

10 INCH TFT NAVIGATION SOUNDER

DS2008 Operation & Installation Manual



NINGLU

Document: NLT-DS2008-SSEN
Edition: V161122

SAFETY INSTRUCTIONS

WARNING



ELECTRICAL SHOCK HAZARD
Do not open the equipment

Only qualified personnel should work inside the equipment.

Immediately turn off the power at the switchboard if water leaks into the equipment.

Continued use of the equipment can cause fire or electrical shock. Contact Ninglu for service.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock. Contact Ninglu for service.

Make sure no rain or water splash leaks into the equipment.

Fire or electrical shock can result if water leaks in the equipment.

▲ CAUTION

Do not power the equipment when the transducer is in air.

The transducer may become damaged.

▲ CAUTION

Please install the transducer correctly. Do not bend, twist, stress or heavily press the transducer cable.

▲ CAUTION

Airproof the connection box if linking two cables together. Earthing from the connection box is forbidden.

▲ CAUTION

The power supply is D.C. 18.0V~31.2V or A.C.110/220V 50/60Hz, please connect standard adapter from our company.

▲ CAUTION

If the clock of the equipment doesn't keep good time, please replace the battery inside. The type of the battery is CR2032 3V.

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FOREWORD

Please read and follow the safety information and operating and maintenance instructions set forth in this manual carefully before attempting to operate the equipment and conduct any maintenance. Your navigation echo sounder will perform to the utmost of its ability only if it is operated and maintained in accordance with the correct procedures.

The NINGLU DS2008 LCD navigation echo sounder is used for domestic and international navigation and inland waterway navigation.

The equipment is designed, produced and documented by NINGLU Technology Co., Ltd., complying with standards for CCS certificate. Also NINGLU has acquired the ISO9001 certificate.

The equipment has dual operation interface: Chinese & English.

The equipment is set in accordance with Beijing Time.

The main features of the DS2008 are as follow:

1. High-contrast 10-inch color TFT LCD display featuring a wide viewing angle and adjustable brightness (640x480 pixels).
2. Modular design supplies strong performance for DS2008.
3. High sensitive gain control is helpful to detect the echo distinctly.
4. NMEA0183 outputs connect well to the equipments, such as repeater and VDR, etc.
5. NMEA0183 outputs not only connect well to the printer DPU-414 from the NINGLU, but can be delivered to PC RS232 to print with SW from the NINGLU.

6. Support GPS data from outside which includes direction, course, speed and time.
7. Dual D.C. power supply or A.C. power supply with adapter.
8. Protection: over voltage, over current, counter-polarity.
9. Excellent design: modern LCD display and electrostatic spraying shell and power filter inputs.
10. User-friendly operation interface, such as soft keys.

SYSTEM DESCRIPTION

The whole navigation echo sounder system consists of DS2008 unit and transducer and power and external equipments.

Main Unit DS2008:

Display screen: 10-inch color LCD sounder unit (640x480 pixels)

Operation panel: for control power and brightness and other operation functions.

Back board: for connecting inputs & outputs and transducer and A.C. or D.C. and for grounding.

Installation frame: for installing the DS2008 unit

Transducer: high sensitive transducer (200kHz, 600W)

Tank: for installing and protecting transducer

Power: Dual D.C. 18.0V~31.2V;

A.C. 110/200V(50/60Hz) with adapter from the NINGLU

Peripheral Equipment:

GPS: input position sign into the equipment

IR261 from the NINGLU: offer depth data (see p40)

VDR (vessel data recorder): record data from the DS2008

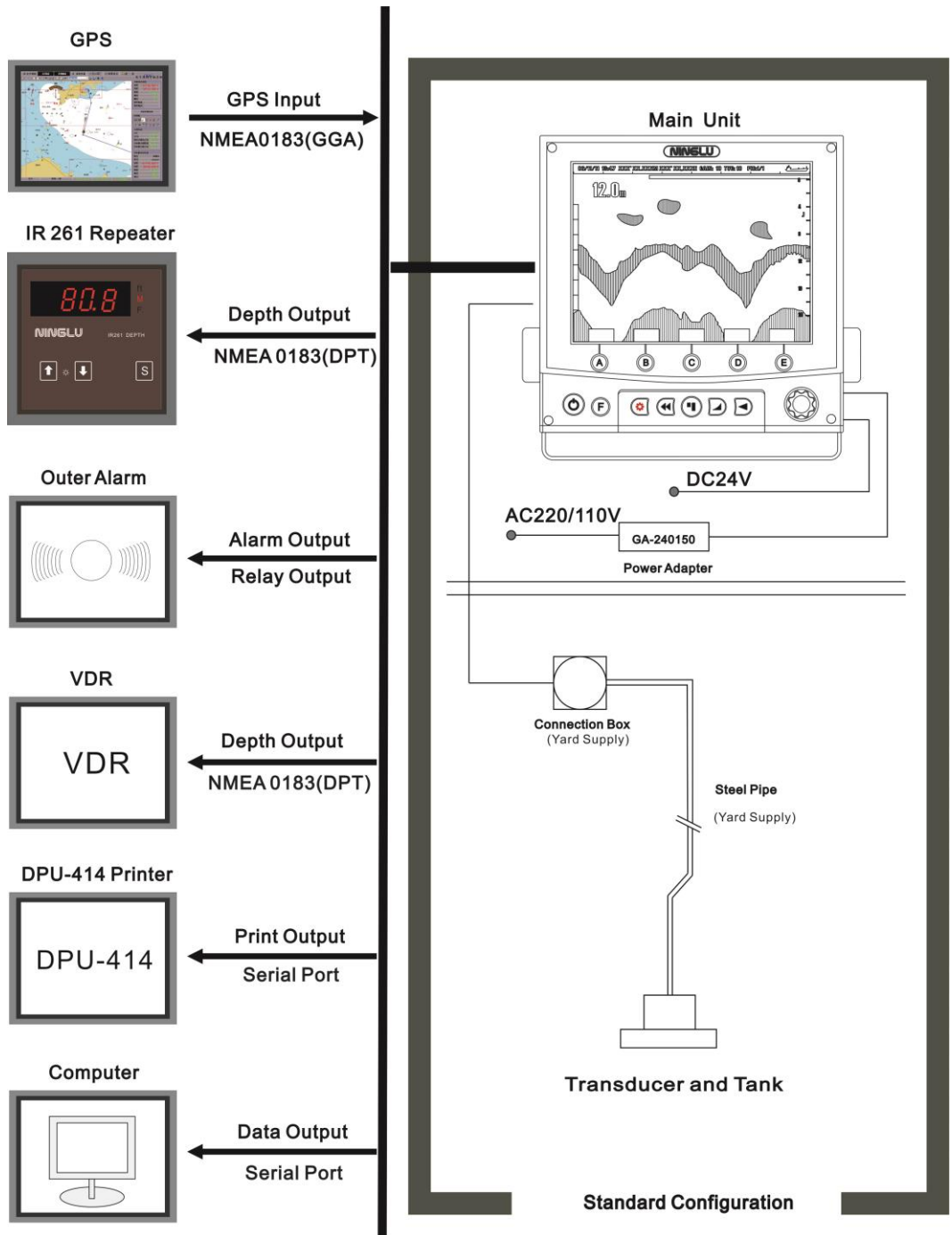
External acousto-optic alarm: output from the DS2008 and offer relay switch signal for external alarm equipment

DPU-414 print: offer direct print

PC & print: the outputs from the DS2008 are delivered to PC RS232 to print with SW from the NINGLU.

The bill of packing:

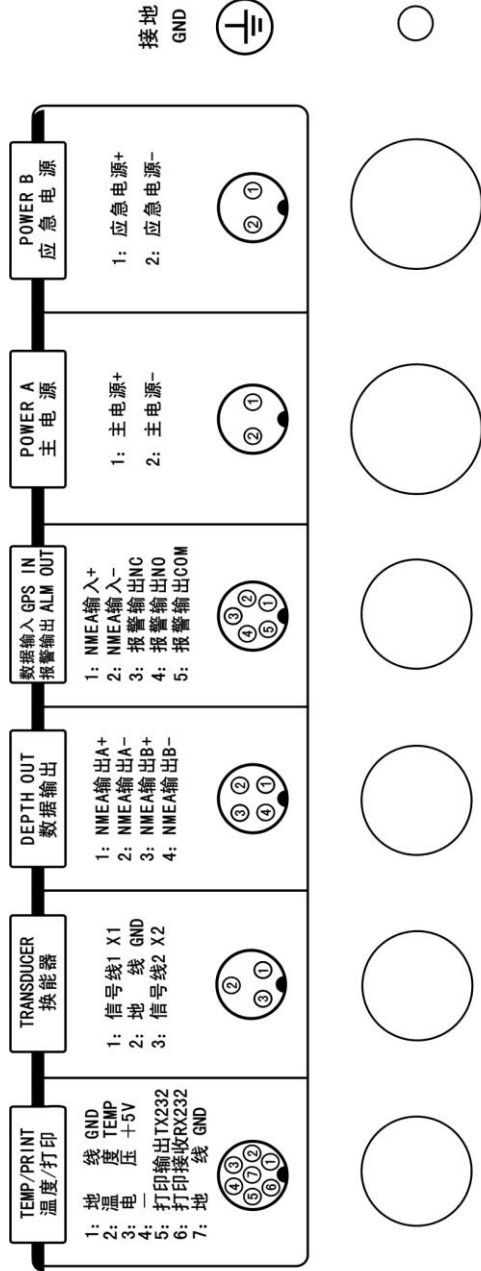
1. One piece of DS2008, including frame and adumbral cover and installation screw
2. One piece of transducer tank. The length of the transducer cable is 15m and you could buy longer cable from the NINGLU if you need.
3. Power: one piece of A.C. adapter and one piece of D.C. cable and pin
4. One piece of pin for transducer inputs & outputs (3p)
5. One piece of pin for NMEA outputs (4p)
6. One piece of pin for NMEA inputs and alarm outputs (5p)
7. One piece of wire (7p+DB9) which connects print
8. One set of Operation manual and certified statement and CCS certificate



System Diagram

ECHO SOUNDER 回声探测仪

MODEL (型号) : ● DS2008 ● FS1008
 FREQUENCY (频率) : ● 200kHz ● 50kHz
 SERIAL (机号) :
 COMPASS SAFE DISTANCE (罗经安全距离)
 STANDARD (标准罗经) : 0.88m
 STEERING (舵罗经) : 0.54m
 POWER SUPPLY (电源) : DC24V
 ADAPTER(适配器) : AC 220/110V 50/60Hz
 NINGLU TECHNOLOGY CO., LTD. CHINA



Backboard Diagram

THEORY DESCRIPTION

System Overview

NINGLU DS2008 is a navigation sounder with a large, high resolution graphic LCD. The echo sounder graphics is continuously shown on the LCD along with complete navigational details. It is possible to connect an external, standard PC with printer, and the sounder contain a 20 hour history memory. Depth, time and all available navigation data are stored continuously so that the last 20 hours of information is always available.

