SZ610-B
Dual-channel Controller
User Manual

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Catalog

Preface

Dear customer

Thank you for using our product. Reading the entire manual before use is highly recommended for operation and maintenance the instrument and out of unnecessary trouble.

Please observe the operating procedures and precautions in this manual.

To make sure the effective after-sales protection provided by the instrument, please do not use any operation or maintenance other than which mentioned in the manual.

Due to non-compliance with the precautions specified in this manual, any fault and loss caused shall not be covered by the warranty, and the manufacturer shall not bear any relevant responsibility. If you have any questions, please contact our after-sales service department or representative.

Carefully unpack the instrument and accessories from the shipping container, and inspect for possible damage during shipping. Check received parts with items on the packing list. If any parts or materials are damaged or missing, please contact our customer service or the authorized distributor immediately.

Save all packing materials until you are sure that the instrument functions properly. Any damaged or defective items must be returned in their original packaging materials.

1 Overview

Dual-channel transmitter is versatile and can be connected to single channel or dual channel according to demand, reducing the cost and installation space of the transmitter. One transmitter is connected to a maximum of two sensors. The color touch screen of the controller displays sensor measurements and other control data in real time, and the guided menu interface is simple to set and convenient for users to operate. Customized acquisition program to achieve our company's all kinds of sensors plug and play. Electrode installation and replacement are quick and convenient. Various data transmission modes are available, and data storage and export functions are available.

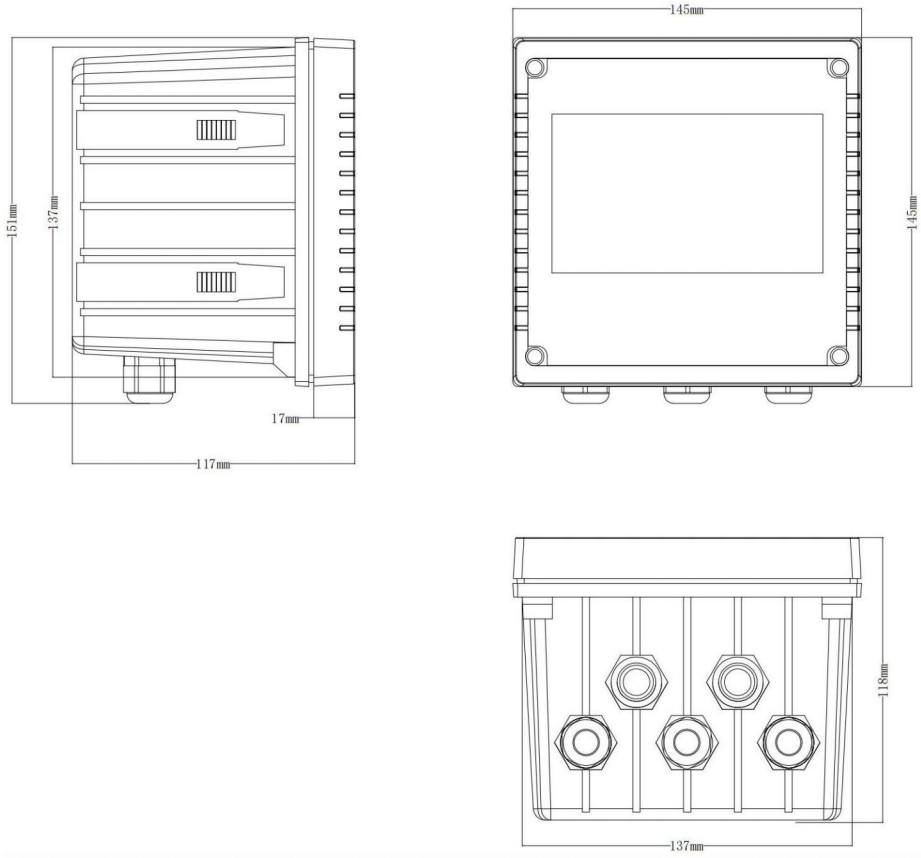
The full serie of water quality sensors can be freely connected with the two-channel transmitter. The parameters that can be measured include DO, pH, ORP, conductivity (salinity), turbidity, SS, CHL, BGA, OIW, COD, ammonia, transparency, chroma, etc. The dual-channel transmitter is widely used in water quality monitoring of surface water, sewage plants, waterworks, water stations, industrial process control and other fields.

Product Features

- ✧ Strong passability, supports our company's digital sensors, can connect any two sensors at the same time, improving integration and reduce operating costs.
- ✧ Plug and play, electrode installation, quick and easy to replace.
- ✧ Supports multiple data transmission modes such as 4-20mA, MODBUS RS485, etc.
- ✧ Adopts 5 " color touch screen, simple operation interface, reliable system and low maintenance.
- ✧ With time display, data storage and export function.
- ✧ Automatically prompt error and warning information, realizing alarm signal upload
- ✧ Wall-mounted installation/panel installation.

1.1 Introduction

▲ Universal Dual-channel Controller



▲Universal Dual-channel Controller size

Configuration Table

Standard configuration	Number	Unit	Remarks
Dual Channel Transmitter	1	pc	
Transmitter Ears	1	Group	

1.2 Technical Specification

Dual-channel Controller	
Display	5 inch color touch screen
Power supply	110-220V AC
Output	One RS485 channel, two 4-20mA channels
Relay	2 relay, program setting response type and response value
Communication protocol	The standard MODBUS RS485 communication function enables real-time transmission of measured values
Material	ABS housing
Storage temperature	-20 to 70 ° C
Working temperature	-15 to 60 ° C
Temperature pressure	Automatic compensation
Size	151.44mm*144.5mm*117mm (height * width * thickness)
Probe type	Support COD, ammonia nitrogen, DO, conductivity salinity, TUR, pH, CHL, BGA, OIW, TSS, chroma, transparency and other sensors
Installation	Wall mounting or disk mounting (hole size 138*138mm)
Weight	0.8 kg
Data storage	Continuous storage >2 years

2 Safety Instructions

2.1 Safety

Pay attention to the high voltage！

Electric shock poses a risk of injury or death: Always disconnect the power supply during electrical connection.

The following is a list of general safety instructions and warnings. Failure to adhere to these instructions can result in damage to the equipment and / or personal injury to the operator.

– Transmitter should be installed and operated only by personnel familiar with the transmitter

and who are qualified for such work.

– Repair of the Transmitter must be performed by authorized, trained personnel only.

– With the exception of routine maintenance, cleaning procedures, as described in this manual, the Transmitter must not be tampered with or altered in any manner.

– Our company accepts no responsibility for damage caused by unauthorized modifications to the transmitter.

– Follow all warnings, cautions, and instructions indicated on and supplied with this product.

– Protective covers must be in place at all times during normal operation.

– If this equipment is used in a manner not specified by the manufacturer, the protection provided by it against hazards may be void.

Warnings:

– Installation of cable connections and servicing of this product require access to shock hazard voltage levels.

– Main power must be disconnected before servicing.

– Switch or circuit breaker shall be in close proximity to the equipment and within easy reach of the OPERATOR; it shall be marked as the disconnecting device for the equipment.

– Main power must employ a switch or circuit breaker as the disconnecting device for equipment.

– Electrical installation must be in accordance with the National Electrical Code and/ or any other applicable national or local codes.

2.2 Backplane Connection Introduction

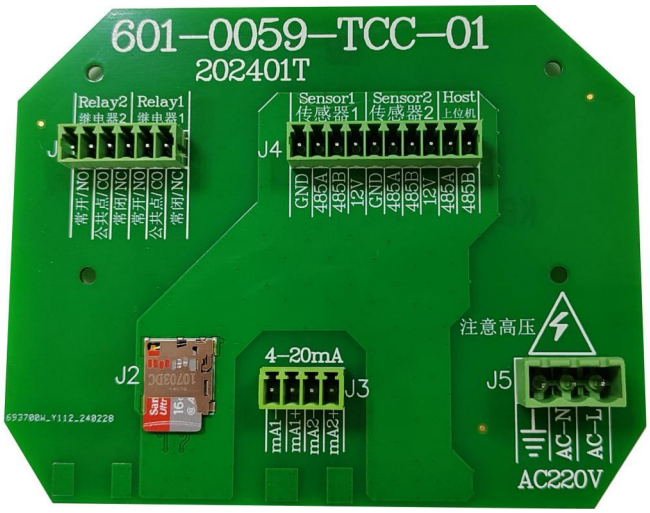


Figure 2.2.1 Back panel Output Connection

Figure 2.2.1 shows an overview of the wiring diagram inside of the controller. Users need to connect the corresponding terminals of AC220V, Relay1, Relay2, 4-20mA, Sensor and Host, and add the memory card to the SD card slot.

AC220V is 220V access side.

Relay1、Relay2 is Relay access terminal, default relay is normally closed.

4-20mA is 4 to 20mA output.

Sensor is sensor access side.

Host is upper computer communication access terminal.

See Table 2.2.1 for detailed descriptions.

Number	Form	Sign	Description	Note
J1	Relay1	NO	Normally Open	
		CO	Common Point	
		NC	Normally Close	
	Relay2	NO	Normally Open	
		CO	Common Point	
		NC	Normally Close	
J2	Data storage			
J3	4-20mA	mA1-	4-20mA output negative	
		mA1+	4-20mA output positive, current	
		mA2-	4-20mA output negative	
		mA2+	4-20mA output positive, current	
J4	Sensor 1	GND	Sensor ground GND	Suitable for all single parameter sensors of our company
		485A	Sensor RS485 Signal A	
		485B	Sensor RS485 Signal B	
		12V	12V Sensor Power supply	
	Sensor 2	GND	Sensor ground GND	
		485A	Sensor RS485 Signal A	
		485B	Sensor RS485 Signal B	
		12V	12V Sensor Power supply	
	Host	HOST 485A	MODBUS Signal A	
		HOST 485B	MODBUS Signal B	
J5	AC220V	AC-L	AC Power Line(Firewire)	Pay attention to high voltage
		AC-N	AC Power (Zero Line)	
		GND	GROUND	

Table 2.2.1 Wire connection definition

Note: Install the sensor, 4-20mA output cable and AC power supply in sequence. Power up when fully assembled.

The transmitter will use either 12 VDC or 220 VAC power. Refer to power supply specifications and ratings and arrange the power cords accordingly in order of size.

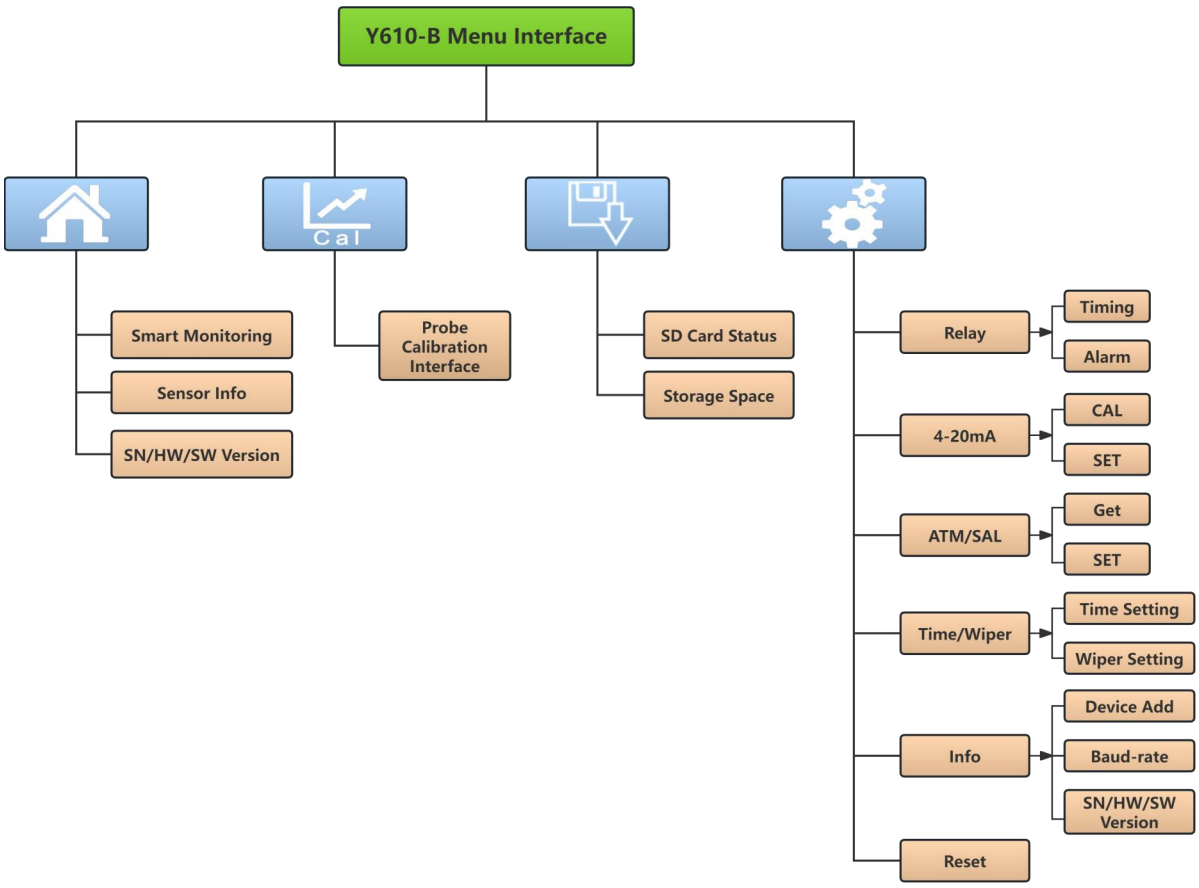
1. For 220V AC power, connect mains power to terminals AC-L, AC-N and (ground). For 12V DC power supply, connect the sensor red wire to terminal "12V" and the sensor black wire to terminal "GND".

