SS/Turbidity/Sludge blanket Controller
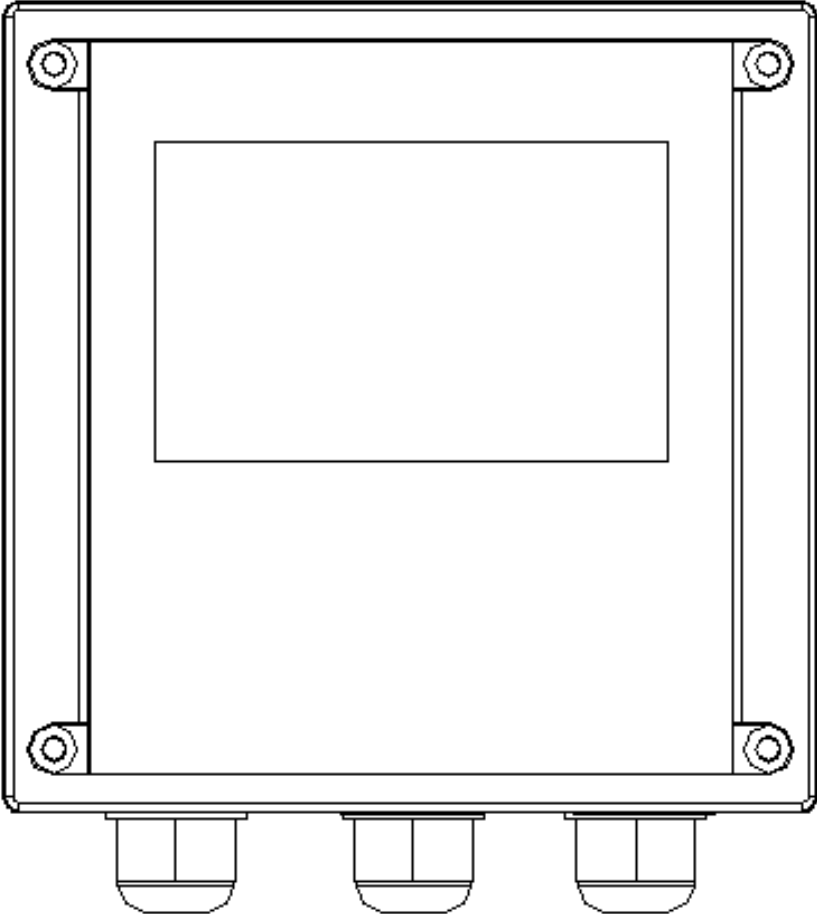
Content

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 suspended solids turbidity, sludge blanket, such as urban wastewater treatment, treatment of industrial effluents, sludge treatment, dredging site, sedimentation tank, 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, 4 sets of brackets.(fixed block, fixed bar, screw)
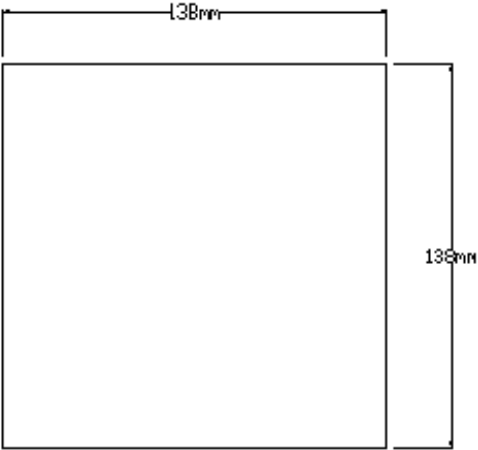
Specifications

Functions	SS	Sludge blanket	Turbidity
Measuring range	0.00 – 50.00g/L	0.0-100.0%	0.0-4000.0
Resolution	0.01	0.1	0.1
Accuracy	<±5%	<±2%	±5%
Temp. compensation	NTC		
Temp. range	0.0 to +50.0℃		
Temp. resolution	0.1℃		
Temp. accuracy	±0.2℃		
Data update time	1-60 Second		
Ambient temperature range	0 to +70℃		
Storage temp.	-20 to +70℃		
Display	Back light, dot matrix		
Main current output1	Isolated, 4 to 20mA output , max. load 500Ω		
Temp. current output 2	Isolated, 4 to 20mA output , max. load 500Ω		
Current output accuracy	±0.05 mA		
RS485	Modbus RTU protocol		
Baud rate	9600/19200/38400		
Maximum relay contacts capacity	5A/250VAC,5A/30VDC		
Cleaning setting	ON: 1 to 1000 seconds, OFF: 0.1 to 1000.0 hours		
One multi function relay	clean/period alarm/error alarm		
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		
Instrument size	144mm X 144mm X 105mm (H/W/D)		
Cutout size	138mm X 138mm		
Weight	0.85Kg		

Instrument installation

The instrument can be panel, wall or pipe mounted installation.
Panel Installation: Make a 138x138 mm square cutout and insert the instrument. Screw in the fixed block with the screws and fixed bar.

