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Important Notice

Manual Handling	Keep this manual in a safe place where you can access it quickly.
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Pictorials

This manual uses the following symbols for easy understanding safety instructions. Always follow these instructions carefully.

	WARNING Always follow this safety instruction to prevent death or injury.
	CAUTION Follow this safety instruction to avoid possible injury or damage to your property. Symbol “△” is a CAUTION or WARNING label indicating the safety instruction.
	WARNING This symbol is an Electrical Shock WARNING label.
	Symbol is an instruction that you must not violate. (This symbol instructs NOT to disassemble the system components)
	Symbol is an operation instruction that you must follow. (This symbol shows the main power OFF instruction.)



WARNING <For System Operators>

Always follow this instruction to prevent death or personal injury.

	Turn power off During abnormality.	If smoke or a small of burning occurs, a fire or an electrical short circuit may result. Turn the power switch OFF and shut down the power supply immediately. Never try to repair the system yourself. Call for service.
 	Do not open Cabinet.	High voltage exists in the instrument. Contact with voltage may cause possible injury or death.
	Do not touch back side of the equipment.	Harmful line voltage is present on back side of the equipment. Never try to touch back side while power is turned on.

	Avoid excessive shock to display unit.	The LCD display module contains a liquid. Do not apply any mechanical shock to the display. If the display broken, liquid may leak and injure your skin and eyes.
	Do not use with poor ventilation.	If you cover this unit or use in an enclosed place, it may malfunction or become damaged as a result of overheating. Use only where there is sufficient ventilation.

Installation Cautions <For service Personnel>

Follow installation instructions to avoid personal injury and system malfunction.

Installation in rigid location.	Mount your Vega series on a rigid frame or base to prevent your unit from working loose.
Use correct Installation materials.	Use the installation materials provided in the standard accessory pack only. If you use hardware of insufficient strength, your system may loosen causing damaged.
Keep away from direct sunlight.	Keep your system out of direct sunlight as it may become damaged by overheating.
Keep away from water.	Take care not to get water on or in your unit as it may be damaged and/or cause an electrical shock.
Keep away from heat source.	Keep your system away from other heat source as it may malfunction, be damaged, or burn.
Use correct power source.	Operate your system within the specified power voltage. An incorrect power supply may cause



Maintenance Cautions<For Maintenance Personnel>

Use the following safety precaution internal inspection.

Discharge capacitors.	High voltage may be retained in the capacitors if the high-tension circuit several minutes after you have turned the power switch off.
Check that power is OFF	To prevent an electrical injury due to erroneous power switching, make sure that the main power supply and the system power switch are both in the off position. Additionally, attach a safety label showing that service is in progress.

Avoid EMI.	Take care not to damage the ESDs (Electrostatic Sensitive Devices) by static electricity from carpet and cloths.
Avoid dust.	Wear a safety mask so as not to breath in dust during inspection or cleaning inside your system instruments.

Operation Notes <For operators>

Observe the following operation notes, otherwise the system failure or deterioration can result. And periodical inspection and maintenance are required for keeping the system in an optimum condition.

Backup important data.	The waypoint and other registered data may become unreadable by unexpected failure. We recommend recording this data separately.
Use correct transducer only.	If you use incorrect transducer, the transmitter circuit may be damaged due to a matching error. Consult is for system information.
Check transducer Connection before power on	Do not turn the power switch ON if the transducer is disconnected or if it is not inserted into the water. If done, the transducer or transmitter circuit may be damaged.
Always clean the transducer	Since transducer performance can drop due to accumulated bottom growth, keep the transducer clean. Never paint transducer surface.
Transducer must be installed by authorized personnel.	Consult us for transducer installation by authorized personnel.

 WARNING	This product is designed to assist a navigation. When you are sailing, use the certified chart from the Government or IMO.
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Vega Series System

Welcome

The Vega series opens a new chapter of performance and integration in vessel navigation system display and management. Whether you are a Cruiser or Sport fisherman or both, 650 gives you the information you need.



CAUTION

The Vega series employs the latest in proven technology to provide accurate navigation information. The Plotter functions of Vega series are totally dependent upon the capability of the navigation source to provide accurate position information. This device is only an aid to navigation. It should be used in conjunction with all other navigation accuracy. For safety, always resolve any uncertainty before continuing navigation.

There is no direct relationship between the color of water areas and their depth. The navigator shall always query the area for depth information and use the official paper chart.



CAUTION

The performance of LCD displays is degraded by continuous direct exposure to ultraviolet rays. Locate your Vega series Display away from direct sunlight. When not in use. Keep the display covered.

Vega Series System



DISPLAY BREAKAGE WARNING

The LCD display module contains a liquid. If the display is broken and the liquid contacts your skin, wash it off immediately in running water for 15 minutes. If the liquid contacts your eyes, immediately flush your eyes with running water for 15 minutes. Contact a physician if any abnormal symptom is experienced.



INDICATION NOTICE

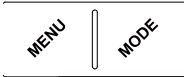
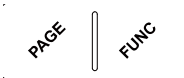
*: It is important or warning notice on front of article

[]: Keyboard.

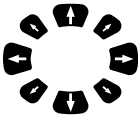
Getting Started

1. The Keyboard

1.1. Fishfinder

KEY	Description
	Uses to select menus and move the cursor.
	Rotary: Uses to select menus. Button: Uses for Enter key.
	Move the depth up and down.
	Reduce or extend depth of water
	[MENU]: Opens the menu page. [MODE]: Setting up Fishfinder mode
	[PAGE]: Opens the pages. [FUNC]: Activates the stored function.
	[MARK]: Add/delete marks. [CURSOR]: Turn on the Time Machine.
	[CANCEL]: Goes back or exists from the menu [PWR]: Power on/off, Restart, Control BRG, Day/Night, Lock touch screen, WiFi, Bluetooth, HY-NET.

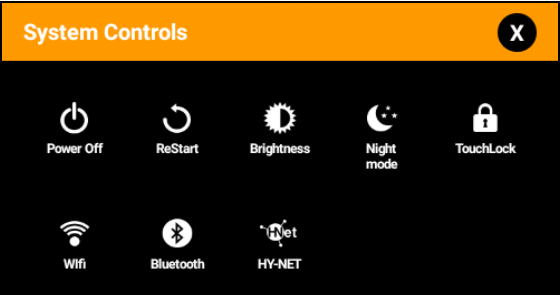
1.2. Fishfinder

KEY	Description
	uses to select menus, move the cursor on the map and selects the frequency of fishfinder.
[MENU]	Opens the menu
[SHIFT▲][SHIFT▼]	Move the depth up and down.
[FUNC]	Activates the stored functions.
[DEPTH▲][DEPTH▼]	Reduce or extend depth of water
[C.R]	Turn on/off the Color Rejection
[N.R]	Turn on/off the Noise Rejection
[WPT INPUT]	Press to input a waypoint and access the waypoint option.
	Activates/Deactivates the cursor.
[PAGE]	Selects the configuration & modification.
[CONT▲][CONT▼]	Control the contrast.
[MODE]	Selects the map orientation & Fishfinder mode.
[HF GAIN▲] [HF GAIN▼]	Control the High Frequency Gain.
STC	Control STC.
[LF GAIN▲] [LF GAIN▼]	Control the Low Frequency Gain.
[CLEAR]	Goes back or exists the menu.
[ENTER]	Ends the everything to confirm selections.
	Power “on/off”, brightness and day/night mode.

1.3. How to



use



(Fig.1.1)

1.3.1. Turn on



Switch on.

1.3.2 Turn off

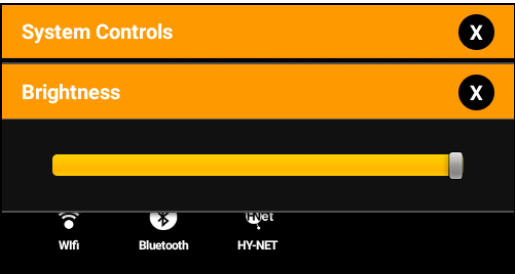
Choose “Power off” on (Fig. 1.1).

1.3.3 Restart

Choose Restart on (Fig. 1.1).

1.3.3. Adjust brightness

Choose “Brightness” on (Fig.1.1).



(Fig.1.2)

1.3.4. Use day/night mode

Choose “night mode” on (Fig.1.1).

1.3.5. How to lock the tough screen

Keep pressing “Toughlock” on (Fig.1.1) and the color changes to orange and activate. In touchlock, touch icons disappear on the screen and deactivate. For activate, keep pressing “ToughLock”.

1.3.6. WiFi

Choose “WiFi” on (Fig.1.1).

1.3.7. Bluetooth

Choose “Bluetooth” on (Fig.1.1).

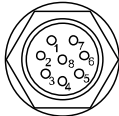
1.3.8. HY-NET

Choose “HY-NET” on (Fig.1.1).