2. Connect sensor cables to terminal block J4 (Sensor1, Sensor2). Red wire - Power (VCC), white wire - 485 Data_B (485_B), green wire - 485 Data_A (485_A), black wire - Ground (GND) .

3. Connect the analog output signal to terminal block J3.

4. Connect relay output signals to terminal block J1 (Relay1, Relay2).

2.3 Menu Structure



2.4 Operating Elements

Operating Element	Description
	Enter the main menu screen
	Enter the Calibration Menu
	Enter the Data Storage Menu
	Enter the Setup Menu
	Change between pages within one menu level 2-channel and 4-channel: Change between the channels
	Change between different parameters of the sensor (Switched parameters can be used to set relay alarms and 4-20mA values)
	Blinking, indicating real-time measurement in progress
	Warn

3 Power up

Dual-channel controller is used as on-line monitoring equipment, and the power switch is not set up for the time being. Connect the power cord to the power connector of online universal transmitter when powering on, and connect the power plug to the utility power, and power on the device. The device enters the main measurement interface and starts to collect various parameters normally （Note: The device does not support hot-swap, need to replace the sensor after power failure） .

3.1 Menu Screen

This device can realize the automatic recognition of sensor types, connecting different types of sensors to enter different measurement interfaces. Figure 3.1.1 shows the main interface of the dual-channel transmitter, Figure 3.1.2 shows the main interface of the single-channel transmitter, and Figure 3.1.3 shows the sensor information interface.

A

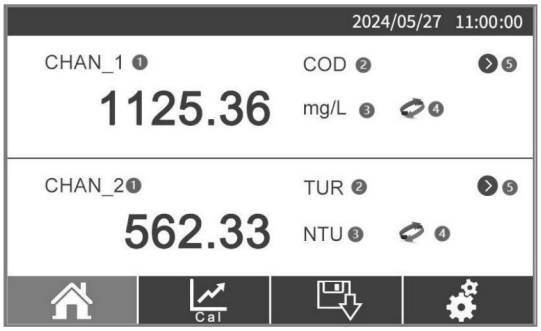


Figure 3.1.1 Dual-channel main screen

B

Figure 3.1.2 Single-channel main screen

C

Figure 3.1.3 Sensor Information Screen

A Dual-channel main screen

①	Sensor1、Sensor2
②	Sensor types（sensor types as in Table 3.1.1）
③	Measur unit
④	Change between different parameters of the sensor
⑤	Change from dual channel to single channel

B Single-channel main screen

①	Single-channel switch to dual-channel
②	COD measured value
③	TOC measured value
④	Turbidity measured value
⑤	Temperature value（COD sensor does not show temperature）
⑥	Single channel switch to sensor information screen （SN/hardware version/software version）

C Sensor Information Screen

①	Sensor screen switch to single channel screen
②	Sensor SN
③	Sensor hardware version
④	Sensor software version

Sensor name

DO	Dissolved Oxygen Sensor	**ORP**	ORP Sensor
TUR	Turbidity Sensor	**BGA**	Blue Green Algae Sensor
EC	Conductivity (Salinity) Sensor	**pH**	pH Sensor
CHL	Chlorophyll Sensor	**TSS**	Sludge Concentration Sensor
OIW	Oil-in-water Sensor	**CDOM**	CDOM Sensor
NH4_N	NH4-N Sensor	**TRANS**	Transparency Sensor
COD	COD Sensor	**BOD**	BOD Sensor
COLOR	Colorimetric Sensor	**DEPTH**	Depth Sensor

Table 3.1.1 Explanation of Sensor Names

3.2 Dissolved Oxygen Measurement Interface

Figure 3.2.1 shows the dissolved oxygen values (mg/L), percent (%), and temperature (。C) measured by the dissolved oxygen probe in the current environment.

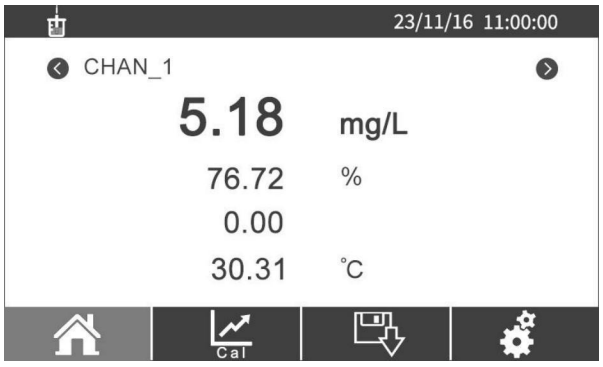


Figure 3.2.1: Dissolved Oxygen Measurement Screen

3.3 COD Measurement Interface

Figure 3.3.1 shows the COD, TOC and turbidity values measured by the COD probe in the current environment.

Figure 3.3.1: COD Measurement Screen

3.4 BOD Measurement Interface

Figure 3.4.1 shows the COD, BOD and TSS values measured by the BOD probe in the current environment.

Figure 3.4.1: BOD Measurement Screen

3.5 pH Measurement Interface

Figure 3.5.1 shows the pH, mv, and temperature (。C) measured by the pH probe in the current environment.

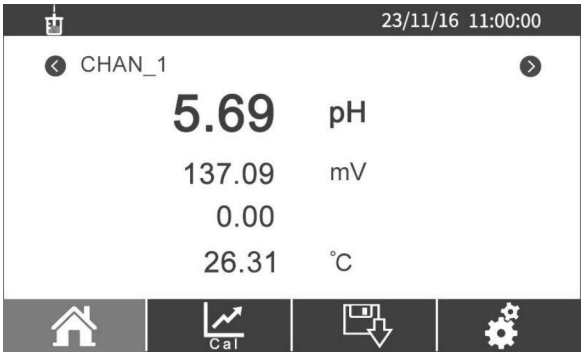


Figure 3.5.1: pH Measurement Screen

3.6 Turbidity Measurement Interface

Figure 3.6.1 shows turbidity values(NTU)measured by turbidity probe in the current environment.

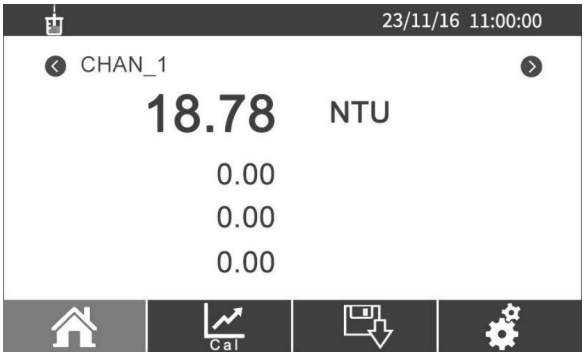


Figure 3.6.1: Turbidity Measurement Screen

3.7 Conductivity Measurement Interface

Figure 3.7.1 shows the conductivity values (μS/cm), salinity values (ppt), TDS values (mg/L), and temperatures (。C) measured by the conductivity probe in the current environment.

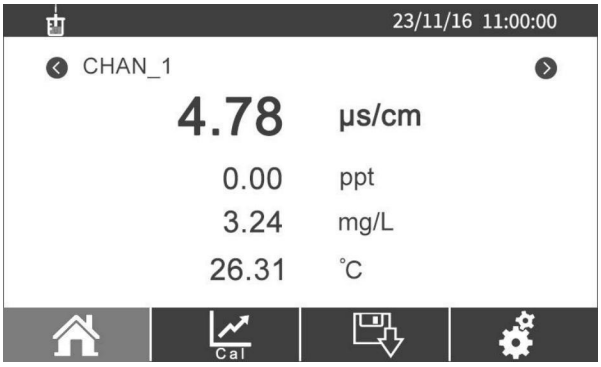


Figure 3.7.1: Conductivity Measurement Screen

3.8 Chlorophyll Measurement Interface

Figure 3.8.1 shows chlorophyll value (μg/L) measured by CHL probe in current environment.

Figure 3.8.1: Chlorophyll Measurement Screen

3.9 Blue-green Algae Measurement Interface

Figure 3.9.1 shows the blue-green algae values (Cs/mL) measured by the chlorophyll probe in the current environment.

Figure 3.9.1: Blue-green Algae Measurement Screen

3.10 Oil-in-water Measurement Interface

Figure 3.10.1 shows the value of oil in water (ppm) as measured by the oil-in-water probe in the current environment.

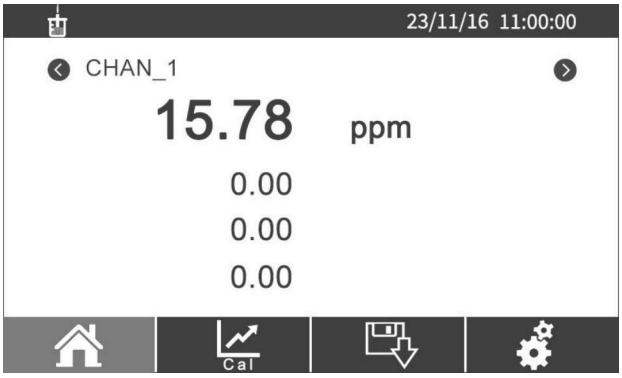


Figure 3.10.1: Oil-in-water Measurement Screen

3.11 Sludge Concentration Measuring Interface

Figure 3.11.1 shows the values (mg/L) measured by the sludge concentration probe in the current environment.

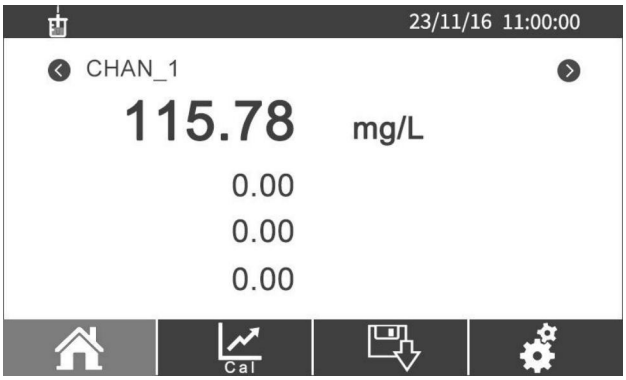


Figure 3.11.1: Sludge Concentration Measurement Screen

3.12 NH4-N Measuring Interface

Figure 3.12.1 shows the ammonium values (mg/L) and pH values measured by the ammonia probe in the current environment.

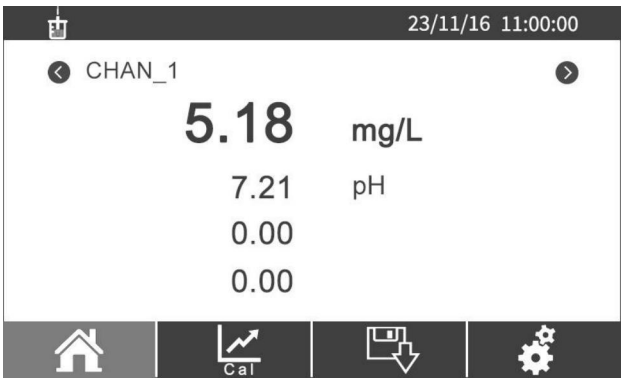


Figure 3.12.1: NH4-N Measurement Screen

3.13 ORP Measuring Interface

Figure 3.13.1 shows ORP values (mV) measured by the ORP probe in the current environment.

