

PH/ORP Dual Input Controller



Content

Safe operation procedures-----	2
Instrument use-----	2
Product content-----	2
Specifications-----	3
Instrument installation-----	4
Connection label-----	5
Electrode connection figure-----	5
Relay contact protection -----	6
Display -----	7
Key-----	8
Keeping mode-----	8
Setting-----	9
Current 1 settings-----	10
Current 2 settings-----	10
Relay 1 settings-----	11
Relay 2 settings-----	11
Relay 3 settings-----	12
Relay 4 settings-----	12
Measuring 1 settings-----	13
Measuring 2 settings-----	13
Temperature settings-----	14
RS485 settings-----	14
Date settings-----	15
Data log settings-----	15
Output test-----	15
Language Settings-----	16
Reset parameters-----	16
Record query-----	17
pH calibration-----	17
ORP calibration-----	21
Default-----	22
Password-----	24
Error code-----	24
RS485 command-----	24

Safe operation procedures

Read the following instructions before using the instrument.

1. After unpacking the instrument please check for damage due to shipping.
2. The instrument must be operated by trained professional and technical personnel.
3. Read the manual carefully to avoid incorrect wiring connection that can cause equipment damage and safe problem.
4. After wiring carefully check all are correct then can power on and make sure the others equipments are correct.
5. Please avoid installing in a high humidity, high temperature, corrosive and in a direct sunlight environment.
6. Please separate the power lines of instrument from other machines that produces high noise in the power lines.

Instrument use

Instruments are used in industrial measuring of the temperature and PH/ORP, such as wastewater treatment, environmental monitoring, fermentation, pharmacy, food process agriculture production, pump control, etc.

The instrument can be panel, wall or pipe mounted.

The instrument provides two current outputs. The maximum load is 500 Ohm.

The instrument provides 3 relays. It can pass though a maximum of 5 Amps at 250 VAC or 5 Amps at 30VDC.

Product content

The product package contains 1 instrument, the printed manual and 2 holders.

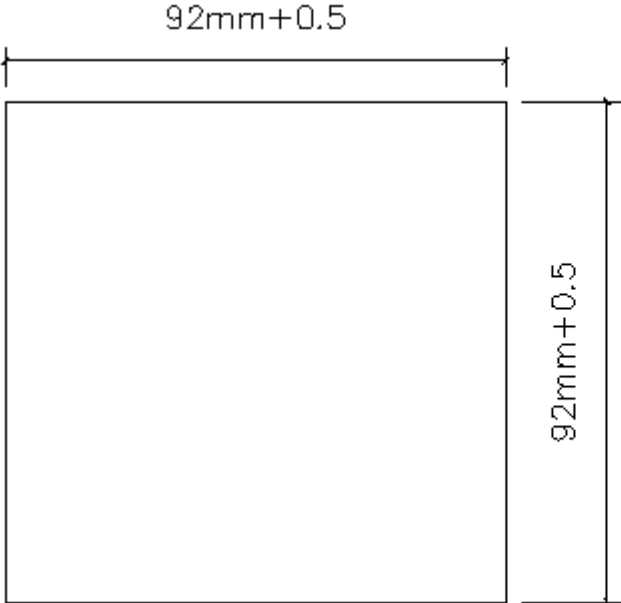
Specifications

Functions	pH	ORP
Measuring range	-2.00pH to +16.00 pH	-2000mV to +2000mV
Resolution	0.01pH	1mV
Accuracy	±0.01pH	±1mV
Temp. compensation	Pt 1000/NTC10K	
Temp. range	-10.0 to +130.0°C	
Temp. compensation range	-10.0 to +130.0°C	
Temp. resolution	0.1°C	
Temp. accuracy	±0.2°C	
Ambient temperature range	0 to +70°C	
Storage temp.	-20 to +70°C	
Input impedance	>10 ¹² Ω	
Display	Back light, dot matrix	
pH1/ORP current output1	Isolated, 4 to 20mA output , max. load 500Ω	
pH2/ORP current output2	Isolated, 4 to 20mA output , max. load 500Ω	
Current output accuracy	±0.05 mA	
RS485	Mod bus RTU protocol	
Baud rate	9600/19200/38400	
Relay maximum contacts capacity	5A/250VAC,5A/30VDC	
Relay delay	0-120 seconds	
Data logging capacity	500,000	
Language selection	English/traditional Chinese/simplified Chinese	
Waterproof grade	IP65	
Power supply	From 90 to 260 VAC, power consumption < 5 watts	
Installation	panel/wall/pipe installation	
Weight	0.55Kg	

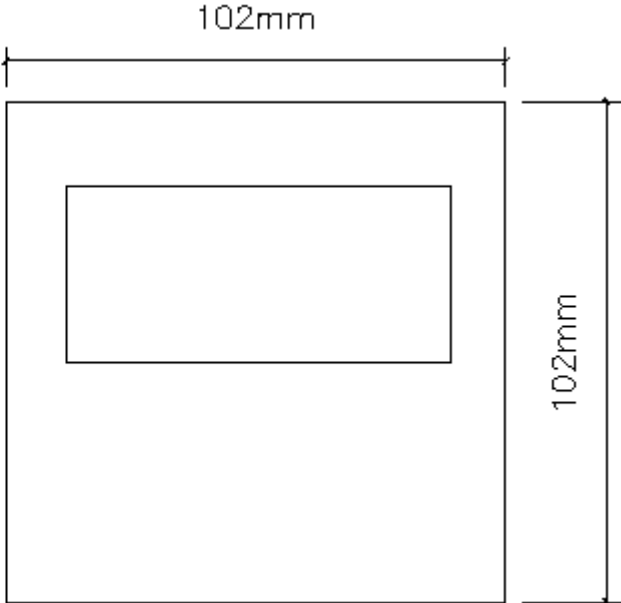
Instrument installation

The instrument can be panel, wall or pipe mounted installation.