The DS2008 is suitable for marine sailing which conforms to the latest marine international standards.

Wave Propagation

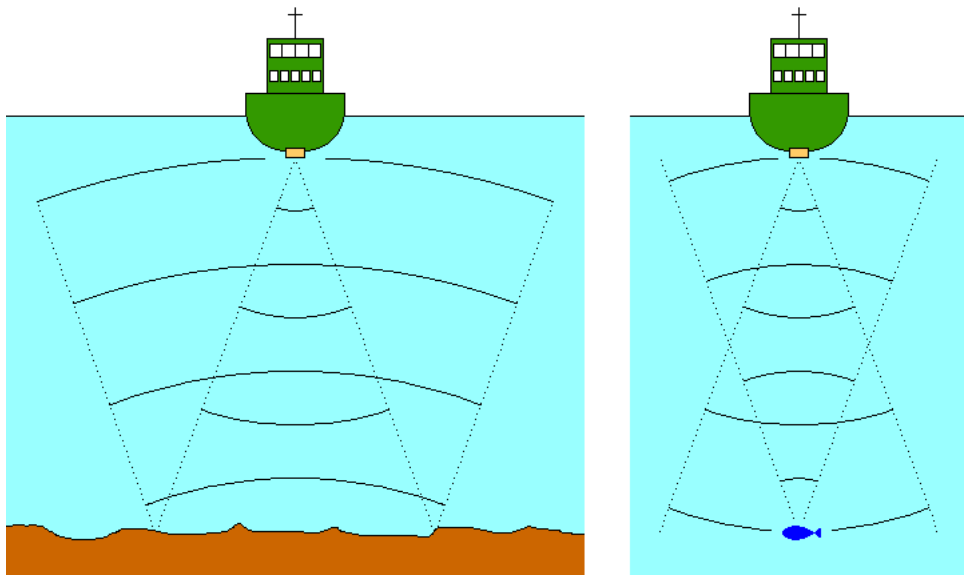


Figure 1: Wave Propagation

The velocity of sound wave propagation in the sea varies slightly with temperature, salinity and pressure. The velocity varies between 1450 and

1520 m/s in shallow sea water, while a velocity around 1480 m/s can be expected at 1000 m depth. In shallow fresh water the velocity varies between 1430 and 1510 m/s.

The DS2008 transmits high energy sound wave pulses into the sea. A flat bottom reflects the transmitted wave as if it were a mirror. The propagating energy is spread over a larger and larger area as it travels down to the bottom and up again. The energy is spread over a four times larger area every time the travel distance doubles. A large school of fish reflects sound waves similarly. The situation is slightly different when observing the echoes from individual fish.

At the bottom there are many small targets. All targets within the beam angle will be reflected. The area which is covered by the beam will increase with the wave spreading. Bottom of the same type (same backscatter) will be displayed with the same colour independent of the depth.

Propagation losses due to absorption are much higher in sea water than in fresh water. Absorption also increases with frequency. At 50 kHz the absorption is 0.8 dB/km in fresh water and 16 dB/km in sea water.

Bottom Echo

A hard flat bottom reflects the transmitted signal as if it were a mirror. The transmitted pulse hits the illuminated bottom area at nearly the same instant, and the echo from different parts of this area arrives back at the surface.

The received echo signal is basically an attenuated copy of the short transmit pulse. The echo signal from a sloped bottom is characterized by having a longer duration and a slower rise and fall time. The transmitted pulse first hits the slope at point **A**, and as time elapses the reflection point

travels along the slope towards point **B**. Many locations do not have a solid hard bottom. Frequently, the bottom is composed of layers of mud, clay and sand which can absorb much of energy sound wave pulses.

The bottom detection algorithm is implemented solely in software. The algorithm is designed with emphasis on reliability in the sense that erroneous depth detections are never output. The DS2008 algorithm is designed to handle a number of difficult situations.

The bottom detection algorithm locks to the first good bottom return. The depth at point A rather than the depth along the transducer axis will be output for a sloped bottom. The detected depth value is always smaller than the depth along the transducer axis implying that a safety margin is automatically included.

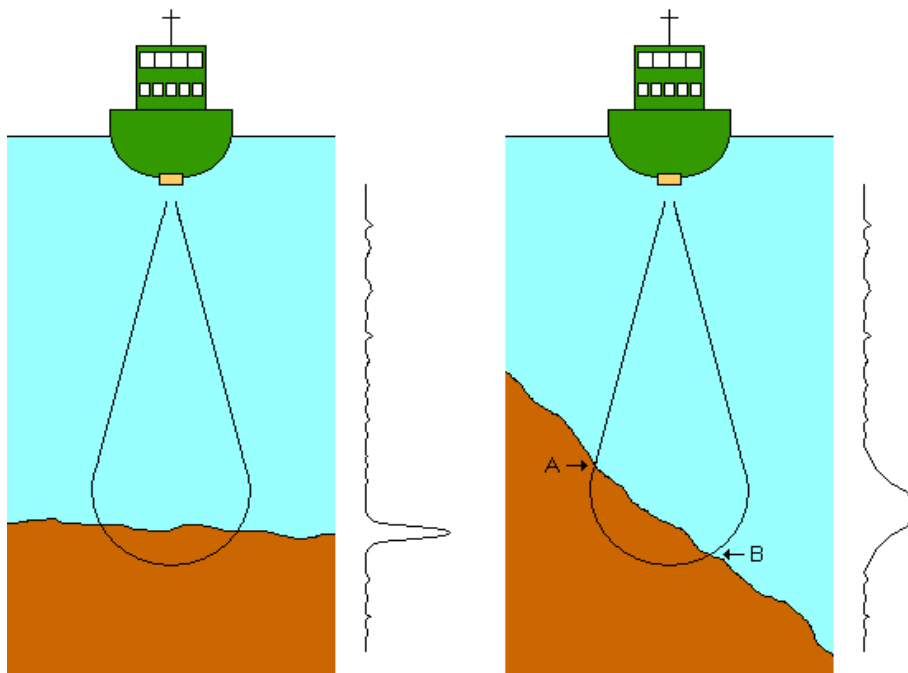


Figure 2: Bottom Echo

Principle of Operation

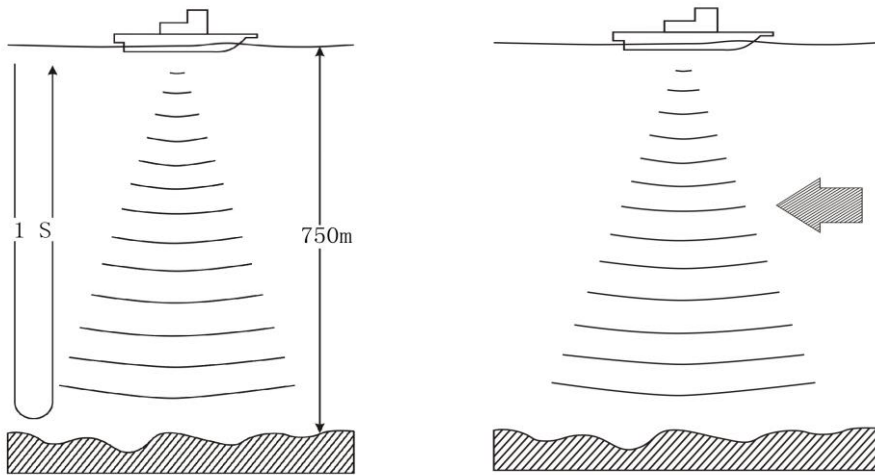


Figure 3: Principle of Operation

The DS2008 sends ultrasonic pulses which can be transmitted and received by the transducer from the surface and records the time until the echo returns from the bottom. By making full use of the properties of ultrasonic waves which travel at about 1500 m/sec and plus the depth of sea gauge, the correct marine depth can be measured.

Data from the surface to the bottom is sectionally detected from the narrow side as is shown in the above figure 3. Being based on the principle that water is an excellent medium for the transmission of sound waves and will bounce off a reflecting layer traveling at about 1500 m/sec, the reflection is detected by the transducer, amplified and transformed into a picture of a slice of the ocean which can be displayed on a LCD screen.

Transducer plays a role of receiving sensor and transmitting sensor and its receiving time is related to the depth range. The shallower the range is, the less the returned time is. By making use of transmitting and receiving time to picks up the reflected echoes the display of fish school or other floating objects and the sea bottom can be seen on the screen.

SPECIFICATIONS

Performance

Dimension: 264(H)x270(W)x93mm(D)

Weight: 3.7kg

Voltage: DC18.0V~31.2V or AC 110/200V 50/60Hz with adapter from the NINGLU.

Power consumption: 30W

Output power: 500W RMS

Transmit frequency: 200 kHz

Ping rate: max 10 pings per second

Protection: over voltage, over current, counter-polarity.

Graphical display: 10-inch color TFT LCD, 640X480 pixels

Echo colors: 7 colors

Time scale: 30s

Resolution: shallow water range \geq 5.00mm per meter and deep water range \geq 0.5mm per meter in the scale of the screen

Accuracy: \pm 1.0% of the range

Minimum detectable depth: 0.3m

Range scope: smaller range scope0~500m and larger range scope0~800m

16 adjustable ranges: 5m,10m, 20m, 30m, 40m, 50m, 60m, 80m, 100m, 150m, 200m, 300m, 400m, 500m, 600m, 800m.

Picture advance speed:

Speed	1	2	3	4	5	6	7
PIC	4/1	2/1	1/1	1/2	1/4	1/8	STOP

User Setting: Gain, Range, Alarm, Draft, Brightness, Color, Auto, data store and replay, data replay ratio, print switch and print interval.

Alarm: Shallow water, Power drop, sound & light of exterior facilities

Alarm Mode: buzzing, letters glittering on screen

Data storing and replaying: continuous latest data storing with a capacity of 20 hours and supporting quickly replaying.

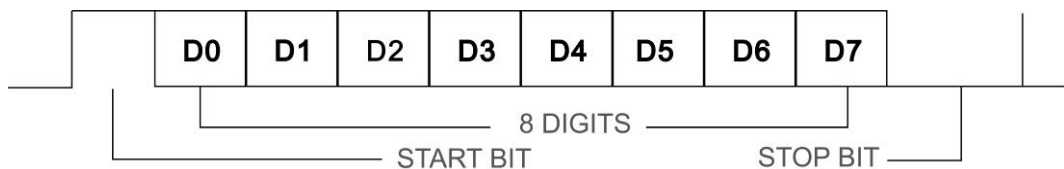
Data input/output Interface

Standard GPS format information is permitted to input and standard NMEA0183 format echo data outputs as DPT into repeater or VDR.