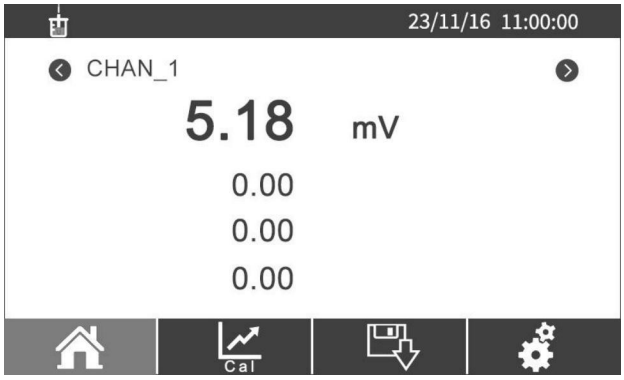


Figure 3.13.1: ORP Measurement Screen

3.14 CDOM Measuring Interface

Figure 3.14.1 shows CDOM values (ppb) measured by the CDOM probe in current environment.

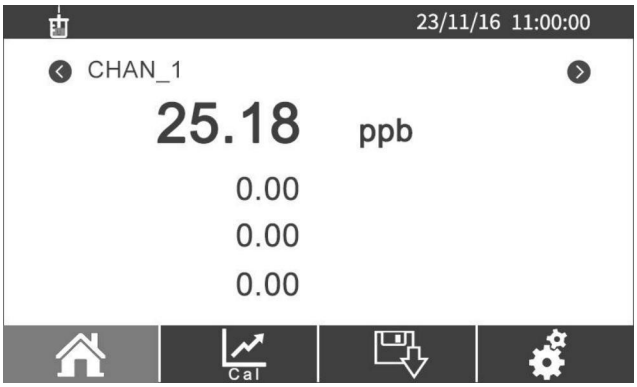


Figure 3.14.1: CDOM Measurement Screen

3.15 Transparency Measurement Interface

Figure 3.15.1 shows the transparency values (cm) measured by the transparency probe in the current environment.

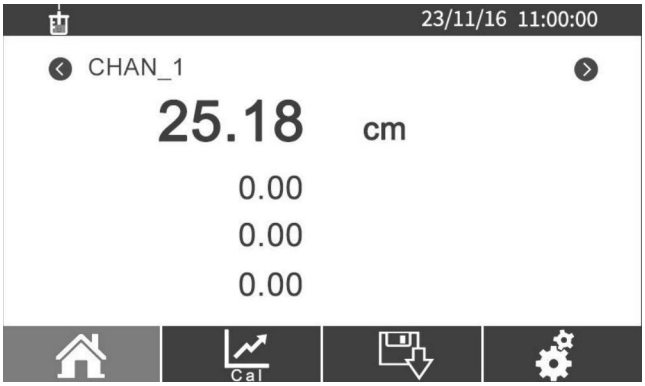


Figure 3.15.1: Transparency Measurement Screen

3.16 Color Measurement Interface

Figure 3.16.1 shows the color values (Hazen) measured by the color probe in the current environment.

Figure 3.16.1: Color Measurement Screen

4 Calibration

4.1 Calibration Interface

Click the icon"  "in the menu bar to enter the calibration interface. Figure 4.1.1 shows the calibration screen of the dual-channel transmitter.

In calibration screen, contains two channels of probe calibration. Each channel probe calibration contains 0-point, 1-point, 2-points. When connecting different probes, please select the number of calibration points supported by the channel where the probe is located.

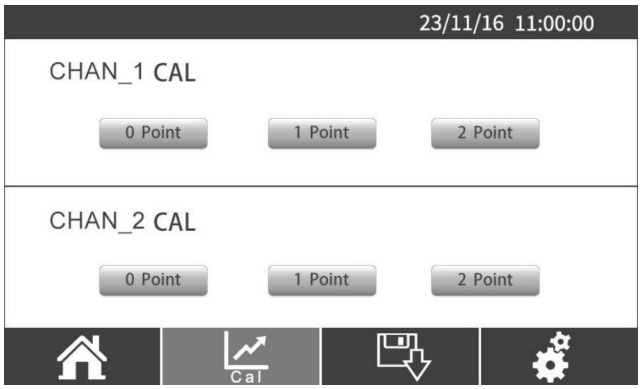


Figure 4.1.1: Calibration Display Interface

4.2 K/B Set

The single probe calibration interface is divided into auto calibration and K/B settings. the default K/B values are: K=1, B=0. The user follows the process of calibrating, calculating the K and B values, and then manually saving them to the probe.

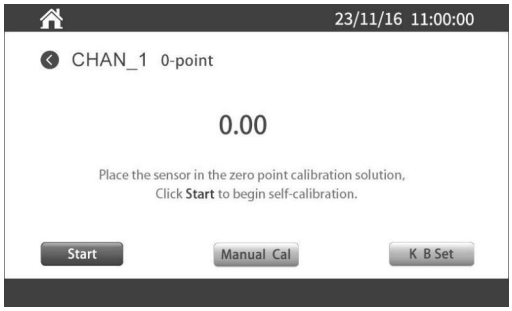


Figure 4.2.1: Single Probe Calibration Interface

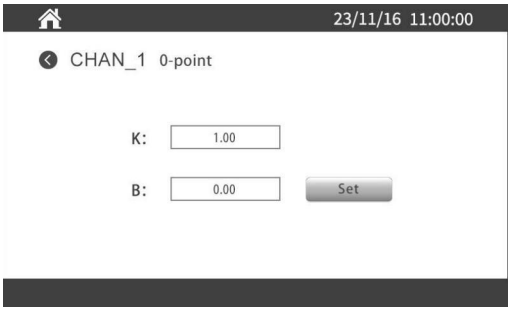


Figure 4.2.2: K/B setup interface

4.3 Dissolved Oxygen Calibration

Calibration Selection

The dissolved oxygen sensor supports two types of calibration, 1-point and 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the dual-channel calibration interface. Select "1 Point" or "2 Points" in "CHAN_1 CAL".

1-point Calibration

Enter the sensor 1-point calibration interface, 1-point calibration standard liquid value to 100% for example. At the prompt, enter the calibration value "100" for 1-point. Place the probe into the standard solution of the calibration input value. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.2.1. 1-point calibration is complete, the bottom of the screen will display "Calibration

Done", as shown in Figure 4.2.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

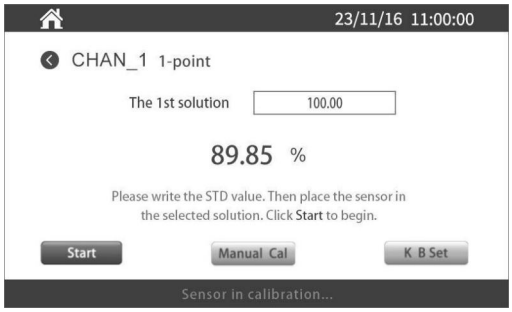


Figure 4.2.1: 1-point calibration in progress

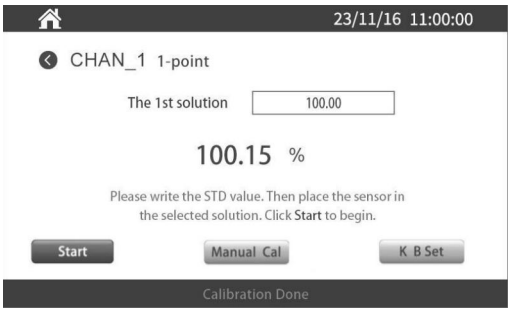


Figure 4.2.2: 1-point calibration complete

2-points Calibration

2-points calibration of dissolved oxygen. We strongly recommend to use 100%SAT DO as first standard value and 0%SAT DO as second standard value.

Enter the first calibration standard value "100" as prompted. Place the sensor in the 1st calibration standard solution. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.2.3. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.2.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

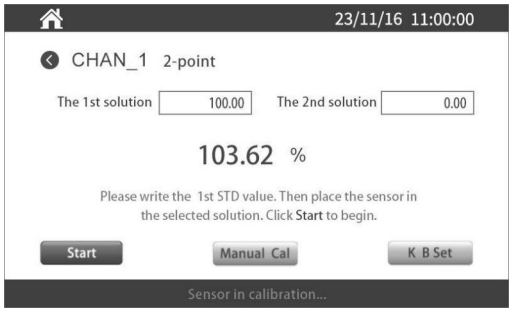


Figure 4.2.3: 1st calibration in progress

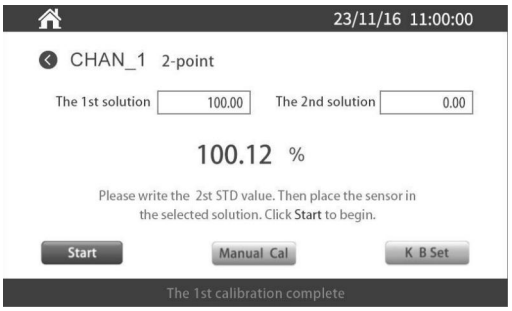


Figure 4.2.4: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value "0".Place the sensor into the 2nd standard solution.Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.2.5. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.2.6. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

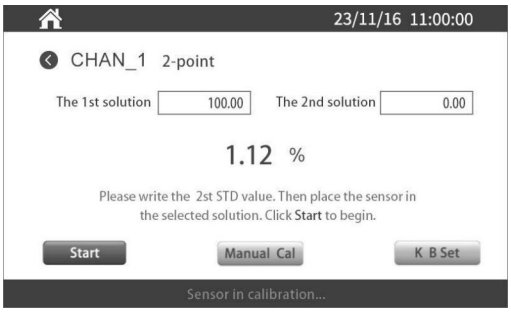


Figure 4.2.5: 2nd calibration in progress

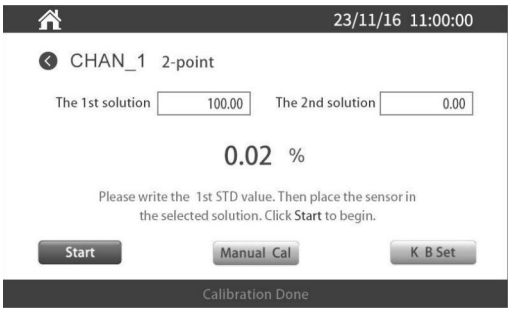


Figure 4.2.6: 2nd calibration complete

4.4 Conductivity Calibration

Calibration Selection

The conductivity sensor supports two types of calibration, 1-point and 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the dual-channel calibration interface. Select "1 Point" or "2 Points" in "CHAN_1 CAL".

1-point Calibration

Enter the sensor 1-point calibration interface, 1-point calibration standard liquid value to 1408.3μS/cm for example. At the prompt, enter the calibration value "1408.3" for 1-point. Place the probe into the standard solution of the calibration input value. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.3.1. 1-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.2.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

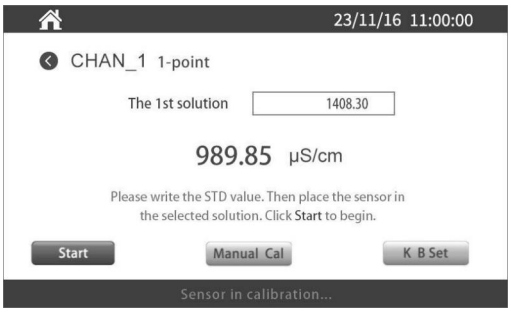


Figure 4.3.1: 1-point calibration in progress

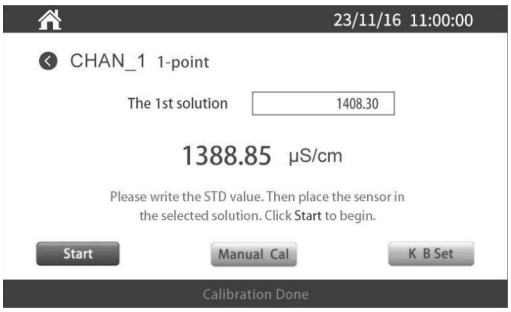


Figure 4.3.2: 1-point calibration complete

2-points Calibration

Enter the sensor 2-points calibration interface, the 1st calibration standard liquid value for the conductivity sensor is taken as 1408.3 μS/cm and the 2nd calibration standard liquid value is

taken as 12852μS/cm.

