KEANLEY

KLS-2300

Well Depth Detector /User Manual

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What is SDI-12?

SDI-12 (Serial Digital Interface) is a serial digital interface with a baud rate of 1200. The SD-12 communication standard, a serial data communication interface protocol widely applied in environmental monitoring around European and American countries in recent years, is now widely used in multi-parameter measurement and control of industry and agriculture, hydrological and meteorological monitoring of rivers, lakes, and seas, as well as in animal husbandry and food production, through which data can be can transmitted over long distances.

Features of KLS-2300

- Transparent mode bidirectional data logger
- Fully comply with SDI-12
- Send SDI-12 command and return a response
- Low energy consumption, high precision, high stability
- One interface can connect SDI-12 sensors with multiple functions
- 256 * 160 Px matrix LCD large screen display
- This device can be used for long-term unmanned operations

KLS-2300 Well Depth Detector

Application scenarios

The SDI-12 Interface Protocol Converter, an advanced device widely used in fields such as agriculture, environmental monitoring, meteorological research, and hydrological measurement, etc., has features of high reliability, stable performance, and easy operation, which can effectively convert data between SDI-12 interface and other interfaces, providing users with a convenient and fast user experience.

In the field of agriculture, the SDI-12 Interface Protocol Converter can convert the soil moisture, temperature, gas concentration and other data measured by sensors into general analog or digital signals for output through the SDI-12 interface, so that users can better control the growth environment of crops and improve yield and quality. In addition, it can also be integrated into irrigation systems, automatically adjusting the irrigation amount based on soil moisture conditions, thus, achieving intelligent agricultural management.

In terms of environmental monitoring, the SDI-12 Interface Protocol Converter can output measurement data from various environmental parameter sensors through the SDI-12 interface, including air temperature and humidity, air pressure, wind speed and direction, to meet the needs of environmental monitoring. For example, in meteorological research, researchers can integrate data from various meteorological parameter sensors into the meteorological station system via this product, accurately monitoring and predicting meteorological changes, and providing convenience for meteorological forecasting.

In addition, the SDI-12 Interface Protocol Converter also plays an important role in the field of hydrological measurement. By converting the data measured by sensors such as water level, flow rate, and rainfall into SDI-12 interface outputs, real-time transmission and remote monitoring of hydrological observation data can be achieved, which is of great significance for water resource management, flood warning, and river flow regulation, etc.

The SDI-12 Interface Protocol Converter is simple to operate. Data transmission and processing can be achieved only by connecting the sensor to the converter which is connected to a data acquisition system or a computer. Meanwhile, it supports data recording and storage functions, allowing users to query historical data at any time and perform data analysis and comparison. In addition, various output interface options are provided, including RS485, RS232, USB, etc., so that users can choose the interface according to their actual needs.

In summary, the SDI-12 Interface Protocol Converter, a high-performance, reliable, and easy to operate device, could be widely applied in fields like agriculture, environmental monitoring, meteorological research, and hydrological measurement. Fast and accurate data transmission and analysis processing can be achieved by seamlessly integrating with various sensors, providing users with a comprehensive solution. No matter you are an agricultural producer, an environmental researchers, or a hydrological observation professionals, you can definitely rely on this powerful device to better carry out your work and achieve better results.

