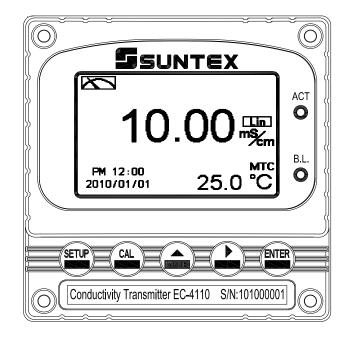
EC-4110 Intelligent Conductivity Transmitter

Operation Manual





Precautions for installation

Wrong wiring will lead to breakdown or electrical shock of the instrument, please read this operation manual clearly before installation.

- •Make sure to remove AC power from the controller before wiring input, output connections, and remove it before opening the controller housing.
- The installation site of the controller should be good in ventilation and avoid direct sunshine.
- •The material of signal cable should be special coaxial cable. Strongly recommend using our coaxial cable. Do not use normal wires instead.
- •Avoid electrical surge when using power. Especially when using three-phase power, use ground wire correctly.
- The internal relay contact of the instruments is for alarm or control function. Due to safety, please must connect to external relay which can stand enough ampere to make sure the safety operation of the instruments. (Please refer to chapter 3.6 "Illustration of electrical connection")

CONTENTS

Precautions for installation

Brief Instruction	1
1. Specifications	
2. Assembly and installation	
2.1 Transmitter installation	5
2.2 Illustration of panel mounting	5
2.3 Illustration of Wall mounting and pipe mounting	6
3. Overview of conductivity / resistivity transmitter Ed	C-4110
3.1 Illustration of rear panel	7
3.2 Illustration of terminal function	7
3.3 Description of terminal function	
3.4 Wiring of cable	9
3.5 Circuit of cable	9
3.6 Illustration of electrical connection	10
4. Configuration	
4.1 Illustration of front panel	11
4.2 Keypad	11
4.3 LED indicators	11
4.4 Display	
5. Operation	
5.1 Measurement mode	13
5.2 Set-up menu	13
5.3 Calibration menu	13
5.4 Shortcuts	13
5.5 Reset	13
5.5.1 Set-up reset	13
5.5.2 Calibration reset	13
6. Settings	
Block diagram of settings	
6.1 Entry of set-up menu	
6.2 Security code of settings(Code)	
6.3 Measurement parameters(Mode)	18
6.4 Temperature	
6.5 Compensation	
6.6 Relay 1	
6.7 Relay 2	22

	6.8	Wash time(Clean)	23
	6.9	Analog output 1 (Cond/Res)	24
	6.10	Analog output 2 (Temperature)	25
	6.11	Date/Time (Clock)	26
	6.12	2 Sample average of measurements (Digital filter)	27
	6.13	Backlight settings	28
	6.14	Contrast settings	29
	6.15	Power frequency (Freq.)	30
	6.16	Automatically back to measurement mode(Return)	31
7.	. Ca	libration	
	E	Block diagram of Calibration	32
	7.1	Entry of calibration menu	33
	7.2	Automatically back to measurement mode(Return)	34
	7.3	Security password of calibration	35
	7.4	Cell constant calibration (CELL Const.)	36
	7.	4.1 Resistivity (Res)	36
	7.	4.2 Conductivity (Cond)	37
	7.5 \$	Standard solution calibration (Std. Sol.)	38
8	. Er	ror messages (Error code)	39
9.	. Ins	stallation of cells	
	9.1	Appearance of cells	40
	9.2 0	Correct installation	40
	9.3]	Incorrect installation	41

Brief Instruction

Description of set-up settings (see chapter 6 for details)

Press and simultaneously to see the overview of the set-up settings now. Then press if you would like to modify set-up settings. Press keypad according to index of keypad on the screen.

Index of keypad

keypad	Accordingly item	Description	
SETUP	धाःBack	Back to upper layer	
	▲: ▲	Choose leftward of change to left page	
MODE	▲: +	Increase digit	
•		Choose rightward of change to right page	
	▶ : -	Decrease digit	
ENTER	ENT : Enter	Confirm settings after modifications and then go through next	
		step	

Selection of set-up items

keypad	Accordingly item	Description	
Mode	\$	Measurement mode, to choose Resistivity (Res) or Conductivity (Cond) measurement	
Temperature	€ ² c	Temperature measurement and compensation, including MTC, PTC, NTC (3 types total). MTCManual temperature compensation, PTC/NTC auto temperature compensation	
Relay 1		First relay setting, to choose action off or Hi/Lo alarm	
Relay 2	<u>2</u>	Second relay setting, to choose action off or Hi/Lo alarm	
Clean	P	Automatic wash time setting, to choose electrode clean equipment's ON and OFF duration	
Analog 1	<u>s</u> -mA	Current output according to Res or Cond setting range	
Analog 2	°C-mA	Current output according to temperature setting range	

Clock		Clock setting (When out of power and reboot it, the instrument's time setting will return to the factory pre-setting)	
Black-light	Ŭ.	Backlight setting, to set Auto/ON/OFF backlight, brightness, and sensitivity	
Contrast		Contrast of screen setting	
Digital Filter	494444444	Take every serial 1~60 measurements, average them continuously, and make it as the readings	
Return	0	Setting of returning to the measurement mode	
Code	ð	Security code of set-up mode. The factory default is 1111, and a designated user can change the code. The set-up code is precedential to calibration code, thus it can pass a different security code of calibration.	