Cutout size
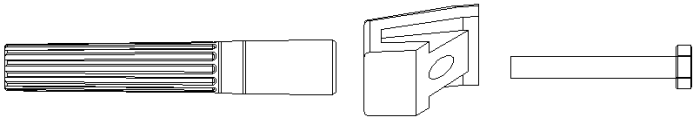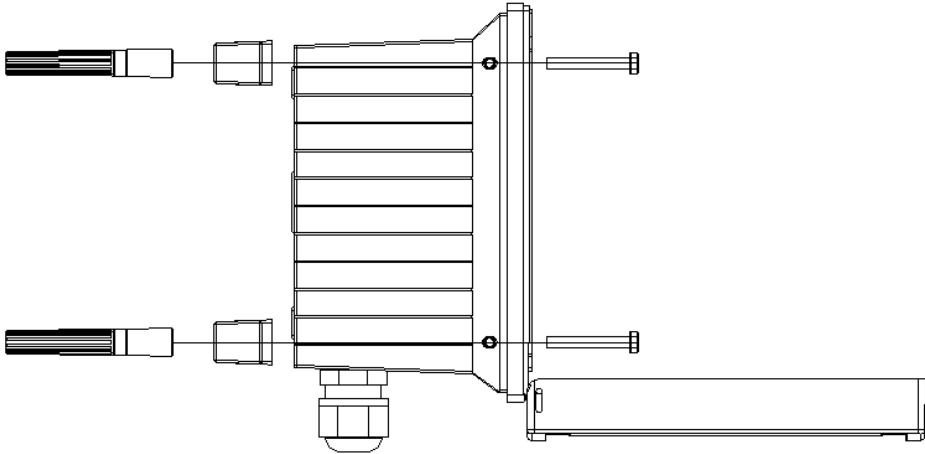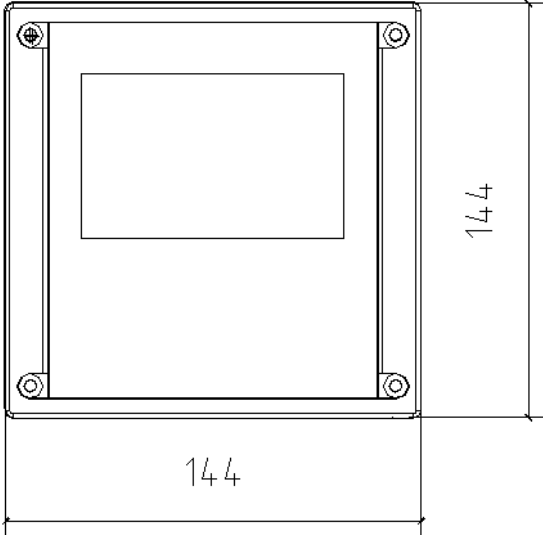
Installation figure

Wall and pipe installation

Connection label

POWER: 90-260VAC   50/60Hz
4-20mA: Isolation Max. Load 500 ohm
Relay: 5A/250VAC   5A/30VDC