2. Specification of the connectors

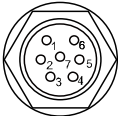
2.1. Metal connectors

2-TD



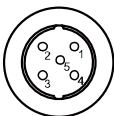
NO	NAME
1	SPD_PULSE
2	SPD_VCC
3	TD1
4	TD_GND
5	TD2
6	TEMP_VCC
7	TEMP_SIG
8	SPD_GND

3-TD



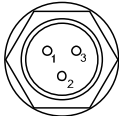
NO	NAME
1	UDI_TD 2
2	UDI_TD 1
3	UFF_TD 2
4	UFF_TD 1
5	TEMP_VCC
6	TEMP_SIG
7	TD_GND

NMEA 2000



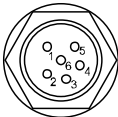
NO	NAME
1	SHIELD
2	DC + 12V
3	DC -
4	CAN_H
5	CAN_L

POWER



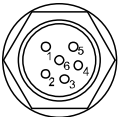
NO	NAME
1	DC +(12V~36V)
2	DC -
3	NC

NMEA0183



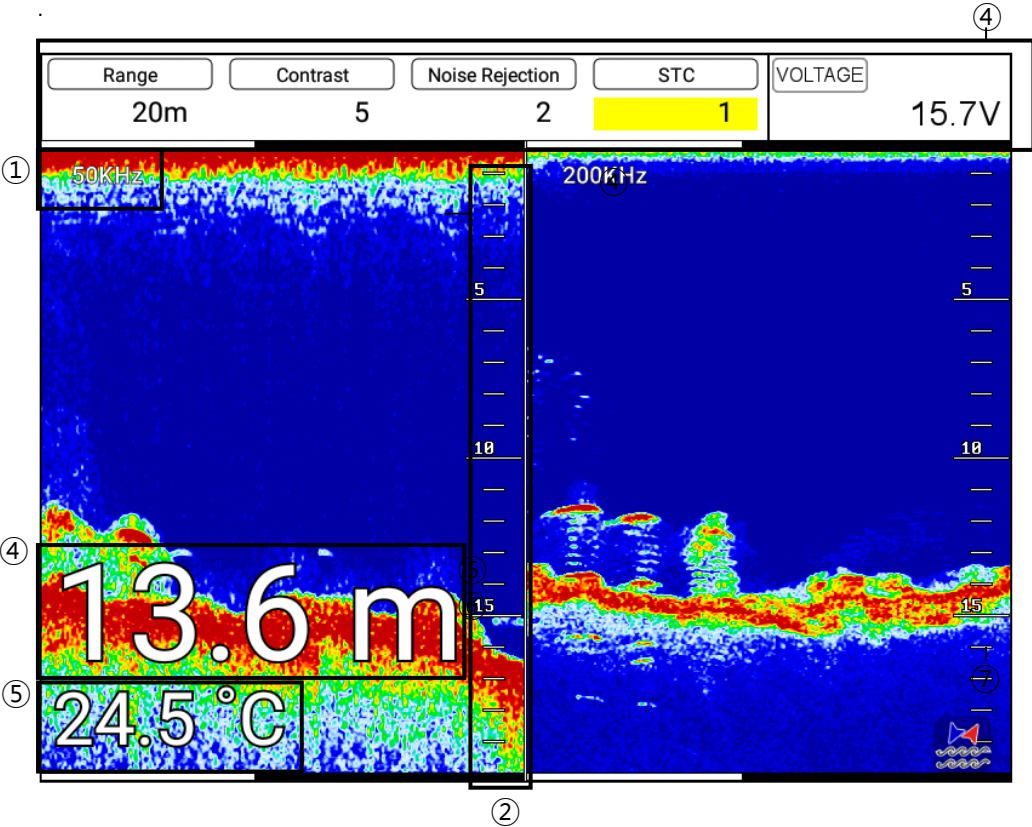
NO	NAME
1	GND
2	TX +
3	GND
4	RX +
5	RX -
6	NC

AIS



NO	NAME
1	GND
2	TX +
3	GND
4	RX +
5	RX -
6	NC

3. Screen Overview



①	Frequency	Showing the using frequency.
②	Depth bar	The graduated ruler of depth.
③	Databar	Showing various data on the top or bottom.
④	Depth	Showing the current depth digits.
⑤	Temperature	Showing the current water temperature.

4. Databar

Showing various data on the top or bottom.

Range	Contrast	Noise Rejection	STC	VOLTAGE
60ft	5	0	1	12.1V

4.1. Customizing

Showing various data as what the user wants.

► [MENU]->Setup->Customizing->Databar->Edit or keep pressing the databar on the screen.

When choosing the frame, setting up in each box as (Fig.1.3).

Range	Contrast	Noise Rejection	STC	VOLTAGE
Auto	5	0	1	12.2V

VOLTAGE

TTG

XTE

W.RNG

W.INFO

(Fig.1.3)

When finishing the set up, press [CANCEL] to exit or touch “EXIT” on the screen..

(*Please, refer “Customizing” for further question.)

4.2. Display

► [MENU]-> Setup->Customizing->Databar->Display

Setting the databar, "Shown/Hidden".

4.3. Position

► [MENU]-> Setup->Customizing->Databar->Position

Setting the databar position on the top or bottom.

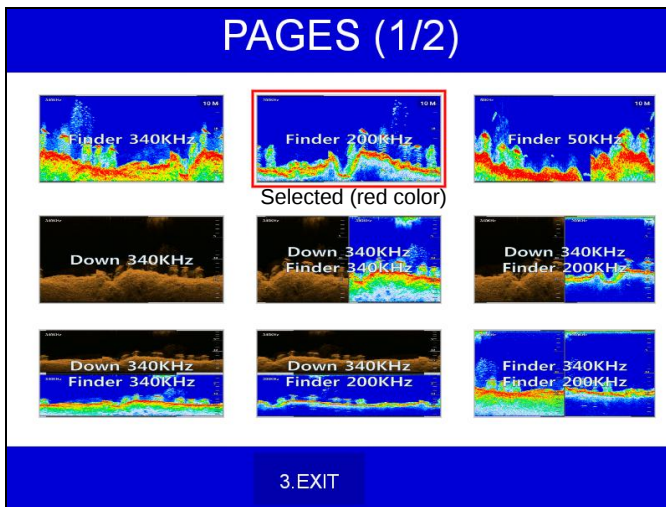
5. Page

► [PAGE]

Choosing the various pages that set up pages.

Move the active(red box) to choose the page.

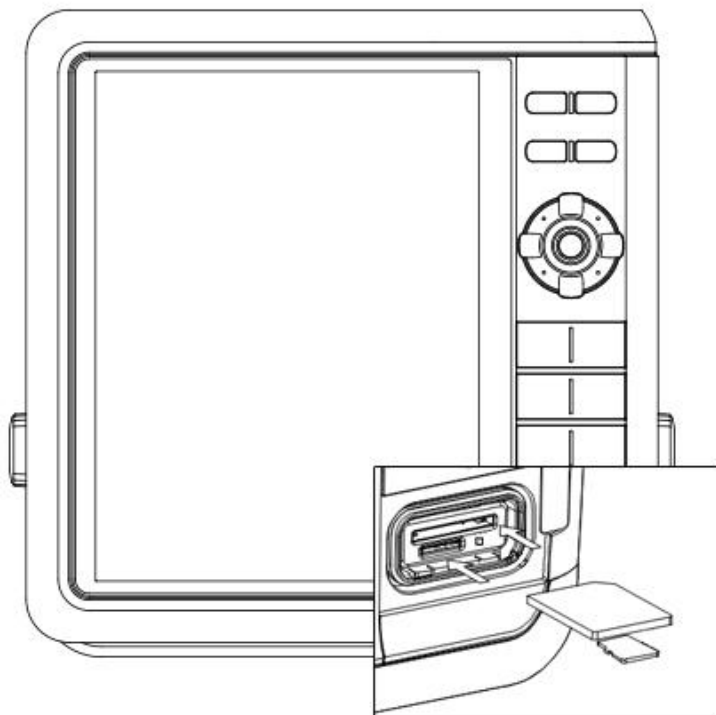
Rotate the knob or press [◀][▶][▼][▲] to move the active on your page and Enter for end.



(Fig.1.4)

6. Memory Card

Inserting the SD and micro SD as (Fig.1.5).



(Fig.1.5)

7. Save WPT

►[MENU]->Other->WPT->Save WPT

WPT can be stored in a SD/Micro SD. So if you want to save the WPTs, a SD/Micro SD must be inserted in the slot.

When storing, name it and you will be able to store many WPT' in the SD/Micro SD.

WPTs are stored in the external SD/Micro SD.

(*Userdata is in “..\HY\Userdata\”)

8. Load WPT

►[MENU]-> Other->WPT ->Load WPT

Userdata loads from the stored SD/MicroSD. If you need to load the userdata, the stored SD/MicroSD must be inserted in the slot.

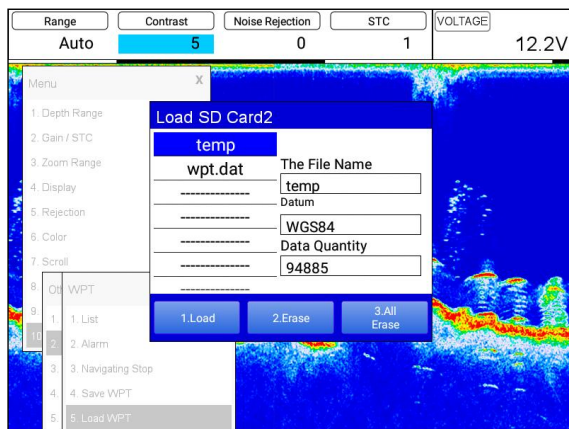
(*Userdata is in “..\HY\UserData\”)

All of WPT in the SD/MicroSD show on the list. Choose one of them and it will show.