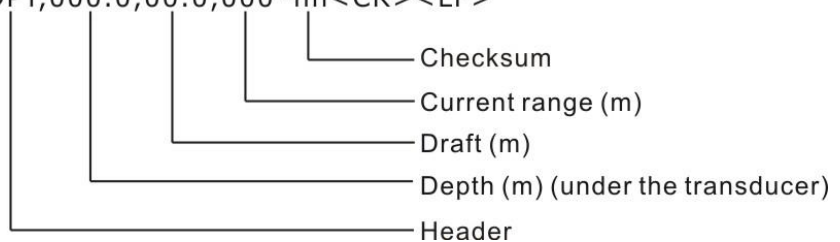
About NMEA0183 outputs

The echo data outputs adopt NMEA0183 format complying with IEC61162-1(Second edition 2007-1)

Data transmission: serial asynchronous mode, Baud rate 4800, 8 digits, no parity bit, 1 stop bit.



Data format: \$--DPT,000.0,00.0,000*hh<CR><LF>



Connecting PC RS232

Output /Connecting RS232 DB9 holder/Pin 2/Pin 5

Work Conditions

Temperature: -10~40°C, complying with IEC60945 standards

Relative Humidity: 10~90%

Main unit waterproofing: IP23, complying with IEC60529 standards

Transducer waterproofing: IP66

OPERATION

Notes

Please check the following items when you turn on this apparatus:

1. Condition Checking

Keep away from magnetic field, direct sunlight, strong shaking, high temperature and rain. The magnetic gyro should keep away from the unit.

The minimal safe distance of the gyro from other equipments as follow:

2. Check unit installation (See the chapter of unit installation)

Gyro type	Standard gyro	Steering gyro
Safe distance	0.88m	0.54m

Check transducer installation (See the chapter of transducer installation) .

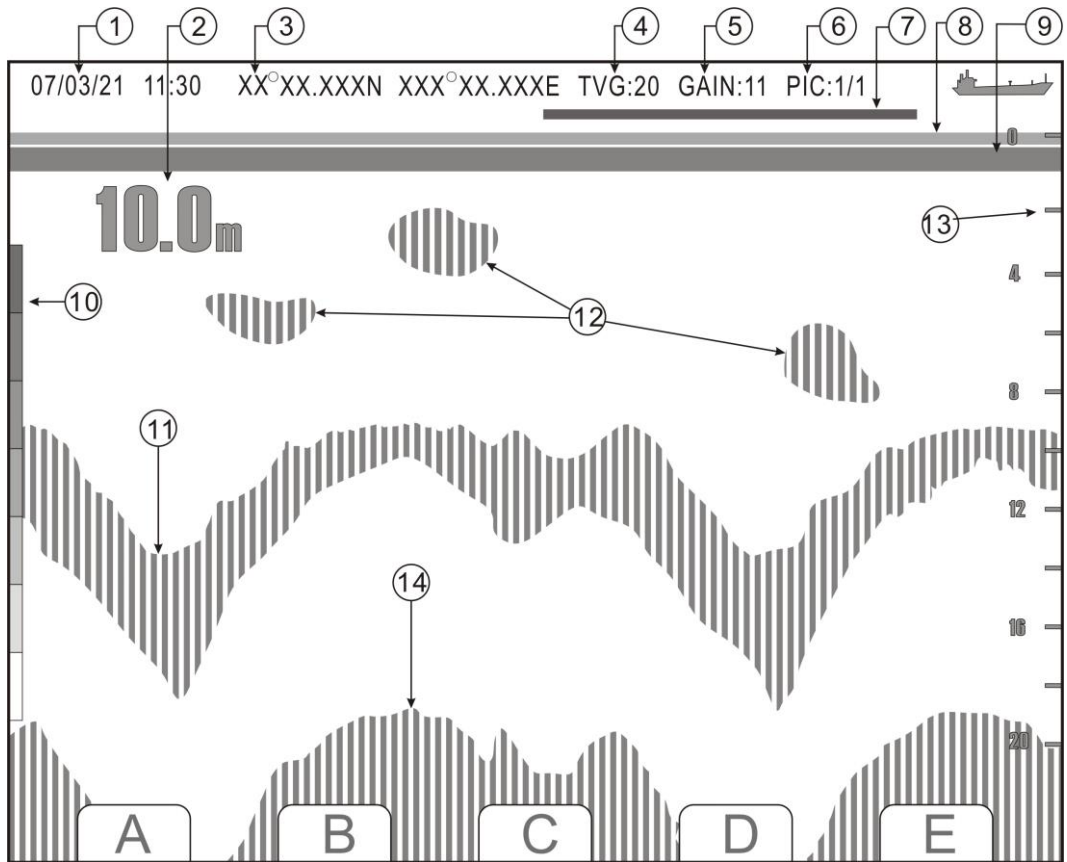
3. Check power supply

The unit adopts dual DC power supply (DC18.0V~31.2V), and you can also choose AC power supply (AC 110/200V 50/60Hz) with adapter from the NINGLU.

4. Check connection

This includes power connection, transducer connection, grounding and exterior facilities connection.

Screen Description

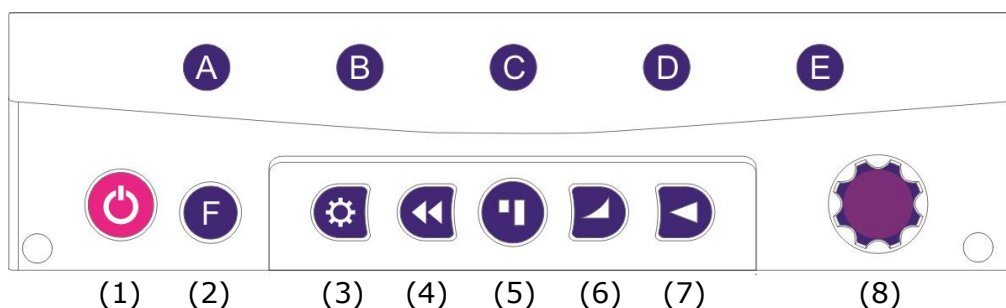


- | | | | |
|-----------------------------------|--------------------|-----------------------|-----------|
| (1) Date | (2) Depth* + Draft | (3) GPS data | (4) GAIN |
| (5) TVG | (6) Picture Speed | (7) Time Scale | (8) Draft |
| (9) Ultrasonic Pulse | (10) Echo Colors | (11) First Echo Data | |
| (12) Fish school or other objects | (13) Basic Range | (14) Second Echo Data | |

Note:

1. Depth* means the distance between transducer and marine bottom. The draft can be set according to the actual draft depth.
2. There are 4 screen functions and A, B, C, D, E represents the menu in every screen respectively.

Operation Panel



- (1) Power Switch (2) Menu (3) Brightness (4) Picture Speed
 (5) Basic Range (6) TVG (7) GAIN (8) Knob

Note:

1. The menu on screen is operated by the function keys marked with A, B, C, D, E. Three screen menus are as follows:

A	B	C	D	E
Screen 1				
Echo Colors	Draft	Buzzer	Alarm Depth	Auto Range
Screen 2				
Data Store	Data Replay	Beginning Hours	Beginning Minutes	Compression Ratio
Screen 3				
Year	Month	Day	Hours	Minutes
Screen 4				
Display Model	Range Max	Print Switch	Print Interval	Language

2. Precision adjustment can be controlled by the knob.

Function Description



Power Switch

After the power is on, when any of the two power supplies is off, the buzzer is on. Press any key will silence the buzzer.



Brightness

The brightness key is used to adjust the LCD brightness (LCD backlight).

【Operation】 Press the brightness key repeatedly, then the screen backlight will alter with the key pressed.



Picture Speed

The picture speed key is used to adjust the picture advance speed. The text PIC: X/Y is displayed on screen indicates that the picture speed has been moving X times to the left when the Y times sounder has been going on.

【Scope setting】 PIC:4/1, PIC: 2/1, PIC: 1/1, PIC: 1/2, PIC: 1/4, PIC: 1/8, STOP (from quickly to slowly). **Default:** PIC: 1/1

【Operation】 Press the picture speed key repeatedly to set the value.



Basic Range

The manual setting of basic range is enabled when the auto range function is disabled.

The available basic range are 5m, 10m, 20m, 30m, 40m, 50m, 60m, 80m, 100m, 150m, 200m, 300m, 400m, 500m, 600m, 800m.

【Scope setting】 0~800m. **Default:** 0~20m

【Operation】 Press the key repeatedly and the value available are 20m, 60m, 100m, 300m, 500m. Then the knob can be used to get a precise value.

TVG

The TVG (Time Varied Gain) key can be used to set the gain on shallow area. Lower TVG will decrease the shallow echo noise.

The text TVG: X is displayed on screen.

The value of X is between 1 and 20 in 1 steps. The sensitivity is at the low point with the value 1 and is at the peak point with the value 20.

【Scope setting】 TVG: 0 ~ TVG: 20. **Default:** TVG: 10

【Operation】 Press the TVG key, and then adjust the knob from max value to min one to get clear echoes.

GAIN

The gain key can be used to set the gain values.

The text GAIN: X is displayed on screen.

The value of X is between 1 and 20 in 1 steps. The sensitivity is at the low point with the value 1 and is at the peak point with the value 20.

【Scope setting】 GAIN: 0 ~ GAIN: 20. **Default:** GAIN: 10

【Operation】 Press the GAIN key, and then adjust the knob from min value to max one to get clear echoes.

Knob

The knob can be used to get a precise value.

Menu

The menu key switches four screen menus in sequence, then the menu on screen is operated by the function keys marked with A, B, C, D, E..

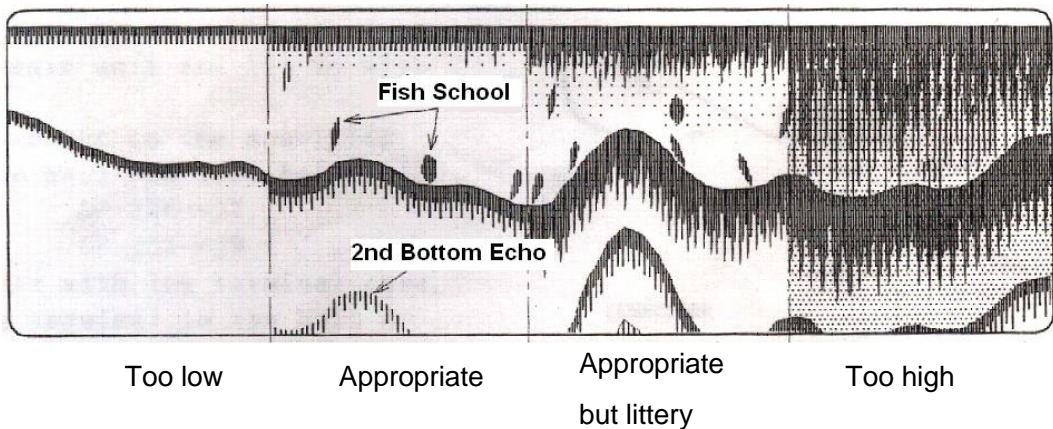
【Operation】 Press the menu key repeatedly.

