

Class B AIS Transponder / AIS Display

With GPS Navigator

HP-528A / HP-528

User Manual

Foreword

Thank you for your choice of HP-528A /HP-528.

We would appreciate feedback from you to go further where we are achieving.

Please carefully read and follow the procedures of installation and operation for best use of your unit.

Features

- 4.3" High-resolution color LCD
- Multi-display screen
- Visual and audio alarm
- Optional NMEA data output
- Quick key and pop-up menu for convenient operation

AIS

- AIS Radar, Multi-lists and plotter screen
- Visual and audio alarm of collision, SART, MOB, watch target lost, watch target deviation, etc.
- Safety message display
- Watch function for fishing net buoy, friend ships, etc.
- Detailed target information

GPS

- Plotter, Highway, Steering, Satellite, SOG meter, COG meter, and User data screen
- SBAS capability
- Storage of 10,000 waypoints, 100 routes and 3,000 track points
- Visual and audio alarm of Arrival, XTE, SBAS, etc.
- MOB and GOTO mark
- Upload and download of waypoint and route

1. Quick Start

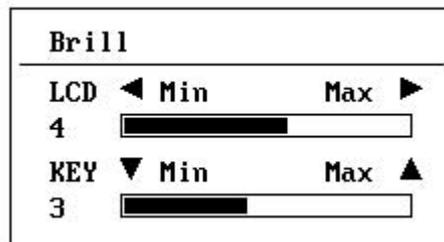
1.1 Power on/Power off

Press the key  to power on the unit. The unit beeps and starts up.

Press and hold the key  for three seconds to power off the unit. The time remaining is counted down until power off.

1.2 Adjust LCD or key panel brilliance

Press the key  to show the brilliance window.



For LCD, press the key  to loop over the brilliance or press  or  key to increase or decrease the brilliance.

For key panel, press the  or  key.

Press **ENT** key or **MENU** key to exit.

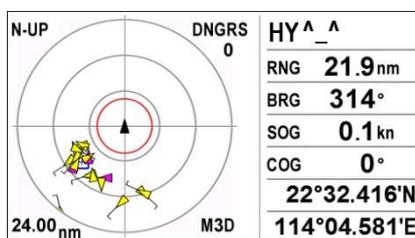
2. Main screens

Main screens are shown as below.

Press **MODE** key to step through sequentially.

Press **MODE** key more than 2 seconds to invert the sequence.

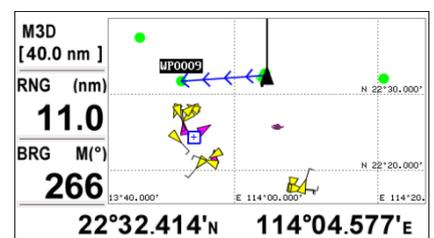
AIS Radar



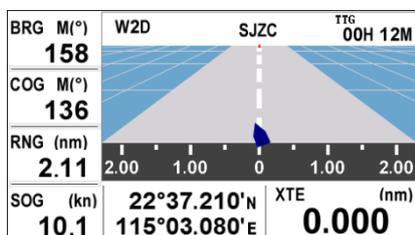
AIS Lists

Target	Danger	Match	Total: 29		
Name/MMSI	RNG(nm)	BRG(°)	SOG(kn)	COG(°)	
371624000	6.25	91	0.0	241	
YUEGUANGZHOU	6.80	88	0.0	96	
477995251	6.98	95	14.3	90	
477197200	7.45	94	10.8	45	
477995174	8.86	325	0.0	0	
000000083	8.88	325	0.0	68	
004773776	8.99	313	--	--	
636092488	10.0	310	9.0	17	
412468180	10.1	311	9.9	7	