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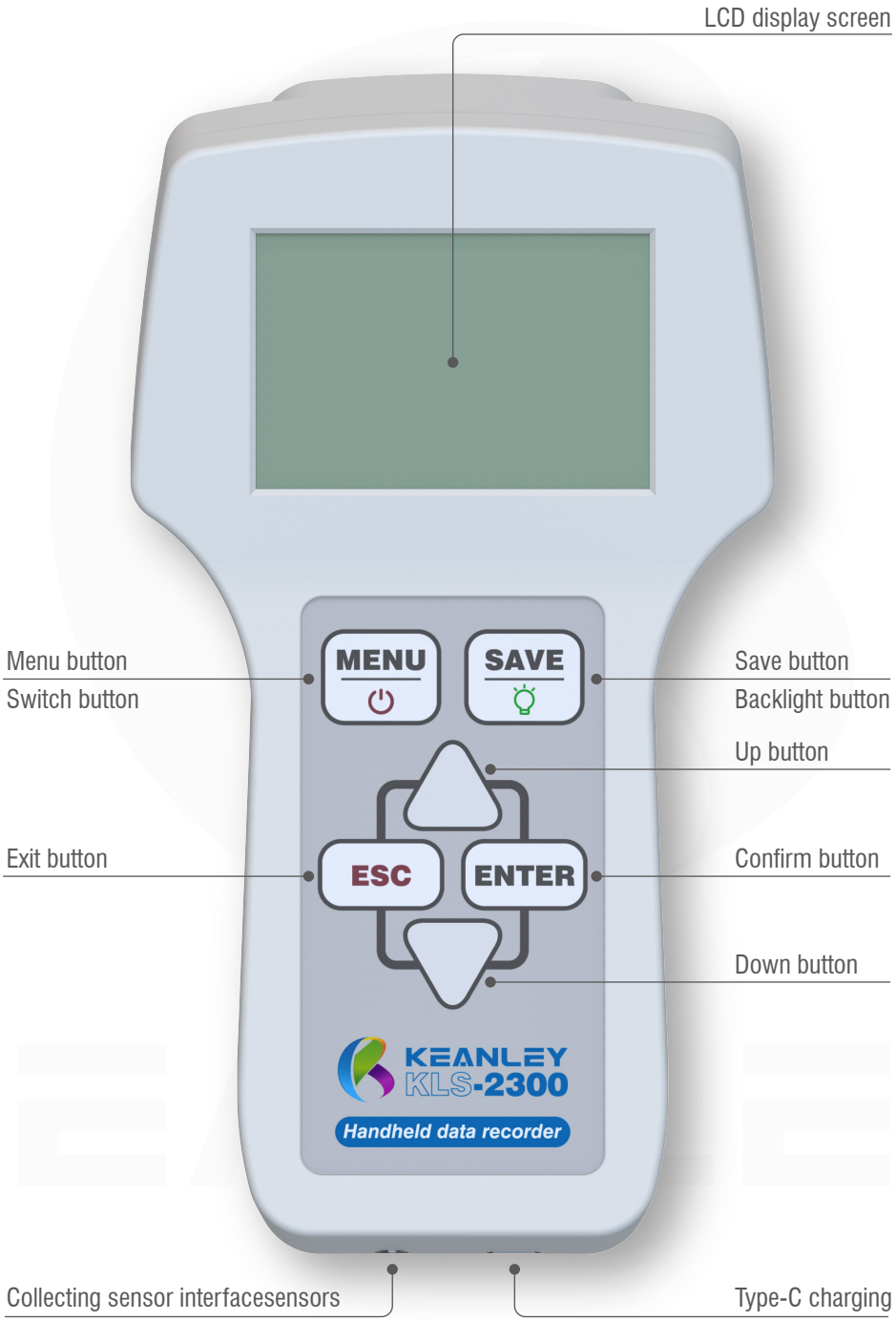
Description of button interface indication



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Devices connection diagram

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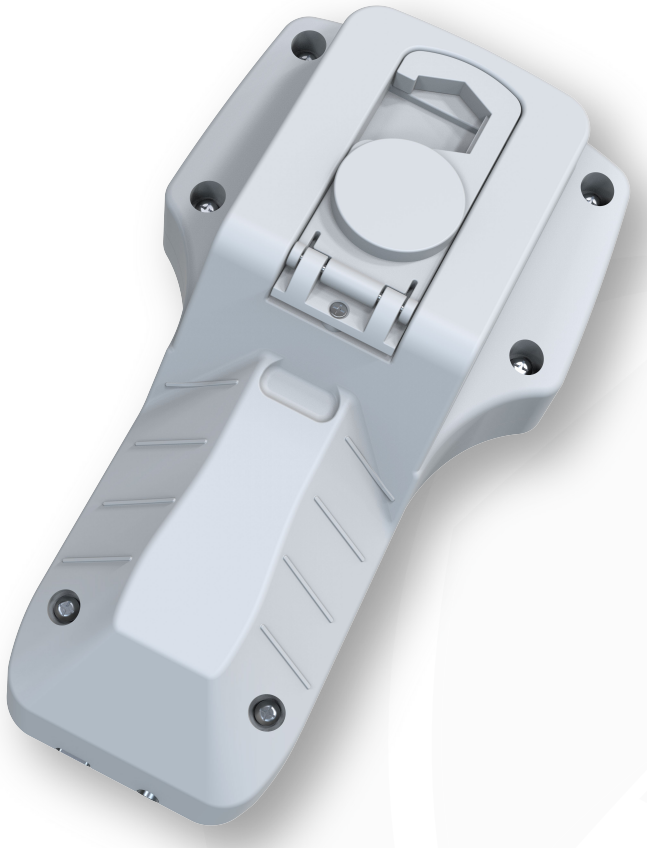
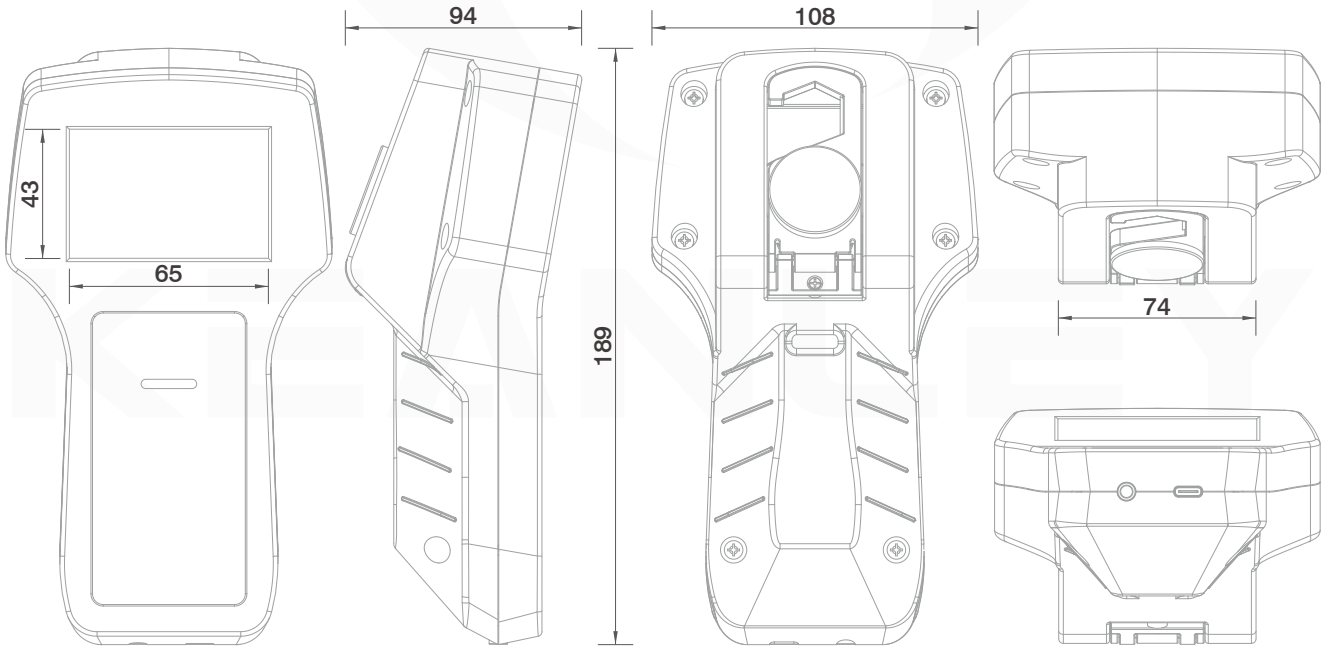