There are two ways to load WPT.

First, showing the stored WPT as well as the existing on the screen. After loading the stored, you will see the window and press [MENU].

Second, showing only stored WPT. After loading the stored, press [ENTER].



|| Fishfinder getting started

1. Transducer setup

► [MENU]-> 9.Setup->10.Function-> 2.TD Setup

Check the type of transducer that you purchased and select the transducer setup as follow.

SS522 Transducer: Select “3 Frequency”.

SS422 Transducer: Select “2 Frequency”.

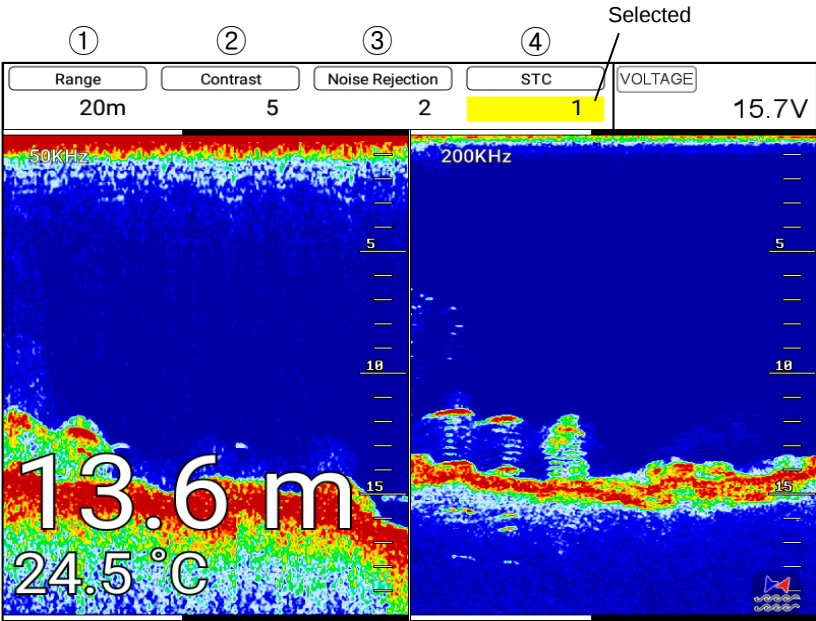
2. Depth/Gain/STC

► [MENU]-> 3.Gain/STC->1.Mode

2.1. Dual mode

Choose the item with using [◀][▶] key. Highlighted is the chosen for activation.

(* Range: Red, Contrast: Blue, Noise Rejection: Green, STC: Yellow)



①	Range	Two modes(AUTO/Manual) are providing. Use [ENTER] for
---	-------	---

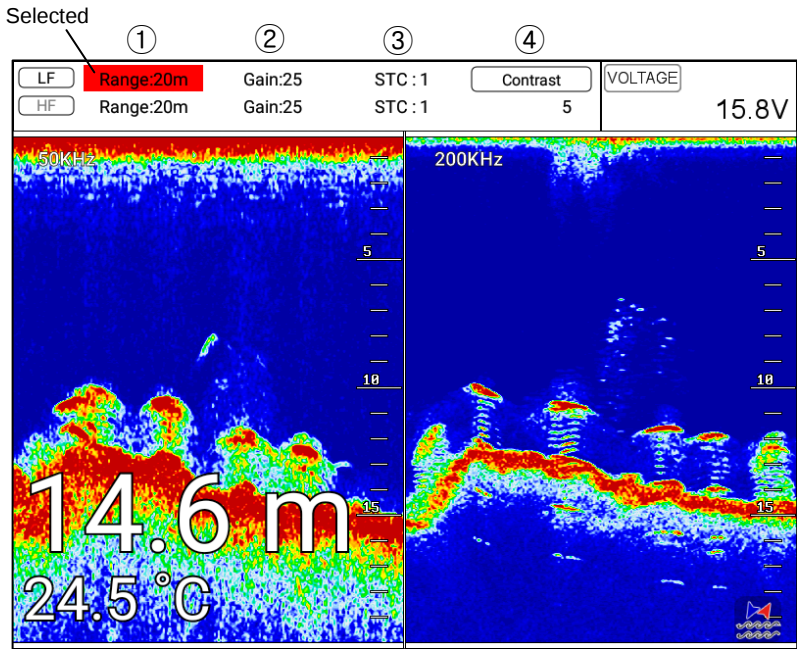
		switching.
②	Contrast	Controlling the contrast level.(Mini. -20 to Max.+20)
③	Noise Rejection	Noise filtering/rejecting.(0 to 30)
④	STC	Rejecting the transmitting nosie.(0 to 20)

(* Use the keys, [+],[−] or ro torary key)

2.2. Single mode

Use the keys, [▲][▼] for frequency and [◀][▶] for for items. The highlights are different in each item.

(* Range: Red, Gain: Magenta, STC: Yellow, Contrast: Blue)



①	Range	Setting is AUTO, AUTO shows and setting is manual, meter digits show. (*Choosing AUTO/Manual by [ENTER] key.
②	Gain	Controlling gain. (*Choosing AUTO/Manual by {ENTER} key. AUTO gain: -

		10 to 10, Mnuual gain: 0 to 50)
③	STC	Rejecting the transmitting noise. (0 to 20)
④	Contrast	Controlling the contrast level.(Mini.-20 to Max.+20)

(* Use the keys, [+],[−] or rotary key)

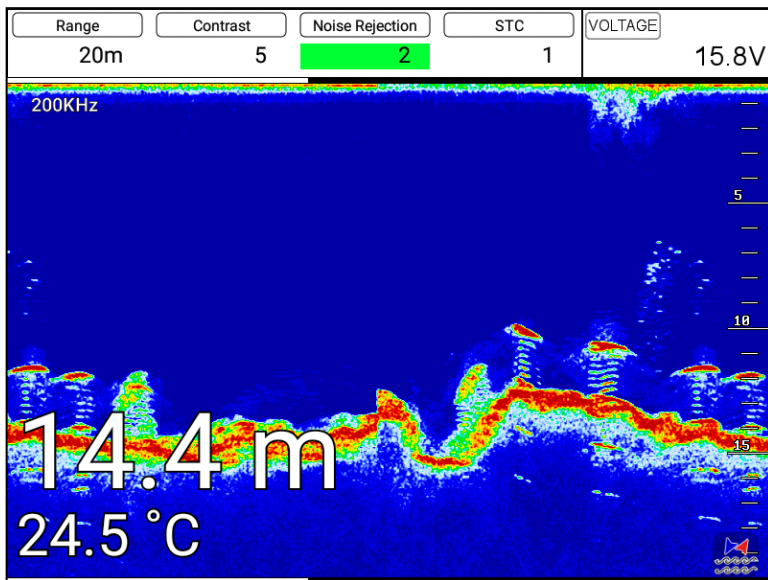
3. Mode

► [MENU]->Mode

Four kinds in Fishfinder.

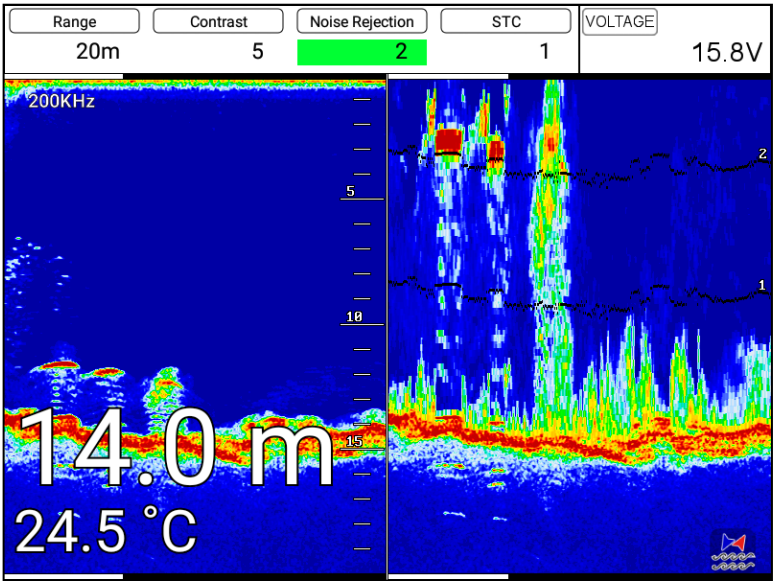
3.1. Normal

Normal mode (with Auto Range active) displays the sounder image with the surface at the top of the screen and the sea bottom in the lower part of the screen. The depth scale indicates the depth range appearing in the display. Bottom contours and fish echoes are displayed at the depths where they are detected. If the depth Range is set manually to a value less than actual water depth, sea bottom echoes are not displayed, but all other echoes within the Range setting are displayed.