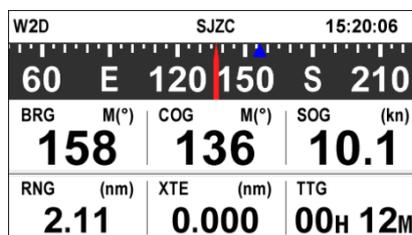
Plotter



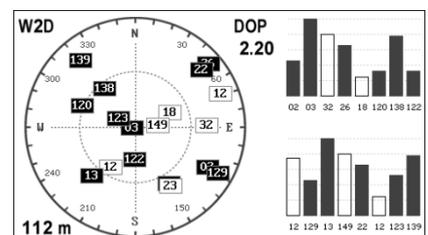
Highway



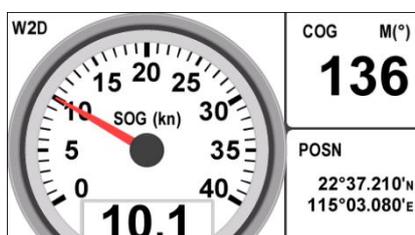
Steering



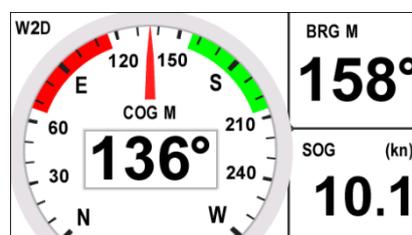
Satellite



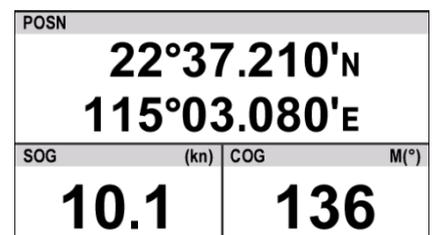
SOG Meter



COG Meter

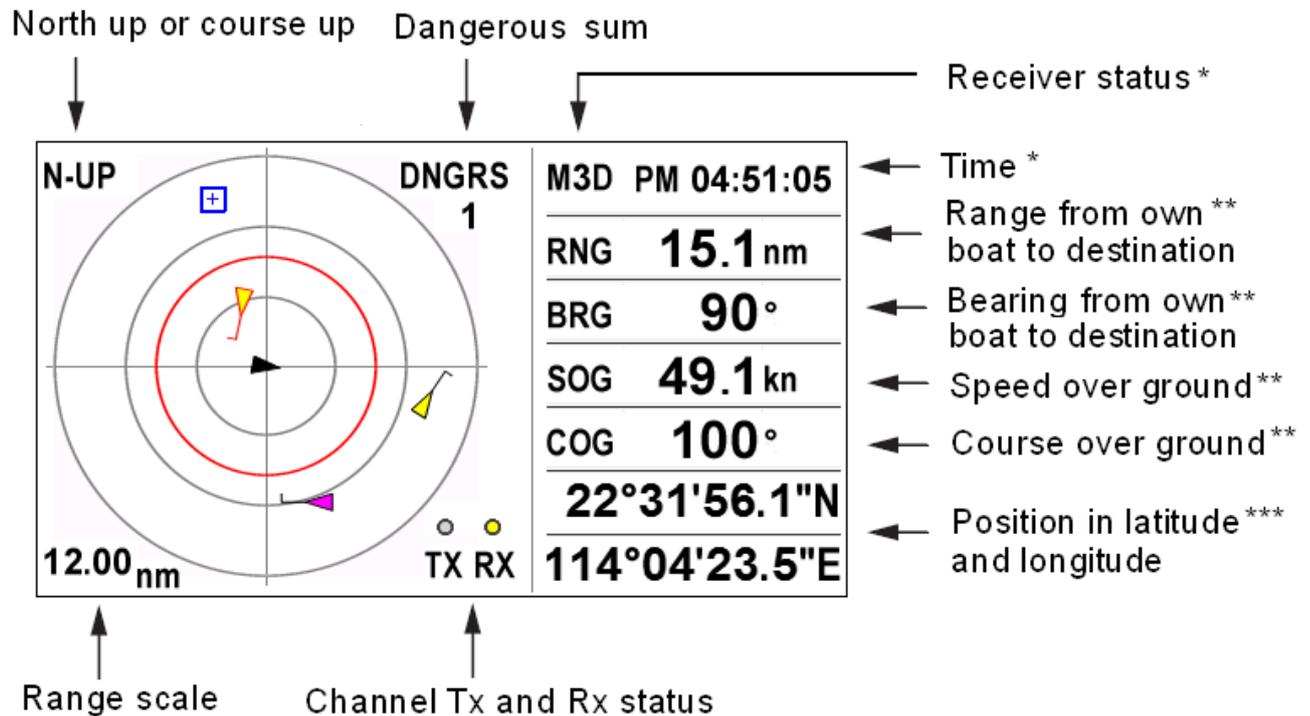


User Data



2.1 AIS Radar

The AIS Radar screen shows the location of other AIS-equipped vessels and shore stations relative to own ship within the current range scale. The position and course of own ship is also displayed in the center. The red color circle indicates the CPA value of AIS settings.



* When target selected, target name or MMSI displays.

** When target selected, range and bearing from own boat to target displays, target SOG and COG displays

*** When target selected, target CPA and TCPA displays

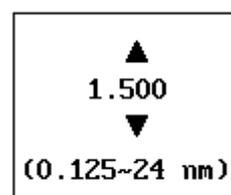
2.1.1 Zoom scale

Scale is available from 0.125 to 24 nm.

Press **ZOOM** key.

Use ▲ or ▼ key to zoom in or zoom out.

Press the **ENT** key to exit.



2.1.2 Direction Up

Press **MENU** key to get a pop-up window.
 Select North up or Course Up.
 Press **ENT** key.