Enter the first calibration standard value "1408.3" as prompted. Place the sensor in the 1st calibration standard solution. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.3.3. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.3.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

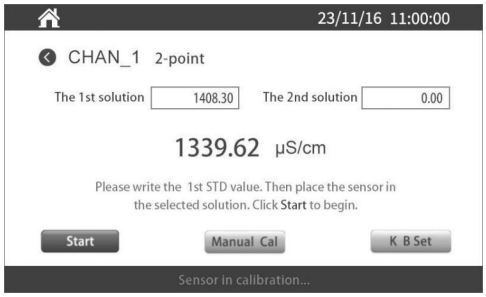


Figure 4.3.3: 1st calibration in progress

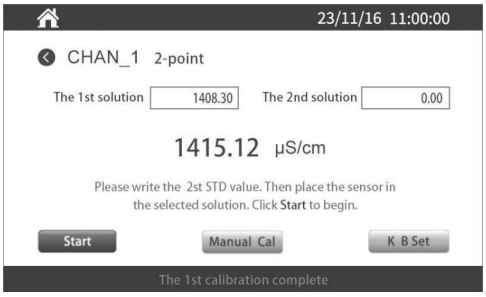


Figure 4.3.4: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"12852".Place the sensor into the 2nd standard solution. Click"Start"to begin, the bottom of the screen will show"Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.3.5. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.3.6. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

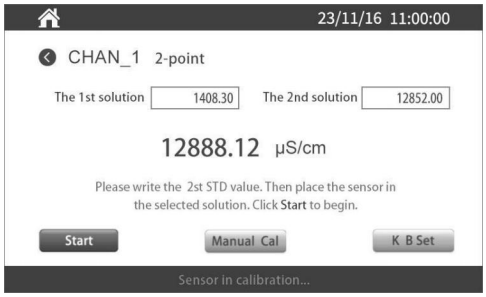


Figure 4.3.5: 2nd calibration in progress

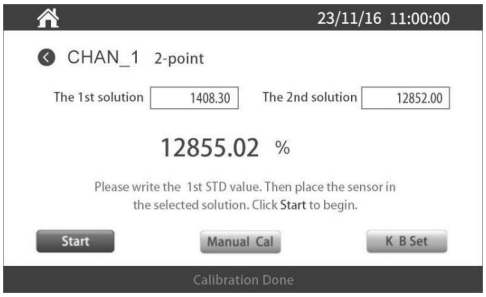


Figure 4.3.6: 2nd calibration complete

4.5 Turbidity Calibration

Calibration Selection

The turbidity sensor supports three types of calibration, 0-point calibration 、 1-point calibration and 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the

dual-channel calibration interface. Select "0 Point"、"1 Point" or "2 Points" in "CHAN_1 CAL".

0-point Calibration

Enter the sensor 0-point calibration interface, 0-point calibration standard value in deionized water for example. At the prompt, place the probe in the zero calibration standard solution. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.4.1. 0-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.4.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

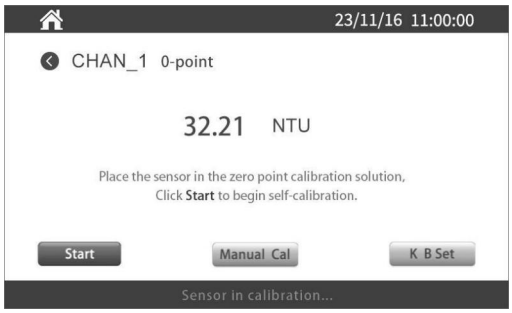


Figure 4.4.1: 0-point calibration in progress

Figure 4.4.2: 0-point calibration complete

1-point Calibration

Enter the sensor 1-point calibration interface, 1-point calibration standard liquid value to 460NTU for example. At the prompt, enter the calibration value "460" for 1-point. Place the probe into the standard solution of the calibration input value. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.4.3. 1-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.4.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

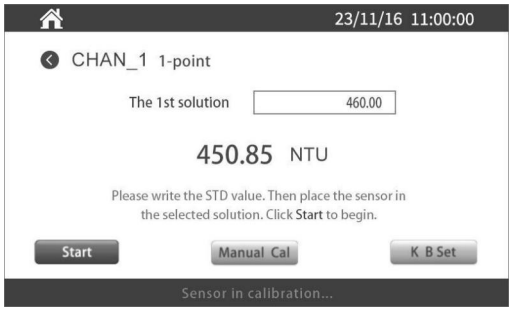


Figure 4.4.3: 1-point calibration in progress

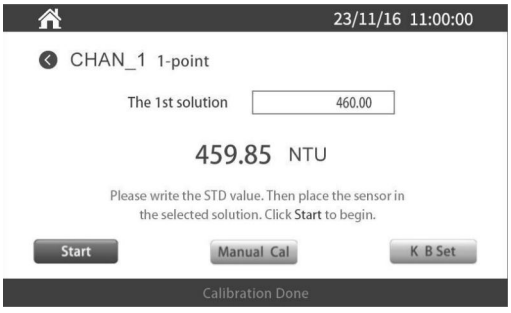


Figure 4.4.4: 1-point calibration complete

2-points Calibration

Enter the sensor 2-points calibration interface, the 1st calibration standard liquid value for the turbidity sensor is taken as 0NTU and the 2nd calibration standard liquid value is taken as 460NTU.

Enter the first calibration standard value "0" as prompted. Place the sensor in the 1st calibration standard solution. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.4.5. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.4.6. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

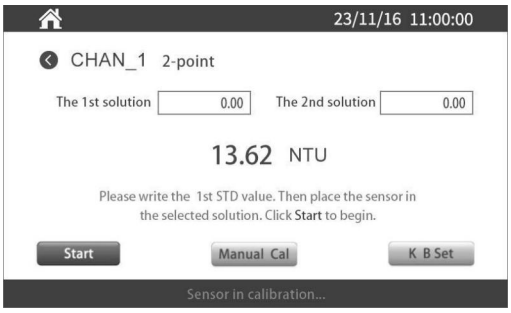


Figure 4.4.5: 1st calibration in progress

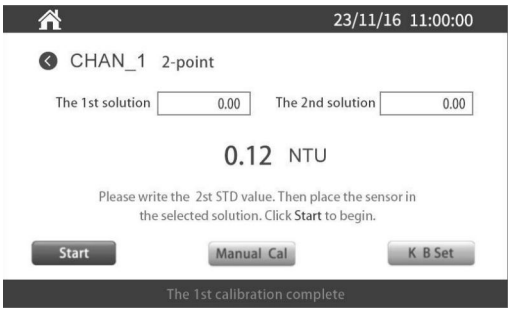


Figure 4.4.6: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"460".Place the sensor into the 2nd standard solution. Click"Start"to begin, the bottom of the screen will show"Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.4.7. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.4.8. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

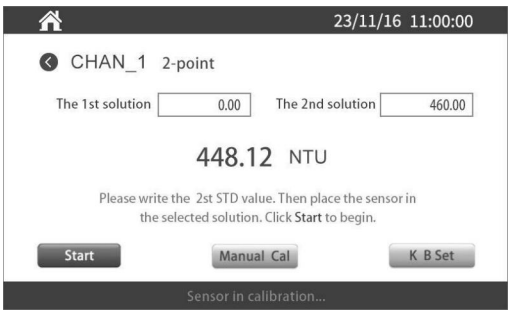


Figure 4.4.7: 2nd calibration in progress

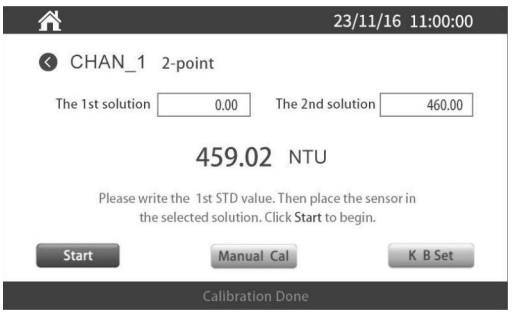


Figure 4.4.8: 2nd calibration complete

4.6 Chlorophyll Calibration

Calibration Selection

The chlorophyll sensor supports three types of calibration, 0-point calibration、1-point calibration and 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the dual-channel calibration interface. Select "0 Point"、"1 Point" or "2 Points" in "CHAN_1 CAL".

0-point Calibration

Enter the sensor 0-point calibration interface, 0-point calibration standard value in deionized water for example. At the prompt, place the probe in the zero calibration standard solution. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.5.1. 0-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.5.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

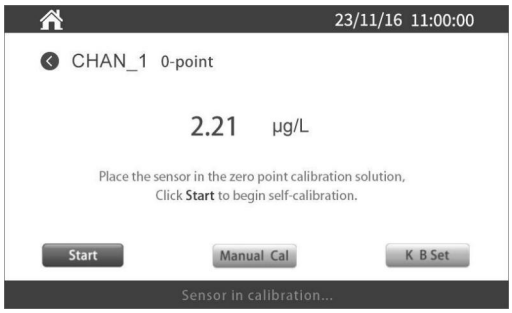


Figure 4.5.1: 0-point calibration in progress

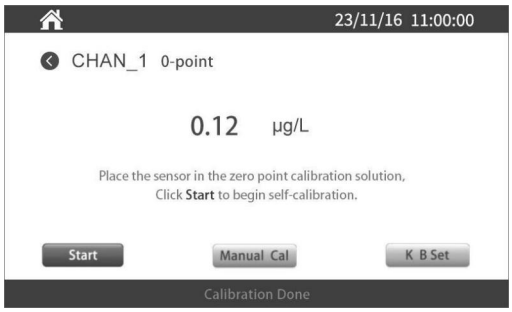


Figure 4.5.2: 0-point calibration complete

1-point Calibration

Enter sensor 1-point calibration interface, 1-point calibration standard liquid value to 227.1µg/L for example. At the prompt, enter the calibration value "227.1" for 1-point. Place the probe into the standard solution of the calibration input value. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.5.3. 1-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.5.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

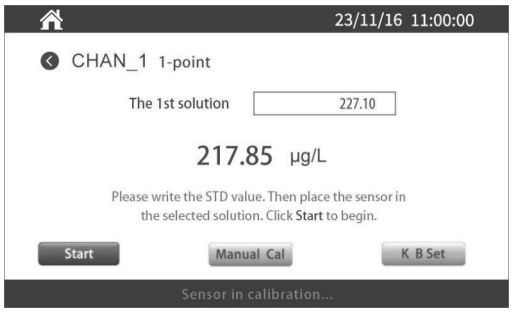


Figure 4.5.3: 1-point calibration in progress

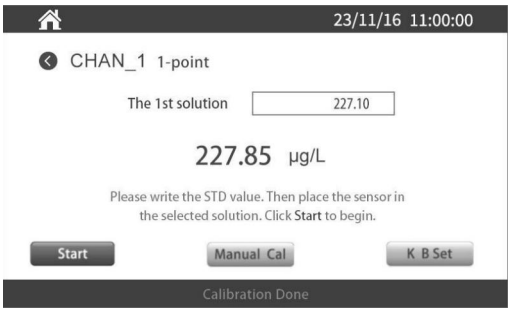


Figure 4.5.4: 1-point calibration complete

2-points Calibration

Enter the sensor 2-points calibration interface, the 1st calibration standard liquid value for the chlorophyll sensor is taken as 0 μg/L and the 2nd calibration standard liquid value is taken as 227.1μg/L.

Enter the first calibration standard value "0" as prompted. Place the sensor in the 1st calibration standard solution.Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.5.5. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.5.6. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

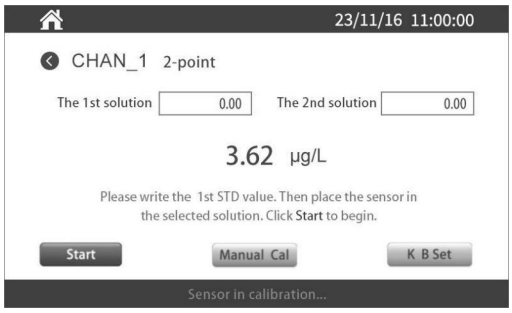


Figure 4.5.5: 1st calibration in progress

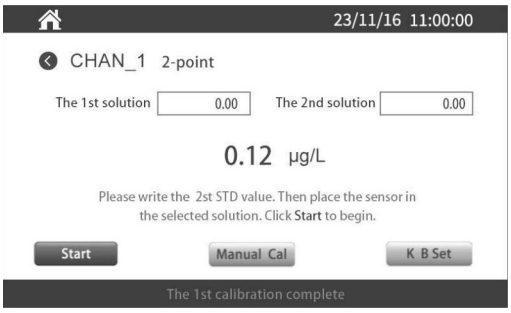


Figure 4.5.6: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"227.1". Place the sensor into the 2nd standard solution. Click"Start"to begin, the bottom of the screen will show"Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.5.7. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.5.8. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

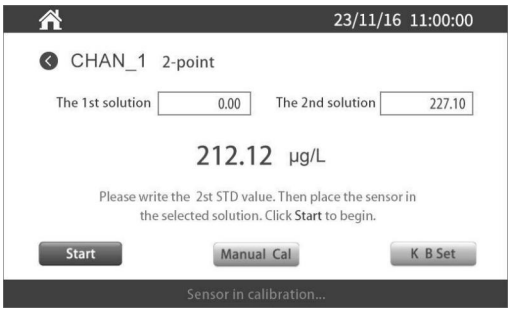


Figure 4.5.7: 2nd calibration in progress

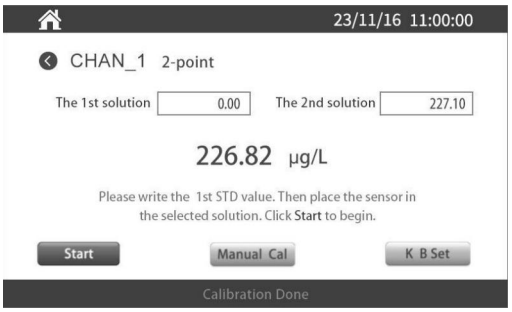


Figure 4.5.8: 2nd calibration complete

4.7 Sludge Concentration Calibration

Calibration Selection

Sludge concentration sensor supports two types of calibration, 1-point and 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the dual-channel calibration interface. Select"1 Point" or "2 Points" in "CHAN_1 CAL".