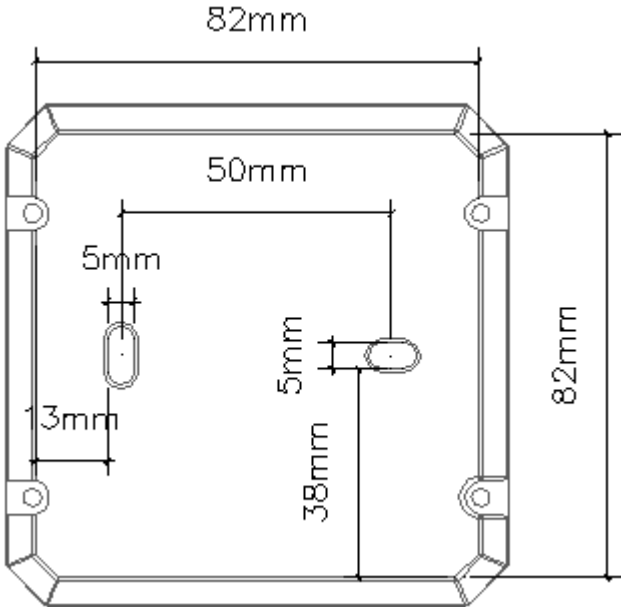
Panel Installation: Make a 92x92 mm square cutout and insert the instrument then screw in the fixed HOLDER.



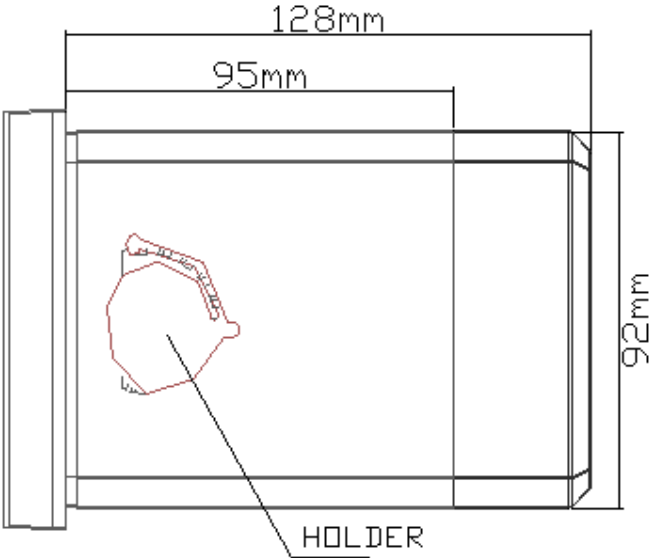
Panel cutout size



Front

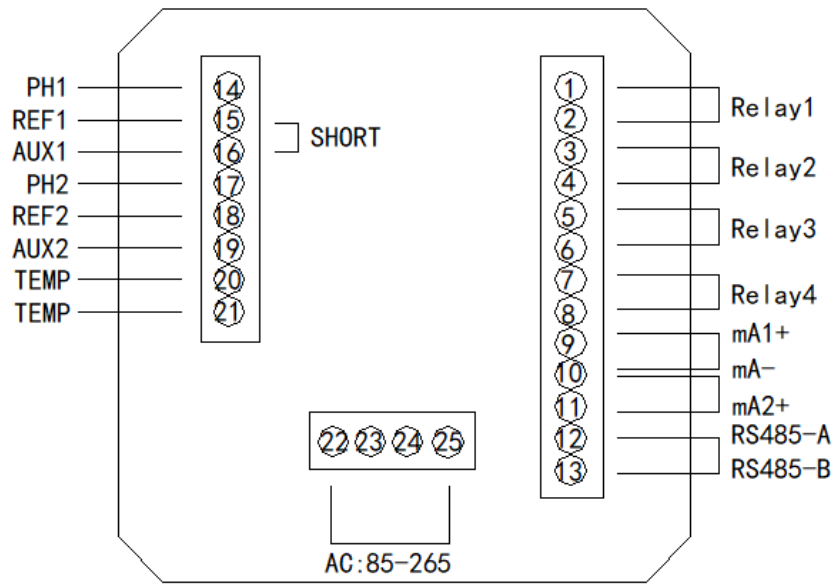


Back (for wall/pipe mounting)