3.2. Bottom Zoom

Bottom Zoom magnifies the sounder display from the sea bottom toward the surface for a short distance. The sea bottom contour is displayed and additional contour lines are added at intervals above the sea bottom to aid in determining distances of echoes near the bottom. Use the Sounder Menu to set the magnified Bottom Range from 2.5 to 20m (10 to 60ft.). Default setting is 10m (40ft.). If the depth Range is set manually, the setting must place the sea bottom echo in the lower portion of the screen for Bottom Zoom to be effective.

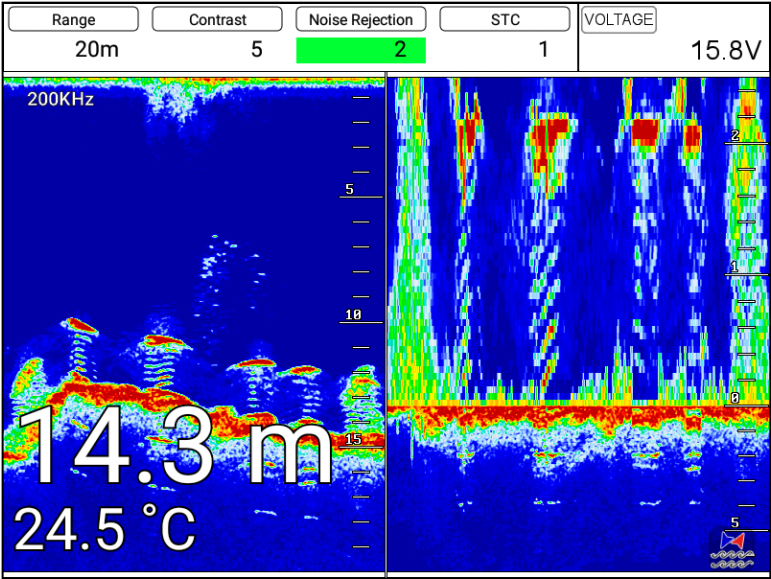


3.3. Bottom Lock

Bottom Lock divides the Fishfinder main screen image for the selected Fishfinder into two sections. The left hand section displays a Normal Mode image. The right hand section of the screen displays the Fishfinder image relative to the sea bottom. The sea bottom appears as a straight line with the Fishfinder image magnified for a short distance toward the surface. A scale appears on the right for estimating distances of echoes near the bottom. Use the Fishfinder Manu to set the magnified Bottom range from 2.5 to 20m (10 to 60ft.). Default setting is 10m (40ft.). If the depth Range is set manually, the setting must place the sea bottom echo in the

lower portion of the screen for Bottom Lock to be effective.

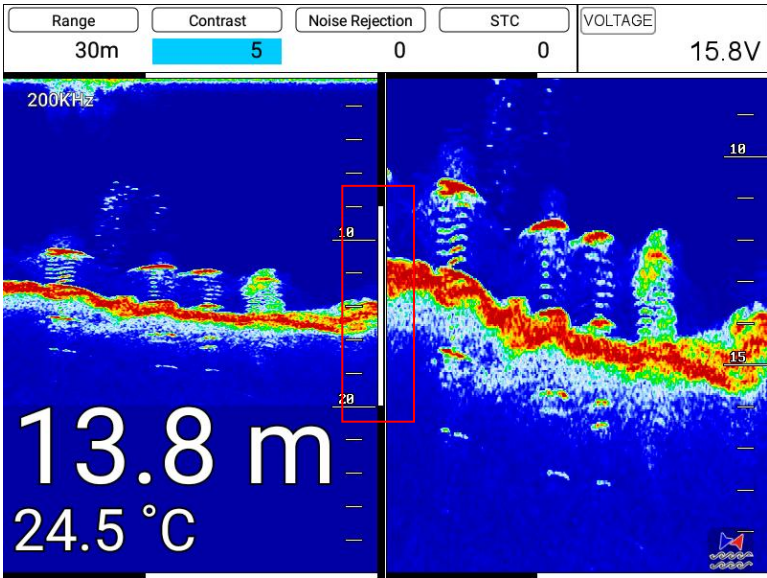
Fishfinder modes are selectable for single frequency or dual and some functions, for example bottom zoom or lock.



3.4. Part Zoom

Shows an enlarged fishfinder screen of the set range.

You can show the screen of left is normal screen and screen of right is part zoom



4. Scroll

► [MENU]->6. Scroll.

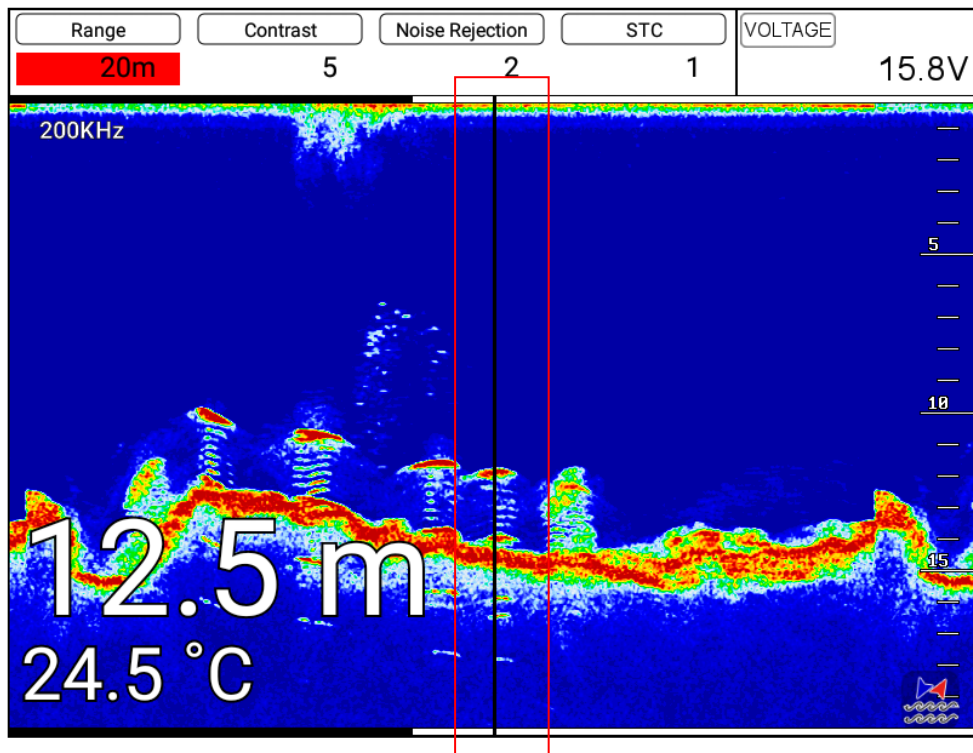
This function allows the users to view the screen in the past fishfinder.

When the cursor is called You can see past the screen using the [←][→] key.

Then after [MARK] key is pressed, the input position is marked in the past.

(★ Input position is incorrect error range according to the situation.)

(★ Leghth of past fishfinder screen by scrolling depend on depth.)



Fishfinder operation

1. Menu

► [MENU]

1.1. Depth Range

Vega selects the best condition for measuring the depth automatically in the environment of the sea.

( The default setting is Auto.)

1.2. Gain/STC

Controlling Gain/STC.

Dual: Controlling Depth, Contrast, Noise Rejection, STC of 50/200KHz at the same time..

Single: Controlling Gain, STC separate of 50/200KHz.

1.3. Zoom Range

Select the range of the bottom zoom or lock. It is necessary to modify the bottom.

1.4. Display

1.4.1. A-scope

A-scope shows the research under the water by a scope to see the environment under the water.

( The default setting is OFF.)

1.4.2. Image Speed:

Select the speed of Fish finder image from 4X until 1/32X.

( The default setting is 1X.)

1.4.3. White Line

It is necessary to research a detailed fish on the bottom or a seaweed under the sea. The color of the bottom changes into white or black to see the bottom easier than red.

( The default setting is OFF.)

1.4.4. Depth

1.4.4.1. Depth

Shown/Hidden the depth range on the screen.

( The default setting is On.)

1.4.4.2. Depth Font

Select the depth range font size on the screen.

( The default setting is Normal.)

1.4.5. TEMP

1.4.5.1. TEMP

Shown/Hidden the temperature on the screen.

( The default setting is On.)

1.4.5.2. TEMP Font

Select the temperature font size on the screen.

( The default setting is Normal.)

1.4.6. Speed

1.4.6.1. Speed

Shown/Hidden the speed on the screen.

( The default setting is Off.)

1.4.6.2. Speed Font

Select the speed font size on the screen.

( The default setting is Small.)

1.4.7. Fish

1.4.7.1 Fish symbol

Fish symbol with sizes and levels show for targets.

(*Fish symbol is only for reference. This could be different from the real.)

1.4.7.2. Fish size

Setup to display of the size of fish.

( The default setting is Off.)

1.4.8. Shift

A user selects this function to see more detailed bottom of the sea. When you turn up the shift, the range of Fish finder shall go up from the shift range. For example, if you raise 5m of shift at 20m range, the surface shall start 5m and the bottom range shall be 25m.

( The default setting is 0m.)

1.5. Rejection

1.5.1. Interference Rejection

When there are another boats around you on sailing, your Fish finder could be disturbed to work. The step of the function is from off to level 2. The bigger number, the more rejection.

( The default setting is OFF.)

1.6. Color

1.6.1. Color Rejection

There are 16 color levels for Fish finder. The color bar is on the left of the Fish finder. If the level is higher, the color of the bar is deleted one by one.