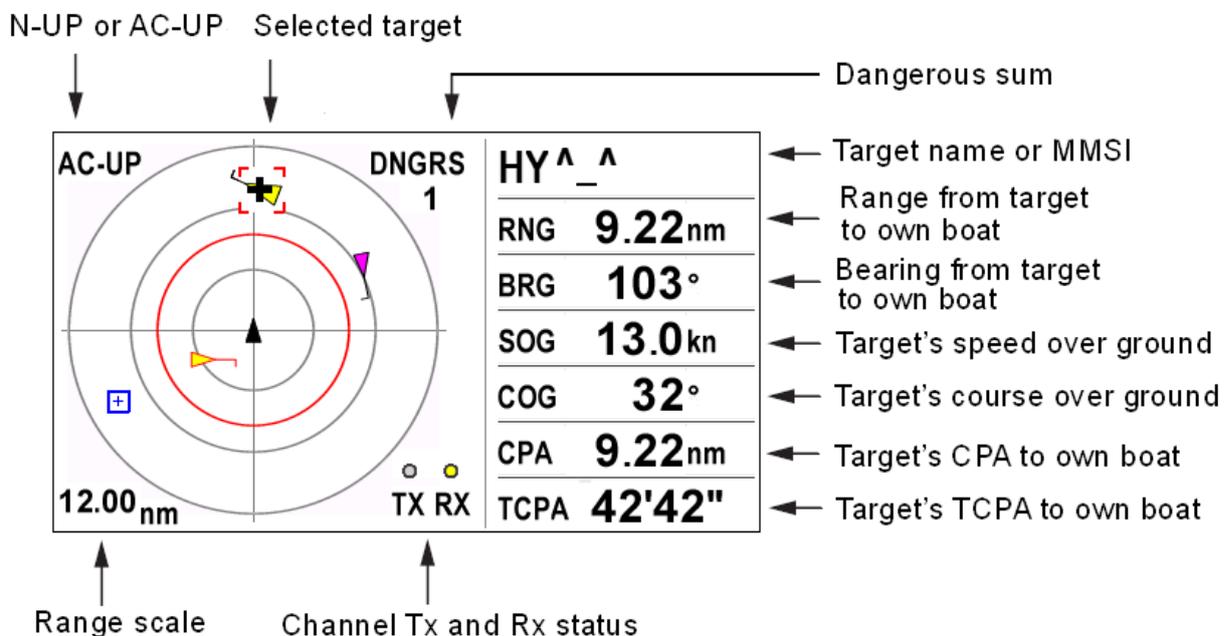
“N-UP” or “AC-UP” is displayed on the up left side of the screen to indicate current selected direction up.

2.1.3 Selected Targets

Use arrow key **▲**, **▼**, **◀**, **▶** to move cursor to the target you want to select.

When a target marker appears, the information of the selected target will be shown in the right column.

If you desire to know more about a target, press **ENT** key to get detailed target information.



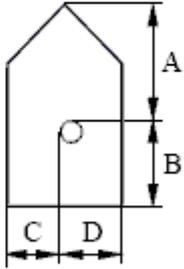
2.1.4 Own boat information

When there is no target selected, press **ENT** key to show your own boat detailed information.

Use **▲** or **▼** key to show own static or own dynamic information.
Press **MENU** key to exit.

Own static data screen shows your static vessel information such as MMSI code, vessel name, GPS antenna position and type of Ship.

Own Static Data	
MMSI	: 123456789
Name	: CHRISTINA
Vessel Type	: 37 Pleasure craft
CPA	: 9.00 km
TCPA	: 6'0"
A	: 12 m
B	: 10 m
C	: 7 m
D	: 8 m



[MENU]:Cancel/Back ▲/▼: 1/2

Own Dynamic Data screen shows your dynamic vessel information such as Latitude and Longitude data, SOG, COG, GPS receiver type, UTC date and time, etc.

Own Dynamic Data			
Date	: Aut/22/2013	SOG	: 183 km/h
Time	: AM 00:35:14	COG	: 190 °
Lat	: 22°30.913' N	RNG	: --.- km
Lon	: 114°03.794' E	BRG	: --- °

[MENU]:Cancel/Back ▲/▼: 2/2

2.2.2 Danger List

The danger list shows any dangerous target whose CPA & TCPA to own boat is less than thresh value.

The dangerous target is sorted by CPA.

The CPA and TCPA value will be updated every 3 seconds, thus the dangerous target is resorted.

If no dangers, in color black, otherwise in color red

Total number of dangers

Target	Danger	Watch	Alarm	Message	Total: 1
Name/MMSI	RNG(nm)	BRG(°)	CPA(nm)	TCPA	
DPE XET	3.94	338	3.94	16'51"	

[ENT]:Detail ▲/▼:Select

To get detailed information about a dangerous target, use ▲ or ▼ key to select the target and then press ENT key.

2.2.3 Watch List

The watch list shows the watch target you set.

Watch target is often set for special care, such as for friend ships, fishing net buoys, etc.

You can switch on or off the lost alarm, position alarm of the watch targets.

Up to 100 AIS targets can be set as your watch targets.

Watch target is in pink color in AIS radar screen and plotter screen.