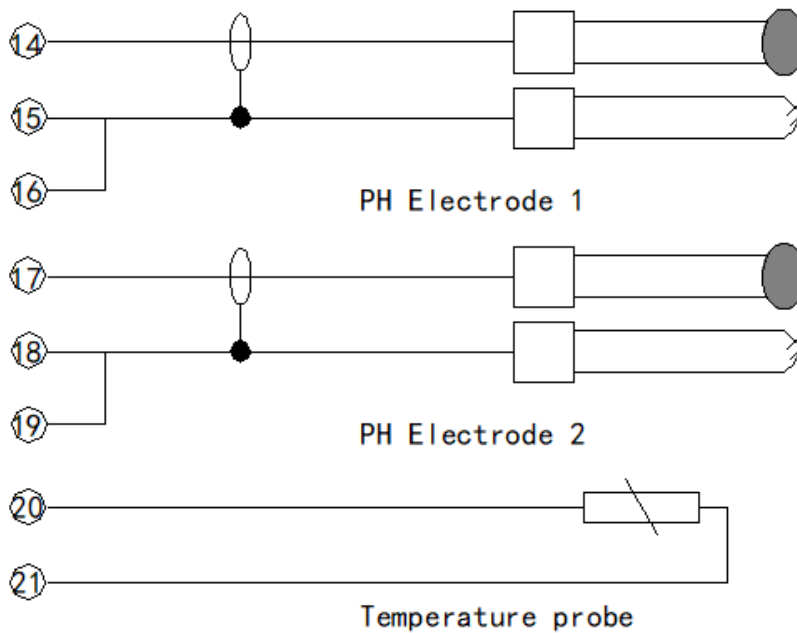


Dimension

Connection label

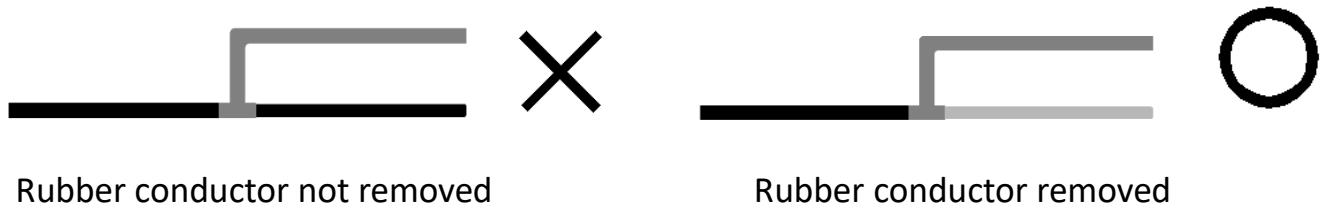


Electrode connection figure



Notice

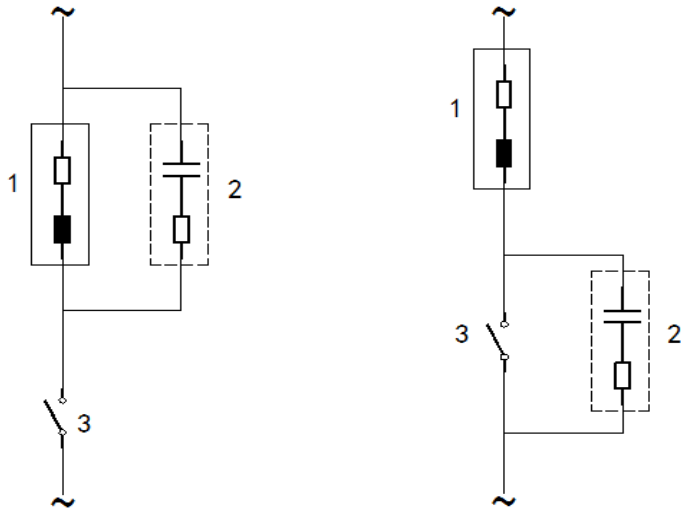
1. User must strip the pH wire to remove the black rubber conductor.



2. Different connection of 2-wire electrode (short pin 2 and 3) and 3-wire electrode (ground pin), Please see the connect label.

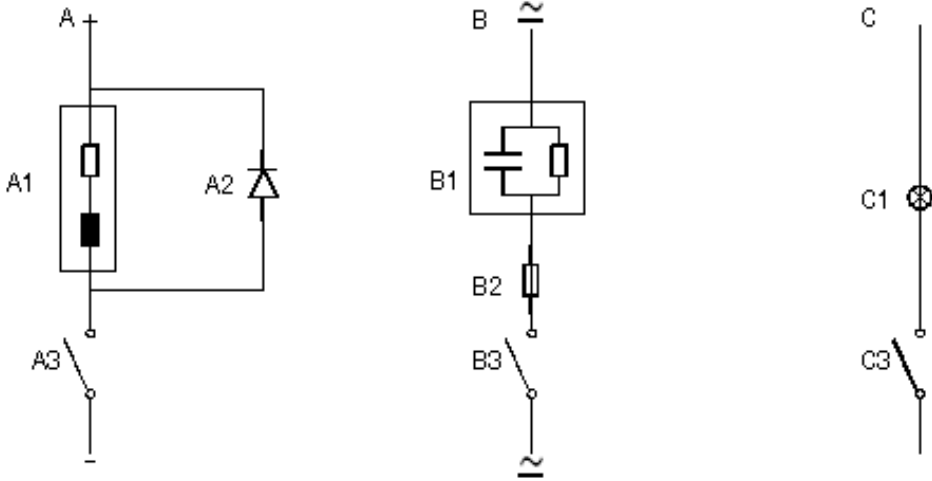
Relay contact protection

Electrical spark at the relay contact may affect the life of the relay, especially in an inductive and capacitive load. In order to inhibit the spark and arc, user should use an RC circuit to extend the life of the relay.



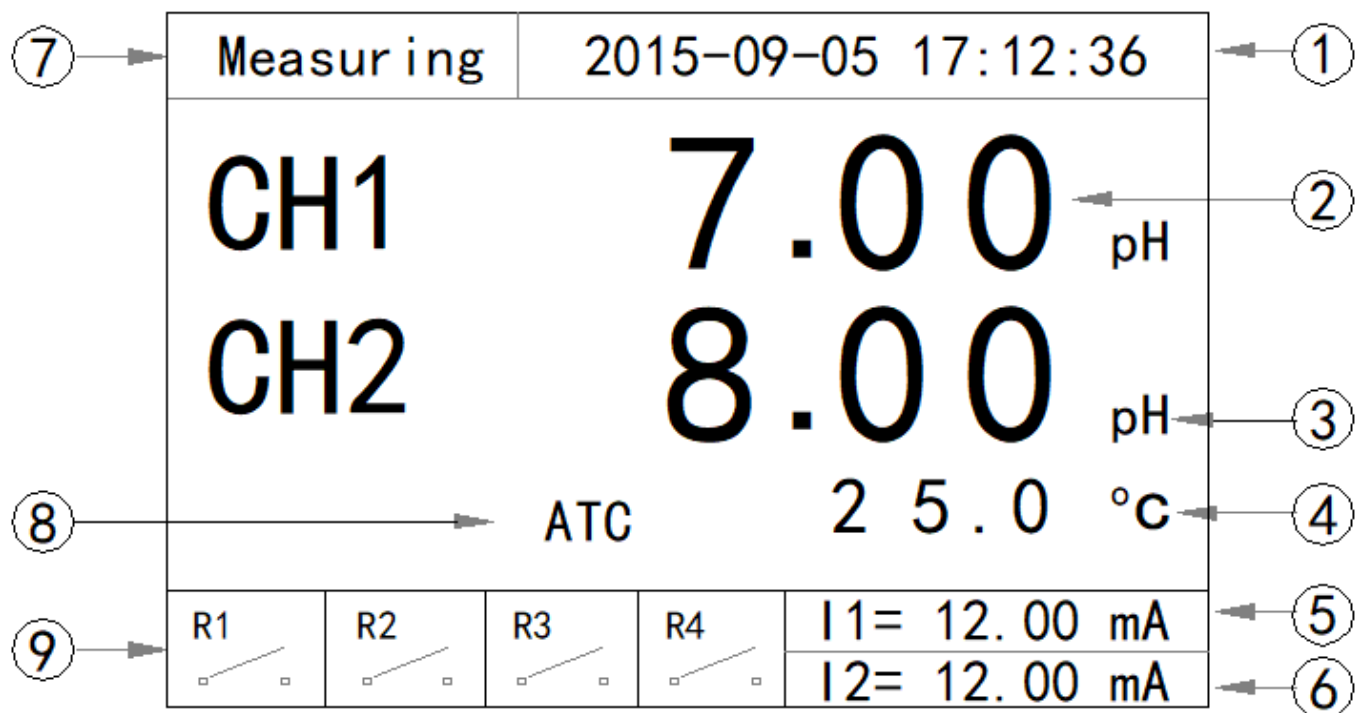
AC protection, use for inductive load

1. load
2. RC eliminate spark, using in 220VAC, R=100 ohm1W,
3. Relay contact



- A. DC protection ,A1: inductive load A2: 1N4007, A3: relay contact
- B. AC/DC protection ,B1: capacitive load ,B2: 0.8 Ohm/1W (DC24V) ,B3: relay contact
- C. Resistive load ,C1:lamp bulb ,C3:relay contact