Terminals: 20 AC, 19 AC (POWER), 18/17 RELAY1, 16/15 RELAY2, 14/13 CLEAN (CONTACTS), 12 OUT1+, 11 GND-, 10 OUT2+ (OUTPUT), 9 RS485B, 8 RS485A (COM), 7 V+, 6 GND, 5 SENSOR B, 4 SENSOR A, 3 SHIELD, 2, 1
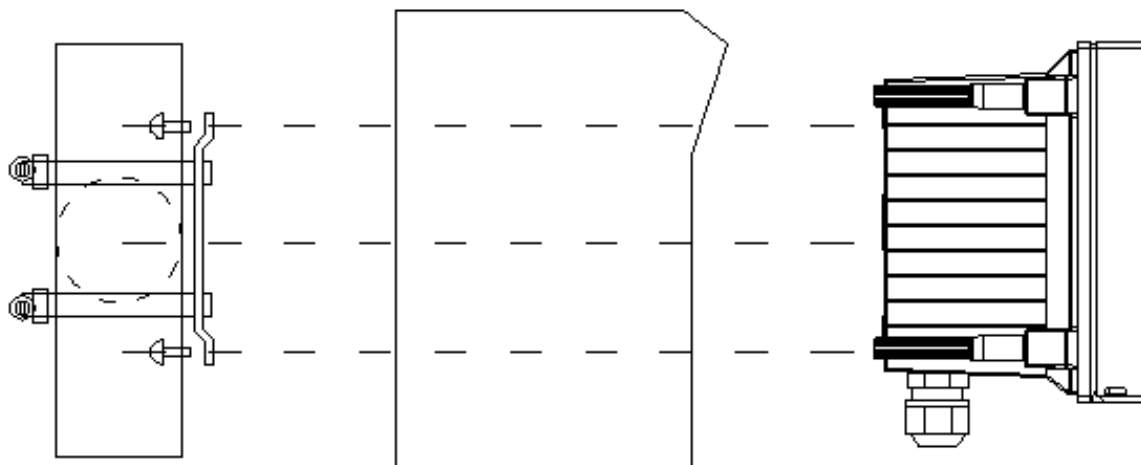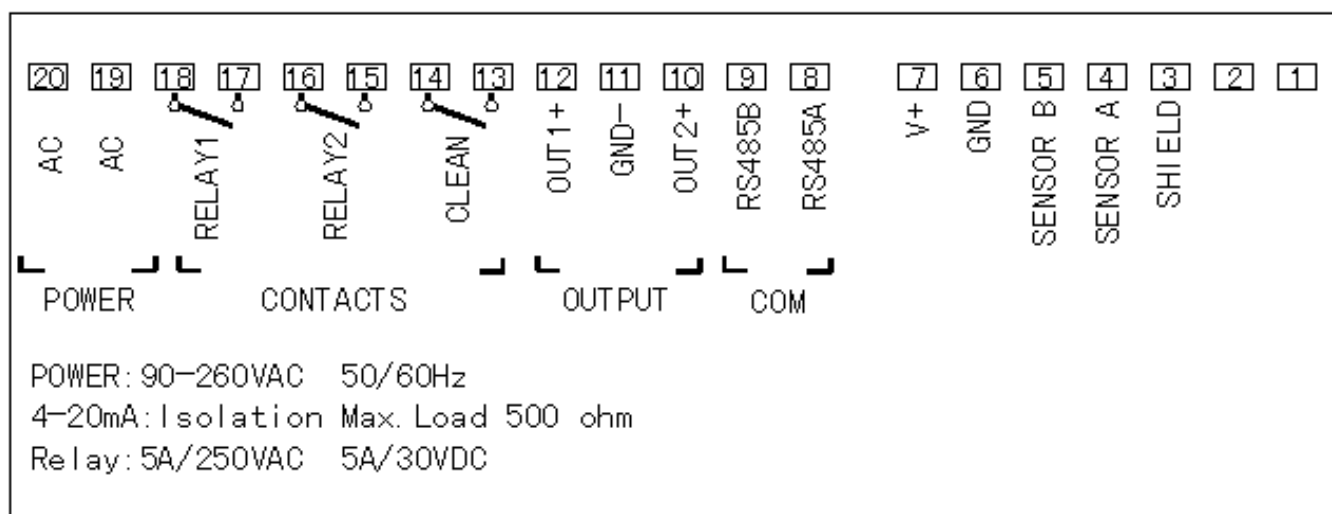
Electrode connection figure

GREEN/YELLOW
WHITE
GREEN
BLACK
RED

Optical electrode
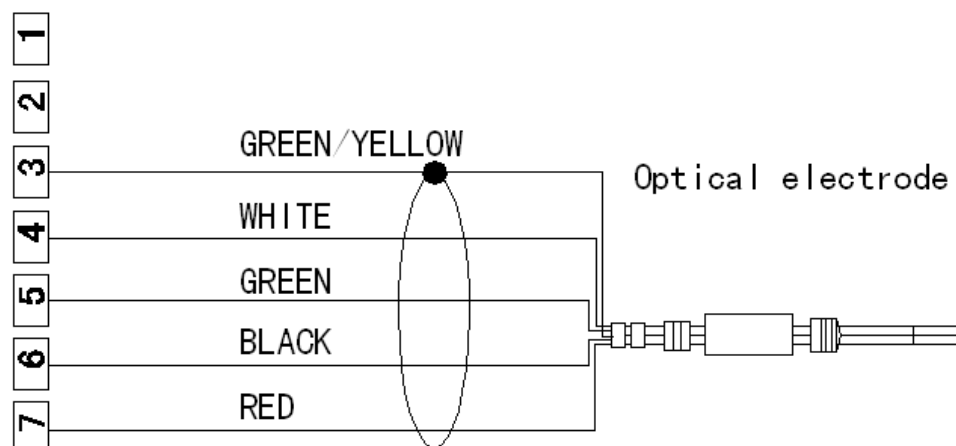
Relay contact protection