How to get the steady data

The key of getting the steady data lies in the correct adjustment of GAIN and TVG.

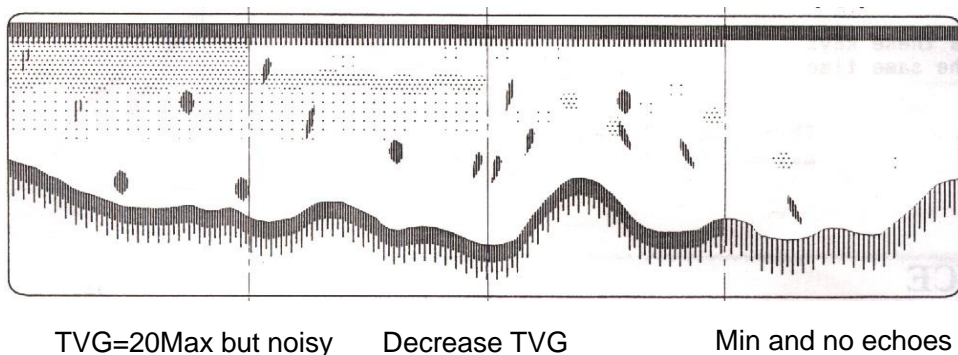
【GAIN】 : Be used to adjust the sensitivity of echoes.

Press the key of GAIN **from min value to max one** and you can get the appropriate sensitivity at one time point which comes before the time point of showing littery wave on screen.

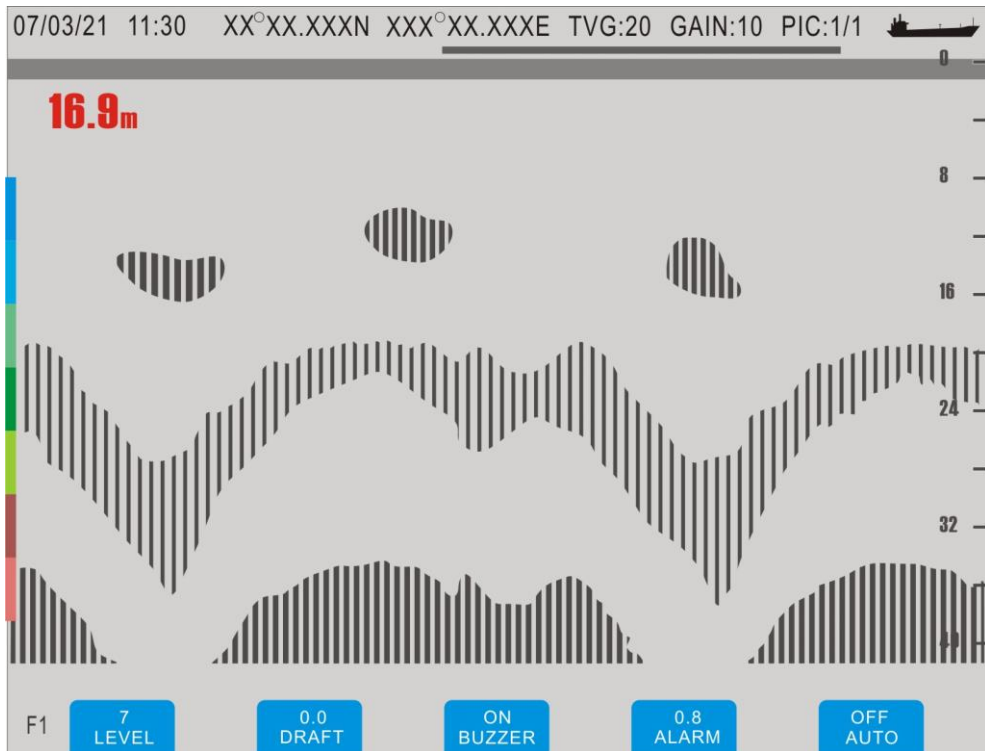


【TVG】 : Be used to compensate for propagation attenuation of the ultrasonic waves, reducing surface noise to provide a smooth display.

According to the surrounding water environment, you can adjust TVG **from max value to min one** to compensate for propagation attenuation of the ultrasonic waves. You should adjust TVG appropriately otherwise you don't get clear echoes.



Screen 1: Echo Colors, Draft, Buzzer, Alarm Depth, Auto Range



Echo Colors

The screen display contains multiple colors depending on the reflectivity from underwater objects of the sounding pulses. Red is strongest, followed by orange, yellow, green, light green, cyan blue and light blue. The echo colors function is used to hide weakest echo colors so as to observe the main echo distinctly.

【Scope setting】 LEVEL3~LEVEL7. **Default:** LEVEL 7

【Operation】 Press the echo colors key repeatedly to hide the light blue, cyan blue, light green, green in sequence. The text X Level represents the color number used now.

Draft

The draft key can be used to set the draft depth. The draft is the distance from water line to the bottom of the ship. Because the transducer is below the bottom of the ship, you must add the draft to get final correct depth.

【Scope setting】 0.0~25.0. **Default:** DRFT: 0.0m

【Operation】 Press the draft key, and then adjust the knob.

Buzzer

Turn on/off the alarm buzzer.

When any of the two power supplies is off, the buzzer is on.

Press any key will silence the buzzer.

If the buzzer is on, the shallow depth alarm sounds when the seabed is shallower than the preset depth. If the buzzer is off, it will not alarm.

【Scope setting】 ON or OFF. **Default:** OFF

【Operation】 Pressing the buzzer key will turn on or off the function.

Alarm Depth

The shallow depth alarm sounds and the depth on screen twinkles when the seabed is shallower than the preset depth. If you turn off the Buzzer function, the shallow depth alarm will not sounds, but the depth on screen twinkles.

【Scope setting】 0.4m~50m. **Default:** 0.8m

【Operation】 Press the alarm depth key, and then adjust the knob in 0.1 steps.

Auto Range

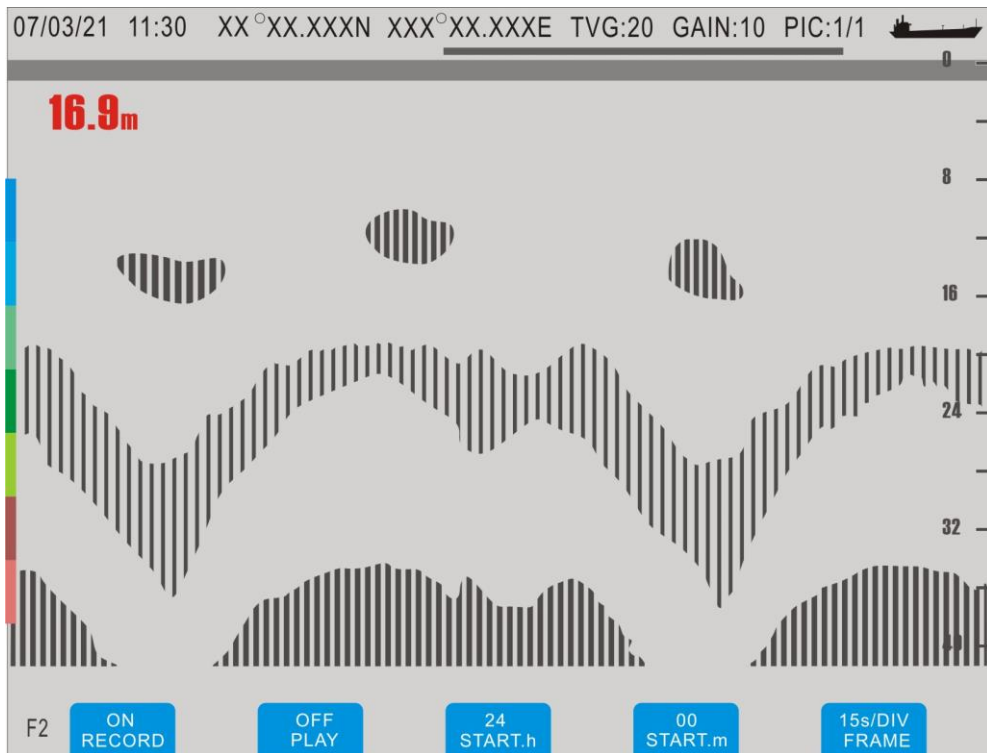
Turn on/off the auto range function.

The text AUTO is displayed on screen when you turn on the auto range function. The automatic function automatically selects the proper range scale according to actual depth, and disables the manual range selecting function meanwhile. If you turn off the auto range function, the text AUTO will be disappeared on screen, and open the manual range selecting function meanwhile.

【Scope setting】 ON or OFF. **Default:** AUTO: OFF

【Operation】 Pressing the auto range key will turn on or off the function.

Screen 2: Data Store, Data Replay, Beginning Hours, Beginning Minutes, Compression Ratio



Note:

1. Only the data store key will work normally when the data is storing. The other keys will function after the storing is cancelled or finished.
2. Only the data replay key will work normally when the data is replaying. The other keys will function after the replaying is cancelled or finished.
3. The compression ratio represents how the data is compressed. The time scale divides into 10 units, and each represents how much the data is stored, this will alter with the compression ratio. As an example, 30M/DIV means that each unit of time scale represents 30 minutes data. So a full screen represents 300 minutes data.

4. The data replay function will replay the history data based on the time setting, the history data of nearest X hours and Y minutes will be replayed. The X is the preset beginning hours, the Y is the preset beginning minutes.

Data Store

The nearest twenty hours echo data will be stored so as to replay later if necessary.

【Scope setting】 ON or OFF. **Default:** RECORD ON

【Operation】 Pressing the data store key will turn on or off the function.

Data Replay

The stored data will be replayed in terms of the preset beginning hours and minutes if the function status is PLAY ON.

【Scope setting】 ON or OFF. **Default:** PLAY OFF

【Operation】 Pressing the data replay key will turn on or off the function.

Beginning Hours

The function can be used to set the beginning hours.

【Scope setting】 00~24 hours. **Default:** 20

【Operation】 Press the beginning hours key, and then adjust the knob.

Beginning Minutes

The function can be used to set the beginning minutes.

【Scope setting】 00~59 minutes. **Default:** 00

【Operation】 Press the beginning minutes key, and then adjust the knob.