Display



1. Date and time
2. Main display
3. Unit
4. Temperature and unit
5. First current output
6. Second current output
7. Measurement status and Error indicator, there is no display if meter is in keeping mode
8. Temp. compensation: auto(ATC) or manual(MTC)
9. Relay indicator

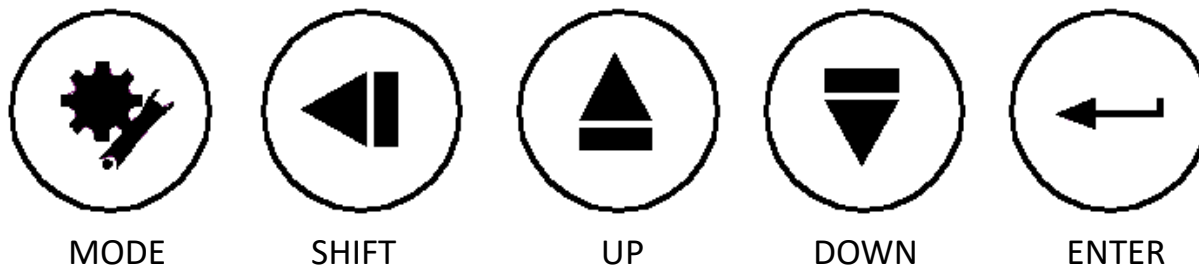
Note:

If the pH readings are under or over the range, it will display -9.99/99.99.

If the ORP readings are under or over the range, it will display -9999/9999.

If the temperature readings are under or over the range, it will display -99.9/999.9.

Key



Key name	Meas. status	Setting status	Cal. status	Record status
MODE	Enter password	Exit	Exit	Exit
SHIFT	none	Move digit	Mode digit	Mode digit
UP	Enter record	Inc	Inc	Inc
DOWN	None	Dec	Dec	Dec
ENTER	ON/OFF back light	Enter	Enter	Enter

Keeping mode

Keeping mode is a safe mode. It is for Calibration, Setting, Record. In this mode all the relays are open(inactive), current output follows the setting by user(last current or fixed current).

The instrument will enter keeping mode when user presses into Calibration, Setting, Record.

It will in keeping mode around 10 seconds when it goes back to measurement mode form the above mentioned 3 modes then left keeping mode.

The instrument will go into the keeping mode when turn on the power.

Current output in keeping mode:

User has two choices: fixed current output or last current output.

Fixed current: User can set the output current from 4.00 to 20.00mA when instrument goes into keeping mode.

Last current: User can set the output current keep at the last current when instrument goes into keeping mode.

Relays in keeping mode: All relays are opened.(inactive)

Setting

Press MODE key to enter the password menu and then press UP/DOWN/SHIFT key to input password 1200 then press ENTER will enter to setting mode or press MODE key to exit. If no key is be pressed and over 10 minutes then it will go back to measurement mode.

PASSWORD
0 0 0 0

PASSWORD
1 2 0 0

Main display

Press UP/DOWN key to choose functions, press ENTER key enter the function.

CONF I G U R A T I O N
<input checked="" type="checkbox"/> Current1 Settings
<input type="checkbox"/> Current2 Settings
<input type="checkbox"/> Relay1 Settings
<input type="checkbox"/> Relay2 Settings
<input type="checkbox"/> Relay3 Settings
<input type="checkbox"/> Relay4 Settings
<input type="checkbox"/> Measurement 1 Settings
<input type="checkbox"/> Measurement 2 Settings

Page1

CONF I G U R A T I O N
<input checked="" type="checkbox"/> Temperature Settings
<input type="checkbox"/> RS485 Settings
<input type="checkbox"/> Date Settings
<input type="checkbox"/> Data Log Settings
<input type="checkbox"/> Output Test
<input type="checkbox"/> Language Settings
<input type="checkbox"/> Reset Parameters

Page2

Notices:

1. When the input data is not in correct range then it will display ERROR on the top of LCD
2. After input data user needs to press ENTER to save the data.
3. Press MODE to exit.
4. No key is be pressed in 10 minutes then it will go back to measurement mode.

Current 1 settings (for channel 1)

CURRENT 1 SETTINGS	
4.00 mA	= + 0 0 . 0 0 pH
20.00 mA	= + 1 4 . 0 0 pH
Offset	= + 0 . 0 0 mA
Filter Time	= 0 0 0 SEC
HOLD Type	= <input type="checkbox"/> Fixed
	0 4 . 0 0 mA
	<input type="checkbox"/> Last

CURRENT 1 SETTING	
4.00 mA	= + 0 0 0 0 mV
20.00 mA	= + 1 0 0 0 mV
Offset	= + 0 . 0 0 mA
Filter Time	= 0 0 0 SEC
HOLD Type	= <input type="checkbox"/> Fixed
	0 4 . 0 0 mA
	<input type="checkbox"/> Last

1. Set the corresponding 4.00mA to pH/ORP.
2. Set the corresponding 20.00mA to pH/ORP, the difference between 4.00mA and 20.00 mA at least for pH is 1.00, for ORP is 100 mV.
3. Set the offset current of pH/ORP, the range is ± 1.00 mA.
4. The filter time range is 0-120 seconds, the low pass filter of software will active when the current from one point to another point if user sets the filter time.
5. Set the current 1 output mode(fixed / last) when instrument enter into keeping mode.