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.
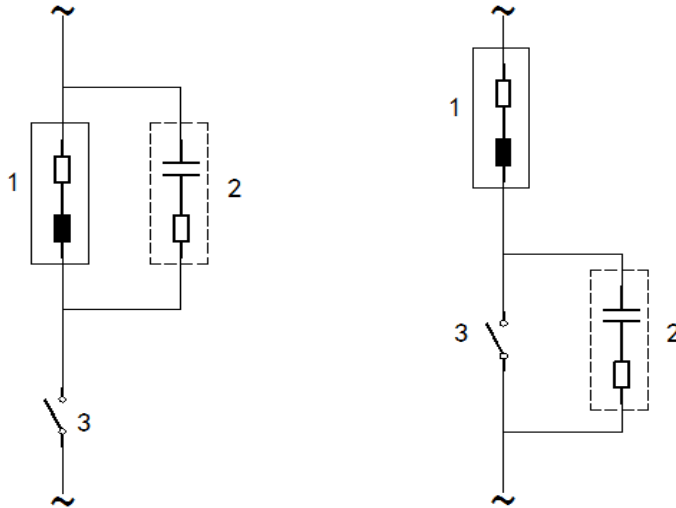
AC protection, use for inductive load
1. load
2. RC eliminate spark, using in 220VAC, R=100 ohm1W,
3. Relay contact
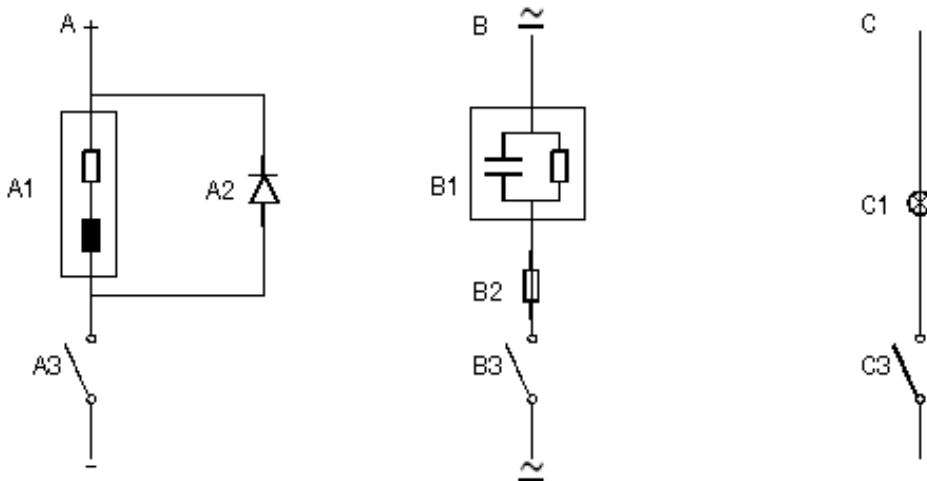
A. DC protection ,A1: inductive load   A2: 1N4007, A3: relay contact
B. AC/DC protection ,B1: capacitive load ,B2: 0.8 Ohm/1W（DC24V）,B3: relay contact
C. Resistive load ,C1:lamp bulb ,C3:relay contact

Display
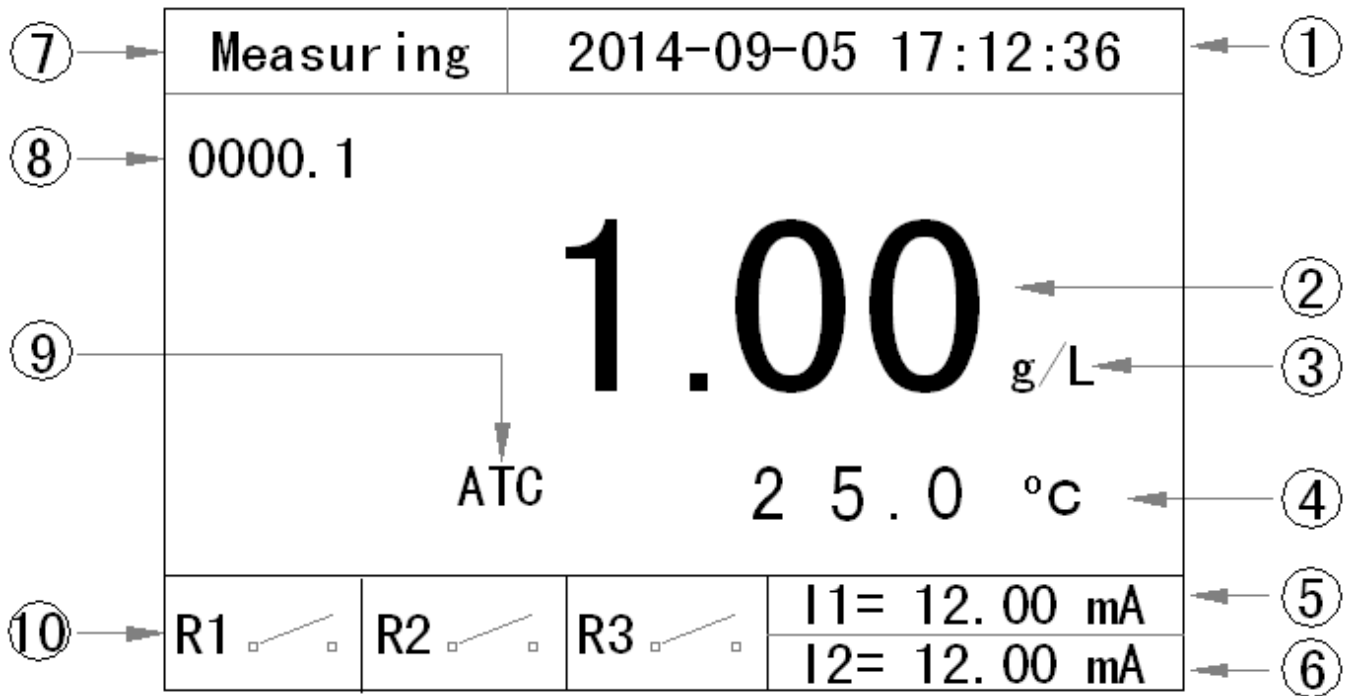
1. Date and time
2. Main display
3. Unit
4. Temperature and unit
5. First current output
6. Second current output
7. Measurement status and Error indicator, there is no display if meter is in keeping mode
8. Count down timer: cycle time/clean time, it also displays the "delay" when relay3 has a delay enabled.
9. Temp. compensation: auto(ATC)
10. Relay indicator