Basic parameters

- Input voltage: DC 4V-8.4V
- Static power consumption: 7.4V@14mA
- Sleep power consumption: 7.4V@3.5mA
- Transmission distance: 1200 meters
- Power output: 7.4V@3.5mA
- Baud rate: 1200
- Communication protocol: standard SDI-12 transparent transmission
- Working temperature: - 20℃~70℃
- Applicable operating system: Windows, Linux and Apple

Dimensions

Unit: mm



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Collection principle diagram

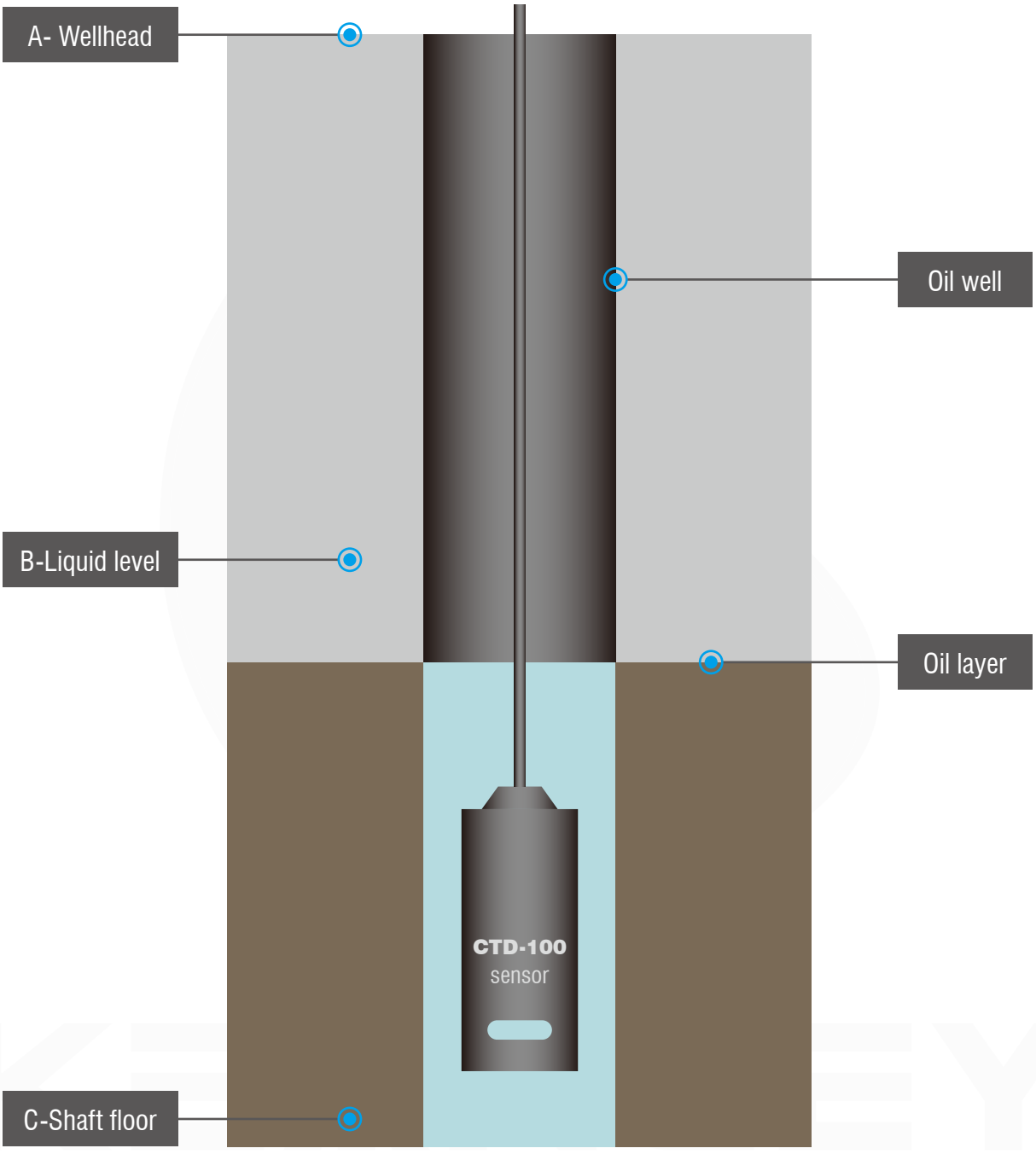
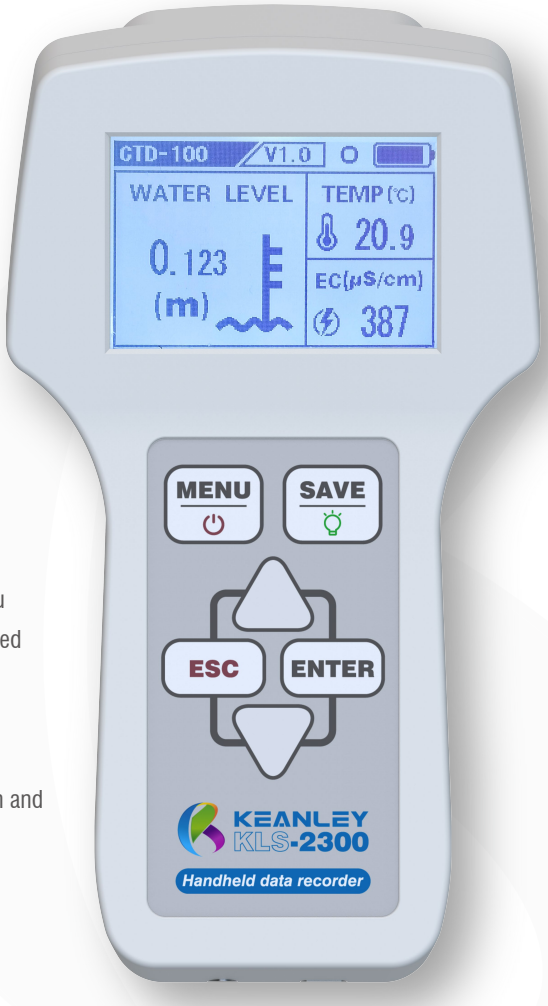