Target	Danger	Watch	Alarm	Message	Total: 1
Name/MMSI	RNG(nm)	BRG(°)	Comment		
[New]					
DPE XET	15.7	151	NET BUOY 1		

[ENT]:Detail ▲/▼:Select

Operations of add, edit or delete can be done for the watch target.

2.2.3.1 Add Watch AIS

Use ▲ or ▲ key to select the first line [New], then press ENT key to add a new watch target.

You can add a new watch by edit or select from target list.

Edit New
From Target

Input the MMSI of the target that you want to watch.
Input the comment for better explication.

The screenshot shows the 'Watch Info.' menu with the following fields and controls:

- MMSI of the watch**: Points to the MMSI field.
- Comment of the watch**: Points to the Comment field.
- Lost alarm on/off**: Points to the Lost Alarm field.
- Position alarm state**: Points to the Posn Alarm field.
- Defined position in latitude and longitude**: Points to the Posn Lat and Posn Lon fields.
- Rang and bearing from the defined position to the current position**: Points to the Posn RNG and Posn BRG fields.
- Rang thresh hold for position alarm trigger**: Points to the '0.27 nm' value.

At the bottom of the menu, the controls are: [MENU]:Cancel/Back, [ENT]:Enter, and ▲/▼:Select.

Lost alarm

If the lost alarm is set on, lost alarm message will pop up when the watch target is declared as a lost one.

Position alarm

If the position alarm is set on, deviation alarm message will pop up when the watch target deviates away from the defined position far than the defined range.

Lost Alarm !	
MMSI	: 432456789
Name	: WEMAR STINE
Lat	: 22°31.440'N
Lon	: 114°02.916'E
RNG	: 6.21 nm
BRG	: 236 °

Deviation Alarm !	
MMSI	: 432456789
Name	: WEMAR STINE
Lat	: 22°31.440'N
Lon	: 114°02.916'E
PosRNG	: 3.67 nm
PosBRG	: 66 °

2.2.3.2 Watch Target Menu

Use ▲ or ▼ key to select a watch target, then press ENT key to get a pop-up menu for further operation.

Detail
Edit Watch
Delete Watch

Detail

Get detailed information of the watch target.

Edit Watch

Edit the watch items, such as MMSI, or switch on/off watch alarms, or modify the position, or position range.

Delete Watch

Delete the watch target from the list.

Watch Info.	
MMSI	: 432456789
Comment	: -----
Lost Alarm	: On
Pos Alarm	: Deviation 0.50 nm
Posn Lat	: 22°38.440'N
Posn Lon	: 114°02.916'E
Deviation RNG	: 6.98 nm
Deviation BRG	: 180 °

[MENU]:Cancel/Back [ENT]:Enter ▲/▼:Select

2.2.4 Alarm List

Show the alarms by sequence of start time.

Target	Danger	Watch	Alarm	Message	Total: 2
Type	Name/MMSI	RNG(km)	BRG(°)	Start Time	
MOB	972013823	29.4	143	PM 07:54:50	
Lost	123456789	--.-	---	PM 07:54:50	

[ENT]:Detail ▲/▼:Select

2.2.5 Message List

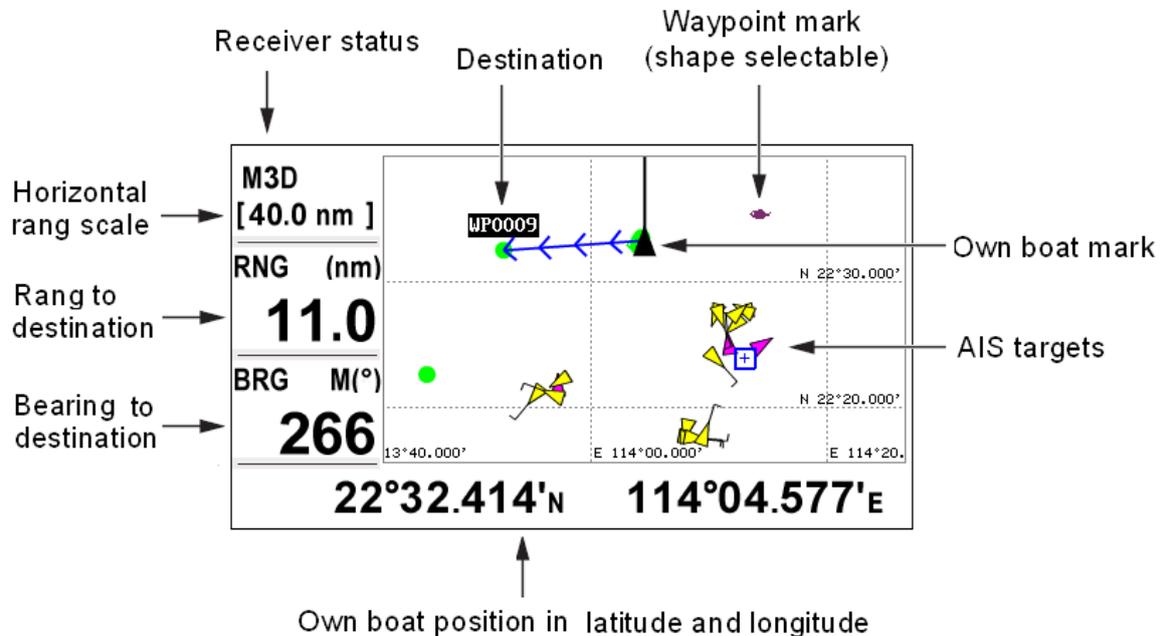
Show the messages by sequence of receive time.