Key
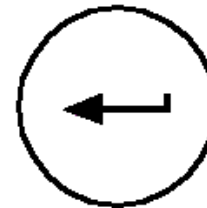
| MODE | SHIFT | UP | DOWN | ENTER |

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 and Clean. 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 or the instrument works in clean mode.

It will in keeping mode around 10 seconds when it goes back to measurement mode form the above mentioned 4 mode 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: Relay1 and Relay2 open.(inactive)

<u>Setting</u>

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

<u>Main display</u>

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

CONFIGURATION
■ Current1 Settings
□ Current2 Settings
□ Relay1 Settings
□ Relay2 Settings
□ Relay3 Settings
□ Measurement Settings
□ Temperature Settings
□ RS485 Settings

Page1

CONFIGURATION
■ Date Settings
□ Data Log Settings
□ Output Test
□ Language Settings
□ 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

```
        CURRENT 1 SETTINGS

4.00 mA       = 0 0 0 0 .0 NTU
20.00 mA      = 0 1 0 0 .0 NTU
Offset        =   + 0 .0 0 mA
Filter Time   =        0 0 0 SEC
HOLD type     = □ Fixed
                 0 4 .0 0 mA
                □ Last
```

```
        CURRENT 1 SETTINGS

4.00 mA       =     0 0 .0 %
20.00 mA      =   1 0 0 .0 %
Offset        =   + 0 .0 0 mA
Filter Time   =        0 0 0 SEC
HOLD type     = □ Fixed
                 0 4 .0 0 mA
                □ Last
```

```
        CURRENT 1 SETTINGS

4.00 mA       =     0 0 .0 0 g/L
20.00 mA      =   5 0 .0 0 g/L
Offset        =   + 0 .0 0 mA
Filter Time   =        0 0 0 SEC
HOLD type     = □ Fixed
                 0 4 .0 0 mA
                □ Last
```

1. Set the corresponding 4.00mA to SS/SB/ NTU.
2. Set the corresponding 20.00mA to SS/SB/ NTU, the difference between 4.00mA and 20.00 mA at least for SS is 1.00g/L, for SB is 10.0%,for NTU is 10.0.
3. Set the offset current of SS/SB/NTU, the range is ±1.00mA.
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

```
        CURRENT 2 SETTINGS

4.00 mA       =     0 0 .0 ℃
20.00 mA      =   5 0 .0 ℃
Offset        =   + 0 .0 0 mA
Filter Time   =        0 0 0 SEC
HOLD type     = □ Fixed
                 0 4 .0 0 mA
                □ Last
```

1. Set the corresponding 4.00mA to temperature.
2. Set the corresponding 20.00mA to temperature, the difference at least between 4.00mA and 20.00 mA is 10.0℃.
3. Set the offset current of temperature, the range is ±1.00mA.
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 2 output mode(fixed / last) when instrument enter into keeping mode.

Relay 1 settings

```
          REALY  1  SETTINGS
ON/OFF           = ■ ON
                 = □ OFF
Close  S.P.      = 0 1 0 0 . 0 NTU
Open   S.P.      = 0 0 0 0 . 0 NTU
Delay  Time      =       0 0 0 SEC
```

```
          REALY  1  SETTINGS
ON/OFF           = ■ ON
                 = □ OFF
Close  S.P.      =   1 0 0 . 0 %
Open   S.P.      =   0 0 0 . 0 %
Delay  Time      =     0 0 0 SEC
```

```
          REALY  1  SETTINGS
ON/OFF           = ■ ON
                 = □ OFF
Close  S.P.      =   5 0 . 0 0 g/L
Open   S.P.      =   0 0 . 0 0 g/L
Delay  Time      =     0 0 0 SEC
```

1. Press UP/DOWN key to ON/OFF (enable/disable) relay1.
2. Close set point: active point for SS/SB/NTU.
3. Open set point: inactive point for SS/SB/ NTU
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 100.0 NTU and turn off it at 0.0 NTU, then the close S.P. needs to set to 100.0 NTU, Open S.P. sets to 0.0 NTU.