Compression Ratio

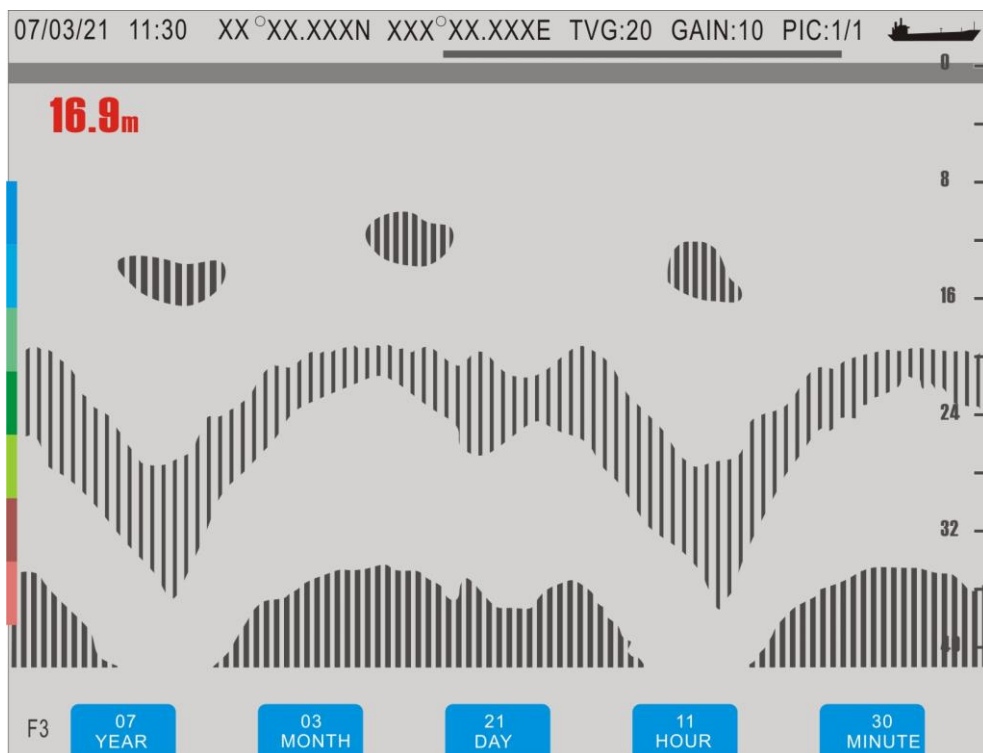
The function can be used to set the compression ratio, the history data can be quickly displayed.

【Scope setting】 15S/DIV, 60S/DIV, 10M/DIV, 30M/DIV, 1H/DIV, 2H/DIV.

Default: 15S/DIV

【Operation】 Press the compression ratio key, and then adjust the knob.

Screen 3: Year, Month, Day, Hour, Minute



Year

The function can be used to set the year value.

【Scope setting】 00~99 (which means the year between 2000 and 2099).

Default: Beijing Time

【Operation】 Press the year key, and then adjust the knob. You should press the year key again to save the value. Press any other key except year key to give up the change.

Month

The function can be used to set the month value.

【Scope setting】 01~12. **Default:** Beijing Time

【Operation】 Press the month key, and then adjust the knob. You should press the month key again to save the value. Press any other key except month key to give up the change.

Day

The function can be used to set the day value.

【Scope setting】 01~31. **Default:** Beijing Time

【Operation】 Press the day key, and then adjust the knob. You should press the day key again to save the value. Press any other key except day key to give up the change.

Hour

The function can be used to set the hour value. The adjustable value is between 0 and 23. The default value is the current hour.

【Scope setting】 00~23. **Default:** Beijing Time

【Operation】 Press the hour key, and then adjust the knob. You should press the hour key again to save the value. Press any other key except hour key to give up the change.

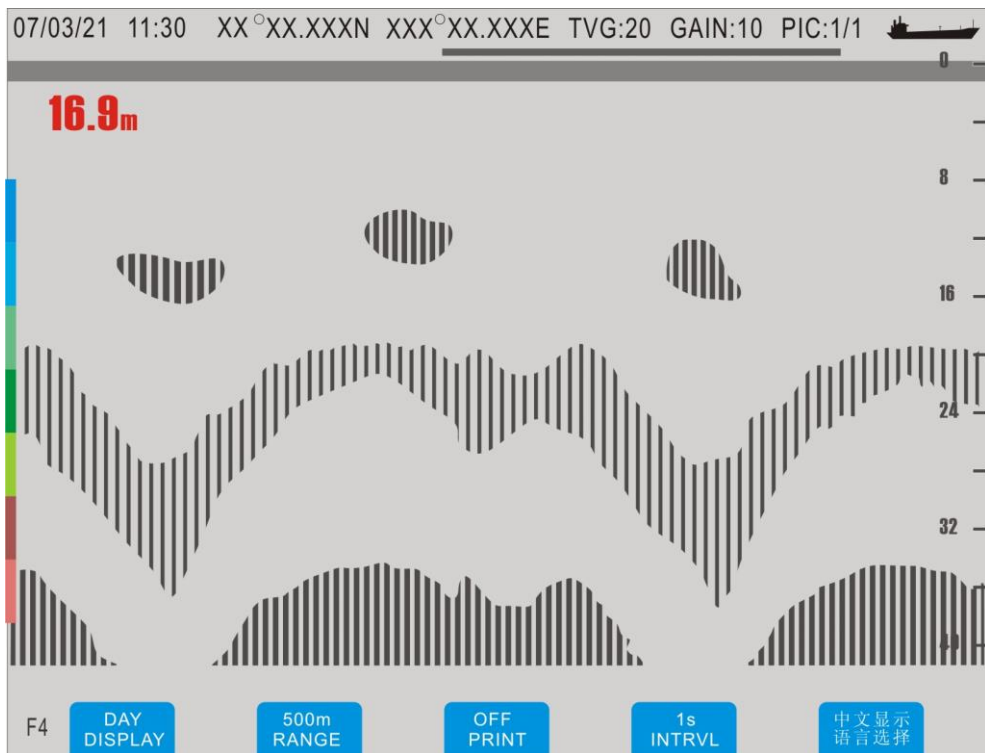
Minute

The function can be used to set the minute value.

【Scope setting】 00~59. **Default:** Beijing Time

【Operation】 Press the minute key, and then adjust the knob. You should press the minute key again to save the value. Press any other key except minute key to give up the change.

Screen 4: Display Model, Range Max, Print Switch, Print Interval, Language



Display Model

The function can be used to set the day or night display model.

【Scope setting】 DAY or NIGHT. **Default:** DAY

【Operation】 Pressing the display key will set the mode of the day or night.

Range Max

The function can be used to set the scope of the max range. The small range is 0~500m, the large range is 0~800m.

【Scope setting】 500m or 800m. **Default:** 500m

【Operation】 Pressing the range key will choose 500m or 800m.

Print Switch

Turn on/off the print function.

【Scope setting】 ON or OFF. **Default:** OFF

【Operation】 Pressing the print key will turn on or off the function.

Print Interval

This function can be used to set the interval for printing each group of data.

【Scope setting】 5s, 10s, 15s, 30s, 60s. **Default:** 30s

【Operation】 Pressing the print interval key repeatedly to set the 5 interval types.

Language

This function is used to set the display language on screen.

【Scope setting】 ENGLISH or CHINESE. **Default:** CHINESE

【Operation】 Pressing the language key will choose English or Chinese language.

*Note :

1. DPU-414 Print settings is as following :

Dip SW-1

- 1 (OFF):Input=Serial
- 2 (ON):Printing Speed=High
- 3 (ON):Auto Loading=ON
- 4 (ON):Auto LF=ON
- 5 (ON):Setting Command=Enable
- 6 (OFF):Printing
- 7 (ON):Density

8 (ON):=100%

Dip SW-2

1 (OFF):Printing Columns=80

2 (ON):User Font Back-up=ON

3 (ON):Character Select=Normal

4 (ON):Zero=Normal

5 (ON):International

6 (ON):Character

7 (ON):Set

8 (OFF):=U.S.A.

Dip SW-3

1 (ON):Data Length=8 bits

2 (ON):Parity Setting=No

3 (ON):Parity Condition=Odd

4 (ON):Busy Control=H/W Busy

5 (OFF):Baud

6 (ON):Rate

7 (ON):Select

8 (ON):=9600 bps.

2. Print Format :

XX/XX/XX XX:XX XX°XX.XXXN(S) XXX°XX.XXXE(W) Depth below transducer=XXX.Xm Draft=XX.Xm

(1) (2) (3) (4) (5) (6)

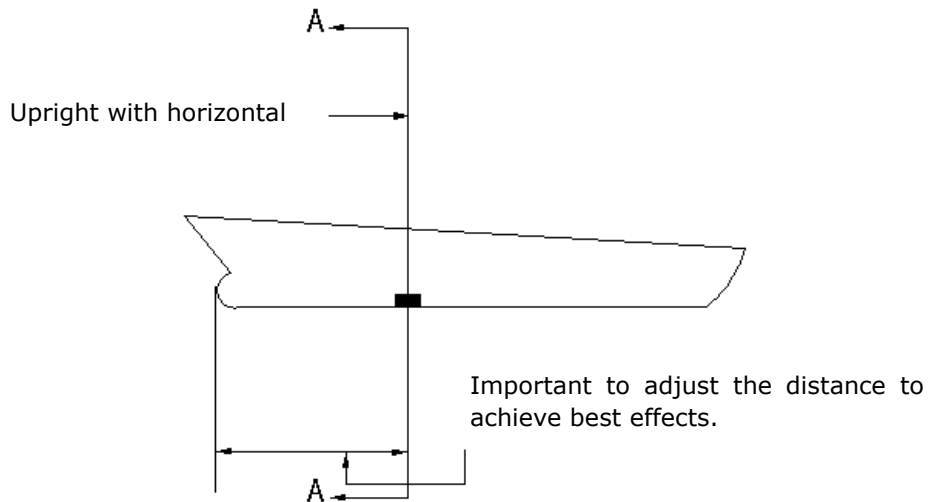
(1) Date (2) Time (3) North Latitude (South Latitude)

(4) East Longitude (West Longitude) (5) Marine Bottom Depth (6) Draft

Depth

INSTALLATION

Transducer Installation



Protect the active element of the transducer and do not paint the surface. Transmission in the air must be avoided! This may cause mechanical damage of the element.

Optimal system operation is achieved by fitting the transducer as deep as possible on the hull. The transmitting surface of the transducer must be installed horizontal. On vessels with a deep keel, if the transducer must be fitted higher than the keel, it should be fitted towards the side, as far from the keel as possible to avoid false keel echo.

Do not mount transducers close to the propeller or aft of other hull installations (outlets, vents or other protruding details).

It is of course necessary to select a part of the hull that is submerged under all load and speed conditions, and to avoid positions where air is trapped in heavy weather.