1.6.2. Finder Screen Color

Select the back ground color of the Fish finder for your convenience.

1.6.3. Image Filter

Activating/Disatctviating the horizontal/vertical image filter.

When image filter activates the fishfinder image looks softer and noise is filtered but the details of fishfinder targets would be less.

1.7. Scroll

This function allows the users to view the screen in the past fishfinder.

When the cursor is called You can see past the screen using the [←][→] key.

Then after [MARK] key is pressed, the input position is marked in the past.

(★ Input position is incorrect error range according to the situation.)

(★ Leghth of past fishfinder screen by scrolling depend on depth.)

1.8. Alarm

1.8.1. Depth

1.8.1.1. Deep Depth Alarm

It alarms when the set deep depth is out of the range.

( The default setting is OFF.)

1.8.1.2. Deep Depth Range

Setup the range of deep depth alarm

( The default setting is 0M.)

1.8.1.3. Shallow Depth alarm

It alarms when the set shallow depth is out of the range.

( The default setting is OFF.)

1.8.1.4. Shallow Depth range

Setup the range of shallow depth alarm

( The default setting is 0M.)

1.8.2. TEMP(Temperature)

1.8.2.1. Low Alarm

It alarms when the set low temperature is out of the range.

( The default setting is OFF.)

1.8.2.2. Low Range

It alarms when the set low temperature is out of the range.

( The default setting is 0.)

1.8.2.3. High Alarm

It alarms when the set high temperature is out of the range.

( The default setting is OFF.)

1.8.2.4. High Range

It alarms when the set high temperature is out of the range.

( The default setting is 0.)

1.8.3. Fish-School

1.8.3.1. Fish-School Alarm

It alarms when it detects school of fish.

It will detect school of fish depend on set depth, range and level of the fishfinder.

( The default setting is OFF.)

1.8.3.2. Fish-school Depth

If the alarm is on, It is available to setup the depth of the Fish-school

( The default setting is 10m.)

1.8.3.3. Fish-School Range

If the the alarm is on, It is available to setup the Range(hight) of the Fish-school.(The bar, next of display is shown)

( The default setting is 50m.)

1.8.3.4. Alarm Interval

If the the alarm is on, It is available to setup the alarm interval.

( The default setting is middle)

1.8.3.5. Color Level

If the the alarm is on, It is available to setup the color level.

It is available to setup the color level

1.9. Setup

1.9.1. Maintenance

It is necessary to check the system or the version for maintenance and demonstrate Vega series with the simulators

1.9.1.1. Program Version

It contains ID and the program version, and it has important information for maintenance and upgrade.

1.9.1.2. OS Version

It contains the version of OS, which is necessary for maintenance and upgrade.

1.9.1.3. Firmware Version

It contains the version of firmware, which is necessary for maintenance and upgrade.

1.9.2. Unit

1.9.2.1. DIST/Speed

Select desired unit of measure for distance and speed. Choose from: nautical mile/knots (nm/kt), kilometer/kilometers per hour(km/kmh), yard/knot(yd/kt).

cf) 1nm = 1.852km, 1kt /h= 1.852km/h, less than 1nm display in yard and over 1nm display in mile

( The default setting is Nm/Kt.)

1.9.2.2. Depth

Select desired unit of measure for depth of water. Choose from: meter(M), foot(ft), fathom(fm), Italian Fathom(lfm), Japanese fathom(Jfm).

cf) 1m = 3.281ft = 0.549fm = 0.609lfm = 0.660jfm

( The default setting is Meter.)

1.9.2.3. TEMP

Select desired unit of measure for temperature of water. Choose from: Celsius(°C), or Fahrenheit(°F).

cf) 1°C = +32°F

1.9.3. Time&Date

1.9.3.1. Reference

Available to adjust the collect local time by the UTC time from the GPS.

( The default setting is incorrect every the country.)

1.9.3.2. Time Format

Sets you preferred time between 12 hour or 24 hour.

( The default setting is 12 hour.)

1.9.3.3. Date Format

Sets you preferred date among YY-MM-DD, MM-DD-YY or DD-MM-YY.

( The default setting is incorrect every the country.)

1.9.3.4. Month format

Sets you preferred date between Character or Number.

1.9.4. Input/Output

1.9.4.1. Output Sentences

The chartplotter allows customizing the NMEA-0183 sentence.

DESCRIPTIONS	CONTENTS OF DATA FIELD	DEFAULT
\$PGGGA	Global Positioning System Fix Data	ON
\$GPVTG	Course and Ground Speed	ON
\$GPZDA	Time and Date	OFF
\$GPRMB	Recommended minimum navigation information	OFF
\$GPRMC	Recommended Minimum Specific GPS/TRANSIT DATA	OFF
\$GPAPB	Heading/track controller (Autopilot) sentence B	ON
\$GPXTE	Cross-track error, measured	OFF
\$GPBOD	Bearing, origin to destination	OFF
\$GPBWC	Bearing and distance to waypoint	ON
\$SYPLT	Samyoung autopilot	OFF

1.9.4.2. Transmit

Available to adjust transmit speed of input/output in each ports.

1.9.4.3. Output Version

Available to adjust Output Version.

( Standard is 2.3.)

1.9.5. Correction

1.9.5.1 Boat Speed

The tolerance of boat speed value can be corrected. When the [Speed source] is set to the [Sensor], it is corrected by %. (setting:-50 ~ 50%) When the [Speed source] is set to the [NMEA], it is corrected by numeral. (setting:-10.0 ~ 10.0)

( The default setting is 0.)

1.9.5.2. Water Temp

The error of water temp value can be corrected.

(setting:-10.0 ~ 10.0 °C, -10 ~ 10 °F)

( The default setting is 0.)

1.9.5.3. Draft Set

The tolerance of depth can be corrected.

( The default setting is 0.0m.)

1.9.6. Simulator

It is necessary for an indoor demonstration. The simulations of Fishfinder in the memory.

1.9.7. Customizing

1.9.7.1. Databar

1.9.7.1.1. Position

Setting up up/down the position of databar on the display.

( The default setting is Down.)

1.9.7.1.2. Edit

It customizes the data bar information.

1.9.7.2. Alpha Blending

You can set the transparency of the background in databar.

1.9.7.3. Screen Layout

Choosing the horizontal or vertical view.

( The default setting is Vertical.)

1.9.7.4. alarm notification window

You can show or hide the alarm notification window when the alarm rings.

1.9.8. Language

Select the language.

1.9.9. Initialization

1.9.9.1. User Initialization

The stored setting is initialized in the user setting.

1.9.9.2. Setup Initialization

reset without deleting user data.

1.9.9.3. Factory Initialization

returning to the initial system from the releasing of factory.

(*All user data will be deleted)

1.9.10. Function

1.9.10.1. Speed Source

Switch the Sensor/NMEA.

- InsideSensor: Use the built-in speed meter for sensor.

- NMEA: Use the external input value for NMEA.

(The default setting is NEMA.)

1.9.10.2. TD Setup

Choosing the frequency of the TD.

1.9.10.3. Buzzer

It is can be buzzer on/off.

( The default setting is on.)

1.9.10.4. Remote Control Settings

1.9.10.4.1. Remote control

You can set whether to use the remote control.

1.9.10.4.2. Remote control register

The remote control allows you to register your product.

1.9.10.4.3. Remote control unregister

This is used to unregister the remote control.

1.9.10.5. Online Update

When internet service including Wi-Fi, updating the latest S/W and map.

1.9.10.6. Language & Input

1.10. Others

1.10.1. Key Setup

You can change [FUNC] key to the desired feature.

1.10.2. WPT

While navigating, shown/hidden "WPT information".

( The default setting is shown.)

1.10.3. Save User Setting

Storing the user initialization for the default. The current is storing.

1.10.4. Pulse

Select the pulse of the output from the transducer. Levels are among Low, Medium and High, which depends upon the depth. Low is proper to research precise a fish school but it is not suitable to measure a deep depth. High is opposite from Low.

( The default setting is Medium.)

1.10.5. Touch Mode

Disactivating the touch screen to avoid any careless operation.

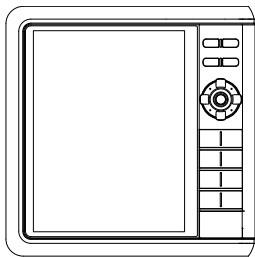
( The default setting is on)

Specification

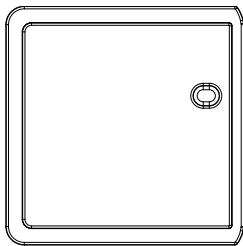
1. Display Screen:	12.1inch Color LCD with LED backlight
2. Resolution:	SVGA (800 X 600 pixels)
3. Power Supply:	DC 12V~36V(+/-10%) 18W
4. Operating Temperature:	-15°C~+50°C
5. Display Mode	*DownImage, Normal, Partial-zoom, Bottom-Lock, Bottom-zoom, Shift
6. Output Power	SS522 : 340/200/50kHz(600W) SS422 : 200/50kHz(1.5kW)
7. Range	Auto/Manual : 2.5m ~ 1,200m
8. Image speed	Fixed 8 speeds (4/1, 2/1, 1/1, 1/2, 1/4, 1/8, 1/16, 1/32) and stop
9. Gain	Contrast 40 levels Manual Gain 50 levels Auto Gain 100 levels
10. Rejection	STC 20 levels Interference rejection 3 levels Noise rejection 3 levels
11. Color	*Down Image 4 kinds Fishfinder 6 kinds
12. Others	Time Machine(GPS data in), NMEA0183, Mark(100,000 points), Fish Symbols, Pulse(4 levels), HDMI

[* Items is a fuction that can only be used when using SS522 transducer.]