Relay 2 settings

```
          REALY  2  SETTINGS
ON/OFF           = ■ ON
                 = □ OFF
Close  S.P.      = 0 0 0 0 . 0 NTU
Open   S.P.      = 0 1 0 0 . 0 NTU
Delay  Time      =       0 0 0 SEC
```

```
          REALY  2  SETTINGS
ON/OFF           = ■ ON
                 = □ OFF
Close  S.P.      =   0 0 0 . 0 %
Open   S.P.      =   1 0 0 . 0 %
Delay  Time      =     0 0 0 SEC
```

```
REALY 2 SETTINGS
───────────────────────
ON/OFF        = ■ ON
              = □ OFF
Close S.P.    =  00.00 g/L
Open  S.P.    =  50.00 g/L
Delay Time    =     000 SEC
```

1. Press UP/DOWN key to ON/OFF (enable/ disable) relay2.
2. Close set point: active point for SS/SB/NTU.
3. Open set point: inactive point for SS/SB/ NTU.
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 0.0 NTU and turn off it at 100.0 NTU, then the close S.P. needs to set to 0.0 NTU, Open S.P. sets to 100.0 NTU.

Relay 3 settings

```
RELAY 3 SETTINGS
───────────────────────
ON/OFF        = ■ ON
              = □ OFF
Period Time   =0001.0 HOUR
Clean Time    =    0010 SEC
Delay Time    =     000 SEC
Function      = □ Rinsing
                □ Interval Alarm
                □ Error Alarm
```

1. Press UP/DOWN key to ON/OFF (enable/disable) relay3.
2. Period time: The period for Rinsing or interval function.
3. Clean time: When period is timeout then relay active.
4. Delay time: the range is 0-120 seconds. Relay needs to delay first then active if the period is timeout.
5. Function: press UP/DOWN key to choose Rinsing/Interval/Error.

Notice:
1. Rinsing: when period timeout then clean-relay will active, when clean time is timeout the repeat count for the period.
2. Interval alarm: When period timeout then clean-relay active until user resets the interval then the clean-relay inactive and repeat count for the period.
3. Error alarm: The clean-relay active when there is a error produce. No delay time function in this mode.

Measurement settings

```
    MEASUREMENT SETTINGS

 Mode          =□ NTU
                □ %
                ■ g/L
 Offset     =      +0.0 g/L
 Filter     =        01
 Meas. Peri. =        05秒
```

1. Choose the mode for measuring, press UP/DOWN key to choose.
2. Offset , range for SS is±5.00g/L ,for SB is±10.0%,for NTU is±100.0.
3. Filter: Range 0-10.
4. Measuring period, range is 1-60 second.

Notice:

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

Temperature settings

```
    TEMPERATURE SETTINGS

 Offset      =  +0.0 ℃
 Display     =  □ YES
                ■ NO
```

1. Temperature offset ,the range is±5.00℃.
2. Temperature display: display the temperature on measurement mode or not.

RS485 settings

```
     RS485 SETTINGS

 ID Address   =001
 Baudrate     =□   9600
              =□  19200
              =□  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

```
       DATA LOG SETTINGS

  ON/OFF        =■ ON
                 □ OFF
  Display Type =□ Record
                 □ XY Chart
  Reset Record =□ Yes
                =□ 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     =□ CLOSE
              □ OPEN
  Relay2     =□ CLOSE
             =□ OPEN
  Relay3     =□ CLOSE
             =□ 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.

Language settings

```
    LANGUAGE SETTINGS

 Language      = ■ English
               = □ 繁體中文
               = □ 简体中文
```

Press UP/DOWN key to choose the language.

Reset parameters

```
      RESET PARAMETERS

 Reset Type   = ■ Current
              = □ Relay1
              = □ Relay2
              = □ Relay3
              = □ 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.

```
        RECORD  002030
┌─────────────────────────────┐
│ 15-08-14    0100.0    NTU   │
│ 21:20:49      25.0    °C    │
│ 15-08-14     10.00    g/L   │
│ 21:20:59      25.0    °C    │
│ 15-08-14     10.00    g/L   │
│ 21:21:09      25.0    °C    │
│ 15-08-14    100.0     %     │
│ 21:21:19      25.0    °C    │
│ 15-08-14    100.0     %     │
│ 21:21:29      25.0    °C    │
└─────────────────────────────┘
```

```
        RECORD  002030
┌─────────────────────────────┐
│ 4000                        │
│                             │
│ 3000                        │
│                             │
│ 2000           ___          │
│             __/   _____ │
│ 1000 _____/                │
│                             │
│ 0000 _____    │
│      15-07-14   21:20:49    │
└─────────────────────────────┘
```
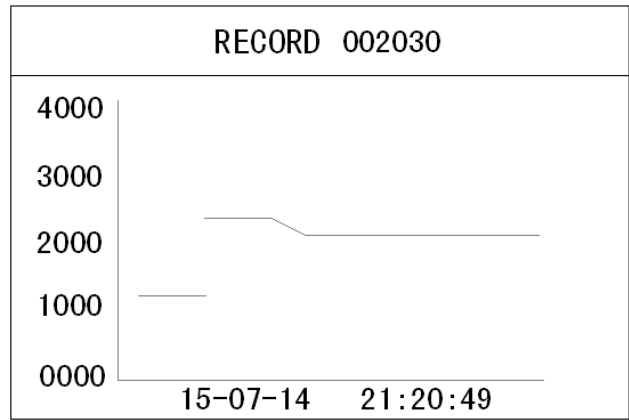
Calibration

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             │
│                             │
│                             │
└─────────────────────────────┘
```