1-point Calibration

Enter sensor 1-point calibration interface, 1-point calibration standard liquid value to 10000mg/L for example. At the prompt, enter the calibration value "10000" for 1-point. Place the probe into the standard solution of the calibration input value. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.6.1. 1-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.6.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

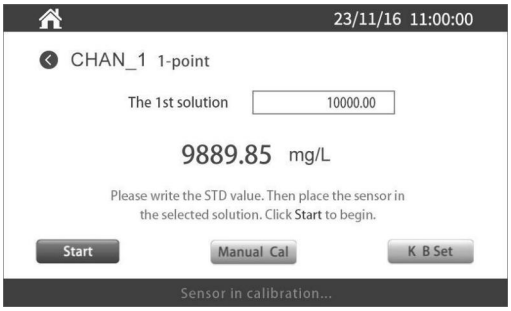


Figure 4.6.1: 1-point calibration in progress

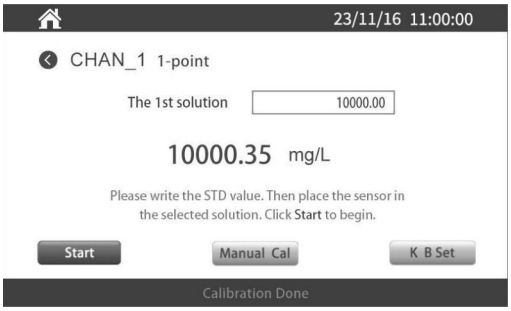


Figure 4.6.2: 1-point calibration complete

2-point Calibration

Enter the sensor 2-points calibration interface, the 1st calibration standard liquid value for the sludge concentration sensor is taken as 0 μg/L and the 2nd calibration standard liquid value is

taken as 10000mg/L.

Enter the first calibration standard value "0" as prompted. Place the sensor in the 1st calibration standard solution.Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.6.3. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.6.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

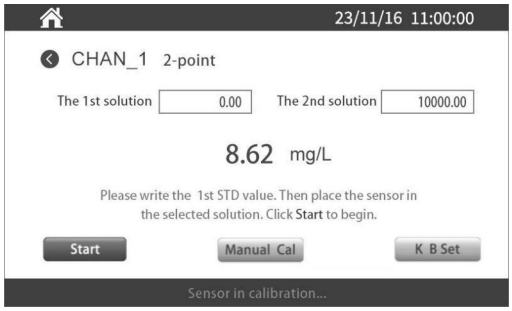


Figure 4.6.3: 1st calibration in progress

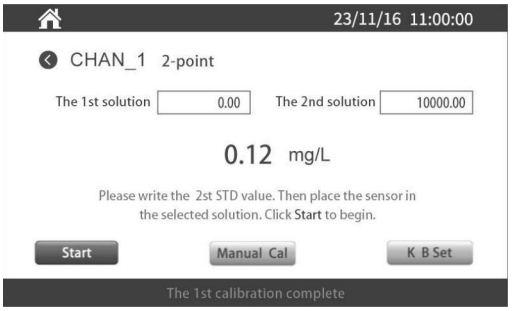


Figure 4.6.4: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"10000". Place the sensor into the 2nd standard solution. Click"Start"to begin, the bottom of the screen will show"Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.6.5. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.6.6. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

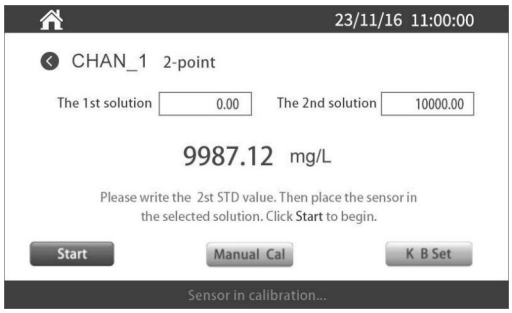


Figure 4.6.5: 2nd calibration in progress

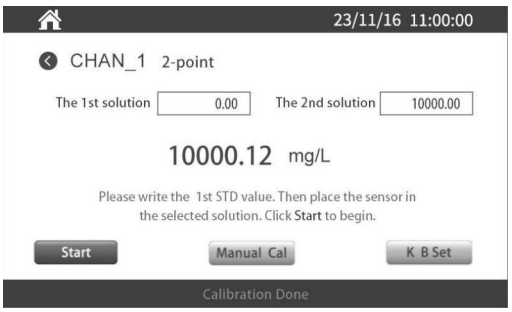


Figure 4.6.6: 2nd calibration complete

4.8 NH4-N Calibration

Calibration Selection

The NH4-N sensor supports ammonium and pH calibration.Ammonium calibration with 1-point and 2-points calibration. pH calibration with 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the dual-channel calibration interface. Select"1 Point" or "2 Points" in "CHAN_1 CAL".

1-point Calibration

Enter sensor 1-point calibration interface, 1-point calibration standard liquid value to 10mg/L for example. At the prompt, enter the calibration value "10" for 1-point. Place the probe into the standard solution of the calibration input value. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.7.1. 1-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.7.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

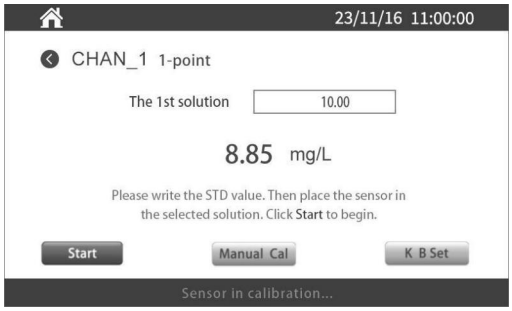


Figure 4.7.1: 1-point calibration in progress

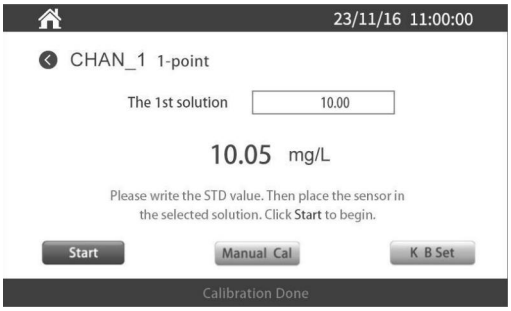


Figure 4.7.2: 1-point calibration complete

2-points Calibration

Enter the sensor 2-points calibration interface, the 1st calibration standard liquid value for the NH4-N sensor is taken as 10mg/L and the 2nd calibration standard liquid value is taken as 100mg/L.

Enter the first calibration standard value "10" as prompted. Place the sensor in the 1st calibration standard solution.Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.7.3. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.7.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

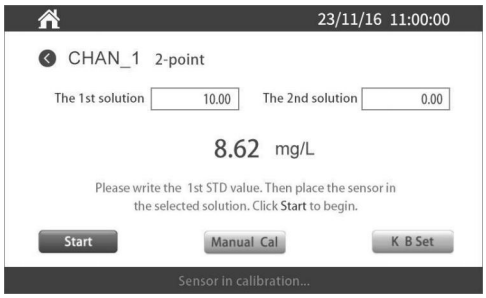


Figure 4.7.3: 1st calibration in progress

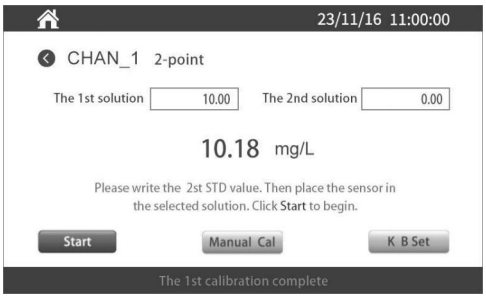


Figure 4.7.4: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"100". Place the sensor into the 2nd standard solution. Click"Start"to begin, the bottom of the screen will show"Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.7.5. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.7.6. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

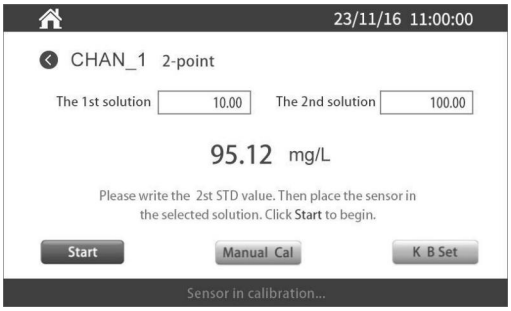


Figure 4.7.5: 2nd calibration in progress

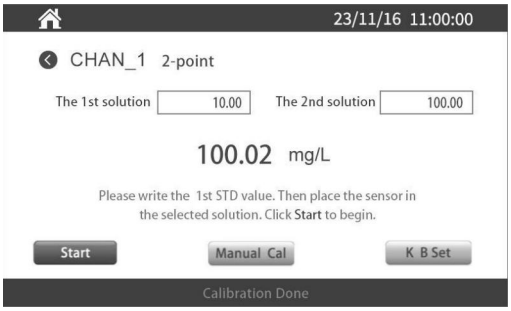


Figure 4.7.6: 2nd calibration complete

pH Calibration

As in chapter 4.11.

4.9 Blue-green Algae Calibration

Calibration Selection

The blue-green algae sensor supports 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon " 

" in the menu bar to enter the dual-channel calibration interface. Select"2 Points" in "CHAN_1 CAL".

2-points Calibration

Enter the sensor 2-points calibration interface, the 1st calibration standard liquid value for the blue-green algae sensor is taken as 0Cells/mL and the 2nd calibration standard liquid value is taken as 54000 Cells/mL.

Enter the first calibration standard value "0" as prompted. Place the sensor in the 1st calibration standard solution.Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.8.1. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.8.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

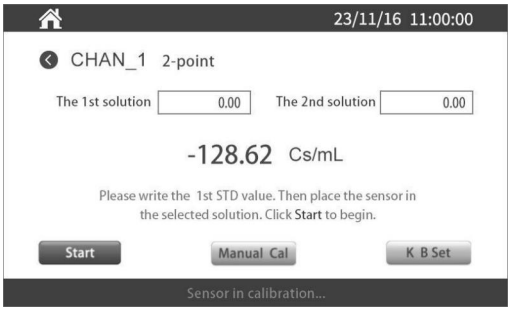


Figure 4.8.1: 1st calibration in progress

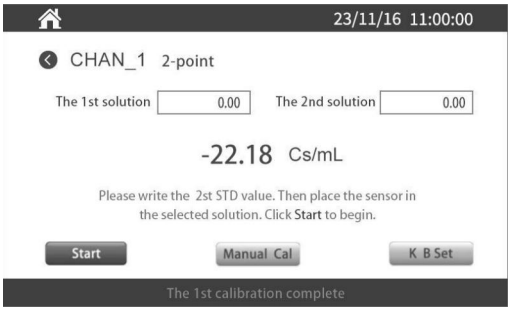


Figure 4.8.2: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"54000". Place the sensor into the 2nd standard solution.Click"Start"to begin, the bottom of the screen will show"Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.8.3. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.8.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

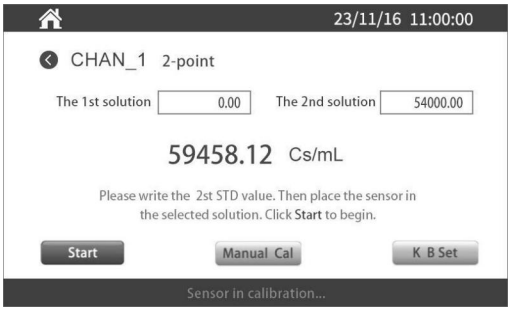


Figure 4.8.3: 2nd calibration in progress

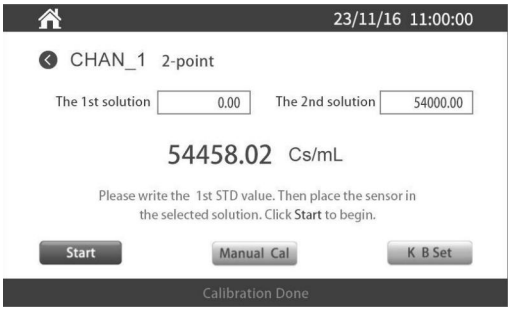


Figure 4.8.4: 2nd calibration complete

4.10 Oil-in-water Calibration

Calibration Selection

The oil-in-water sensor supports three types of calibration, 0-point calibration、1-point calibration and 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the dual-channel calibration interface. Select "0 Point"、"1 Point" or "2 Points" in "CHAN_1 CAL".