Standard Equipment Configuration List



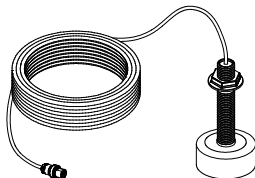
Display unit



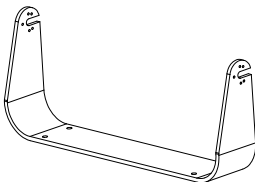
Protector



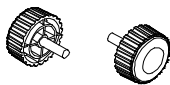
Manual



Transducer



Mounting Bracket

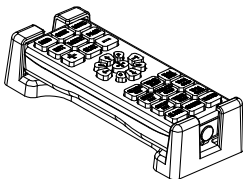


Knobs

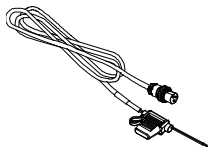
SS522/SS422(Choose one)



Fuse & Bolt

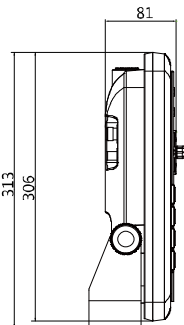
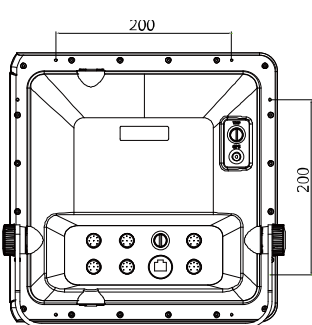
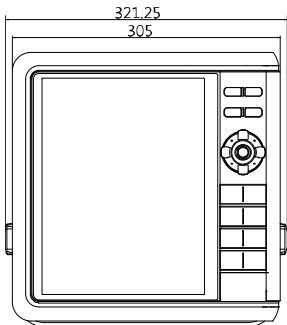


Remote control(option)



Power cable

Dimension



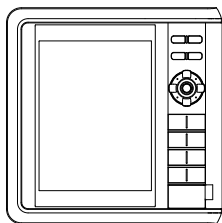
VG-10F

Specification

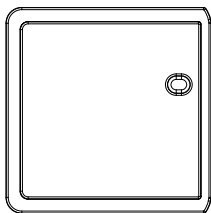
1. Display Screen:	10.4inch Color LCD with LED backlight
2. Resolution:	SVGA (800 X 600 pixels)
3. Power Supply:	DC 12V~36V(+/-10%) 17W
4. Operating Temperature:	-15°C~+50°C
5. Display Mode	*DownImage, Normal, Partial-zoom, Bottom-Lock, Bottom-zoom, Shift
6. Output Power	SS522 : 340/200/50kHz(600W) SS422 : 200/50kHz(1.5kW)
7. Range	Auto/Manual : 2.5m ~ 1,200m
8. Image speed	Fixed 8 speeds (4/1, 2/1, 1/1, 1/2, 1/4, 1/8, 1/16, 1/32) and stop
9. Gain	Contrast 40 levels Manual Gain 50 levels Auto Gain 100 levels
10. Rejection	STC 20 levels Interference rejection 3 levels Noise rejection 3 levels
11. Color	*Down Image 4 kinds Fishfinder 6 kinds
12. Others	Time Machine(GPS data in), NMEA0183, Mark(100,000 points), Fish Symbols, Pulse(4 levels), HDMI

[* Items is a fuction that can only be used when using SS522 transducer.]

Standard Equipment Configuration List



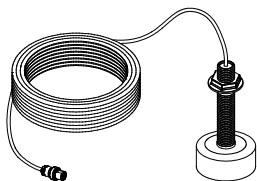
Display unit



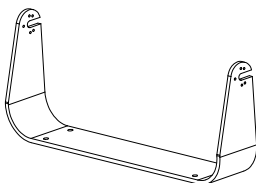
Protector



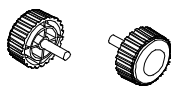
Manual



Transducer



Mounting Bracket

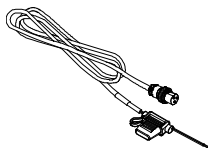


Knobs

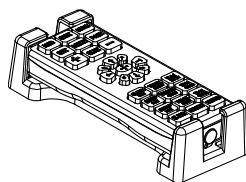
SS522/SS422(Choose one)



Fuse & Bolt

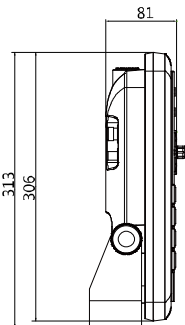
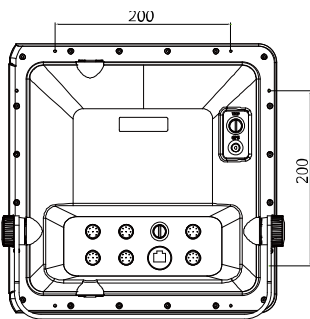
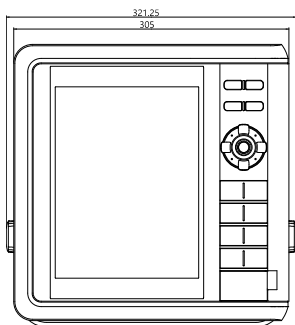


Power cable



Remote control
(Option)

Dimension



Customizing items

POG	LAT/LOT of the present position. (Red: out of GPS service/Black: GPS on service/Blue: SBAS or DGPS on service)
SOG	(Speed Of Ground) Boat speed.
COG	(Course Of Ground) Boat direction.
DATE	Date of today.
TIME	Present time.
HDOP	Horizontal Dilution Of Precision.
PDOP	Position Dilution Of Precision.
W.POG	WPT Position Of Ground
W.NAME	(WPT Name) the present WPT of the destination
#DEPTH	Present depth.
#TEMP	(Temperature) Present water temperature.
TOT TIME	(Total Time) Total using time
VOLTAGE	Present voltage. (unstable voltage shows in red)
TTG	(Time To Goal) Remaining time to the destination.
ETA	Estimated time of arrival.
XTE	Cross track error.
W.RNG	Distance from the present position to the WPT.
W.BRG	Bearing between the present position and the WPT.
W.INFO	The total number of WPT and shows the WPT symbol/color.
TRACK	The total number of track and shows the track color.
DATE&TIME	The current date and time.
C.POG	LAT/LOT of the cursor.
C.BRG	Bearing between the present position and the cursor.
C.RNG	Distance between the present position and the cursor.

|| Display Unit Installation

Vega series brings expandable display technology to your bridge or navigation station. A careful installation will assure maximum benefit from Vega series integrated features.

Display Unit Location

Select a location for your Vega series display unit that provides easy viewing from all likely operator's positions. The display unit is designed to be mounted on either a console or from an overhead surface. The Vega series display is also designed for flush mounting using six threaded holes on the rear panel. Locate the display in an area with protection from the elements and avoid direct sunlight on the viewing window. Also, consider access to the rear panel of the unit for connecting power and cables to the various remote sensors. The mounting surface must be flat and solid to support the unit and prevent vibration. There should be access to the inside of the surface to permit through bolt fastening for the mounting bracket.

Display Unit Installation

Temporarily install the mounting bracket on the Genesis display unit and place the unit at the selected location.



The Vega series display unit is unstable when the mounting bracket is not secured. Hold the unit in place at all times.

Check the suitability of the location and make any adjustments. When all is satisfactory, use the holes in the mounting bracket as a guide and mark the holes locations on the mounting surface.

Drill a 1/4 in. diameter hole at each marked location. Mount the Vega series display bracket using bolts through the mounting surface. Place large flat washers on the opposite side of the mounting surface from the bracket and then install lock washers and nuts. Tighten securely.

Install the display unit into the mounting bracket. Check alignment and operation of the pivots and security of the mounting. Make any adjustments necessary to prevent binding and assure even meshing of the pivot locking washers. It is advised to remove the display unit and store it in a safe

place to prevent damage during the rest of the installation process.

- Power Connection

Power is supplied to the Vega series Charting System through a connector on the rear panel of the display unit.

Route the power cable from the Vega series location to the ship's power distribution panel.

Connect the black wire to a battery negative (-) terminal of the power panel.

Connect the white wire to a fused battery positive (+) terminal of the power panel (12 to 24 Vdc nominal). If a fused terminal is not available, install an in-line fuse holder.

- Care and Cleaning

Vega series is made to withstand marine elements but a little care ensures a trouble free life.

Accumulations of salt and sand, if not removed, will eventually mar the finish. No solvents or harsh cleaners should be used. The display unit may be wiped down with a damp cloth while avoiding the display window. Be careful not to scratch the display window surface. Gently remove any sand or other grit particles before cleaning the display window. The display window should be cleaned only with water and a clean soft cloth using very light pressure.