If a flat, horizontal section is not available for transducer fitting, the shipyard must construct a suitable bed.

Transducer, Tank and Welding

Transducer and tank installation

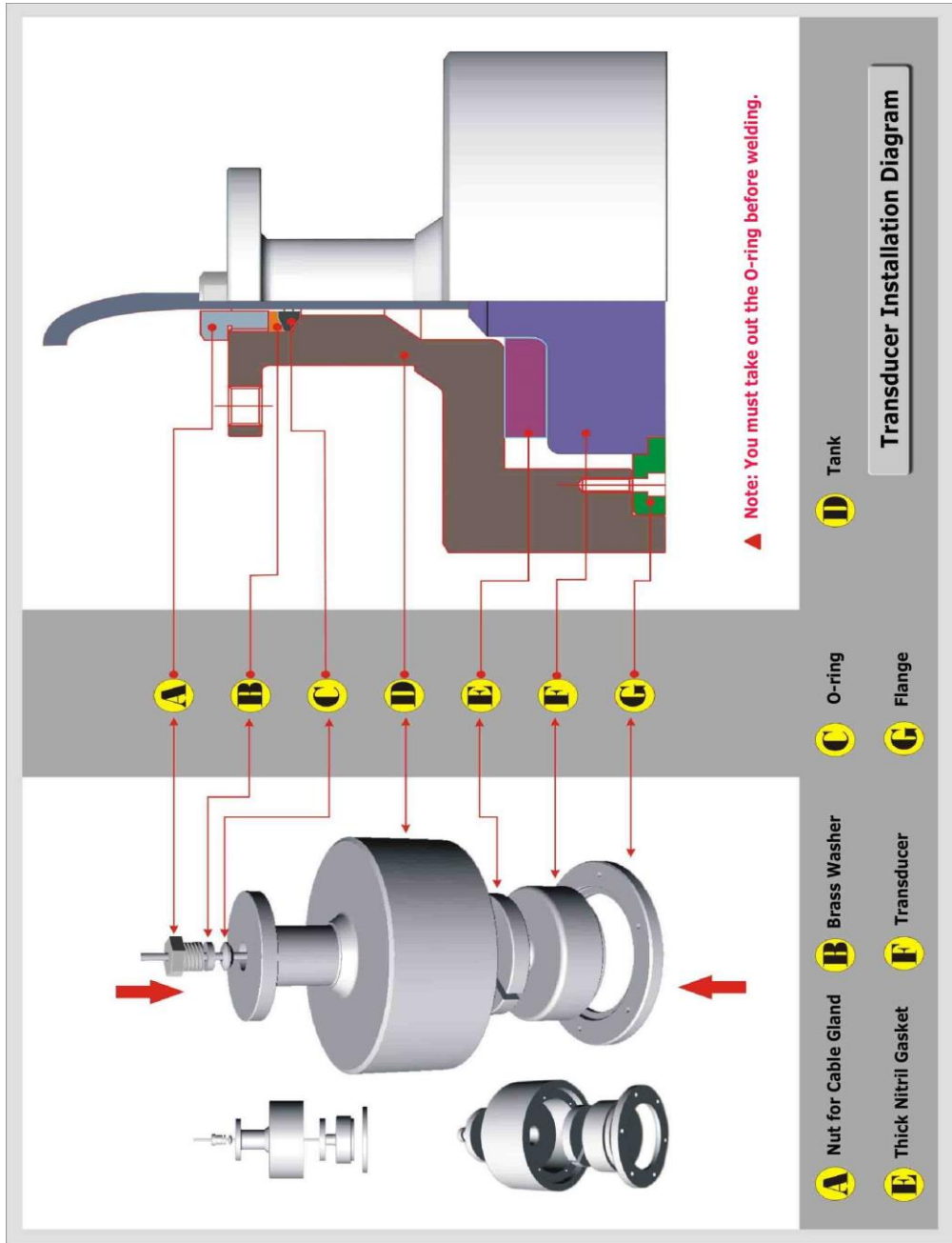
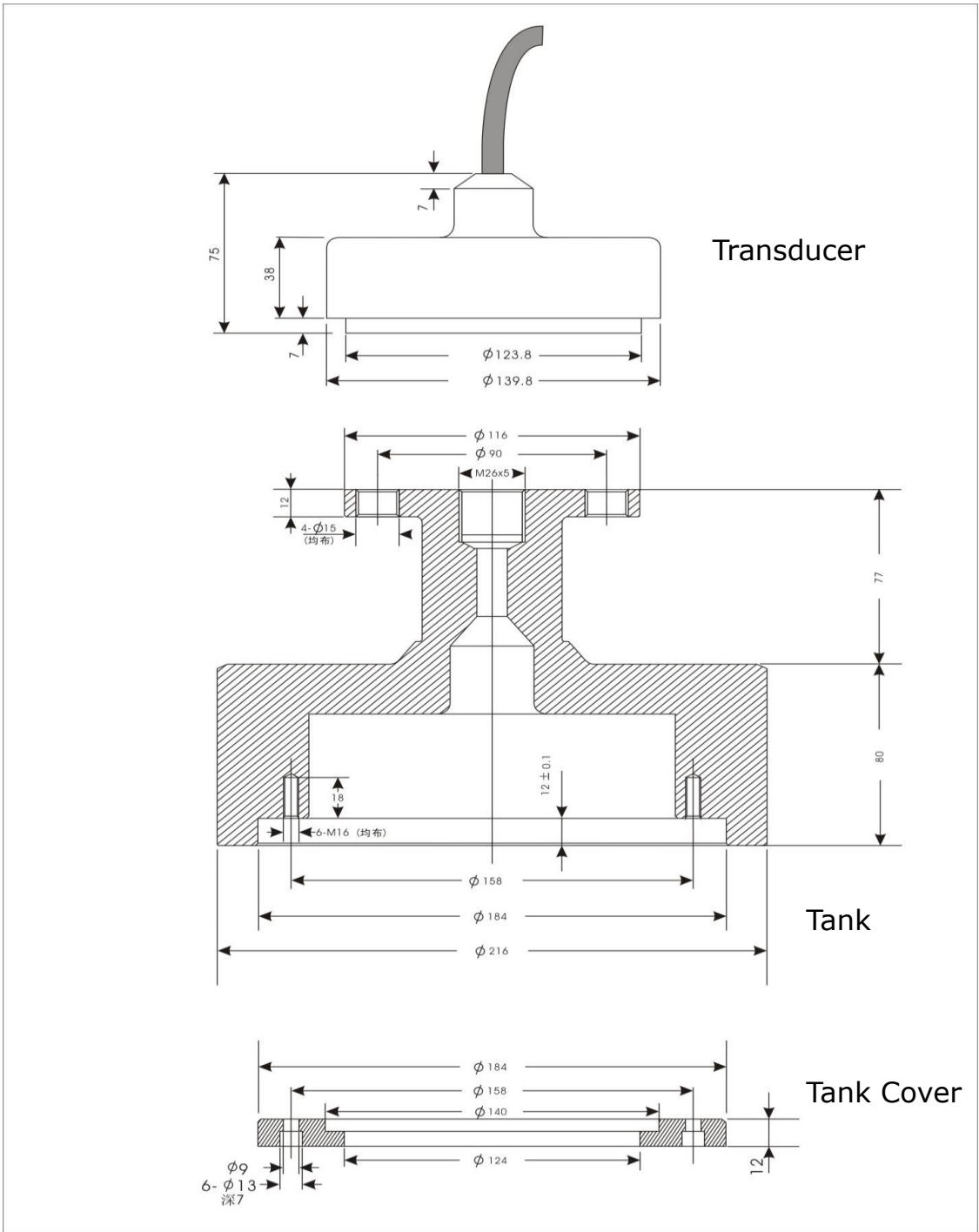


Figure of transducer and tank



Welding steps of transducer tank

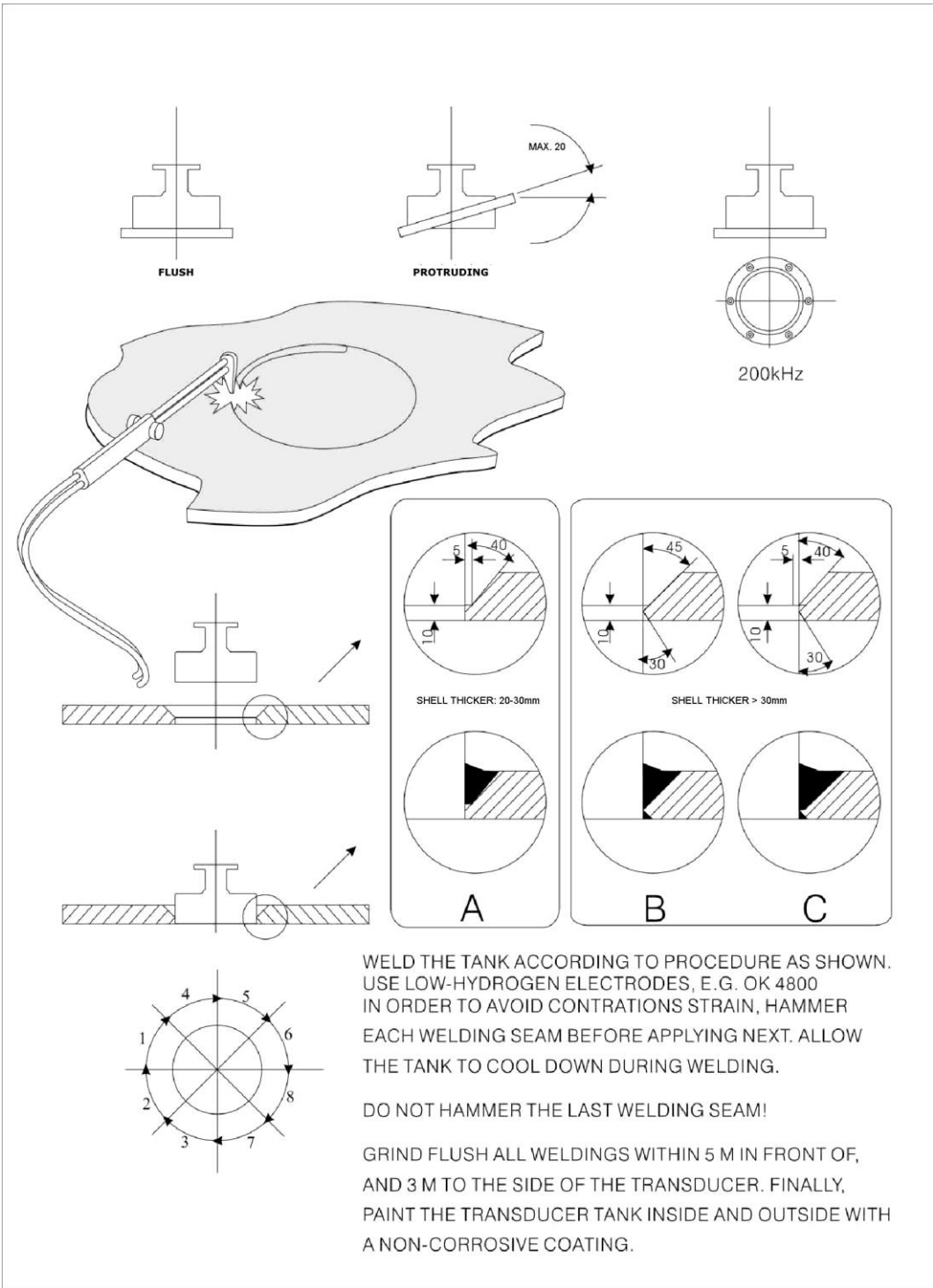
1. Screw off six screws of cover board with socket cap wrench.
2. Take out the washer and O-ring inside tank to keep them from warping.
3. Chisel a hole whose size is the same with the tank at the bottom of the ship to keep tank horizontal with the bottom of the ship.
4. Weld two thick iron bars in the center of the hole temporarily to put tank into the hole.
5. Weld the tank according to procedure as shown use low-hydrogen electrodes, E.G. OK 4800. In order to avoid contraction strain, hammer each welding seam before applying next. Allow the tank to cool down during welding. Grind flush all welding within 5M in front of and 3M to the side of the transducer. Finally, paint the transducer tank inside and outside with a non-corrosive coating.