0-point Calibration

Enter the sensor 0-point calibration interface, 0-point calibration standard value in deionized water for example. At the prompt, place the probe in the zero calibration standard solution. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.9.1. 0-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.9.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

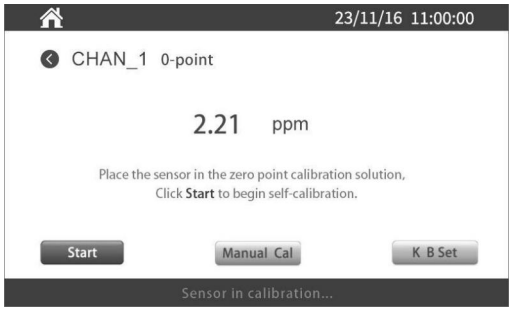


Figure 4.9.1: 0-point calibration in progress

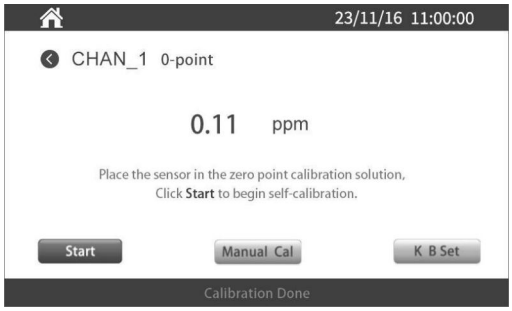


Figure 4.9.2: 0-point calibration complete

1-point Calibration

Enter sensor 1-point calibration interface, 1-point calibration standard liquid value to 44ppm for example. At the prompt, enter the calibration value "44" for 1-point. Place the probe into the standard solution of the calibration input value. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.9.3. 1-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.9.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

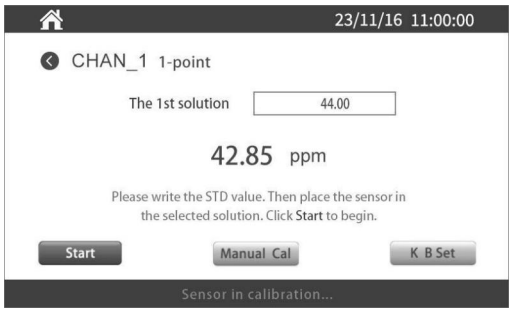


Figure 4.9.3: 1-point calibration in progress

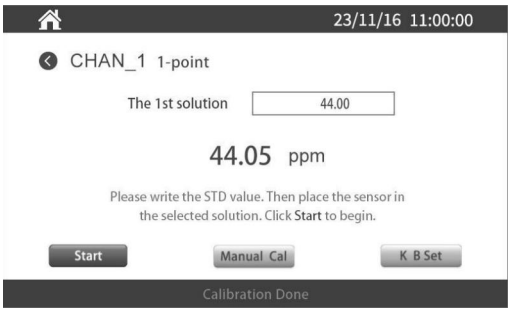


Figure 4.9.4: 1-point calibration complete

2-points Calibration

Enter sensor 2-points calibration interface, 1st calibration standard liquid value for oil-in-water sensor is taken as 0 ppm and the 2nd calibration standard liquid value is taken as 44ppm.

Enter the first calibration standard value "0" as prompted. Place the sensor in the 1st calibration standard solution.Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.9.5. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.9.6. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

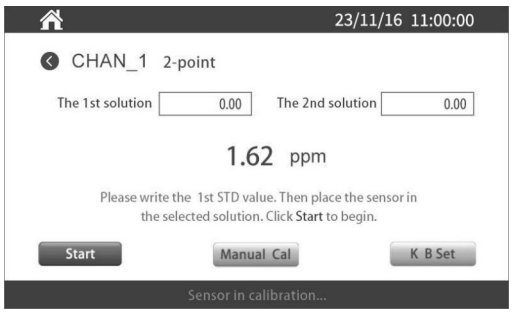


Figure 4.9.5: 1st calibration in progress

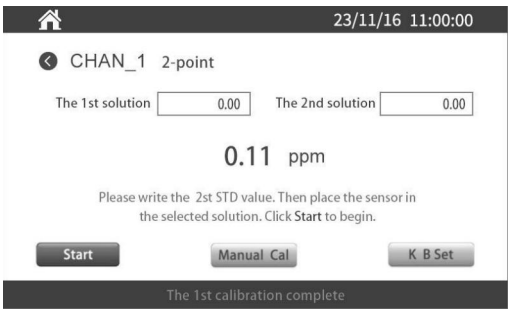


Figure 4.9.6: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"44". Place the sensor into the 2nd standard solution.Click"Start"to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.9.7. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.9.8. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

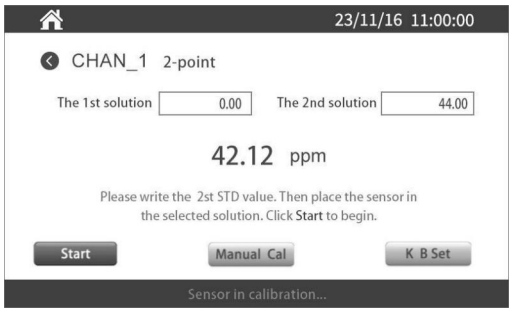


Figure 4.9.7: 2nd calibration in progress

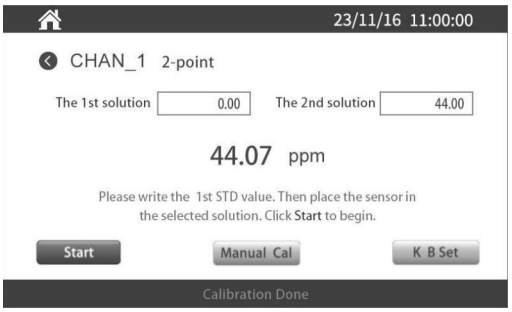


Figure 4.9.8: 2nd calibration complete

4.11 COD Calibration

Calibration Selection

The COD sensor supports two types of calibration, 1-point calibration and 2-points calibration.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the dual-channel calibration interface. Select"1 Point" or "2 Points" in "CHAN_1 CAL".

1-point Calibration

Enter sensor 1-point calibration interface, 1-point calibration standard liquid value to 150mg/L for example. At the prompt, enter the calibration value "150" for 1-point. Place the probe into the standard solution of the calibration input value. Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.10.1. 1-point calibration is complete, the bottom of the screen will display "Calibration Done", as shown in Figure 4.10.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

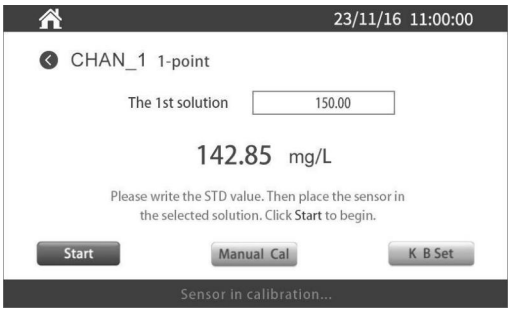


Figure 4.10.1: 1-point calibration in progress

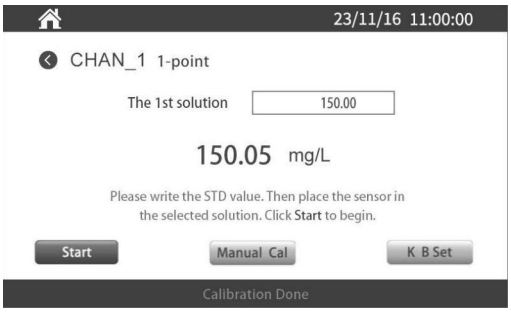


Figure 4.10.2: 1-point calibration complete

2-points Calibration

Enter sensor 2-points calibration interface, the 1st calibration standard liquid value for the COD sensor is taken as 150mg/L and the 2nd calibration standard liquid value is taken as 450mg/L.

Enter the first calibration standard value"150" as prompted. Place the sensor in the 1st

calibration standard solution.Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.10.3. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.10.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

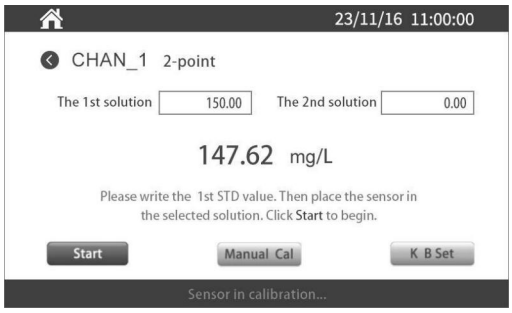


Figure 4.10.3: 1st calibration in progress

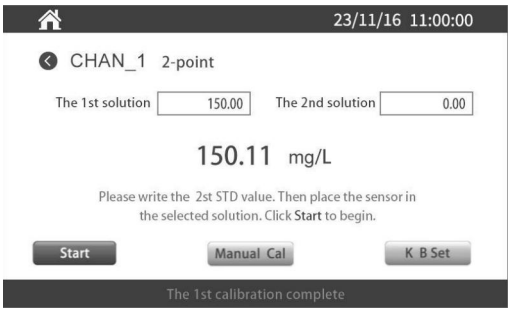


Figure 4.10.4: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"450". Place the sensor into the 2nd standard solution.Click"Start"to begin, the bottom of the screen will show"Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.10.5. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.10.6. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

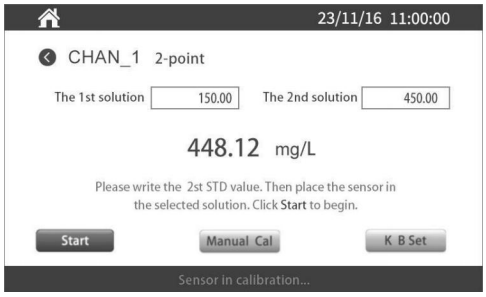


Figure 4.10.5: 2nd calibration in progress

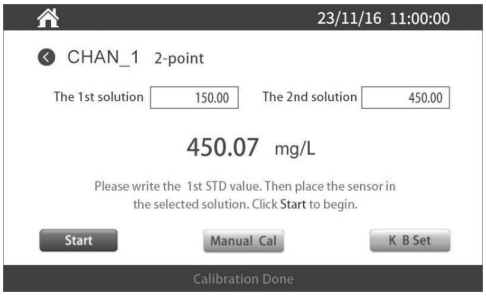


Figure 4.10.6: 2nd calibration complete

4.12 pH Calibration

Calibration Selection

The pH sensor supports 2-points calibration. The calibration solution values are 4.01,6.86 and 9.18 (4, 7 and 10).

If solution to be tested is acidic, choose 4.01, 6.86 (or 4, 7) for the calibration standard solution.
If solution to be tested is alkaline, choose 6.86, 9.18 (or7, 10) for calibration standard solution.

Take the sensor in "CHAN_1" as an example, click the icon "Cal" in the menu bar to enter the dual-channel calibration interface. Select "2 Points" in "CHAN_1 CAL".

2-points Calibration

Enter the sensor 2-points calibration interface, the 1st calibration standard liquid value for the pH sensor is taken as 4.01 and the 2nd calibration standard liquid value is taken as 6.86.