Reference

- NMEA

A standard developed by the National Marine Electronics Association and used by most marine equipment manufacturers for data communication is known as NMEA 0183 version 1.5 and version 2.0. NMEA0183 specifications offer many recognized sentences for exchanging data between many types of marine equipment.

The following technical information is provided for reference and is accurate to the best of our knowledge at the time of printing. Please refer to the appropriate NMEA specifications for details and the latest information.

The data sentences used by the HGP-660 are as follows.

Output sentences:

Descriptions	Contents of data field
\$GPGGA	Global Positioning System Fix Data
\$GPGLL	Geographic Position, Latitude/Longitude
\$GPGSA	GPS DOP and active satellites
\$GPGSV	GPS Satellites in View
\$GPVTG	Course and Ground Speed
\$GPZDA	Time & Date
\$GPRMC	Recommended Minimum Specific GPS/TRANSIT DATA
\$GPAPB	Heading/track controller (Autopilot) sentence B
\$GPXTE	Cross-track error, measured
\$GPBOD	Bearing, origin to destination
\$GPRMB	Recommended minimum navigation information

II Transducer Installation

An input designation means, in put to Fishfinder unit and an output designation means, output from Vega series. Sensors will have similar designations, but from the sensors point of view. Therefore, a sensor output will connect to an Vega series input and a sensor input will connect to an Fishfinder unit output.

Transducer Installation

If you have chosen a Sonar option for your fishfinder a transducer must be installed on your vessel unless an exiting compatible transducer is installed. The installation of sonar transducers requires some planning and skill to achieve the best result. It is strongly advised hat you read the installation instructions completely before starting. The two basic types of transducers are transom mount and through-hull mount. There are variations within each type to provide for options such as temperature sensors, speed sensors and for different beam angels and sonar frequencies. Several different transducers may be used with the VEGA series. Refer to the optional Equipment list for the variations available.

CAUTION

Mounting a sonar transducer for your digital fishfinder requires drilling holes into the hull of your boat which could affect its water integrity. Therefore, installation should be attempted only by qualified individuals. If you have any doubt about your ability to complete the process successfully, we recommend you obtain the services of a HAIYANG dealer or marine service center with knowledge and experience in transducer installation .

Since your digital fishfinder performance depends upon how well the transducer is installed, please carefully observe the following mounting procedures.

For proper performance, the transducer's mounting location must be chosen carefully. The transducer must be mounted in a location that is free from turbulence and air bubbles created by movement of the boat through water. Air bubbles greatly reduce the efficiency of the transducer. It is also strongly

recommended, for transom mounted transducers, the transducer be mounted in an area with the least amount of disturbed water passing under the transom. To determine the best mounting location, operate the boat at several different speeds and observe the water as it passes under the transom. Turbulence caused by the trim tabs, motor mounting, the keel, and lifting strakes.

Transom Mounting

Transducers designed for transom mounting give good performance when installed on most boat types, however, the transom transducer style should not be used on boats with inboard engines. For boats with poor water flow under the transom or on in-boards, consider selecting a through-hull transducer. HAIYANG offers many styles of transducers.

Determine the transducer mounting place by referring to the steps mentioned above. For best result, the transducer face should be level. Also, the transducer face should be mounted from flush to 1/4 inch below the under surface of the hull. The trailing edge of the housing should be about 1/8 inch below the leading edge. The adjustable stainless steel bracket is designed to allow fine tuning of the transducer position once the installation is completed.

Route the transducer cable as far as possible away from the boat's power cables, engine controls and other electrical cables. Do not route transducer cables near your VHF radio power or antenna cables. Assemble the transducer using the brackets and hardware supplied. Actual fastening to the hull of your boat depends upon the hull construction and hull material. If additional items must be used, be sure to obtain marine stainless steel hardware. Also, be sure to use marine waterproof sealant on all through hull fastenings. Do not use silicone RTV, since it does not have long life underwater.

Transom Transducer Maintenance

If your boat is kept in the water, sea growth can quickly accumulate on the face of the transducer. In just two weeks in some locations, your Sonar performance could be affected. It is recommended that at least the face of the transducer be coated with special transducer antifouling paint. Alternatively, the entire transducer can be painted and is easier to keep clean. **Do not use regular antifouling paint.** All copper base antifouling paints are unsatisfactory and will prevent normal operation. If fouling does occur, use a stiff brush or putty knife to remove growth. Be careful not to gouge the face of the Transducer. Occasional wet sanding of the transducer face is permissible with #220 grit or finer wet or

dry paper.

Do not use solvents to clean your transducer. The high impact polycarbonate housing is very durable but solvents will destroy it. Keep acetone, MEK, lacquer thinner and most other thinner/solvents away from your transducer.

Through-hull Transducers

Through-hull transducers are recommended for in-boards and other vessels with disturbed water flow under the transom. HAIYANG offers several models of bronze through-hull transducers. To enjoy the full capability of your Sonar, select a dual frequency model with temperature sensor. Sturdy bronze construction assures a secure installation and provides a strong base for fairing blocks, if needed, to compensate for hull shape.

The transducer should be installed in a location free of bubbles and away from disturbed water flow. Smooth water flow around the transducer and along its surface is very important for consistent operation.

Areas in the center third of water line length at cruising speed are usually satisfactory.

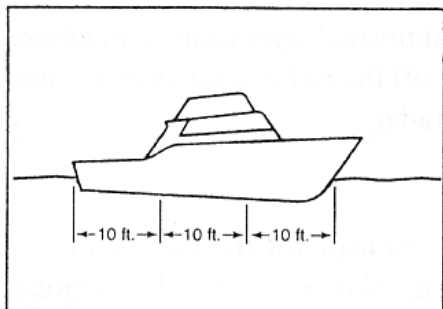
Locations forward of the engine and in a flat area near the center line of the boat are preferred. Do not install the transducer behind water intakes, other through-hull fittings or irregularities in the hull.

Dead-rise

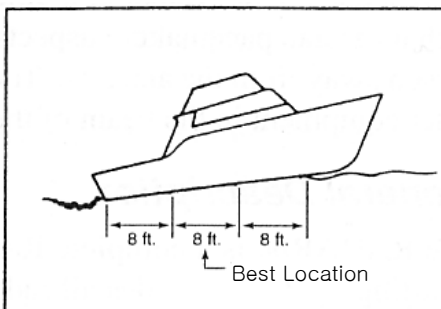
On hulls with dead-rise of 5 or less, the transducer may be mounted directly through the hull. Where dead-rise is greater than 5, fairing blocks must be used to orient the face of the transducer parallel with the water surface.

In this case, no fairing block is necessary. To prevent leakage, any gaps between the stem threads and holes drilled in the hull should be completely filled with waterproof marine sealant.

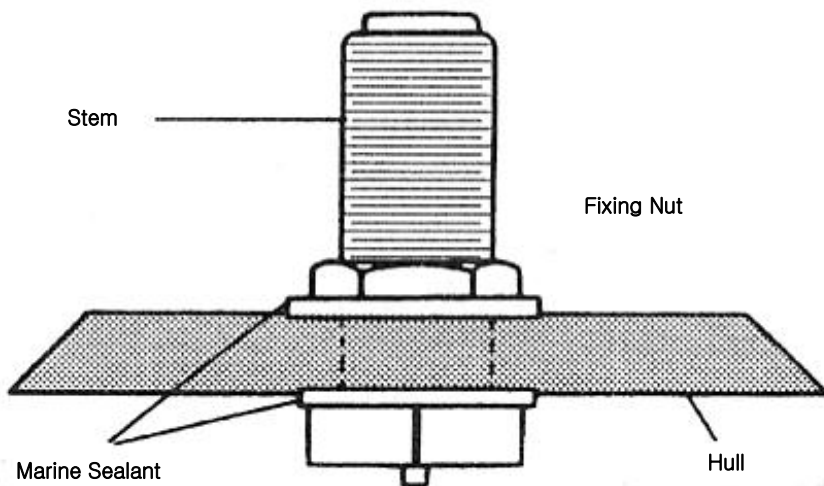
Tighten the stem nuts securely but do not over tighten. In this situation, install fairing blocks both inside and outside the hull. Install the transducer with the face aiming straight down. To prevent leakage, any gaps between the stem threads and holes drilled in the hull should be completely filled with waterproof marine sealant. Tighten the stem nuts securely but do not over tighten.



