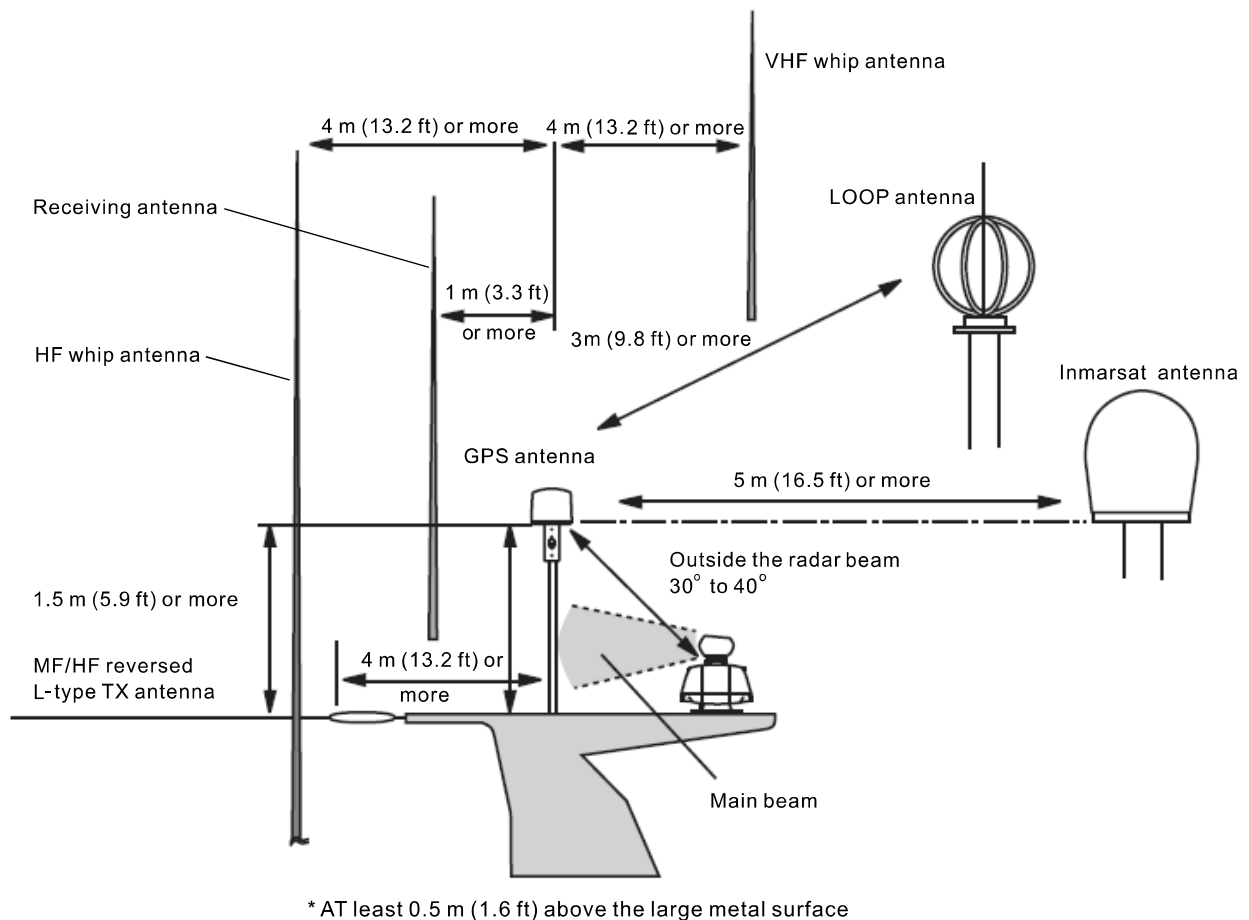
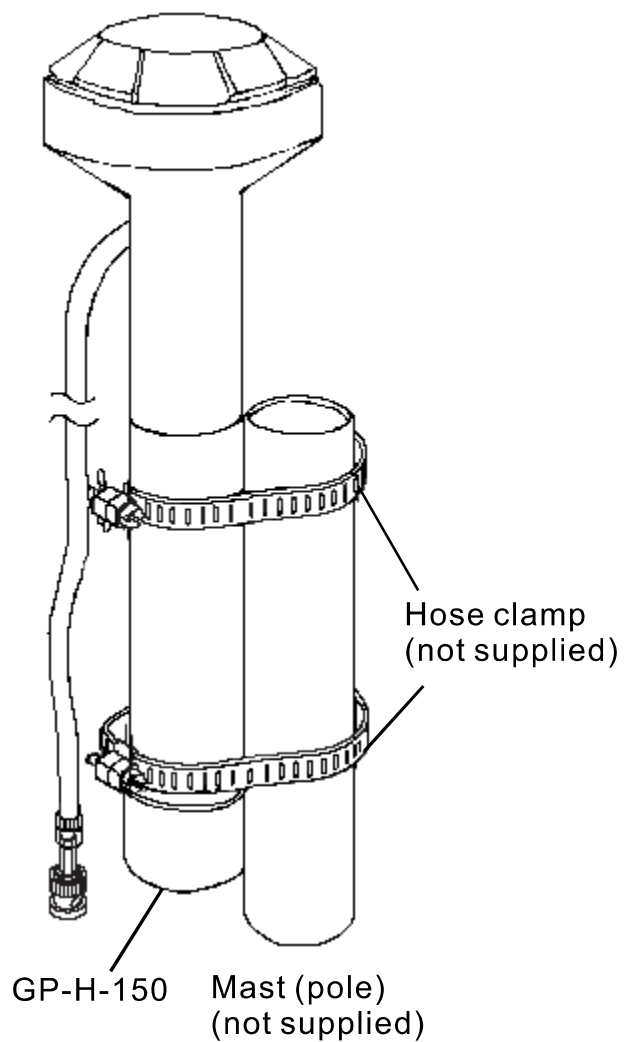