Manu

```
         CALIBRATION
┌─────────────────────────────┐
│  ■ NTU Calibration          │
│  □ NTU Working Mode         │
│  □ SB Calibration           │
│  □ SB Working Mode          │
│  □ SS Calibration           │
│  □ SS Working Mode          │
└─────────────────────────────┘
```

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

1. NTU calibration and working mode.
2. Sludge blanket calibration and working mode.
3. Suspended solid calibration and working mode.

Turbidity calibration

Zero calibration

```
   NTU ZERO CALIBRATION

 Cal.Value      =        0.0 NTU

 Reading     = 0 0 0 1.3 NTU




   Wait stable and press ENTER
```

1. Put the electrode to the deionized water.
2. Waiting for the reading is stable and then press ENTER to go to next or press MODE to exit.

Slope calibration

```
   NTU SLOPE CALIBRATION

 Cal.Value      = 2 0 0 0.0 NTU

 Reading     = 2 0 1 0.0 NTU




   Wait stable and press ENTER
```

1. Put the electrode to the standard buffer.
2. Waiting for the reading is stable and then press ENTER to finish the calibration or press MODE to exit.

Notice:
   The calibrating value is fixed to 2000.0NTU

Turbidity working mode

```
     NTU WORKING MODE

  ■ Factory Default
  □ User Calibration
```

1. Factory default, restore to the default parameters.
2. User calibration, using the user calibration parameters

Sludge blanket calibration

```
        SB CALIBRATION

Cal.Value      =  100.0 %

Reading        =  101.3 %




  Wait stable and press ENTER
```

1. Put the electrode to the 100% sludge blanket.
2. Waiting for the reading is stable and then press ENTER to finish the calibration or press MODE to exit.

Sludge blanket working mode

```
        SB WORKING MODE

  ■ Factory Default
  □ User Calibration




```

1. Factory default, restore to the default parameters.
2. User calibration, using the user calibration parameters

Suspended solid calibration

Zero calibration

```
      SS ZERO CALIBRATION

Cal.Value     =      0.00 g/L

Reading       =     00.03 g/L




  Wait stable and press ENTER
```

1. Put the electrode to the deionized water.
2. Waiting for the reading is stable and then press ENTER to go to next or press MODE to exit.

```
┌─────────────────────────────────┐
│        SS CALIBRATION           │
├─────────────────────────────────┤
│  Cal.Value    =  2 0.0 0 g/L    │
│                                 │
│                                 │
│                                 │
├─────────────────────────────────┤
│     Input standard data         │
└─────────────────────────────────┘
```

Input slope standard buffer.

Slope calibration

```
┌─────────────────────────────────┐
│     SS SLOPE CALIBRATION        │
├─────────────────────────────────┤
│  Cal.Value   =   2 0.0 0 g/L    │
│  Reading     =   2 0.1 3 g/L    │
│                                 │
│                                 │
├─────────────────────────────────┤
│  Wait stable and press ENTER    │
└─────────────────────────────────┘
```

1. Put the electrode to the standard buffer.
2. Waiting for the reading is stable and then press ENTER to finish the calibration or press MODE to exit.

<u>Suspended solid working mode</u>

```
┌─────────────────────────────────┐
│        SS WORKING MODE          │
├─────────────────────────────────┤
│  ■ Factory Default              │
│  □ User Calibration             │
│                                 │
│                                 │
│                                 │
│                                 │
└─────────────────────────────────┘
```