WARNING: Do not hammer the last welding seam!

Notes: If the thickness of the hull is from 20m to 30m, you can use the method of welding in picture A; If the thickness of the hull is more than 30m, you can use the method of welding in picture B or picture C.

6. Remove the two thick iron bars after welding the tank. Then go through the tank, the washer and O-ring with the cable of transducer in turn and screw on the nut of cover board. Finally screw on transducer cover with socket cap wrench.
7. After finishing all welding, it is necessary to make experiment on oil paint and water-tight seal and air-tight seal to keep the bottom of the ship tight.
8. If you have questions during the welding, please contact the manufacturer.

Welding of transducer tank



WELD THE TANK ACCORDING TO PROCEDURE AS SHOWN. USE LOW-HYDROGEN ELECTRODES, E.G. OK 4800 IN ORDER TO AVOID CONTRACTIONS STRAIN, HAMMER EACH WELDING SEAM BEFORE APPLYING NEXT. ALLOW THE TANK TO COOL DOWN DURING WELDING.

DO NOT HAMMER THE LAST WELDING SEAM!

GRIND FLUSH ALL WELDINGS WITHIN 5 M IN FRONT OF, AND 3 M TO THE SIDE OF THE TRANSDUCER. FINALLY, PAINT THE TRANSDUCER TANK INSIDE AND OUTSIDE WITH A NON-CORROSIVE COATING.

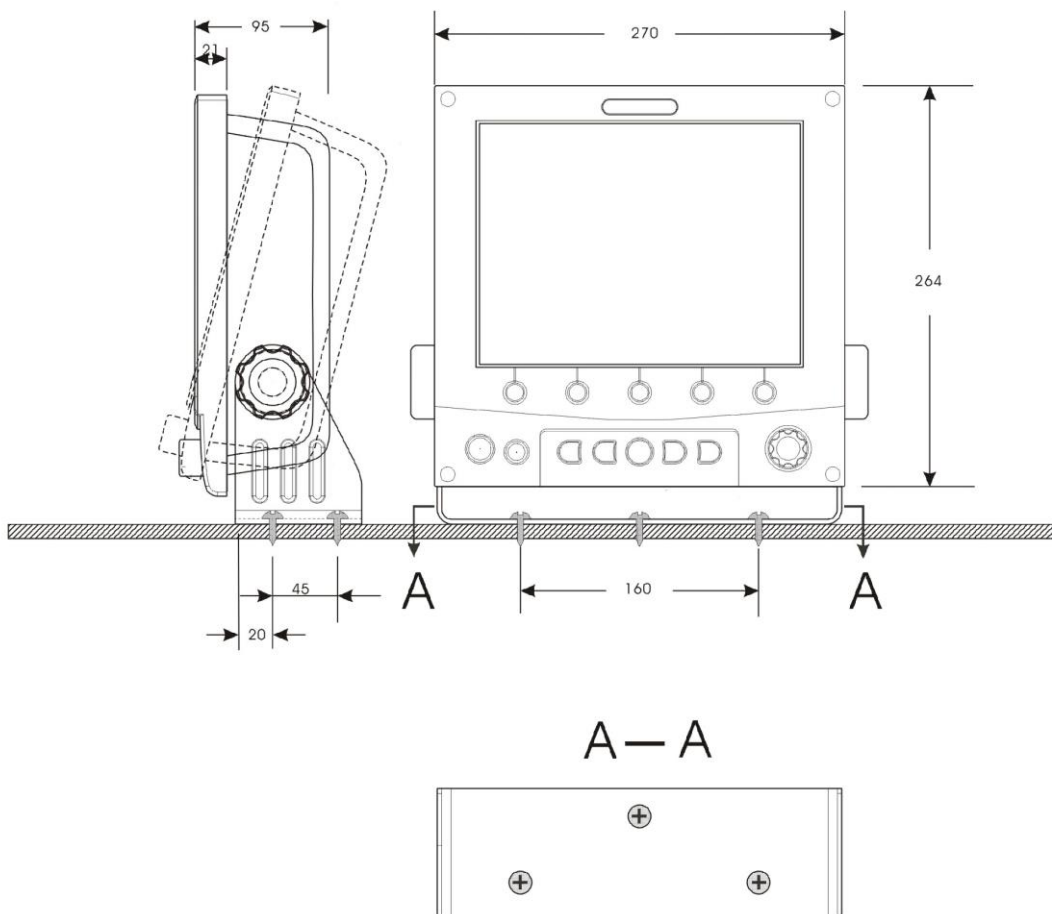
Unit mounting

You have three methods to mount the main unit. Table, ceiling and flash mounting is shown as follows.

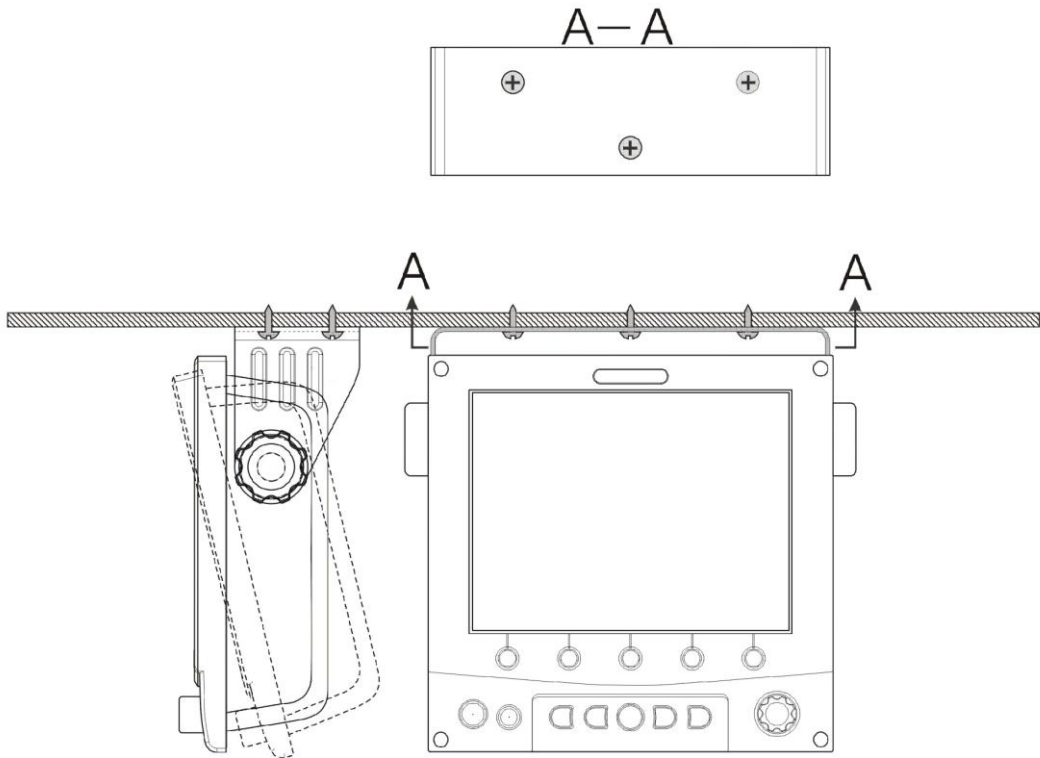
You should reassemble the rear cabinet upside-down when you make ceiling mounting.

You should cut a chamfer angle square window on you working panel when you make flash mounting.