Current 2 settings (for channel 2)

CURRENT 2 SETTINGS	
4.00 mA	= + 0 0 . 0 0 pH
20.00 mA	= + 1 4 . 0 0 pH
Offset	= + 0 . 0 0 mA
Filter Time	= 0 0 0 SEC
HOLD Type	= <input type="checkbox"/> Fixed
	0 4 . 0 0 mA
	<input type="checkbox"/> Last

CURRENT 2 SETTINGS	
4.00 mA	= + 0 0 0 0 mV
20.00 mA	= + 1 0 0 0 mV
Offset	= + 0 . 0 0 mA
Filter Time	= 0 0 0 秒
HOLD Type	= <input type="checkbox"/> Fixed
	0 4 . 0 0 mA
	<input type="checkbox"/> Last

The Settings are as same as “Current 1 Settings”.

Relay 1 settings(for channel 1)

RELAY 1 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S. P.	= + 1 0 . 0 0 pH
Open S. P.	= + 0 4 . 0 0 pH
Delay Time	= 0 0 0 SEC

RELAY 1 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S. P.	= + 1 0 0 0 mV
Open S. P.	= + 0 4 0 0 mV
Delay Time	= 0 0 0 SEC

1. Press UP/DOWN key to ON/OFF (enable/disable) relay1.
 2. Close set point: active point for pH/ORP.
 3. Open set point: inactive point for pH/ORP.
 4. Delay time: the range is 0-120 seconds. Relay needs to delay first then active if the measuring data is reach to close set point.
- Ex: If user wants turn on the pump at pH10.00 and turn off it at pH4.00, then the close S.P. needs to set to pH10.00, Open S.P. sets to pH4.00.

Relay 2 settings(for channel 1)

RELAY 2 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S. P.	= + 0 4 . 0 0 pH
Open S. P.	= + 1 0 . 0 0 pH
Delay Time	= 0 0 0 SEC

RELAY 2 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S. P.	= + 0 4 0 0 mV
Open S. P.	= + 1 0 0 0 mV
Delay Time	= 0 0 0 SEC

1. Press UP/DOWN key to ON/OFF (enable/disable) relay2.
 2. Close set point: active point for pH/ORP.
 3. Open set point: inactive point for pH/ORP.
 4. Delay time: the range is 0-120 seconds. Relay needs to delay first then active if the measuring data is reach to close set point.
- Ex: If user wants turn on the pump at pH4.00 and turn off it at pH10.00, then the close S.P. needs to set to pH4.00, Open S.P. sets to pH10.00.

Relay 3 settings(for channel 2)

RELAY 3 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S.P.	= + 1 0 . 0 0 pH
Open S.P.	= + 0 4 . 0 0 pH
Delay Time	= 0 0 0 SEC

RELAY 3 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S.P.	= + 1 0 0 0 mV
Open S.P.	= + 0 4 0 0 mV
Delay Time	= 0 0 0 SEC

1. Press UP/DOWN key to ON/OFF (enable/disable) relay3.
 2. Close set point: active point for pH/ORP.
 3. Open set point: inactive point for pH/ORP.
 4. Delay time: the range is 0-120 seconds. Relay needs to delay first then active if the measuring data is reach to close set point.
- Ex: If user wants turn on the pump at pH10.00 and turn off it at pH4.00, then the close S.P. needs to set to pH10.00, Open S.P. sets to pH4.00.

Relay 4 settings(for channel 2)

RELAY 4 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S.P.	= + 0 4 . 0 0 pH
Open S.P.	= + 1 0 . 0 0 pH
Delay Time	= 0 0 0 SEC

RELAY 4 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S.P.	= + 0 4 0 0 mV
Open S.P.	= + 1 0 0 0 mV
Delay Time	= 0 0 0 SEC

1. Press UP/DOWN key to ON/OFF (enable/disable) relay4.
 2. Close set point: active point for pH/ORP.
 3. Open set point: inactive point for pH/ORP.
 4. Delay time: the range is 0-120 seconds. Relay needs to delay first then active if the measuring data is reach to close set point.
- Ex: If user wants turn on the pump at pH4.00 and turn off it at pH10.00, then the close S.P. needs to set to pH4.00, Open S.P. sets to pH10.00.

Measurement 1 settings(for channel 1)

MEASUREMENT SETTINGS	
Mode	= <input checked="" type="checkbox"/> pH <input type="checkbox"/> ORP
Electrode	= <input type="checkbox"/> Glass <input type="checkbox"/> Antimony
Offset	= + 0 . 0 0 pH
Filter	= 0 0

MEASUREMENT SETTINGS	
Mode	= <input type="checkbox"/> pH <input checked="" type="checkbox"/> ORP
Electrode	= <input type="checkbox"/> Glass <input type="checkbox"/> Antimony
Offset	= + 0 0 0 mV
Filter	= 0 0

1. Choose the mode for measuring, press UP/DOWN key to choose.
2. Electrode selection, press UP/DOWN key to choose.(for pH only)
3. Offset , range for pH is $\pm 1.00\text{pH}$,for ORP is $\pm 100\text{mV}$.
4. Filter: Range 0-10.

Notice: If the reading is not stable then user can set the filter to average the readings.

Measurement 2 settings(for channel 2)

MEASUREMENT 2 SETTINGS	
Mode	= <input checked="" type="checkbox"/> pH <input type="checkbox"/> ORP
Offset	= + 0 . 0 0 pH

MEASUREMENT 2 SETTINGS	
Mode	= <input type="checkbox"/> pH <input checked="" type="checkbox"/> ORP
Offset	= + 0 0 0 mV

1. Choose the mode for measuring, press UP/DOWN key to choose.
2. Offset , range for pH is $\pm 1.00\text{pH}$,for ORP is $\pm 100\text{mV}$.

Temperature settings

TEMPERATURE SETTSINGS	
Automatic	= <input checked="" type="checkbox"/> Auto <input type="checkbox"/> Manual
Probe	= <input type="checkbox"/> Pt 1000 <input type="checkbox"/> NTC 10K
Offset	= + 0 . 0 °C
Manual Meas.	= + 0 2 5 . 0 °C
Manual Cal.	= 2 5 . 0 °C

TEMPERATURE SETTSINGS	
Display	= <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

1. Temperature compensation setting, press UP/DOWN key to choose.
2. Temperature probe, press UP/DOWN key to choose.
3. Temperature offset ,the range is $\pm 5.00^{\circ}\text{C}$.
4. Temperature for measuring when user set the temperature to manual.
5. Temperature for calibration mode when user sets the temperature to manual.
6. Temperature display: display the temperature on measurement mode or not.