Target	Danger	Watch	Alarm	Message	Total: 2
From	Type	CAST	Content	Receive Time	
972124614	Safety	Broad	MOB ACTIVE	AM 11:46:07	
972124614	Safety	Broad	MOB ACTIVE	AM 11:46:05	

[ENT]:Detail ▲/▼:Select

2.3 Plotter

Show the ship, waypoints, routes, tracks, AIS targets in a plotter graph.



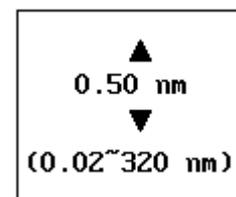
2.3.1 Plotter zoom

Zoom scale is available among 0.02 ~ 320 nm.

Press **ZOOM** key.

Use **▲** or **▼** key to zoom in or zoom out.

Press **ENT** key to exit.



2.3.2 Center own boat

Normally when own boat is travel off the plotter screen, it will automatically return back to the center of the screen.

When cursor is shown, it won't center automatically. Pressing **ENT** key and hold for more than 2 seconds will center own boat in the screen again.

2.3.3 Display options

Press **MENU** key twice to pop up an option window:

1. Show COG line or not.
2. Show the waypoint name of the GOTO, or of the route or of all the waypoints.

WP Name Disp Goto
WP Name Disp All
WP Name Disp Route
COG Line Off
COG Line On

2.3.4 Add a new waypoint

Use arrow key **▲, ▼, ◀, ▶** to move cursor in the plotter screen, and press **ENT** key to add a new waypoint at cursor position.

2.3.5 Waypoint pop-up menu

Use arrow key **▲, ▼, ◀, ▶** to move cursor to a waypoint, when you get an enlarged image of the waypoint, it means the waypoint is being selected.

Press **ENT** key, a pop-up menu appears as one of below, so operations could be made on the selected waypoint.

Different content menu will pop up, that is depending on the state of the selected waypoint.

WP0006	WP0001	WP0002	WP0003
Goto	Move	Move	Move
Move	Cancel Goto	Skip	Skip Off
Edit	Edit	Cancel Route	Cancel Route
Delete	Delete	Edit	Edit

For example,

WP0006 is a normal waypoint, neither a GOTO or of a GOTO route,

WP0001 is a GOTO waypoint,

WP0002 is a waypoint of a GOTO route,

WP0003 is a skipped waypoint of a GOTO route,

A GOTO waypoint could not be deleted until it is cancelled GOTO.

2.3.6 Move Waypoint

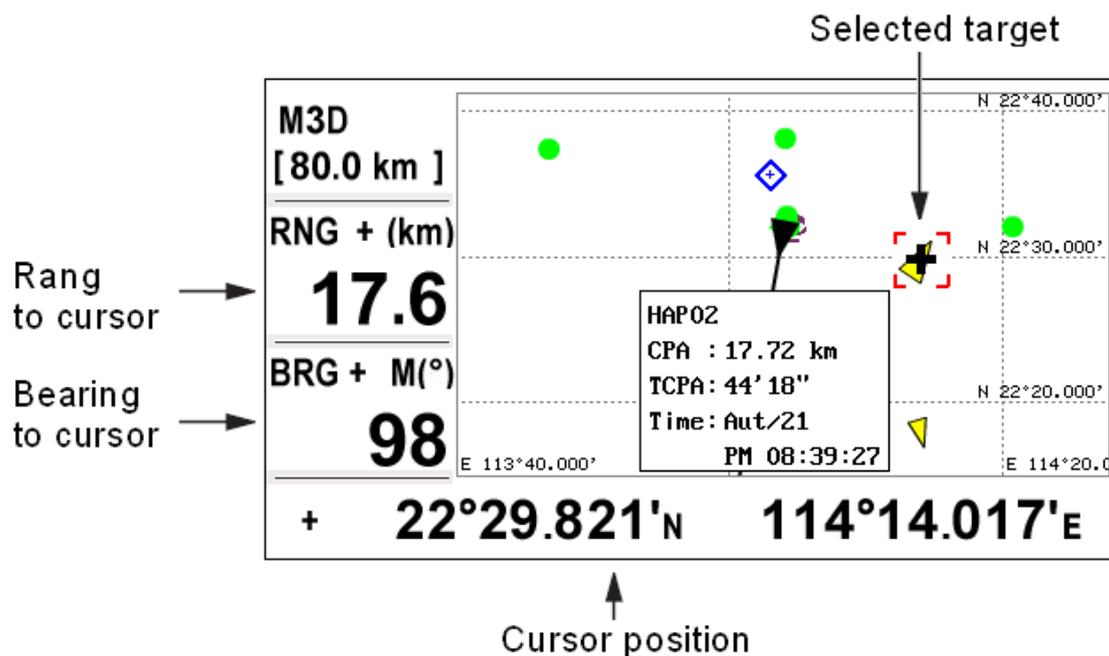
1. Select **Move** in the pop-up menu, and press **ENT** key to start.
2. Use arrow key **▲, ▼, ◀, ▶** to move cursor to a new position.
3. Press **ENT** key, then the waypoint is moved to the new position.