1. Factory default, restore to the default parameters.
2. User calibration, using the user calibration parameters

Default

NTU	20.00mA corresponding	100.0	NTU	range: 10.0 to 4000.0
NTU	4.00mA corresponding	0.0	NTU	range: 0.0 to 3990.0
				difference : 10.0
SB	20.00mA corresponding	100.0	%	range: 10.0 to 100.0
SB	4.00mA corresponding	0.00	%	range: 0.0 to 90.0
				difference : 10.0
SS	20.00mA corresponding	50.00	g/L	range: 1.00 to 50.00
SS	4.00mA corresponding	0.00	g/L	range: 0.00 to 49.00
				difference : 1.00
Temp. 20.00mA corresponding		50.0	℃	range: 10.0 to 50.0
Temp. 4.00mA corresponding		0.0	℃	range:-0.0 to 40.0
				difference : 10.0
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 to 120
Current 2 filter		0	second	range: 0 to 120
Current 1 fixed output		4.00	mA	range: 4.00 to 20.00
Current 2 fixed output		4.00	mA	range: 4.00 to 20.00
Current 1 HOLD type		fixed		range: fixed/last
Current 2 HOLD type		fixed		range: fixed/last
Relay 1 NTU close S.P.		100.0	NTU	range: 0.0 to 4000.0
Relay 1 NTU open S.P.		0.0	NTU	range: 0.0 to 4000.0
				difference : 0.1
Relay 1 SB close S.P.		100.0	%	range: 0.0 to 100.0
Relay 1 SB open S.P.		0.0	%	range: 0.0 to 100.0
				difference : 0.1
Relay 1 SS close S.P.		50.00	g/L	range: 0.00 to 50.00
Relay 1 SS open S.P.		0.00	g/L	range: 0.00 to 50.00
				difference : 0.1
Relay 1 delay time		0	second	range: 0-120
Relay 2 NTU close S.P.		100.0	NTU	range: 0.0 to 4000.0
Relay 2 NTU open S.P.		0.0	NTU	range: 0.0 to 4000.0
				difference : 0.1
Relay 2 SB close S.P.		100.0	%	range: 0.0 to 100.0
Relay 2 SB open S.P.		0.0	%	range: 0.0 to 100.0
				difference : 0.1
Relay 2 SS close S.P.		50.00	g/L	range: 0.00 to 50.00
Relay 2 SS open S.P.		0.00	g/L	range: 0.00 to 50.00
				difference : 0.1

Relay 2 delay time	0	second	range: 0 to 120
Relay 3 period time	1.0	hour	range: 0 to 1000.0
Relay 3 clean time	10	second	range: 0 to 1000
Relay 3 delay time	0		range: 0 to 120
Relay 3 function	error alarm		range: clean/period alarm/ error alarm
Save time	60	second	range: 5 to 120
ID address	1		range: 1 to 255
Baudrate	9600		range: 9600,19200,38400
NTU offset	0.0	NTU	range: +/- 100.0
SB offset	0.0	%	range: +/- 10.0
SS offset	0.0	g/L	range: +/- 5.00
Mode	NTU		range: 0=NTU,1=SB,2=SS
Temp. Offset	0.0	°C	range: +/- 5.0
Language	English		range: English/tranditional Chinese /simple Chinese
Filter	1		range: 0 to 10
Measuring period	1	Second	range: 1 to 60

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   NTU/ SB/SS reading   reading: NTU/SBX 0.1, SSX0.01
(01)   0x01   NTU/ SB/SS current   reading:X 0.01
(02)   0x02   Temperature   reading:X 0.1
(03)   0x03   Temperature current   reading:X 0.01
(04)   0x04   Error code   reading:X 1
(05)   0x05
(06)   0x06
(07)   0x07
(08)   0x08
(09)   0x09   Model type   fix to 11

03:definition
Address
(00)   0x00   NTU 20.00mA corresponding   reading:X0.1
(01)   0x01   NTU 4.00mA corresponding   reading:X0.1
(02)   0x02   SB 20.00mA corresponding   reading:X0.1

(03)	0x03	SB 4.00mA corresponding	reading:X0.1	
(04)	0x04	SS 20.00mA corresponding	reading:X0.01	
(05)	0x05	SS 4.00mA corresponding	reading:X0.01	
(06)	0x06	Temp. 20.00mA corresponding	reading:X0.1	
(07)	0x07	Temp. 4.00mA corresponding	reading:X0.1	
(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 NTU close S.P.	reading:X0.1	
(17)	0x11	Relay1 NTU open S.P.	reading:X0.1	
(18)	0x12	Relay1 SB close S.P.	reading:X0.1	
(19)	0x13	Relay1 SB open S.P.	reading:X0.1	
(20)	0x14	Relay1 SS close S.P.	reading:X0.01	
(21)	0x15	Relay1 SS open S.P.	reading:X0.01	
(22)	0x16	Relay1 delay time	reading:X1	
(23)	0x17	Relay2 NTU close S.P.	reading:X0.1	
(24)	0x18	Relay2 NTU open S.P.	reading:X0.1	
(25)	0x19	Relay2 SB close S.P.	reading:X0.1	
(26)	0x1A	Relay2 SB open S.P.	reading:X0.1	
(27)	0x1B	Relay2 SS close S.P.	reading:X0.01	
(28)	0x1C	Relay2 SS open S.P.	reading:X0.01	
(29)	0x1D	Relay2 delay time	reading:X1	
(30)	0x1E	Relay3 clean period	reading:X0.1	
(31)	0x1F	Relay3 clean time	reading:X1	
(32)	0x20	Relay3 delay time	reading:X1	
(33)	0x21	Relay3 function	reading:X1	0:clean,1:period alarm ,2:Error alarm
(34)	0x22	Record saving time	reading:X1	
(35)	0x23	Mode	reading:X1	
(36)	0x24	NTU offset	reading:X0.1	
(37)	0x25	SB offset	reading:X0.1	
(38)	0x26	SS offset	reading:X0.01	
(39)	0x27	Temp. offset	reading:X0.1	
(40)	0x28	Language	reading:X1	0=English ,1=tranditional Chinese,2=simple Chinese
(41)	0x29	Filter	reading:X1	