Notice:

1. When user chooses AUTO and doesn't connect temperature probe then the display will not correct.
2. When select the probe needs to make sure the probe type is correct.
3. Manual measurement: the instrument will

use this temperature for compensation in measurement mode when user chooses Manual.

4. Manual calibration: the instrument will use this temperature for compensation in calibration mode when user chooses Manual.

RS485 settings

RS485 SETTSINGS	
ID Address	= 0 0 1
Baud Rate	= <input type="checkbox"/> 9600 <input type="checkbox"/> 19200 <input type="checkbox"/> 38400

1. ID address:1-255.
2. Baud rate ,press UP/DOWN key to choose.

Date settings

DATE SETTINGS	
Year	= 2 0 1 5
Month	= 0 8
Day	= 1 5
Hour	= 1 3
Minute	= 3 6
Second	= 0 4

Press UP/DOWN key to set the date. When power off the date will be kept for around 2 days.

Data log settings

DATE LOG SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
Display Type	= <input type="checkbox"/> Record <input type="checkbox"/> XY Chart
Reset Record	= <input type="checkbox"/> Yes <input type="checkbox"/> No
Save Period	= 0 6 0 SEC

1. Press UP/DOWN key to ON/OFF (enable/disable) this function.
2. Display type, press UP/DOWN key to choose
3. Erase all the records.
4. Saving period from 5 to 120 second.

Notice:

1. When user chooses ON, then it will save measuring data follow the save period time.
2. Display type: Record, display the detail of record(5 records in one page), XY chart, display a chart.(150 records in one page)
3. When reset the records, it will spend around 10 seconds.

Output test

OUTPUT TEST	
Current1	= 0 4 . 0 0 mA
Current2	= 0 4 . 0 0 mA
Relay1	= <input type="checkbox"/> CLOSE <input type="checkbox"/> OPEN
Relay2	= <input type="checkbox"/> CLOSE <input type="checkbox"/> OPEN
Relay3	= <input type="checkbox"/> CLOSE <input type="checkbox"/> OPEN

1. Current 1 output: 4.00-20.00mA, press UP/DOWN to set.
2. Current 2 output: 4.00-20.00mA, press UP/DOWN to set.
3. Relay 1 output, press UP/DOWN to choose.
4. Relay 2 output, press UP/DOWN to choose.
5. Relay 3 output, press UP/DOWN to choose.

Notice: This function for testing the output only.

OUTPUT TEST	
Relay4	= <input type="checkbox"/> CLOSE <input type="checkbox"/> OPEN

Language settings

LANGUAGE SETTINGS	
Language	= <input checked="" type="checkbox"/> English <input type="checkbox"/> 繁體中文 <input type="checkbox"/> 简体中文

Press UP/DOWN key to choose the language.

Reset parameters

RESET PARAMETERS	
Reset Type	= <input checked="" type="checkbox"/> Current = <input type="checkbox"/> Relay1 = <input type="checkbox"/> Relay2 = <input type="checkbox"/> Relay3 = <input type="checkbox"/> Relay4 = <input type="checkbox"/> All

Press UP/DOWN key to choose the reset.

Notice: The reset will not affect the calibrated parameters.

Record query

Press UP key at the measurement mode to enter record query mode.

INPUT RECORD START NUMBER
0 1 0 3 0 0

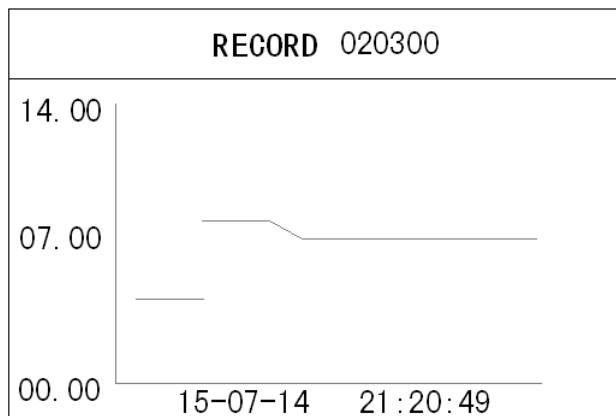
Press UP/DOWN and SHIFT key to input record number then press ENTER key enter or press MODE key exit.

Display pH record at record

RECORD 020300		
15-08-14	07.00	pH
21:20:49	07.50	pH
15-08-14	07.00	pH
21:20:59	07.50	pH
15-08-14	07.00	pH
21:21:09	07.50	pH
15-08-14	07.00	pH
21:21:19	07.50	pH
15-08-14	07.00	pH
21:21:29	07.50	pH

The first for channel 1, the second for Channel 2

Display pH record at XY chart



The XY chart for channel 1 only

pH Calibration

Press MODE key to enter the password menu and then press UP/DOWN/SHIFT key to input password 1100 then press ENTER will enter to calibration mode or press MODE key to exit. If no key is be pressed and over 10 minutes then it will go back to measurement mode.

PASSWORD
1 1 0 0

PASSWORD
0 1 0 0

Manu

CALIBRATION	
<input checked="" type="checkbox"/> Channel 1 Calibration	
<input type="checkbox"/> Channel 2 Calibration	

Press UP/DOWN key to select the channel and then press ENTER key to go to next manu.

CALIBRATION	
<input checked="" type="checkbox"/> Automatic Calibration	
<input type="checkbox"/> Manual Calibration	
<input type="checkbox"/> Reset Parameters	

Press UP/DOWN key to select the functions and then press ENTER key to enter.

1. Automatic calibration: follow the indication to select standard buffer.
2. Manual input calibration: manual input standard buffer.
3. Reset parameters: reset all of the calibrated parameters to default.

Notice:

If the electrode efficiency is lower than 80% or the waiting time is too long and can not locked, user should check the electrode if aged, user should Replace the new electrode.

Automatic calibration

CALIBRATION	
<input checked="" type="checkbox"/> 6.86	7.00 pH
<input type="checkbox"/> 7.00	25.0 °C
Select buffer and press ENTER	

Stand calibration

1. Put the electrode to the first buffer.
2. Press UP/DOWN key to select the correct buffer and then press ENTER to start calibration.
3. User can press ENTER to go to next or wait for it auto lock.
4. Display the idea pH on the right side.
5. If the offset is over +/-1.5 pH or temperature

is over 0.0-60.0°C then it will display error message on the button of LCD.

