Portable Ultrasonic Water Depth Meter---HLU-SF

1. Profiles:

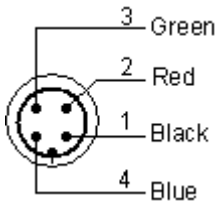
Holykell HLU-SF ultrasonic water depth meter is used in reservoirs, lakes, rivers or shallow sea water etc. The main principal is to place ultrasonic transducer above water or in water and use ultrasonic spreading in the water to get calculated water depth by instrument. This instrument adopts the international advanced technology, equipped also with water depth measurement functions, control functions, data transfer functions and man-machine communication capabilities. This instrument is a water depth measurement instrument of ultrasonic receive and dispatch sensor, servo circuit, temperature compensation, salinity compensation and compensation circuit unit, monitor, and control signal output and serial data or analog output unit (optional). Its main advantages are high reliability, long life, easy access, simple operation, accurate measurement of features and less-maintenance, it has already been widely used in the hydrographic survey, hydropower plant, reservoir area, shallow seas, lakes, rivers, surveying, environmental waters monitoring etc.

■ the water depth meter has different compensation of water quality and water sound temperature for sea water, river water, and cost performance are surpassed import type.

■Standard configuration of instrument: 1. Sensor; 2. handheld instrument, high-capacity lithium-ion battery (built-in), 3.Dedicated charger. Can be selected a variety of portable protective box when you ordering.

2. Instrument composition and port definition

超声波测深仪传感器



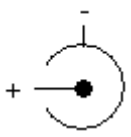
Sensor connection

◆ Front

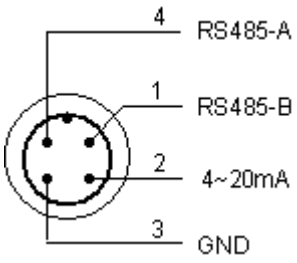
超声波测深仪
手持式仪表

◆ Back

测深仪专用充电器



Charge Port



Signal Output and wiring

3. Specifications:

Maximum Range: 100m, 200m, 300m (default 100m, can be customizable)
Detection accuracy: ± 0.5% FS (based on 20 ° C water standard plane)
Blind Zone Detection: ≤ 500 to 800mm (at F0 ~ FS, according to the sensor range)
Draft depth: ≥ 500mm
Detection methods: of 0.1 ~~ 100Hz / s (without special requirements, 1Hz / s is default)
Beam angle: 18 ° ± 2 °
Operating frequency: 50kHz~200kHz (based on matching sensor dependent)
Output signal: 4 ~20 mA, RS485 (can be customizable)
Instrument operating parameters:
Dispaly: LCD multi-information screen+ backlight , water depths four-digit +15 field data display
Display resolution: d = 1mm/1cm (user settings)
Keyboard: five touch of a button
Operating Temperature: 0 ℃ ~ 50 ℃; Storage temperature: - 20 ℃ ~ 70 ℃
Operating Humidity: ≤ 80% RH non-condensing (instrument)
Storage humidity: ≤ 70% RH non-condensing (instrument)
Dimensions: 235 × 115 × 70mm
Operating voltage: built-in rechargeable lithium battery, standby time of approximately 6 hours intermittent
Sensor operating parameters:
Application medium: fresh water, sea water (determined when you ordering)
Operating temperature: 0 ℃ ~ 40 ℃temperature compensation automatic
Sensor lead: 10meters, lead is done acoustic matching before delivery.
Weight: Net.weight≤ 2.5Kg, Gross Weight ≤ 3.5Kg with suitcase packing
Package Size: 90 × 16 × 24cm (containing the suitcase)
Installation: handheld portable; 1 inch threaded mounting of sensor
Dedicated charger: Input voltage: 110 to 240VAC 50/60Hz
Output voltage: 12.6VDC 350mA

◆ ◆ Special Caution!

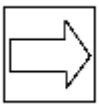
The device contains LI-CELL, only applicable with the allocated charger and storage between 0 ~ 40 ℃; Please keep away from fire, heat, collision, water and short pass, otherwise explosion might happen! The battery and charger are consumables, without of warranty; when the green indicator light, that means the battery is fully charged, please unplug the charger timely.

The range based on the area of beam projection corresponding distance and steel smooth plane target perpendicular to the sensor axis, otherwise may reduce range or can't be measured without good reflect target.