Water Line Drifting



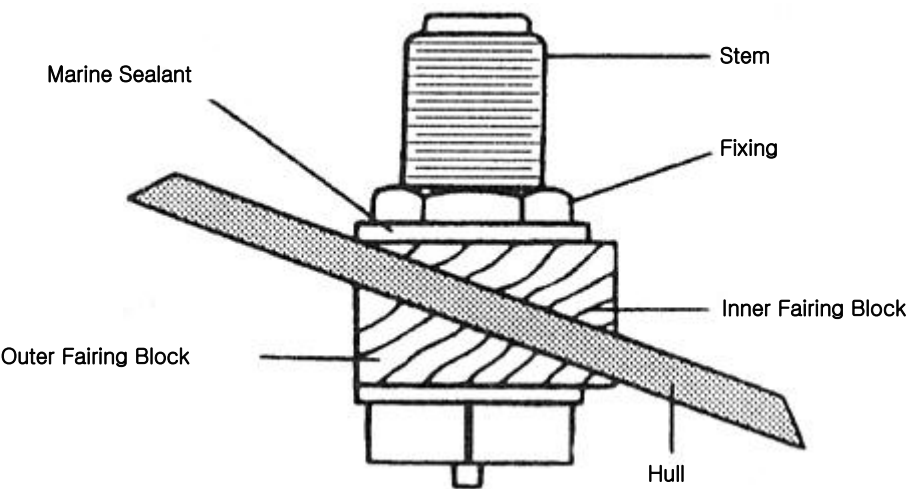
Water Line Cruising

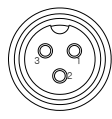
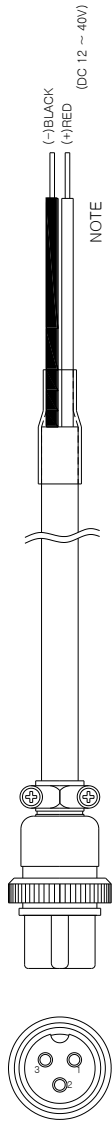
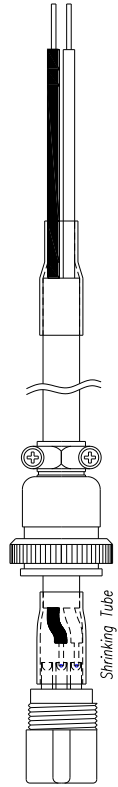
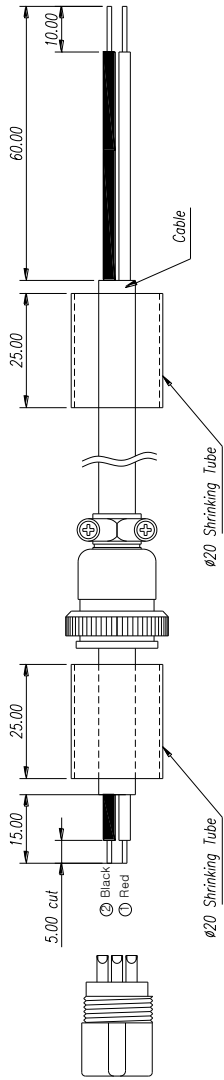


Through-hull Transducer Maintenance

If your boat is kept in the water, performance of your digital fishfinder will be adversely affected by accumulations of sea growth on the face of the transducer. To prevent sea growth effects, the face of the transducer may be coated with antifouling paint specially formulated for transducers. Do not use

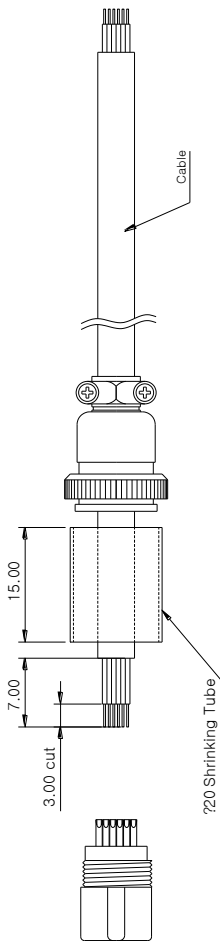
regular antifouling paint on the face of the transducer. The bronze housing may be coated with any antifouling paint. If fairing blocks are used, especially if made of wood, complete sealing prior to painting is important.



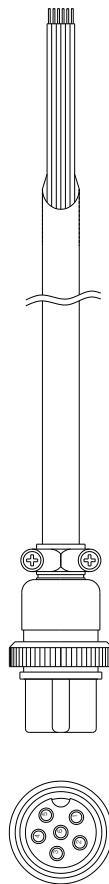
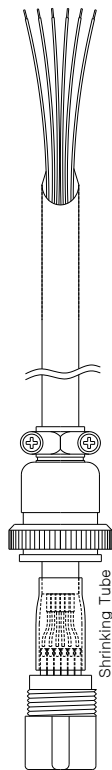


MATERIAL		DESCRIPTION	
SCALE	MODEL	Smart Series	
PERN	CHK. BY	DES. BY	DATE
Y.S.KIM	Y.S.KIM	Y.S.KIM	05.07.2012
DWG. NO.		S7-DC10303M	
		Power Cable	

HAIYANO OLIX CO.,LTD



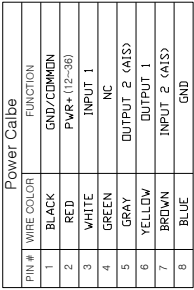
Data Cable	
Pin #	FUNCTION
1	GND
2	TX+
3	GND
4	RX+
5	RX-
6	NC



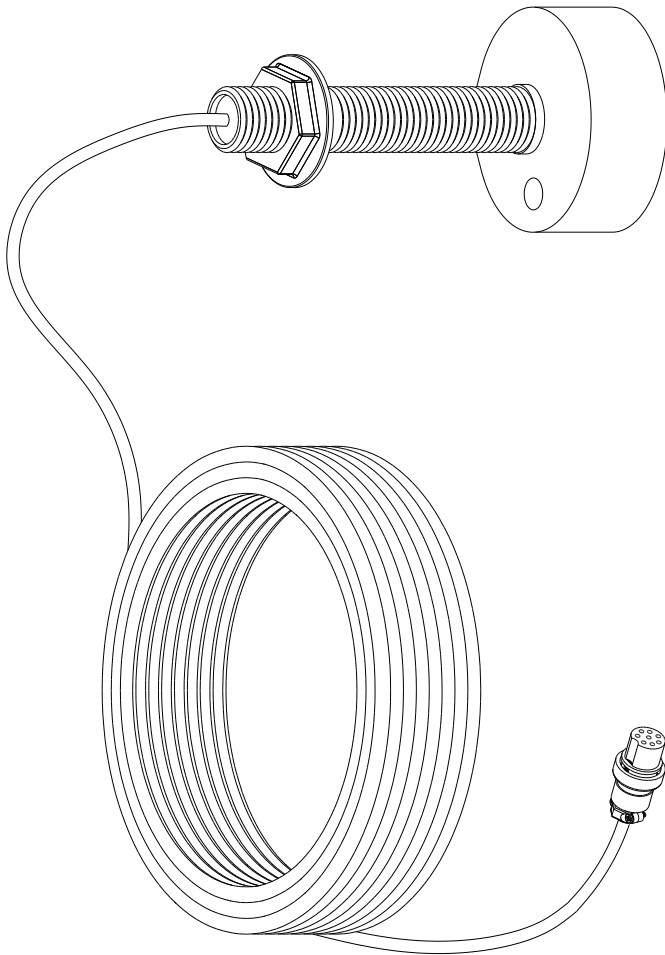
16-06P
To HD-70 series (J2/J3)

MATERIAL		DESCRIPTION	
SCALE	NONE	Smart Serelis	Data Cable
PERN	CHK BY DES BY DRA BY DATE	DWG. NO.	S7-DC10103M
Y.S.KIM	Y.S.KIM	Y.S.KIM	05.07.2012

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	MATERIAL	DESCRIPTION	
	MODEL		
SCALE 1/2	Smart Series		
PERN Kim Y.S.	CHK. BY Kim Y.S.	DES. BY Kim Y.S.	DATE 2012.05.07
		DWG. NO. S7-DC10301P	
			



○ SPD_PULSE*
 ○ SPD_VCC*
 ○ I2C_GND
 ○ I2C_VCC
 ○ I2C_GND
 ○ TEMP_VCC
 ○ TEMP_GND
 ○ SPD_GND*
 * mark option

MATERIAL		Smart Series		DESCRIPTION	
SCALE	MODEL	DES. BY	DATE	DWG. NO.	Transducer
PERIN Kim Y.S.	CHK. BY Kim Y.S.	DES. BY Kim Y.S.	DRA. BY Seuk.J.E.	2014.02.05	TDSS502M

HAIRYANG OILIX CO.,LTD



HAIRY ARMO

Declaration of Warranty

Declares of under his sole responsibility that the produced Plotter with Fish Finder manufactured by

HAIYANG OLIX Co., LTD.

103-903 BucheonTechnopark, 22 Samjak-ro

Bucheon-si, Gyeonggi-do, Korea

TEL +82 32 327 4712 FAX +82 32 327 4713

Web-site: <http://www.haiyang.co.kr>

Guarantee for One Year

Haiyang Electronic Equipment Co., LTD warrants the produced equipment, Equipment for One (1) year for guarantee as bellows.

1. Main Unit: One (1) year guarantee after a user purchases the product within one (1) year
2. Accessories: One (1) year for consumed accessories (including TD) after a user purchases them.

Service in Charge

1. Over the term from the guarantee
2. Damage from user's carelessness (inundation, impact)
3. Intentional dismantle, modification or remodeling of the unit.
4. Unauthorized parts, components or accessories are used in the unit.
5. Installed or maintained by unauthorized person
6. Consumed parts and components (batteries, LCD, etc) run out.
7. Faults or damages from other reasons.

Model		Serial No.	
Date of Purchase		Customer Name	
Name of Dealer		Price	

※ Caution – Keep this warranty card with the receipt for fast and good service