Figure 1. Working principle of well depth detector.

Step 1: When the sensor comes into contact with the B-Liquid level, an alarm prompt is received. At the same time, please record the measurement distance from the A-Wellhead to the B-liquid level (see the corresponding scale of the cable ruler)

Step 2: When the sensor comes into contact with the C-Shaft bottom, the display of the well depth will no longer change. At this time, please record the data (see handheld device LCD display screen).

Electrical characteristics of the device



- MENU button: Return to the main menu
- SAVE button: Save the currently modified parameters
- ESC: Return to the previous menu
- ENTER: Enter the current icon menu
- ▲and ▼ button: Switch icon selection and plus/minus setting area value

Figure 2. KLS-2300 well depth detector.

1. Electrical characteristics of the device.

Parameter	Minimum value	Typical value	Maximum value
Input voltage	4V	7.4V	8.4V
Input current	6mA	14mA	30mA
Output voltage	4.0V	7.4V	8.4V
Output current	2.5mA	3.5mA	8mA
Sleep current	-	20uA	-

Table 1. Electrical characteristics of KLS-2300 well depth detector

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Operation and interface display

■ After receiving the KLS-2300 device, press MENU on the button menu to wake up the device. First, enter the welcome interface, and then enter the data display interface of the sensor.

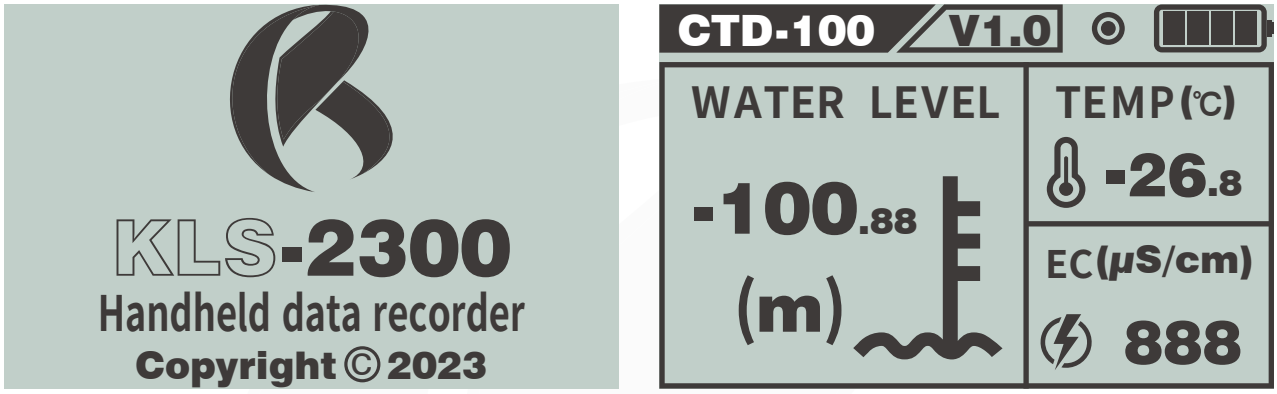

Figure 3. Wake up interface display.