Enter the first calibration standard value "4.01" as prompted. Place the sensor in the 1st calibration standard solution.Click "Start" to begin, the bottom of the screen will show "Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.11.1. when the 1st calibration is complete, the bottom screen displays "The 1st calibration complete" , as shown in Figure 4.11.2. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

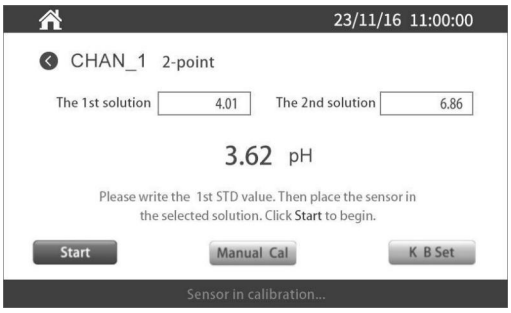


Figure 4.11.1: 1st calibration in progress

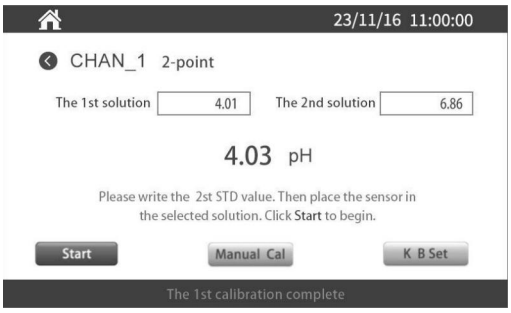


Figure 4.11.2: 1st calibration complete

Follow the prompts, enter the 2nd calibration fluid value"6.86". Place the sensor into the 2nd standard solution.Click"Start"to begin, the bottom of the screen will show"Sensor in calibration..." and wait for the calibration values to stabilize, as shown in Figure 4.11.3. when the 2nd calibration is complete, the bottom screen displays "calibration Done", as shown in Figure 4.11.4. During the calibration process, if the calibration value is stable you can click "Manual Cal" to finish the calibration in advance.

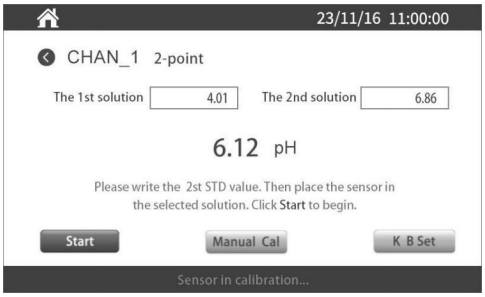


Figure 4.11.3: 2nd calibration in progress

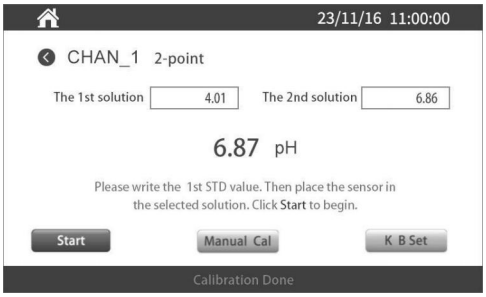


Figure 4.12.4: 2nd calibration complete

4.13 ORP Calibration

ORP doesn't do user calibration.

5 Data Download

Click on the menu bar icon "  " to enter the data download interface. Data stored once every 1 minute (default). Figure 5.1.1 shows the data download interface display of the dual-channel transmitter.

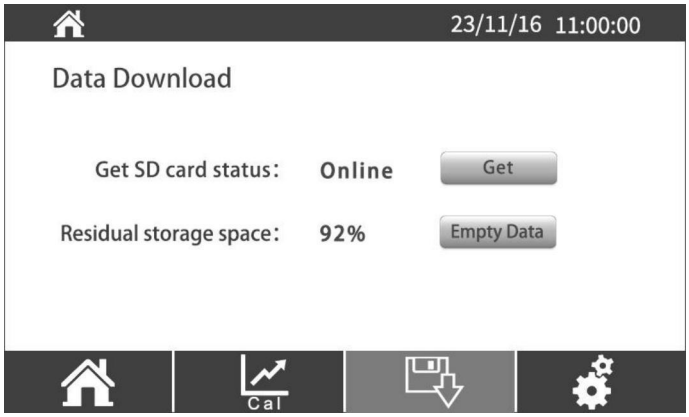


Figure 5.1.1: Data download interface

Measurement data from the two-channel transmitter is read and stored online in real time. Disconnect the power supply before downloading data. Remove the SD card on the transmitter's internal circuit board to obtain data.

In the data download screen, you can click "Get" to check if the SD card is online. Or you can check the remaining storage space on the SD card.

6 Setup

6.1 Setup Interface

Click menu bar icon "  " to enter ain interface of setup. Figure 6.1.1 shows the main interface of the dual-channel transmitter setup. In the Setup screen, Includes relay, 4-20mA, barometric pressure/salinity, time/brush, transmitter information, and restoration of factory settings.

Figure 6.1.1: Setup Main Interface

6.2 Relay Setup

In the setup interface, click "Relay" to enter the relay setup interface, as shown in Figure 6.2.1. The transmitter contains two relays, each contain timing and alarm setup.

Figure 6.2.1: Relay Setting Interface

Relay Timing

Take "Relay_1" as an example, click "Timing" to enter the relay_1 timing interface.

Relay_1 timing opens for 120 seconds and closes for 360 seconds. This means that relay_1 is turned on once every 120 seconds, and each time it is turned on for 360 seconds.Click "OK" to modify the timing time, automatically return to the previous menu. As shown in Figure 6.2.2.

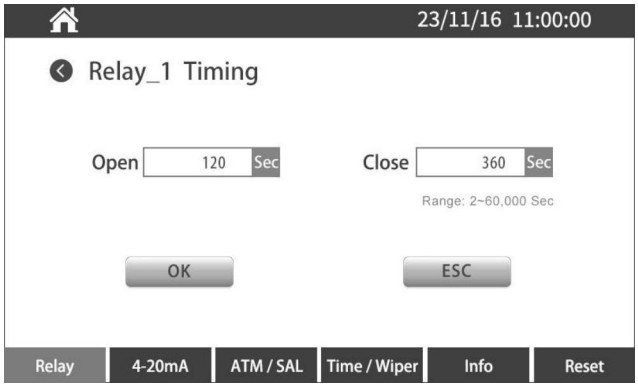


Figure 6.2.2: Relay 1 opens once every 120 seconds for 360 seconds

Relay Alarm

Take "Relay_1" as an example, click "Alarm" to enter the alarm interface of relay_1. Relay_1 alarm interface to set the probe of CHAN_1, the probe of CHAN_1 take turbidity sensor as an example.Click "  " in the main interface to switch different sensor parameters to set the relay upper and lower limit alarm values.

Alarm (L-H) is set from 20.0 to 100.0 NTU, as shown in Figure 6.2.3.If Alarm(L-H) is set to 20.0-100.0 NTU, it means that the turbidity sensor does not alarm for measurements between 20 and 100 NTU. When the measured value of the turbidity sensor is lower than 20NTU or higher than 100NTU, "  " will appear at the top of the main interface. The relay is normally open, as shown in Figure 6.2.4.

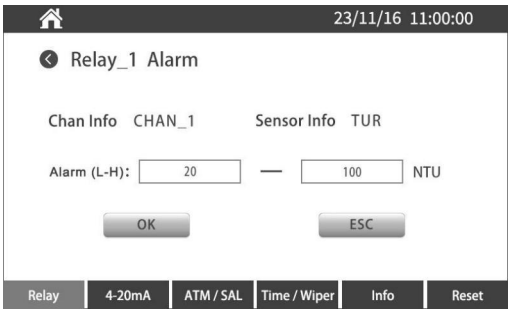


Figure 6.2.3: Alarm (L-H) Upper and lower limit alarm settings

Figure 6.2.4: Main interface alarm

Functional Description

Alarm L: Relay for lower limit value alarm, normally open if the measured value exceeds the lower limit value.

Alarm H: Relay for upper limit value alarm, normally open if the measured value exceeds the upper limit value.

6.3 4-20mA Setup

In the setting interface, click "4-20mA" to enter the 4-20mA setting interface, as shown in Figure 6.3.1. Transmitter contains two channels of 4-20mA, each 4-20mA includes calibration and setup.

Figure 6.3.1: 4-20mA setting interface

4-20mA Calibration

Take "4-20mA_1" as an example, click "CAL" to enter 4-20mA_1 calibration interface.

Enter the 4-20mA calibration interface, according to the prompts, first press the "4mA Cal" button to start 4mA calibration, as shown in Figure 6.3.2. Then enter the 4mA measured value according to the prompts and click "Set", as shown in Figure 6.3.3. If the 4mA calibration is complete, it will prompt"4mA Calibration Succeed".

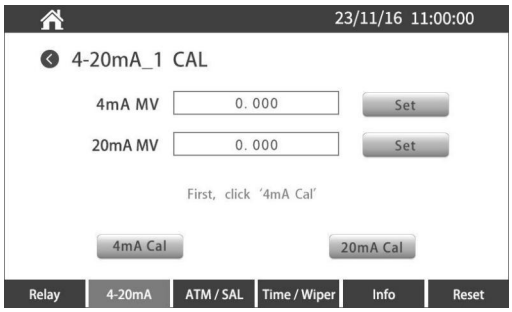


Figure 6.3.2: 4mA calibration start

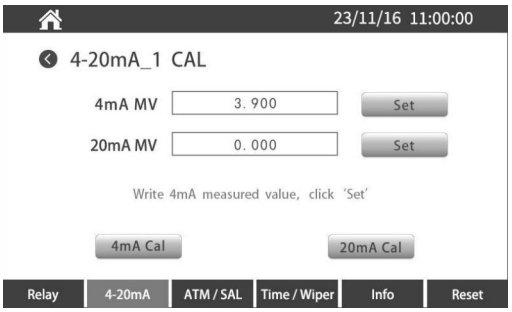


Figure 6.3.3: In 4mA calibration

Follow the prompts and click the "20mA Calibration" button. Start the 20mA calibration as shown in Figure 6.3.4. Then according to the prompts, enter the 20mA measured value and click "Set", as shown in Figure 6.3.5. 20mA calibration is complete and the measured 4mA and 20mA values are displayed.

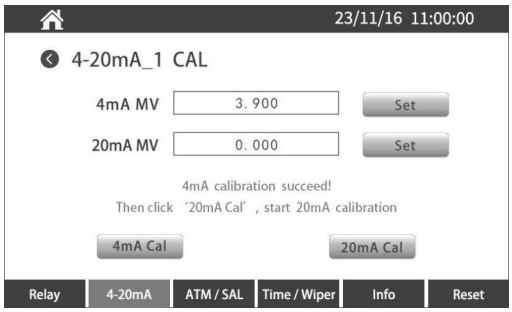


Figure 6.3.4: 20mA calibration start

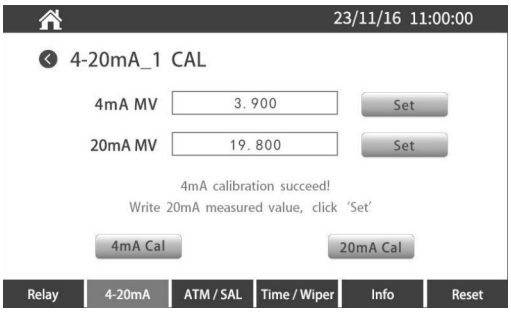


Figure 6.3.5: In 20mA calibration

4-20mA Setup

Take "4-20mA_1" as an example, click "SET" to enter 4-20mA_1 SET interface. 4-20mA_1 SET interface to set the probe of CHAN_1, the probe of CHAN_1 take turbidity sensor as an example. Click "  " in the main interface to switch different sensor parameters to set the 4-20mA value. 4-20mA_1 setup interface, the 4-20mA setting needs to be set within the measuring range of the sensor. 4mA corresponds to the low value of the sensor, 20mA corresponds to the high value of the sensor. Example: The 4-20mA setting of the turbidity sensor is 4mA corresponds to 0 and 20mA corresponds to 1000, as shown in Figure 6.3.6. Click "OK" will automatically return to the previous menu. When connecting different probes, you need to reset and save the settings after power off.