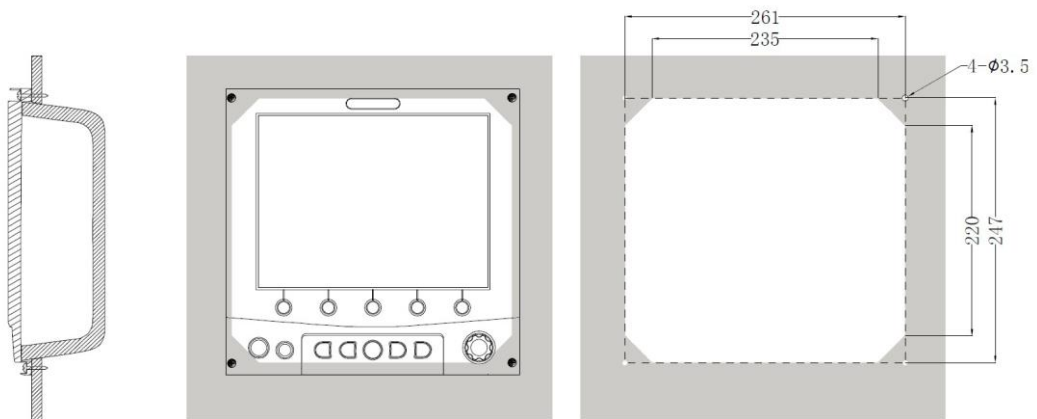
Table



Hang



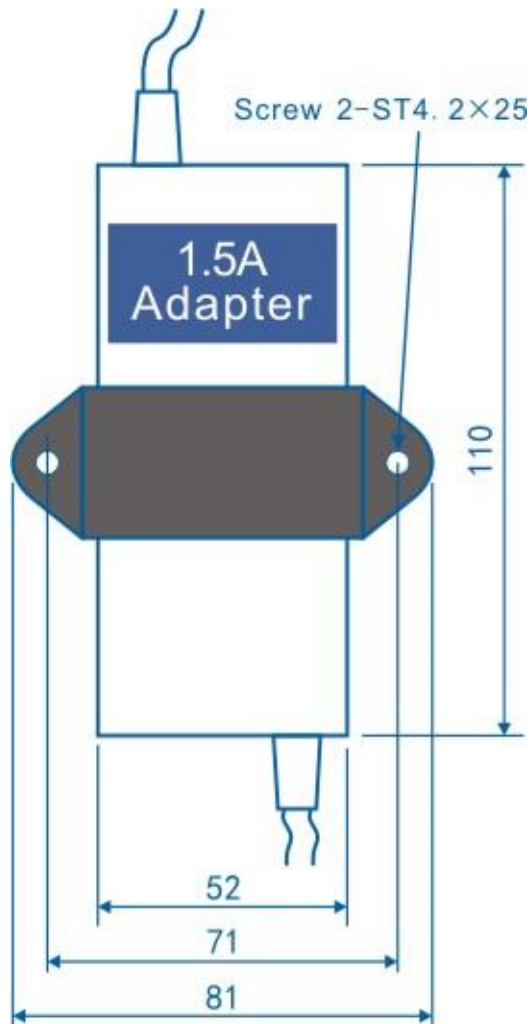
Flush



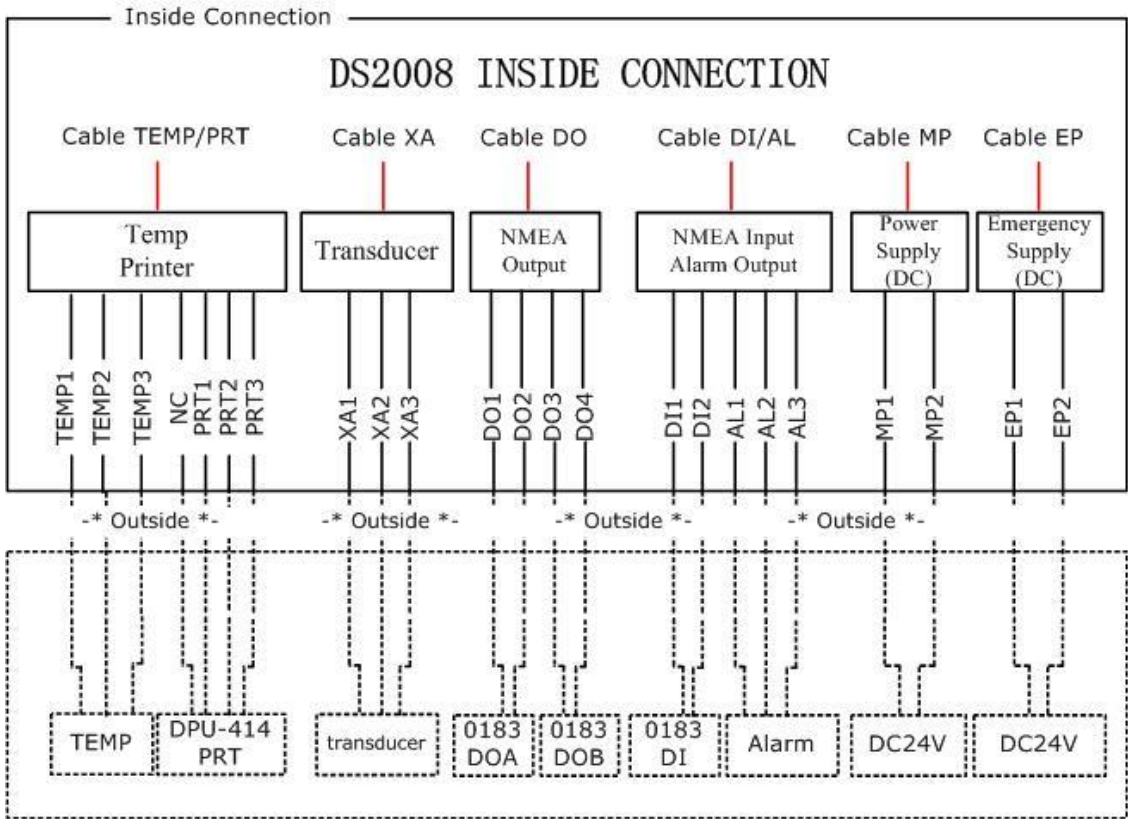
Power adapter mounting

Power adapter (GA-240150), AC220/110V to DC24V, adapter holder and screws. Weight: 0.24kg.

Unit: mm



SYSTEM CONFIGURATION



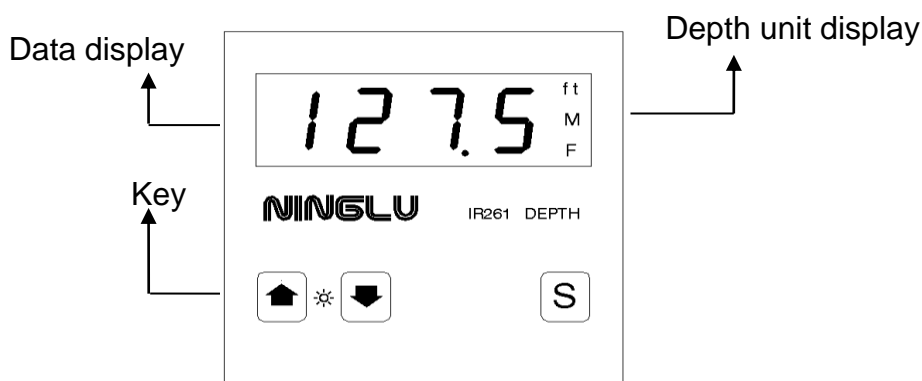
Item	Discription	Item	Discription
TEMP1	Earthing Line	DO3	NMEA0183 B Output +
TEMP2	TEMP	DO4	NMEA0183 B Output -
TEMP3	Voltage +5V	DI1	NMEA0183 Input +
NC (4)	No Connecting	DI2	NMEA0183 Input -
PRT1 (5)	Printer TX	AL1	Alarm Output NC
PRT2 (6)	Printer RX	AL2	Alarm Output NO
PRT2 (7)	Grounding	AL3	Alarm Output COM
XA1	Transducer Line I	MP1	Power Supply +
XA2	Grounding	MP2	Power Supply -
XA3	Transducer Line II	EP1	Emergency Supply +
DO1	NMEA0183 A Output +	EP2	Emergency Supply -
DO2	NMEA0183 A Output -	----	-----

IR261 Introduction

Introduction

IR261 can be chosen to use with DS2008 to display depth data exactly. Also it has some accessional functions, such as depth unit display, shallow water alarm, data losing alarm and display brightness adjustment. Meanwhile, it can also be used other sounder with NMEA outputs.

IR261 panel picture



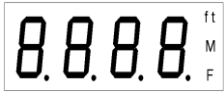



IR261 connection

The holder cable wire of the unit has been connected before finishing manufacture. You need just connect outside cable wire.

No.	Color	Function	No.	Color	Function
1	Red	Power supply+(DC10-40V)	5	Orange	NMEA0183 B output+
2	Black	Power supply- (DC10-40V)	6	Green	Brightness +
3	Blue	NMEA0183 input+	7	Yellow	Brightness -
4	White	NMEA0183 output/input-	8	Gray	Brightness remote joint

IR261 operation manual

Default value

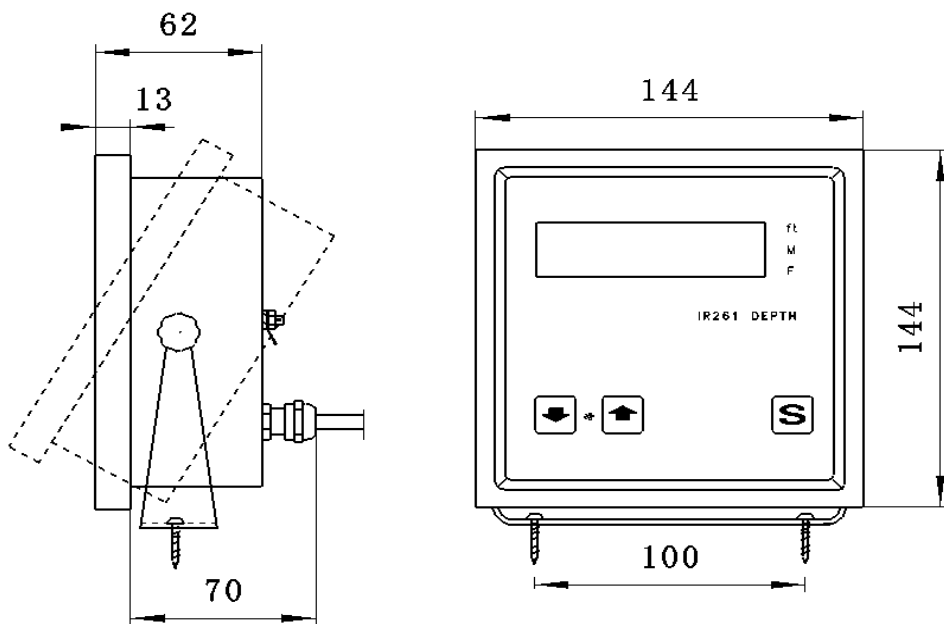
No.	Function	Operation	Display
1	Automatic checkout	If data display is off after power on, all display lamps will be on in 3s. Then check the unit or the cable connection between the unit and IR261.	
2	Data display	Display XXX.X M after the unit turns on and the unit of display data is "M". If there is no data into the equipment, there is no number display on screen but "M".	
3	Unit switch	Press the key of "S", you can switch the unit between "ft" and "M" and "F".	
4	Display brightness adjustment	Press the key of "↑" or "↓", you can adjust data display brightness.	
5	Dormancy	Press the key of "↑" and "↓" at a time, then the unit is in the dormancy and all display lamps is off. Under this circumstance, press any key to recover normal work state and the setting before the dormancy still works.	
6	Alarm setting	Press the key of "S" and then LED and display lamps would be switched between "ft" and "M" and "F" and "AL". When the equipment is in the state of "AL", LED displays "ALXX M" to show the state of alarm setting. Then you can set tens digit through pressing the key of "↑" and you can set units digit through pressing the key of "↓". After finishing setting, press the key of "S" to choose unit. Choose "AL00M" to set alarm depth to turn off alarm setting. When the depth value is smaller than the setting value, the number is displayed flickeringly.	

IR261 installation

The methods of IR261 installation are as follow:

Flush installation

The unit can be fixed on the fixing bracket with two knobs after installing fixing bracket seen in the installation picture.



Embedded installation

First, screw off four screws of the front frame with socket cap wrench;
Second, fix the unit with four screw (ST4.2×25) on the installation position;
Finally, install the front frame over again.