■ At this time, press MENU on the button menu again to return to the menu bar.

Figure 4. Menu bar of KLS-2300 well depth detector.

2. Meanings of the icons in the menu bar.

① Sensor switching selection	② Screen brightness and backlight adjustment	③ Alarm threshold setting
		
④ Screen contrast adjustment	⑤ Sensor collection time frequency	⑥ About us information
		

Table 2. Meanings of the icons in the menu bar of KLS-2300 well depth detector.

■ This icon ① represents the type selection of the sensor, and the black icon box indicates the current selection. Press ▲or▼on the button menu to switch icons. After selecting the first icon, press Enter on the button menu to enter the sensor type selection interface as shown in Figure 5.

Figure 5. Sensor type selection of the well depth detector KLS-2300.

■ This interface shows that we have currently loaded 5 types of sensors. Press ▲ or ▼ on the button menu to switch between sensor models. The icon with a black box indicates that it is currently selected, and the above figure shows that 1. CTD-100. is currently selected. Press Enter key to enter this sensor interface, as shown in Figure 6. The CTD-100 in the upper left corner of the first line represents the model of the currently selected sensor, V1.0 represents the current version. The breathing circle icon shows dynamic breathing to indicate that the program is running well. The battery icon represents the current battery level of the device. The three interfaces in the second line, WATER LEVEL, indicate that the water level tested by the CTD-100 sensor is -100.88 meters. TEMP indicates that the current temperature at the location of the sensor is -26.8 ℃. EC indicates that the current conductivity of the sensor at its location is 888us/cm.

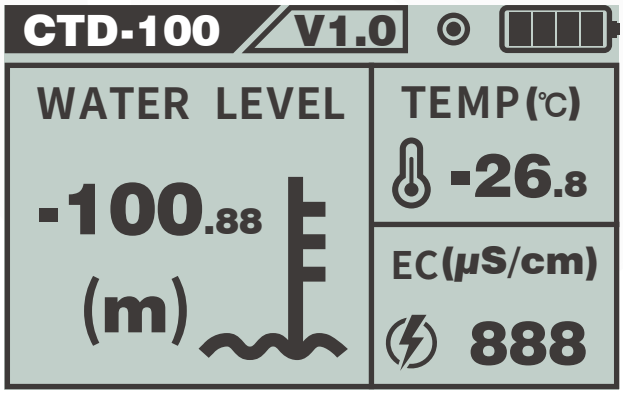

Figure 6. Data page of the current sensor CTD-100.

■ Icon ② is used to adjust brightness. Press ▲ or ▼ on the button menu to select the brightness adjustment icon.

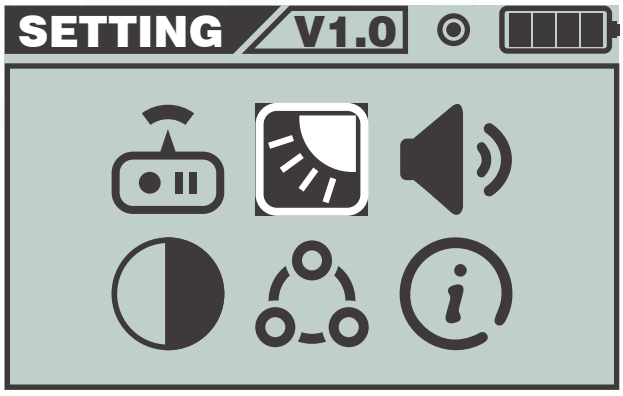

Figure 7. Select the brightness adjustment icon.

■ Press Enter on the button menu to enter brightness adjustment. Currently, the displayed brightness is 50%. Press ▲ or ▼ on the button menu to adjust the screen brightness.

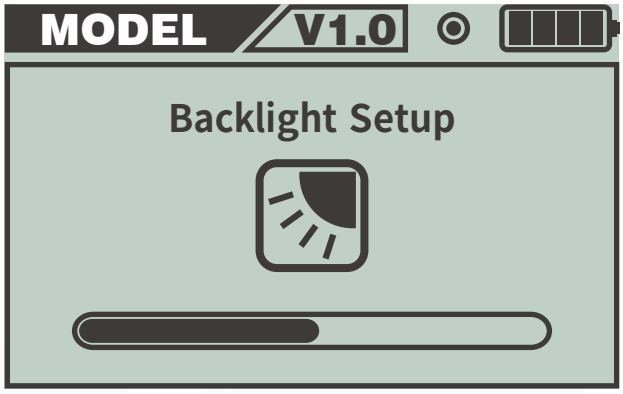

Figure 8. Screen brightness adjustment diagram.