2.3.7 Select AIS Target

Use arrow key **▲, ▼, ◀, ▶** to move cursor to a target, a small window will pop up and show the basic information of the target.

To get detailed information of the target, press **ENT** key.

In the detailed information screen, press **MENU** key to return back.



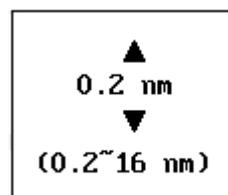
2.4 Highway

It is a 3D highway view of own boat towards the destination.

When the boat mark is aligned with the center white line, the boat is on course. When it deviates left or right, a steer direction sign will flash.

The XTE scale is available among 0.2 ~ 16 nm.

1. Press the **MENU** key.
2. Use **▲** or **▼** to choose the range.
3. Press the **ENT** key to exit.



2.5 SOG meter

There are 4 speed scales.

1. Press the **MENU** key.
2. Use **▲** or **▼** to choose the range.
3. Press the **ENT** key.

0-20 kn
0-40 kn
0-80 kn
0-160 kn

2.6 User data

Two customized user data screens are available.

User data 1: default with 3 fields of POSN, SOG and COG.

User data 2: default with 4 fields of RNG, BRG, XTE, and TTG.

POSN			
22°37.210'N			
115°03.080'E			
SOG	(kn)	COG	M(°)
10.1		136	

RNG	(nm)	BRG	M(°)
2.11		158	
XTE	(nm)	TTG	
0.000		00H 12M	

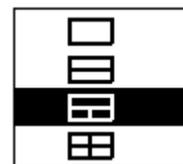
2.9.1 Screen division

Screen can be divided into 1 – 4 fields.

Press **MENU** key to get a pop-up window.

Select the division you want.

Press **ENT** key.

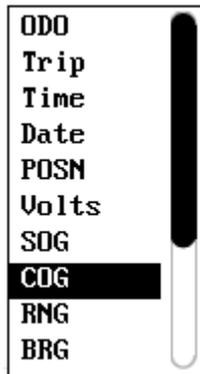


2.9.2 Data field

1. Use arrow key **▲, ▼, ◀, ▶** to select a data field.

POSN	22°36'08.7"N		SOG	(kn)	27.0
	114°39'16.5"E				
BRG	M(°)	XTE	(nm)		
64		0.387 ->			

2. Press **ENT** key to pop up the data list.



ODO: Odometer distance
Trip: Trip distance
Time: Time
Date: Date
POSN: Position
Volts: Power voltage
SOG: Speed over ground
COG: Course over ground
RNG: Range

BRG: Bearing
XTE: Cross-track error
TTG: Time to go
ETA: Estimated time to arrival
WPT: Waypoint to go
None: Blank

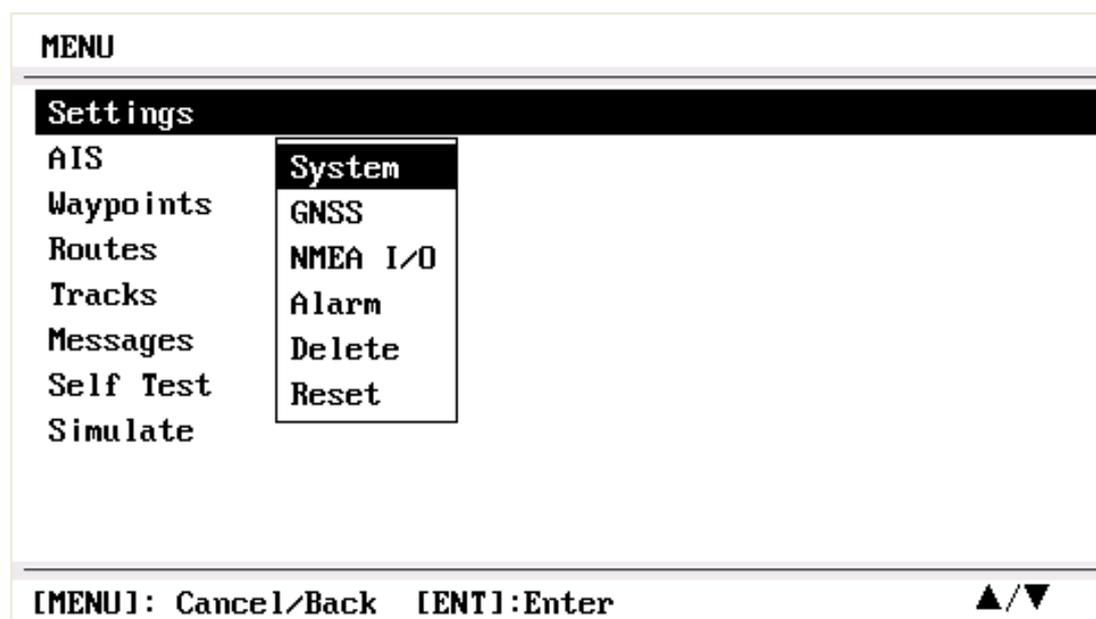
3. Select the data to show and press **ENT** key.