Figure 4.5 Recommended GPS Antenna installation

## 2. Fixing the GPS antenna unit

(Case1)

Antenna unit  
GP80-10M



(Case2)

Antenna unit  
GP80-10M

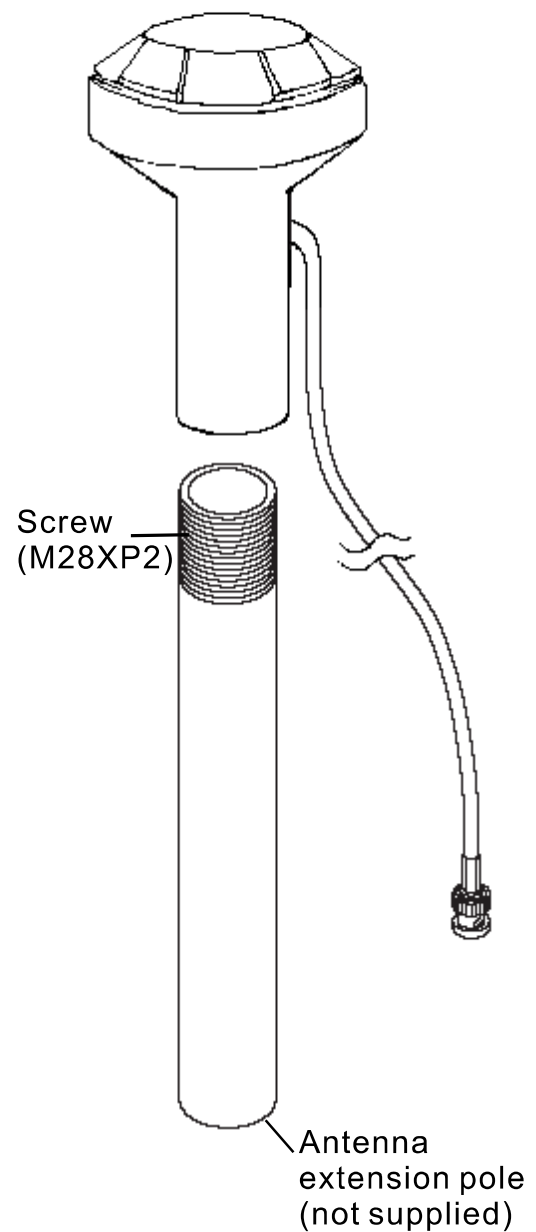


Figure 4.6 Fixing the GPS antenna unit

## 4.8 Inter-connections of The System

As shown below, connect the various cables to their prescribed locations on the rear panel of the display unit.