Slope calibration

CALIBRATION	
<input type="checkbox"/> 1.68 <input checked="" type="checkbox"/> 4.01 <input type="checkbox"/> 9.18 <input type="checkbox"/> 10.01 <input type="checkbox"/> 12.45	4.00 pH 25.0 °C
Select buffer and press ENTER	

1. Put the electrode to the second buffer.
2. Press UP/DOWN key to select the correct buffer and then press ENTER to start calibration.
3. User can press ENTER to go to next or wait for it auto lock.
4. Display the idea pH on the right side.
5. If the offset is over 30% or temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

Display efficiency

CALIBRATION	
<input type="checkbox"/> 1.68 <input checked="" type="checkbox"/> 4.01 <input type="checkbox"/> 9.18 <input type="checkbox"/> 10.01 <input type="checkbox"/> 12.45	4.00 pH 25.0 °C
EFFICIENCY = 98.0 %	

If the efficiency is lower than 80%, that means the electrode is aged, user should Replace the new electrode.

Manual calibration

Stand calibration

CALIBRATION	
7.00	7.00 pH 25.0 °C
Input buffer and press ENTER	

1. Put the electrode to the first buffer.
2. Press UP/DOWN key input the standard buffer and then press ENTER key to start calibration. User can press ENTER to go to next or wait for it auto lock. If the input is over 7.00+/-1.5pH then it will display ERROR on the top of LCD.
3. Display the idea pH on the right side.
4. If the idea pH is over 7.00+/-1.5 pH or temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

Slope calibration

CALIBRATION	
4.0 1	4.00 pH 25.0 °C
Input buffer and press ENTER	

1. Put the electrode to the second buffer.
2. Press UP/DOWN key input the standard buffer and then press ENTER key to start calibration. User can press ENTER to go to next or wait for it auto lock. If the input is over 0.00 to 14.00pH then it will display "ERROR" on the top of LCD.
3. Display the idea pH on the right side.
4. If the input is over 0.00-14.00 pH, or temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

Display efficiency

CALIBRATION	
04.01	4.00 pH 25.0 °C
EFFICIENCY = 98.0 %	

If the efficiency is lower than 80%, that means the electrode is aged user should Replace the new electrode.

If the efficiency is lower than 50%, it will not accept this calibration

Reset parameters

RESET PARAMETERS
RESET

This will reset all of the calibrated parameters to default.

ORP Calibration

Press MODE key to enter the password menu and then press UP/DOWN/SHIFT key to input password 1100 then press ENTER will enter to calibration mode or press MODE key to exit. If no key is be pressed and over 10 minutes then it will go back to measurement mode.

PASSWORD
0 0 0 0

PASSWORD
1 1 0 0

Menu

CALIBRATION
<input checked="" type="checkbox"/> Manual Calibration <input type="checkbox"/> Reset Parameters

Press UP/DOWN key to select the function and then press ENTER key to enter function.

1. Manual input standard buffer.
2. Reset parameters: reset all of the calibrated parameters to default.

Manual calibration

CALIBRATION	
0 8 6 mV	0 8 8 mV
Input buffer and press ENTER	

1. Put the electrode to the standard buffer.
2. Press UP/DOWN key input the standard buffer and then press ENTER key to start calibration. User can press ENTER to go to next or wait for it auto lock.
3. Display the idea ORP on the right side.

Reset parameters

RESET PARAMETERS
RESET

This will reset all of the calibrated parameters to default.

Default

pH1	20.00mA	corresponding	14.00	pH	range: -1.00 - 16.00
pH1	4.00mA	corresponding	0.00	pH	range: -2.00 - 15.00
					difference : 1.00
ORP1	20.00mA	corresponding	1000	mV	range: -1900 - 2000
ORP1	4.00mA	corresponding	0	mV	range: -2000 - 1900
					difference : 100
pH2	20.00mA	corresponding	14.00	pH	range: -1.00 - 16.00
pH2	4.00mA	corresponding	0.00	pH	range: -2.00 - 15.00
					difference : 1.00
ORP2	20.00mA	corresponding	1000	mV	range: -1900 - 2000
ORP2	4.00mA	corresponding	0	mV	range: -2000 - 1900
					difference : 100
Current 1 output offset			0.00	mA	range: +/- 1.00
Current 2 output offset			0.00	mA	range: +/- 1.00
Current 1 filter			0	second	range: 0 - 120
Current 2 filter			0	second	range: 0 - 120
Current 1 fixed output			4.00	mA	range: 4.00 - 20.00
Current 2 fixed output			4.00	mA	range: 4.00 - 20.00
Current 1 HOLD type			last		range: fixed/last
Current 2 HOLD type			last		range: fixed/last
Relay 1 pH close S.P.			10.00	pH	range: -2.00 - 16.00
Relay 1 PH open S.P.			4.00	pH	range: -2.00 - 16.00
					difference : 0.01
Relay 1 ORP close S.P.			1000	mV	range: -2000 - 2000
Relay 1 ORP open S.P.			400	mV	range: -2000 - 2000
					difference : 1
Relay 1 delay time			0	second	range: 0-120
Relay 2 pH close S.P.			4.00	pH	range: -2.00 - 16.00

Relay 2 PH open S.P.	10.00	pH	range: -2.00 - 16.00 difference : 0.01
Relay 2 ORP close S.P.	400	mV	range: -2000- 2000
Relay 2 ORP open S.P.	1000	mV	range: -2000 - 2000 difference : 1
Relay 2 delay time	0	second	range: 0 – 120
Relay 3 pH close S.P.	10.00	pH	range: -2.00 - 16.00
Relay 3 PH open S.P.	4.00	pH	range: -2.00 - 16.00 difference : 0.01
Relay 3 ORP close S.P.	1000	mV	range: -2000 - 2000
Relay 3 ORP open S.P.	400	mV	range: -2000 - 2000 difference : 1
Relay 3 delay time	0	second	range: 0-120
Relay 4 pH close S.P.	4.00	pH	range: -2.00 - 16.00
Relay 4 PH open S.P.	10.00	pH	range: -2.00 - 16.00 difference : 0.01
Relay 4 ORP close S.P.	400	mV	range: -2000- 2000
Relay 4 ORP open S.P.	1000	mV	range: -2000 - 2000 difference : 1
Relay 4 delay time	0	second	range: 0 – 120
Record period	60	second	range: 5 - 120
ID address	1		range: 1 - 255
Baud rate	9600		range: 9600,19200,38400
PH1 offset	0.00	pH	range: +/- 1.00
PH2 offset	0.00	pH	range: +/- 1.00
ORP1 offset	0	mV	range: +/-100
ORP2 offset	0	mV	range: +/-100
Mode	pH		range: 0=PH, 1=ORP
Temp. Offset	0.0	°C	range: +/- 5.0
Manual Temp. for measurement	25.0	°C	range: -10.0 - 130.0
Manual Temp. for calibration	25.0	°C	range: 0.0 - 60.0
Language	English		range: English/traditional Chinese /simple Chinese
Filter	1		range: 0 - 10
Temp. compensation	MTC		range: ATC/MTC
Temp. probe	Pt1000		range: Pt1000, NTC10K
Record type	record		range: record/XY chart