4. Press **MENU** key to exit.

3. Menu

A concise menu is offered to customize a variety of settings and to manage waypoints, routes, tracks, messages, etc.

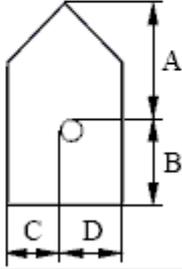
Press **MENU** key once or twice or more (depend on your current display screen) to enter into the menu.



3.1 AIS

Press **MENU** key to display the main menu.

Press **▲** or **▼** key to select **AIS** item, and press **ENT** key.

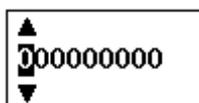
Menu >AIS			
MMSI	:	██████████	
Name	:	-----	
Vessel Type	:	30 Fishing	
Call Sign	:	-----	
CPA	:	6.24 nm	A : 0 m
TCPA	:	6 min	B : 0 m
Ex Alarm Buzz	:	On	C : 0 m
AIS TX	:	Off	D : 0 m
			
[MENU]:Cancel/Back		[ENT]:Enter	▲/▼:Select

Notes:

For HP-528, only CPA and TCPA are available for setting.

3.1.1 MMSI

1. Select MMSI item, Press **ENT** key.



2. Press **▲** or **▼** key to input the specific 9-digit MMSI code.
3. Push **◀** or **▶** key to move cursor forward or backward.
4. Push **MENU** key to cancel the modification, or press **ENT** key to confirm the modification.

Notes:

1. When the MMSI is "-----", which means an invalid MMSI, the transponder operates as just an AIS receiver.
2. If the MMSI code has already been set, you cannot change again.
3. If you enter a code that starts with "0" or "00," it won't be accepted and it will load the previous MMSI code.

3.1.2 Vessel Name

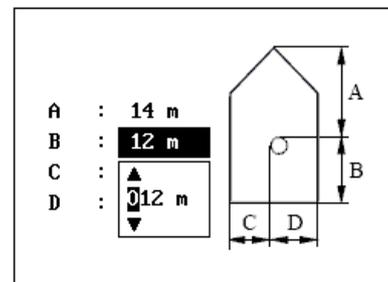
The vessel's name is of up to 20 characters.

3.1.3 Vessel Type

Push ▲ or ▼ key to select your vessel type from the list, then push ENT key to save it or press MENU key to cancel.

3.1.4 GPS antenna position

- A : Bow, 0 ~ 511 meters.
- B : Stern, 0 ~ 511 meters.
- C : Port, 0 ~ 63 meters.
- D : Starboard, 0 ~ 63 meters.



Press MENU to cancel or press ENT key to save the configuration.

3.1.5 Setting CPA/TCPA

Enter CPA (Closest Point of Approach) and TCPA (Time to CPA) values. These settings help you find a dangerous target to avoid a collision.

When an AIS target is closer than your CPA and TCPA settings, an alarm icon will flash on the up left corner of the screen and the alarm buzzer sounds.

- Push ▲ or ▼ key to select either “CPA” or “TCPA.”
- Push ◀ or ▶ key to input the value into that item.
- CPA : default 6 km
- TCPA : default 6 min

Push MENU key to cancel or press ENT key to save the configuration.

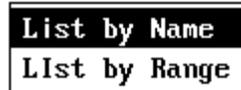
3.1.6 Setting Channel TX

Switch on/off the channel TX.

If channel TX is switched off, the unit works as a AIS receiver.

3.2 Waypoints

Enter into the waypoint list by sort of name or by sort of range to own boat.



3.2.1 Create new waypoint

Move to the [NEW] line, press ENT key to create a new waypoint with default value:

Name: WP**** Lat/Lon: current own boat position

The name, position, icon, color and comment field of the waypoint could be edited.

3.2.2 Waypoint operation

Move to the list line of a waypoint.

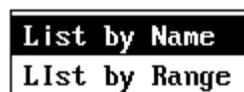
Press ENT key to pop up a menu by which you can operate on a waypoint.

Different content menu will pop up, as it depends on the state of the selected waypoint.



3.3 Routes

Enter into the route list by sort of name or by sort of range.