Display unit.

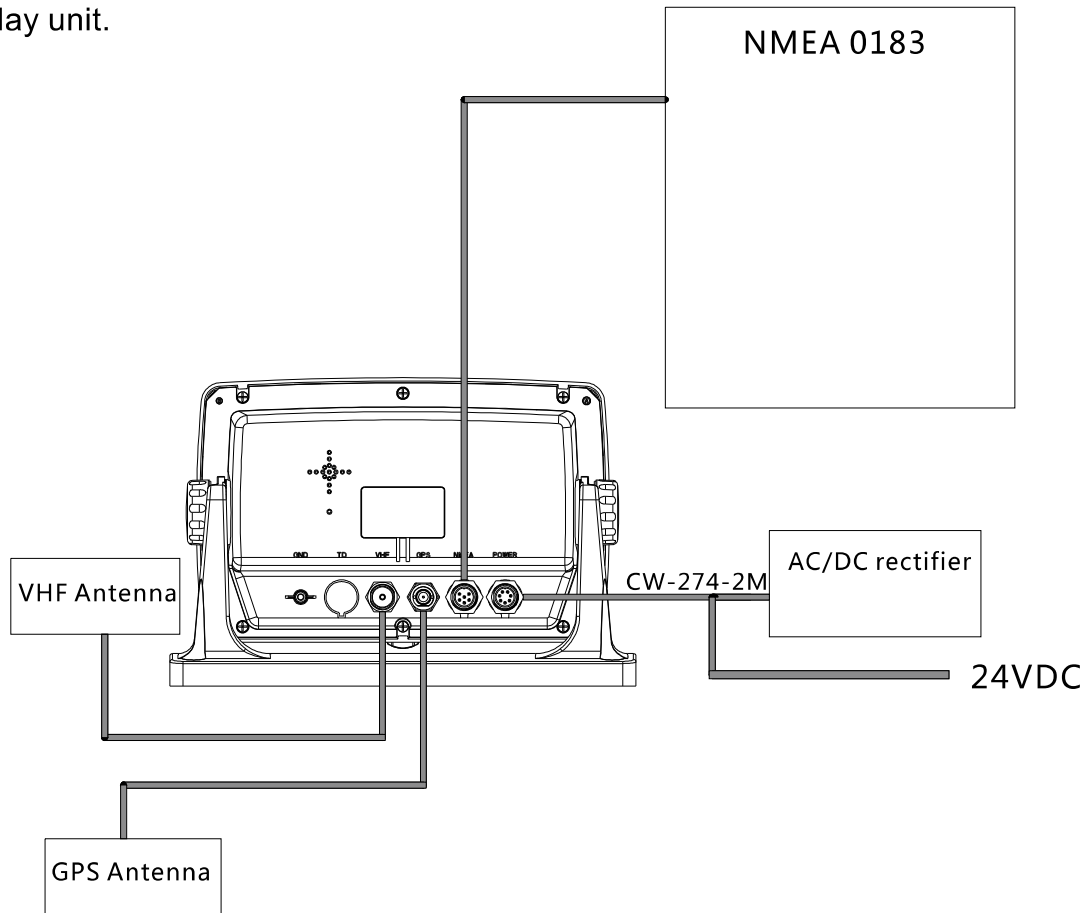
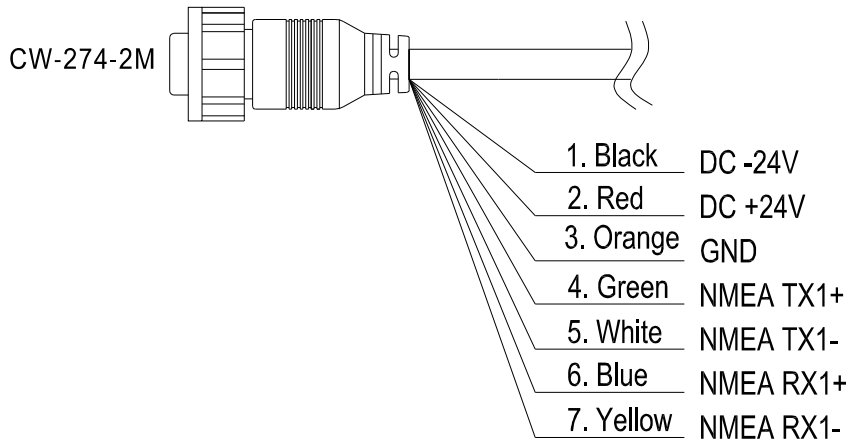