■ Press SAVE on the button menu to save the current displayed brightness value. The Successful screen display lasts for 1 second and then returns to the Backlight setup interface. Press ESC on the button menu to return to the previous level menu

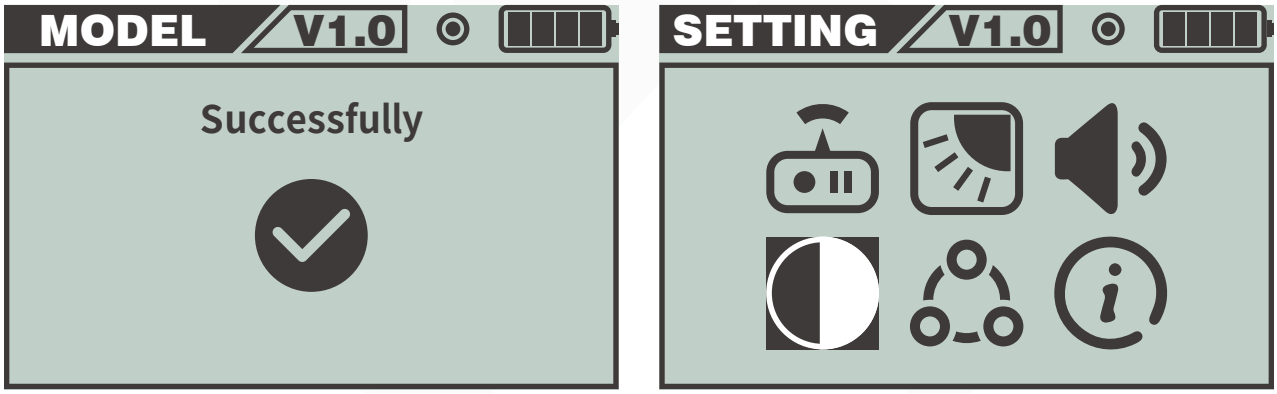

Figure 9. Saving screen brightness and returning to MENU diagram

■ Icon ④, screen contrast adjustment. Press ▲ or ▼ on the button menu to select the contrast icon and press Enter on the button menu to enter the screen contrast adjustment interface. The remaining operations are the same as the Backlight Setup interface and will not be elaborated further.

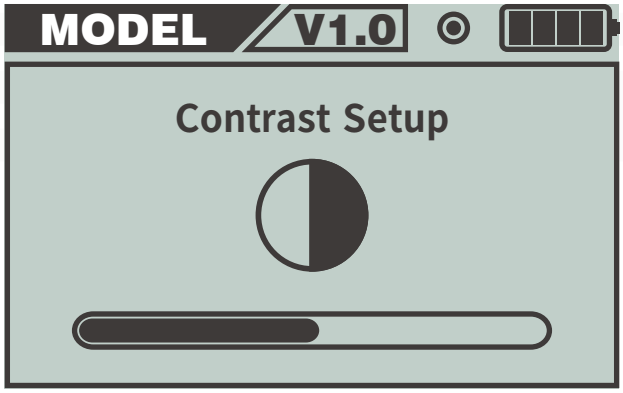

Figure 10. Screen contrast adjustment interface

■ Press ESC on the button menu to return to the main interface, then press ▲ or ▼ on the button menu, and select the collection time frequency setting icon.

Figure 11. Collection time and frequency setting icon.

■ Icon ⑤, circular collection time setting. Press Enter on the menu button to enter the circular collection time setting of the sensor. Figure 12 shows the current sensor collection time, which can be modified by pressing ▲ or ▼ button. After modification, press SAVE on the button menu to save.

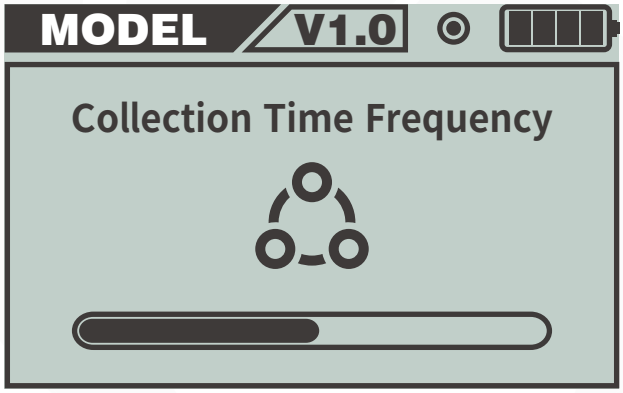

Figure 12. Circular collection time setting.

■ Press ESC on the button menu to return to the previous level menu.

Figure 13. About us.

■ Press ▲ or ▼ on the button menu to select the icon ⑥ to view information about us. After selecting it, press Enter on the button menu to enter.