3.3.1 Create new route

Move to the [NEW] line, press ENT key to create a new route.

The name and comment of the route could be edited.

3.3.2 Manage waypoints in a route

Waypoints can be added, changed, skipped or deleted in a route.

Move to the waypoint line.

Press **ENT** key to pop up a menu.

For the last line, only **Add** operation could be selected.



3.3.3 Route operation

Routes can be set as a destination, edited or deleted.

Move to the list line of a route.

Press **ENT** key to pop up a menu by which you can operate on a route.

Different content menu will pop up, according to the state of the selected route.



3.3.4 Route destination

Route can be set as destination by forward or reverse direction.



3.4 Tracks

Track log is stored at an interval of distance or by auto mode.

Track color is set to distinguish from each track log.

Tracks are deleted by color index or by all color.

When track memory is full, the oldest track is erased automatically to free space for the latest one. Track memory usage is shown in the screen.

3.5 Messages

System messages are shown in this screen.

Such as GPS Error, GPS no fix, etc.

Active alarms are also shown in this screen.

3.6 Self Test

A system test and LCD test is ready for diagnostics.

System information and RAM, ROM, GPS status is shown in system test screen. Press each key to check whether the key functions properly.

During LCD test, each press of **ENT** key changes the grade of RGB color sequentially. Press **MENU** key to exit.

3.7 Simulate

A simulate mode is a demonstration display of the unit.

Current position, course and speed could be set to simulate the trip.

3.8 Settings

Default settings works well under normal circumstances.

Customize the settings to make the unit for your purpose.

3.8.1 System

Select language and custom settings, such as unit, date, time, data format, etc.

3.8.2 GNSS

Settings of GPS SBAS, and other navigating parameters.



3.8.3 NMEA I/O

A sort of NMEA data could be output or input.

Type	I/O	NMEA data	Baud rate
------	-----	-----------	-----------

REM1 Output	O	DTM, GGA, GLL, RMB, RMC, VTG, ZDA	4800
REM2 Output	O	DTM, GGA, RMB, RMC, VTG, ZDA, BWC*	4800
AP Output	O	AAM*, APB*, BOD*, BWC*, GLL, VTG, XTE, ZDA	4800
GPS Output	O	GGA, GSA, GSV, VTG	4800
GPS Input	I	GGA, GSA, GSV, VTG, RMC, GLL	4800
AIS Input	I	VDM, VDO	38400
AIS+GPS Input	I	VDM, VDO, GGA, GSA, GSV, VTG, RMC, GLL	38400
AIS Output	O	VDM, VDO, GGA, GSA, GSV, VTG, RMC, GLL	38400

Notes: * No data when there is no destination.

RS-232 / RS-422 port supports these types:

None
REM1 Output
REM2 Output
AP Output
GPS Output
GPS Input
AIS Input
AIS+GPS Input

HP-528

None
REM1 Output
REM2 Output
AP Output
GPS Output
AIS Output

HP-528A

Notes:

When **GPS Input** is set, the unit makes use of the GPS NMEA data from external device instead of from the signal of its own GPS antenna.

When **AIS Input** is set, the unit will parse the AIS NMEA data from external device, but use GPS antenna of its own.

When **AIS+GPS Input** is set, the unit will parse the AIS NMEA data from external device, and also makes use of the GPS NMEA data from external device instead of from the signal of its own GPS antenna.

3.8.4 Alarms

These settings are for the alarms of XTE, SBAS, arrival, etc.
All the alarms could be switched on or off.

When an alarm is activated, the buzzer sounds and the alarm window will pop up for remind, together with an alarm icon flashes on the up right of the screen.

You can silence the buzzer and close an alarm pop up window by pressing any key.

To ignore all the alarm pop windows, press **MENU** key.

The alarm icon remains until the reason for the alarm disappears.

4. GOTO WPT MOB

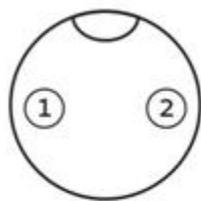
The unit provides quick function keys.

In plotter screen, press **GOTO** key to start navigating to where cursor is.

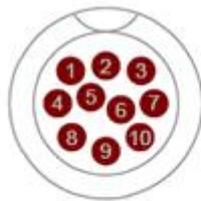
In every display screen, press **WPT** key to lay a waypoint at the current position where own boat is.

In every display screen, press **MOB** key and hold 2 seconds to activate a MOB mark.

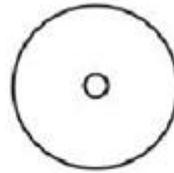
5. Installation



Power



NMEA Data Port



GPS Antenna



VHF Antenna

Power

DC12V-24V

- ① Power + (White)
- ② Power - (Black)

NMEA Data Port:

- ① RS-232 RX
- ② RS-232 TX
- ③ GND
- ④ RS-422 RX-
- ⑤ RS-422 RX+
- ⑥ RS-422 TX-
- ⑦ RS-422 TX+