Password

Press MODE key

1100:Calibration mode

1200:Setting mode

If no key is be pressed and over 10 minutes then it will go back to measurement mode.

Error code

Error 01	memory error
Error 02	reading is over maximum
Error 03	reading is under minimum
Error 04	temperature is over maximum
Error 05	temperature is under minimum
Error 06	current 1 output is over 20.5 mA,the maximum is 22.00mA
Error 07	current 1 output is under 3.8 mA, the minimum is 3.5mA
Error 08	current 2 output is over 20.5 mA,the maximum is 22.00mA
Error 09	current 2 output is under 3.8 mA, the minimum is 3.5mA
Error 10	record error
Error 11	ADC damage
Error 99	default parameters lost

RS485 command

The instrument use the standard Modbus-RTU protocol, all of the data are word type(2 bytes), the range is -32767~32767 ,16 system.

PC command:

	ID address	command	Start address	Data number	CRC16
length	1 byte	1byte	2 byte	2 byte	2 byte
Ex.	0x01	0x03	0x0001	0x0001	0xD5CA

Instrument response:

	ID address	command	Data number	data	CRC16
length	1 byte	1 byte	1byte	N byte	2 byte
Ex.	0x01	0x03	0x02	0x02 0xBC	0xB895

If response is 01,the command is wrong.

If response is 02,the address is not correct.

If response is 03,data number is not correct.

command 03: read the settings

command 04: read the readings

04:definition

address

(00)	0x00	pH1/ORP1 reading	reading : pH X 0.01, ORP X 1
(01)	0x01	pH1/ORP1 current	reading : X 0.01
(02)	0x02	pH2/ORP2 reading	reading : pH X 0.01, ORP X 1
(03)	0x03	pH2/ORP2 current	reading : X 0.01
(04)	0x04	Temperature	reading : X 0.1
(05)	0x05	Error code	reading : X 1
(06)	0x06		
(07)	0x07		
(08)	0x08		
(09)	0x09	Model type	fix to 1

03:definition

Address

(00)	0x00	pH1	20.00mA corresponding	reading:X 0.01
(01)	0x01	pH1	4.00mA corresponding	reading:X 0.01
(02)	0x02	ORP1	20.00mA corresponding	reading:X 1
(03)	0x03	ORP1	4.00mA corresponding	reading:X 1
(04)	0x04	pH2	20.00mA corresponding	reading:X 0.01
(05)	0x05	pH2	4.00mA corresponding	reading:X 0.01
(06)	0x06	ORP2	20.00mA corresponding	reading:X 1
(07)	0x07	ORP2	4.00mA corresponding	reading:X 1
(08)	0x08	Current 1	offset	reading:X0.01
(09)	0x09	Current 2	offset	reading:X0.01
(10)	0x0A	Current 1	filter	reading:X1
(11)	0x0B	Current 2	filter	reading:X1
(12)	0x0C	Current 1	fixed current	reading:X0.01
(13)	0x0D	Current 2	fixed current	reading:X0.01
(14)	0x0E	Current 1	HOLD type	reading:X1 0=fixed,1=last
(15)	0x0F	Current 2	HOLD type	reading:X1 0=fixed,1=last
(16)	0x10	Relay1	pH close S.P.	reading:X0.01
(17)	0x11	Relay1	pH open S.P.	reading:X0.01
(18)	0x12	Relay1	ORP close S.P.	reading:X1
(19)	0x13	Relay1	ORP open S.P.	reading:X1
(20)	0x14	Relay1	delay time	reading:X1
(21)	0x15	Relay2	pH close S.P.	reading:X0.01
(22)	0x16	Relay2	pH open S.P.	reading:X0.01
(23)	0x17	Relay2	ORP close S.P.	reading:X1
(24)	0x18	Relay2	ORP open S.P.	reading:X1
(25)	0x19	Relay2	delay time	reading:X1
(26)	0x1A	Relay3	pH close S.P.	reading:X0.01

(27)	0x1B	Relay3 pH open S.P.	reading:X0.01
(28)	0x1C	Relay3 ORP close S.P.	reading:X1
(29)	0x1D	Relay3 ORP open S.P.	reading:X1
(30)	0x1E	Relay3 delay time	reading:X1
(31)	0x1F	Relay4 pH close S.P.	reading:X0.01
(32)	0x20	Relay4 pH open S.P.	reading:X0.01
(33)	0x21	Relay4 ORP close S.P.	reading:X1
(34)	0x22	Relay4 ORP open S.P.	reading:X1
(35)	0x23	Relay4 delay time	reading:X1
(36)	0x24	Record saving time	reading:X1
(37)	0x25	Mode1	reading:X1 0=pH,1=ORP
(38)	0x26	Mode2	reading:X1 0=pH,1=ORP
(39)	0x27	pH1 offset	reading:X0.01
(40)	0x28	ORP1 offset	reading:X1
(41)	0x29	pH2 offset	reading:X0.01
(42)	0x2A	ORP2 offset	reading:X1
(43)	0x2B	Temp. offset	reading:X0.1
(44)	0x2C	Manual temp. for measurement	reading:X0.1
(45)	0x2D	Manual temp. for calibration	reading:X0.1
(46)	0x2E	Temp. compensation	reading:X1 0=Auto,1=manual
(47)	0x2F	Temp. probe	reading:X1 0=Pt1000,1=NTC10K
(48)	0x30	Language	reading:X1 0=English ,1=traditional Chinese,2=simple Chinese
(49)	0x31	Filter	reading:X1