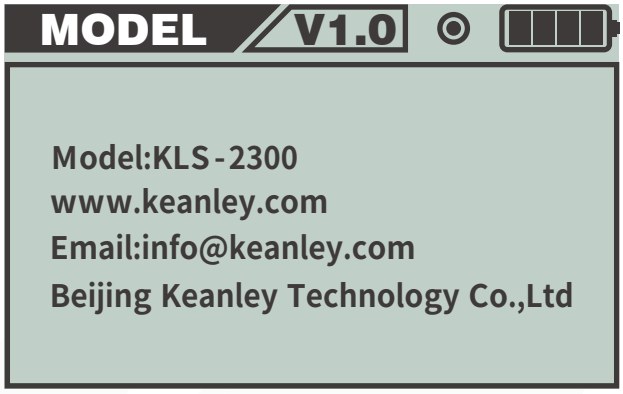

Figure 14. Device information diagram.

■ Press ESC on the button menu to return to the main interface, then press ▲ or ▼ on the button menu to select the icon ③, threshold setting interface.

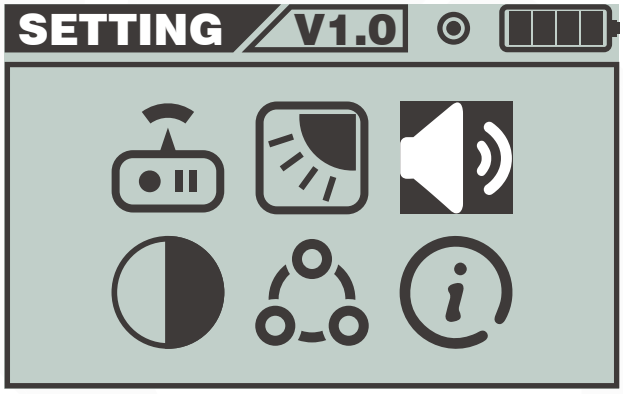

Figure 15. Device alarm parameter threshold setting icon.

■ The alarm is displayed in the upper left corner. Press Enter on the button menu to enter Figure 16, where Water Level represents the water level alarm threshold and Conductivity represents the conductivity alarm threshold. Water Level is currently selected.

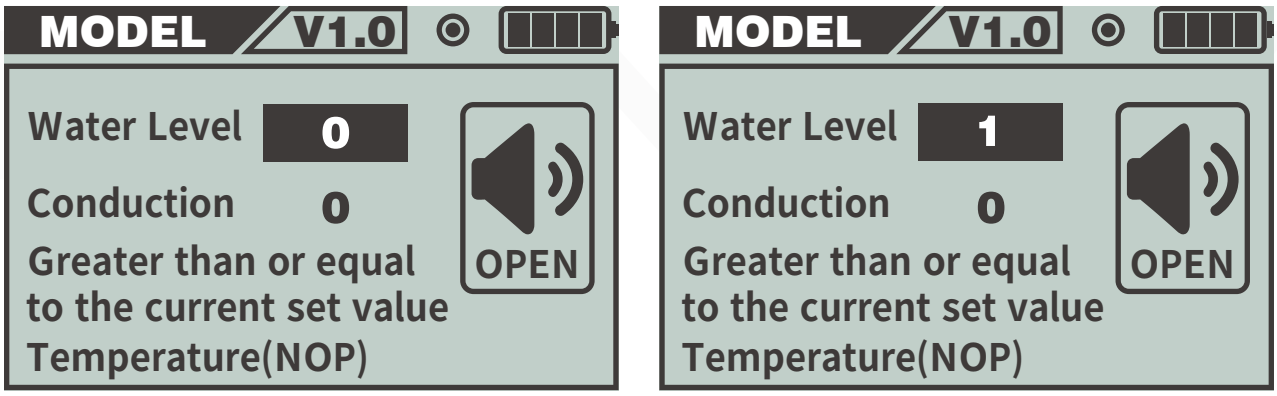

Figure 16. Device alarm parameter threshold setting diagram.

■ Press Enter to switch to Conduction.

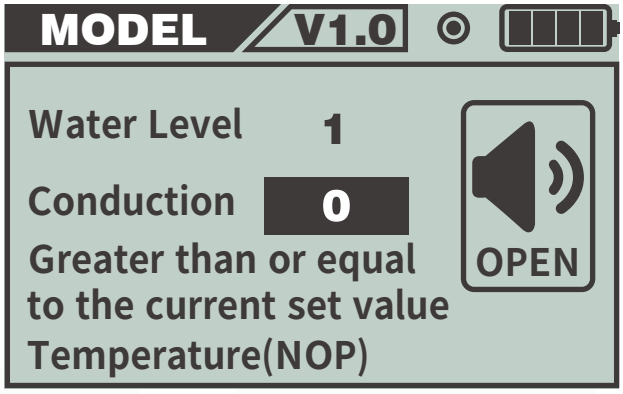

Figure 17. Alarm parameter threshold setting diagram.

■ Sleep function. long press MENU button, a white screen will appear first, and then enter sleep mode.