4. Instrument display and keyboard definition:

■ **Instrument display:**

■ **Keyboard definition:**

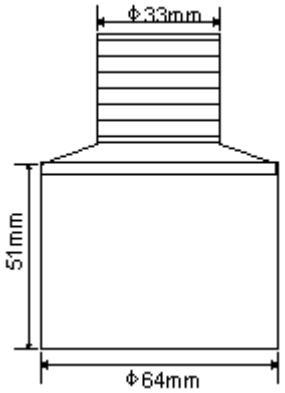
	Addend key: press this key and add "1" of blink digit number then determine the decimal point in setting status, when you need negative numbers operation, Press to tune out or remove the negative sign; Press the key for 5 seconds in working status you can turn off the display and access a power saving mode.
	Flip over key: when press this key in working status will display P1, then press shift key to enter P1 menu to set or read parameters, each time you press the page key will display the next menu, total item is eleven.
	Shift key: press this key to shift, when each digit has been set then press the key till each digit all flashing is mean setting parameters stored in the operation; when under show off power-saving mode, press the key can open the display; while press this key for 5 seconds can turn on the backlight in working condition, press the key for five seconds again will close the backlight.
	Boot key: Press to boot, power indicator will light.
	Power-off key: Press this key, POWER is off.

5. Menu operation：

Menu Access	Press flip over key in working status will display P1, press the shift key again, will enter P1 menu, the menu is as follows:
L1 ××××	The first limit alarm output: no use.
L2 ××××	The second limit alarm output: ditto.
L3 ××××	The third limit alarm output: ditto.
L4 ××××	The fourth limit alarm output: ditto.
E××××	Draft depth Settings, set one half of the negative distance between the surface to depth sensor emission face into the menu, it will automatically count the draft depth when the instrument display depth of water. Parameter setting method: press shift key to shift, press addend key to flicker a addend, input necessary numerical, press the shift key when flicker in the bottom, when all the four parameters setting don't flicker any more, press flip over key to save the setting parameters and enter the next menu.
N××××	Salinity value Settings, when salinity value is 0 for fresh water depth; While used in sea water, output corresponding value according to the current salinity of water. Such as when salinity is 3.6%, N should be 0.036 output. Parameter setting method: ditto.
d ×	The machine address number Settings, the function is special for multiple machines on line with upper computer communication, virtual value is 1 ~ 99. Parameter setting method: press the addend key plus one once, press the shift key minus 1 once, the default value is 0.
bo ×××	Communication Baud rate setting, Baud rate is as follows: 0.3, 0.6, 1.2, 2.4, 4.8, 9.6, 19.2 Kbps. Parameter setting method: press the addend key to increase, press the shift key to reduce.
P ×	Emission power Settings, effective value is 0 ~ 15, set according to the working conditions (taking stable and accurate for moderate, generally according to the factory set point). Parameter setting method: ditto.
C××××	Temperature of current measured water. This menu is only for observation, can't be modified.
CA××××	The output analog value of current measured depth. This menu is only for observation, can't be modified.
Exit menu	When parameters has been set up completely, press flip over key for 3 seconds, then will exit P1 menu and enter the normal working state.

6. Installation dimension of sensor：

【The following picture is the schematic diagram of sensor body, the final size and appearance is subject to the real goods】



◆Installation suggestion: sensor installation should consider the protection requirements of the cable, we suggest to make cable through the pipe, then connect pipe to sensor connector, other external fittings can connect the pipe directly. In order to avoid cable fracture to cause permanent damage of sensor, cable should be avoid under the stress of the installation of fittings.

7. Application Notice:

1. Ultrasonic water depth sensor is precision instrument, it must be power on more than 5 minutes before using.
2. Ultrasonic water depth sensor can only work in the water. It can't work in the air.
3. It needs input N value(salinity value) in the P1 menu when it works in the sea water.
4. Ultrasonic water depth sensor has been matched with instrument circuit, can’t be interchangeable. In order to improve the service life of instrument, please build awnings above the water depth sensor when it works outdoor, don't put the ultrasonic water depth sensor in the environment of long-term sunny or raining.
5. Transmitting power can’t be set too large or too small, otherwise it won’t be able to work normally
6. Ultrasonic water depth sensor has blind zone, the data display is random within the blind zone.
7. The sensitivity is very high of instrument, so there can't have too strong noise and electromagnetic interference nearby when use it. It will affect the stability of the instrument and even shorten the service life of the instrument if flow momentum is big, temperature and humidity isn’t within the regulation range, temperature change too fast and instrument surface is with moisture condensation etc.
8. Strictly prohibit putting LCD products into high or low temperature environment.

8. Communication protocol of Serial port:

【Standard Baud rate】

Half duplex asynchronous mode, Baud rate can be set freely from 600 to 19200 BPS.