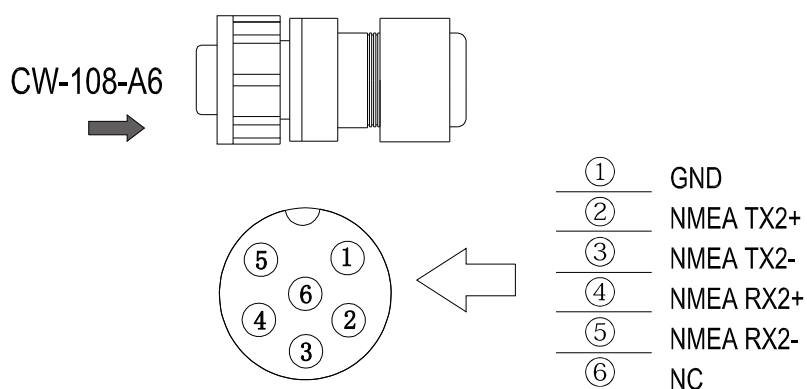
Figure 4.7 Inter-connections

### 4.8.1 Preparation of DC Power cable (CW-274-2M)

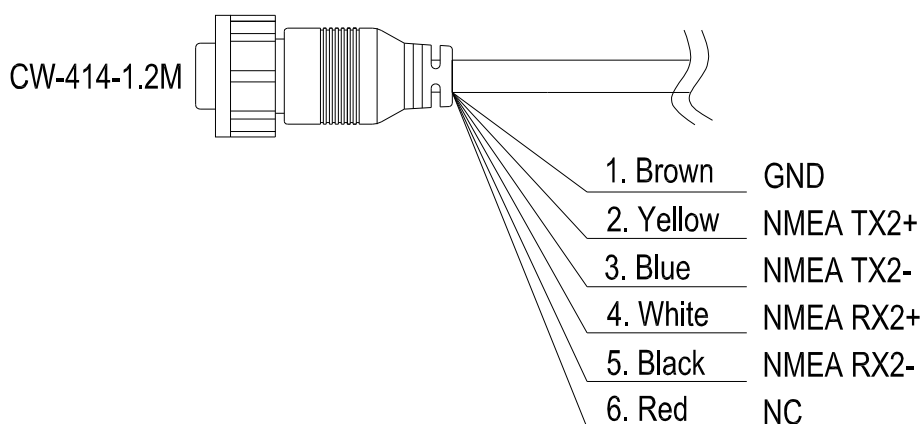




### 4.8.2 The data interface definitions (CW-108-A6)



### 4.8.3 OPTION preparation of NMEA connector (CW-414-1.2M)



## 4.9 Post-installation Inspections

Before you turn the KTN-70A on, check the following points to make sure the KTN-70A operates properly:

1. Is the ship's supply voltage and current within the proper range?  
Input voltage: 24 VDC at POWER connector.
2. Are the cables routed and connected properly? No wrong connections, no short circuits and etc.?



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