CTD sensor characteristics

1. Sensor interface and appearance.

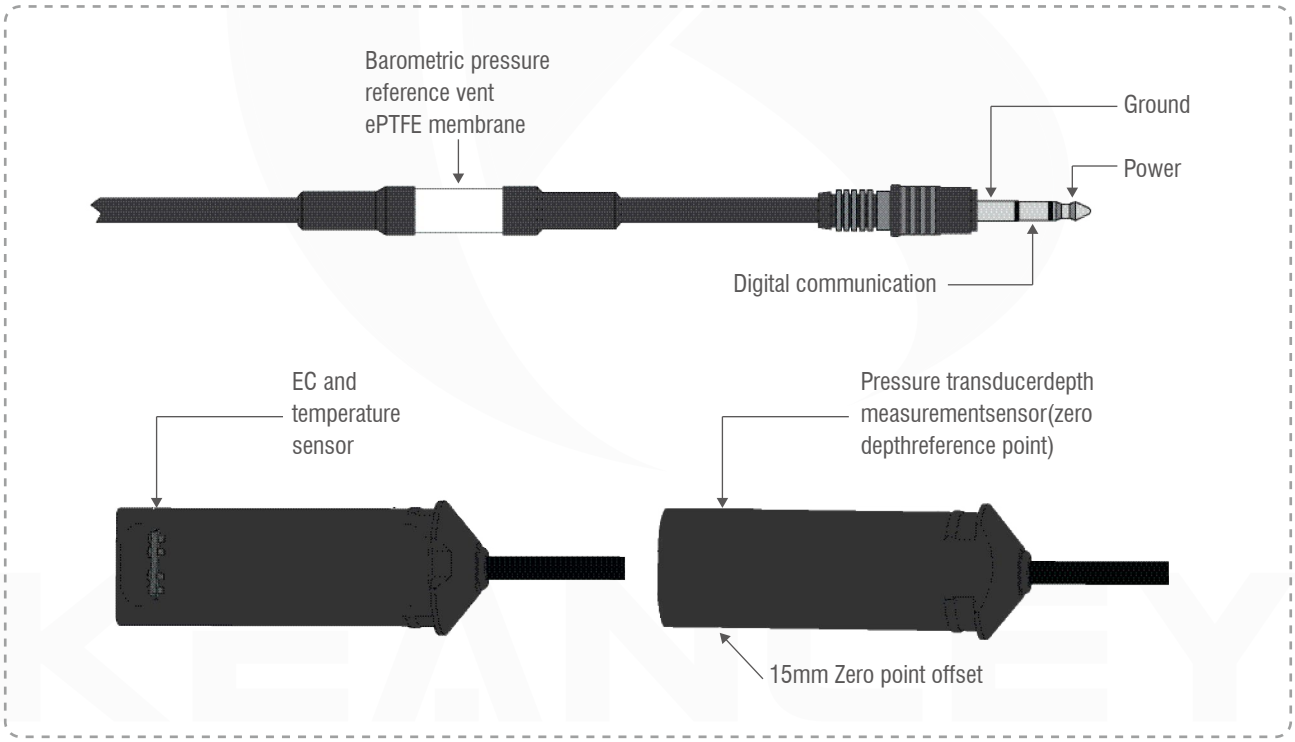

Figure 18. Sensor interface and appearance.

2. Description of the sensor.

The CTD-100 sensor is a compact water level sensor with a diameter of 3.4 cm, suitable for small spaces. It is a low-cost, durable, and easy-to-use tool for monitoring EC, temperature, and depth in groundwater and surface water. More importantly, it is a multifunctional instrument. When used together with the KLS-2300 data logger system, no additional sensors needed to measure and reference atmospheric pressure. The sensor has a measuring range of 0 to 120dS/m and a measuring depth of 100m, allowing for precise depth and EC measurements for various applications.

3. Functions of the sensor.

- Continuously monitor water levels changes of groundwater and surface by CTD sensor
- Ventilation sensors mean no additional sensors needed to measure and reference atmospheric pressure
- Integrated conductivity, water depth, and temperature measurement
- 3.4cm diameter sensor, suitable for small spaces
- Working temperature range: 0~60 ° C

4. Specifications of the sensor measurement.

Water depth	0-100m	Temperature	-40°C ~ +60°C	Conductivity	0~120 dS/m
Resolution	1mm	Resolution	0.1°C	Resolution	0.001 dS/m
Accuracy	± 0.25% of the full scale at 20 ° C	Accuracy	±1°C	Accuracy	± 0.01 dS/m or ± 10%, whichever is greater

Table 3. Specifications of the sensor measurement

5. Communication protoco

Output DDI serial or SDI-12 communication protocol.

6. Electrical characteristics of the sensor.

Name	Power voltage	Digital input voltage logic high	Digital input voltage logic low	Digital output voltage logic high	Current consumpt
Minimum value	4.0V	2.8V	-0.3V	-	2.5mA
Typical value	-	3.6V	0.0V	3.6V	3.5mA
Maximum value	15V	5.0V	0.8V	-	8.0mA

Table 4. Electrical characteristics of the sensor.

Safety Tips

- Avoid unauthorized modifications to the device
- Please do not use any third-party water level probes from other manufacturers
- Avoid any external impact
- Please replace the device battery in a safe area
- Only use the listed 7.4V/3600mAh battery pack 18650

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