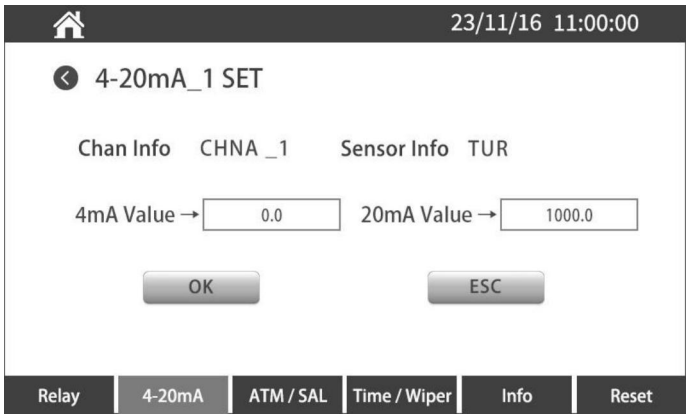


Figure 6.3.6: 4-20mA setting interface

Setting Range Description

4-20mA settings need to be set within the measurable range. The sensor measurement ranges are as follows.

measurement parameter	Measurement range
Dissolved Oxygen Sensor	0-20mg/L or 0-200% saturation
Conductivity Sensor	Conductivity： 0.001-5mS/cm or 0.001-100mS/cm Salinity： 0-2.5ppt or 0-80ppt TDS:0-3200mg/ L or 0-64000mg/L
Turbidity Sensor	0-1000NTU
Chlorophyll Sensor	0-500μg/L
Sludge Concentration Sensor	0-4000mg/L； 0-15000mg/L
NH4-N Sensor	0-100mg/L / 0-1000mg/L
Blue-green Algae Sensor	0-300000cells/mL
Oil-in-water Sensor	0-150ppm
COD Sensor	COD:0-500mg/L ； 0-1500mg/L TOC:0-180mg/L ； 0-600mg/L TUR:0-500NTU
BOD Sensor	COD:0-500mg/L ； 0-1500mg/L BOD:0-400mg/L ； 0-1200mg/L TSS:0-5000mg/ L
Ph Sensor	0-14
ORP Sensor	-1999-1999mV
Transparency Sensor	0-500cm
Colorimetric Sensor	0-500Hazen
Depth Sensor	0m-2m…100m
Low-range Turbidity Sensor	0-10NTU

6.4 ATM/SAL

In the setting interface, click “ATM/SAL” to enter the ATM/SAL setting interface, as shown in Figure 6.4.1.

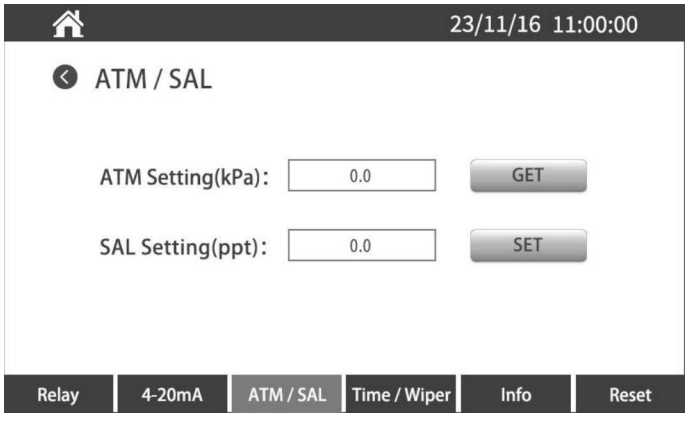


Figure 6.4.1: ATM/SAL setting interface

In the ATM/SAL setting interface, click “Get” to get the current barometric pressure and salinity value, as shown in Figure 6.4.2.

Air pressure setting calibrates the transmitter's built-in air pressure sensor. Enter the current standard air pressure value, using the current air pressure of 101.3 as a base example. Then enter the salinity value, the default value for salinity is 0. Click “Set” to modify the barometric pressure and salinity values successfully, as shown in Figure 6.4.3.

Figure 6.4.2: "Get" air pressure and salinity values

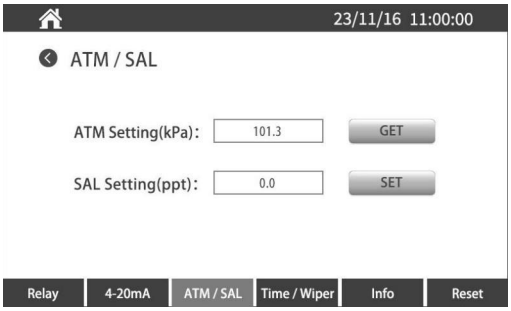


Figure 6.4.3: "SET" air pressure and salinity values

6.5 Time/Wiper

In the setting interface, click“Time/Wiper”, enter the time / brush setting interface, as shown in Figure 6.5.1.

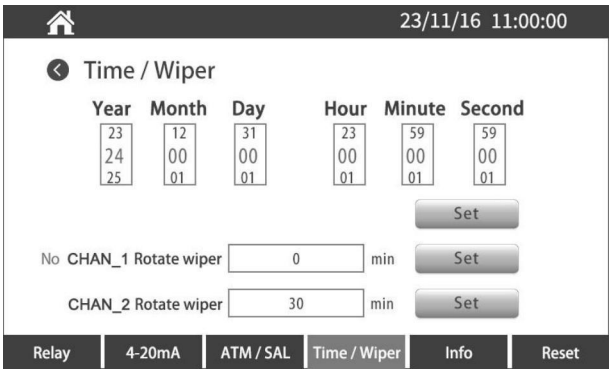


Figure 6.5.1: Time/Wiper setting interface

Time Setting

In the Time/Wiper Setting screen. Slide the Year/Month/Day, Hour/Minute/Second of the time up or down to set the value to the desired value. Click “Set” and the time in the upper right corner of the screen will change to the current setting.

Wiper Setting

In the Time/Wiper Setting screen. Take the example of CHAN_1 connected to a turbidity sensor (no cleaning brush) and CHAN_2 connected to a self-cleaning blue-green algae sensor, as shown

in Figure 6.5.1. CHAN_1 brush activation front display "No". Indicates that CHAN_1 is connected to a brushless sensor and cannot be set. CHAN_2 Brush activation for 30 minutes indicates that the sensor cleaning brush is activated every 30 minutes.

6.6 Transmitter Info

In the setting interface, click "Transmitter Info" to enter the transmitter setting interface, as shown in Figure 6.6.1. To change the baud rate, it is recommended to reboot the transmitter.

Transmitter information interface contains the Aevice Add, Baud-rate, SN, HW and SW Version.

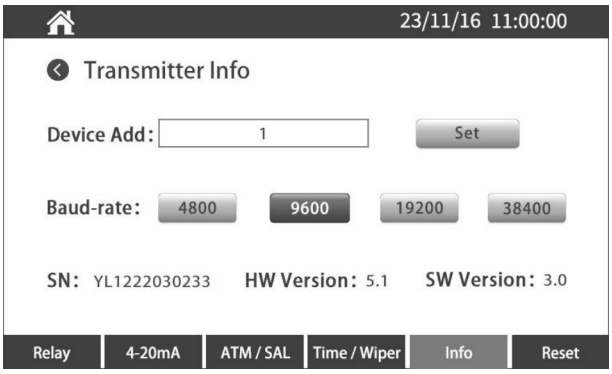


Figure 6.5.1: Transmitter information setting interface

6.7 Reset

In the setting interface. Click "Reset" to enter the interface of restoring factory setting, as shown in Figure 6.6.1.

In the factory restore interface. Includes recovery of the following functions, Cal Reset, ATM Reset, 4-20mA Reset and Lang Reset. After selecting the function, there will be a pop-up box prompting "Operation succeeded!". Then click "OK" to reset successfully.

The transmitter is equipped with a language memory function. Select "Lang Reset", restart the transmitter and select the desired language (Chinese/English) again.

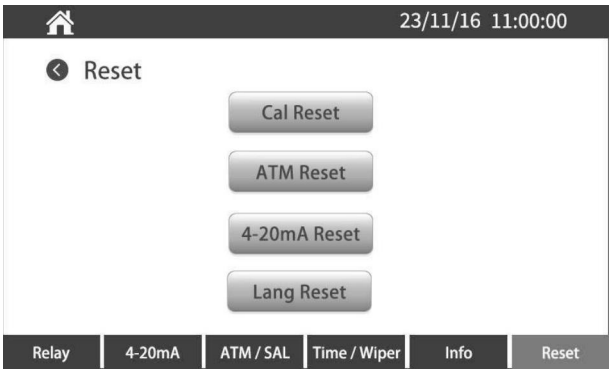


Figure 6.5.1: Restore factory setting interface

7 Transmitter External Output

Online controller can response to Modbus RTU commends to export sensor measurement value. (or access to a wireless module for networking communications) The protocol frame format is as follows.

Request Frame

The format of the request frame for obtaining measurements is as follows:

Definition	Address	Function Code	Start Address		Number of Registers		CRC	
Byte	0	1	2	3	4	5	6	7
Content	0x01	0x03	0x26	0x00	0x00	0x11		

Response Frame

The format of the transmitter answer frame is as follows (Remarks: data 1, data 2, temperature value: small end storage mode, floating point number)

Definition	Address	Function Code	Number of Byte	Register Data	CRC	
Byte	0	1	2	3-36	37	38
Content	0x01	0x03	0x22			

Probe 1 data				Probe 2 data				Type codes	
Data 1	Data 2	temperature	Data 3	Data 1	Data 2	temperature	Data 3	Probe 1	Probe 2

Note: Data1/ Data2 / Data3 can be different values based on different sensor installed

Sensor Type	Data1	Data2	Temperature	Data3	Type code
DO Probe	SAT（%）	DO value（mg/L）	Temp	0	01
COD Probe	COD value（mg/L）	TOC value（mg/L）	0	TUR（NTU）	06
BOD Probe	COD value（mg/L）	BOD value（mg/L）	0	TSS（mg/L）	14
pH Probe	Ph value	mV value	Temp	0	03
Turbidity Probe	TUR（NTU）	0	0	0	05/16
Conductivity Probe	conductivity（uS/cm）	salinity(ppt)	Temp	TDS(mg/L)	02
Chlorophyll Probe	Chlorophyll（ug/L）	0	0	0	07
OIW Probe	OIW（ppm）	0	0	0	12/17
Sludge Concentration	TSS（mg/L）	0	0	0	08

Probe					
BGA Probe	BGA（cells/mL）	0	0	0	13
NH4-N Probe	NH4-N （mg/L）	pH	0	LG(NH4+)(mg/L)	09
ORP Probe	ORP(mv)	0	0	0	04
Depth Probe	Depth （mm））	0	0	0	10
Transparency Probe	Transparency （cm）	0	0	0	15
Colorimetric Probe	Colorimetric （hazen）	0	0	0	11

Example: for temperature of 26.397°C, dissolved oxygen concentration of 4.801mg/L, Oxygen saturation of 59.935%.

Definition	**Address**	**Function Code**	**Number**	**Register value**							**CRC**	
Byte	0	1	2	3~6	7~10	11~14	15~18	19~34	35	36	37	38
Content	0x01	0x03	0x22	59.935	4.801	26.397	0	0	01	0		

The transmitter answer frames are as follows:

Temperature and oxygen concentration byte allocation in register.

DO in（mg/L） （3~6)				**DO in（%） （7~10)**				**Temp（11~14)**			
0xCB	0xA1	0x99	0x40	0x71	0xBD	0x6F	0x42	0x0E	0x2D	0xD3	0x41

8 Maintenance

Front panel cleaning

Clean the front panel with a damp soft cloth (water only, no solvents). Gently wipe the surface and dry with a soft cloth.

9 Trouble Shooting

Review the table below for possible causes of common problems:

Problem	**Possible Cause**
Display is blank.	No power.
	Hardware failure.
Incorrect measurement readings.	Sensor improperly installed.
	Sensor or transmitter needs calibration.

	Hardware failure.
Alarm symbols appear.	Setpoint in alarm condition (setpoint exceeded).

Table 9-1 List of Common Problems

10 Warranty Description

(1) The warranty period is 1 year（Except for consumables）.

(2) This quality assurance does not cover the following cases.

① Due to force majeure, natural disasters, social unrest, war (declared or undeclared), terrorism, the War or damage caused by any governmental compulsion.

②damage caused by misuse, negligence, accident or improper application and installation.

③ Freight charges for shipping the goods back to Yosemite Sensing Technology.

④ Freight charges for expedited or express shipping of parts or products covered by the warranty.

⑤ Travel to perform warranty repairs locally.

(3) This warranty includes the entire contents of the warranty provided by Yosemite Sensing Technology with respect to its products.

① This warranty constitutes a final, complete and exclusive statement of the terms of the warranty, and no person or The agent is authorized to establish other warranties in the name of Yosemite Sensing Technology.

② The remedies of repair, replacement, or return of payment as described above are exceptional cases that do not violate this warranty, and the remedies of replacement or return of payment are for our products themselves. Based on strict liability or other legal theory, Yosemite Sensing Technology shall not be liable for any other damage caused by a defective product or by negligent operation, including any subsequent damage that is causally related to these conditions.