MC version communication format (standard Baud rate).

1: Host machine: After sending address (1 ~ 64)of binary code then inquire receiving data.

2: Slave: to response by interrupt mode, each frame sending 21 byte.

Sending data Sequence of Slave:

First 5 bytes is water depth value (5 bytes ASC code, the unit is meter)

The sixth to twentieth bytes is production testing code (no business of the user); the twenty-first byte is "accumulation sum" verify word!

★For example: some time the superior machine receive a frame level data which sent by HLU-SF as follows,

30 2E 35 30 31 31 31 33 2E 37 36 31 41 5C 2D 86 3F 00 4D B5 E6

- - - - - depth value = 0.501m(30 2 E 35 30 31);

- - - - - 6-20 bytes is production testing code;

- - - - - E6 is accumulating sum

To enable users to enjoy better quality and frontier science technology achievement, HLU-SF products will continue to upgrade, -- -- -- -- - if there is a technical subject to change without prior notice)

9. Frequently questions and treatment methods:

Difficult questions	Possible reason of difficult questions	Treatment methods
No display after press Bootkey or measurement is not normal, sensor without sound…	1.Built-in lithium battery power is not enough 2.Built-in lithium battery is failure	1. To charge instrument in time. 2.Need to replace built-in lithium battery, please contact the supplier of ultrasonic water depth instrument.（be sure not to power on and operation by yourself）
Sensor has sound, but without display...	1.Instrument into close display energy saving mode 2.Display chip or screen has been damaged	1.Deep press the shift key to open display 2. Contact supplier of ultrasonic water depth instrument.
With display, but digital can‘t change according to distance surface, and the sensor without	1. Input working voltage is too low, the sensor of ultrasonic water depth gauge does not work; 2.Sensor of ultrasonic water depth	1.Power supply according to the required voltage. 2. Contact manufacturer of ultrasonic water depth instrument.

sound...	gauge or power driver has been damaged.	
Has display and sound, but the measuring numerical value disorderly jump, or numerical value is not change according to the distance change...	1. The depth of water meter installed too inclined, reflection is not good; 2. The power setting too big, and then caused remaining vibration or diffraction is big; 3. Don't properly used in air environment; 4. There are two or more than two sets of water depth meter are working in close, causing echo interference; 5. The water has too big electromagnetic interference; 6. Gain parameters has been modified artificially.	1. Adjust the sensor's axis and make it perpendicular to the water surface 2.Generally, under 20 m range, power P is about 10, above 30 m range, power P is about 10 ~ 15 (also have special); 3.Put the sensor into water to measure; 4. Move another instrument to the distant measurement area; 5.Shielding interference; 6.Contact the manufacturer of ultrasonic water depth meter
Sensor has sound and display horizontal line "----"	1.Depth of water meter's range is small, but the working range is too big; 2.The application range is not wrong, the application of the water environment turbidity is too large or bed no reflection conditions, and can't get the echo; 3. Setting of Power P is too small or too large.	1. Adjust the working range of water depth meter to actual range; 2. Adjust application environment to appropriate water with reflection plane; 3.Access to user menu the depth of water meter user menu and change transmitted power, increase or decrease P until display is stable.
The sensor has sound and the error of water depth value error is more than ten centimeters...	1.There is a large obstacles in water under sensor, which cause reflection wave; 2.The installation is too nearby the shore side, wave distinguishes is reflex midway; 3.Check whether it is correct of "N value" setting; 4.Check whether it is normal of temperature "C" value.	1.2. Change installation places. 3.Setting correct N value (please refer to the instruction); 4. If the temperature difference is more than ten degrees, it means the sensor is damaged, please contact supplier timely.
	1.The range migration parameters FX	1.Contact supplier;

4～20mA output is abnormal: it is too high or too low, display 10 mv ...	has been illegally modified; 2.The output fine adjustment parameter AX has been illegally modified; 3. Low battery.	2. Contact the distributor or the manufacturer to set correct parameter; 3. Charging in time.
The water depth meter of serial output and the upper host or PC cannot be online...	1. The setting of extension baud rate is not consistent with the setting of host machine; 2.Extension address is 0 or excess range; 3.Twisted-pair cable is too thin, capacitance is too big of wires; 4. 232-485 converter is abnormal of PC.	1.Check the host and extension set, adjust Baud rate to be consistent; 2.Check host's Ar value, make the extension address does not overflow; 3. Using ⩾Φ 2 mm twisted-pair cable; 4. Consulting the manufacturer of serial converter or replace the serial converter.