Description of calibration settings (see chapter 7 for details)

Press and simultaneously to see the last calibration information. Then press if you would like to make a new calibration or modify setting of calibration. Press keypad according to index of keypad on the screen.

Index of keypad:

keypad	Accordingly item	Description	
CAL	GAL:Back	Back to upper layer	
	▲: ▲	Choose leftward of change to left page	
MODE	▲: +	Increase digit	
8	▶ : ▶	Choose rightward of change to right page	
	▶ : —	Decrease digit	
ENTER	ENT : Enter	Confirm settings after modifications and then go through next step	

Selection of calibration items (up to three-point calibration)

keypad	Accordingly item	Description
Code	å	Security code of calibration mode. The factory default is 1100.
Return	С С	Time interval setting of returning to the measurement mode
Cell Constant	CELL Const.	To adjust the instrument cell constant setting until the value the same with the given cell constant of the sensor
Solution	Std. Sol.	Use the appropriate standard solution to calibrate the system

Note

SUNTEX reserves the right to change the figure of icons and contents. The actual icons and contents please refer to the instruments.

1. Specifications

M	lodel	EC-4110	
Measuring modes		Resistivity/Conductivity/Temp.	
Resistivity		0.00 MΩ·cm~20.00 MΩ·cm	
Ranges	Conductivity	0.00 μS/cm~200.0 mS/cm manual or auto range selectable	
	Temp.	-30.0~130.0°C	
	Resistivity	0.01 MΩ·cm	
Resolutions	Conductivity	0.01 µS/cm	
	Temp.	0.1°C	
	Resistivity	±1% ± 1Digit	
Accuracy	Conductivity	±1% ± 1Digit	
	Temp.	±0.2°C± 1Digit	
Temp	perature	NTC30KΩ or PT1000 or	
	ensation	Manual temperature compensation selectable	
Calibra	tion mode	(1)Cell constant adjustment (2)Standard solution calibration	
Ambie	ent Temp.	0~50 °C	
Stora	ge Temp.	-10~70 °C	
Cell Constant		0.01, 0.05, 0.1, 0.5, 10.00 cm ⁻¹ fixed, freely selectable 0.008~19.99 cm ⁻¹	
Temperatu	re Coefficient	Linear temperature compensation from (0.00%~ 40.00%) and Non-Linear compensation	
Di	splay	Large LCD display with environment light sensor auto/manual illumination function	
Analog	g output 1	Isolated DC 0/4~20mA corresponding to main measurement, max. load 500Ω	
Analog	g output 2	Isolated DC 0/4~20mA corresponding to Temp., max. load 500Ω	
Sottingo	Contact	RELAY contact · 240VAC 0.5A Max.(recommend)	
Settings Activate		Two sets of individual HIGH or LOW programmable control	
Wash		RELAY contact: ON 0~99min. 59sec. / OFF 0~999hr 59min.	
Certification		IP65 (NEMA 4)	
Power Supply		100V~240VAC±10%,50/60Hz,5W max.	
Inst	allation	Wall or Pipe or Panel Mounting	
Dime	ensions	96m × 96mm × 132mm (H×W×D)	
Cut off [Dimensions	93 mm × 93 mm (H×W)	
Weight		0.5Kg	

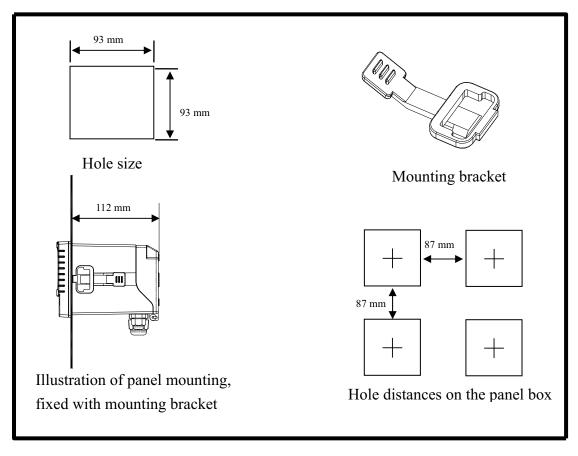
Note: The specifications are subject to change without notice.

2. Assembly and installation

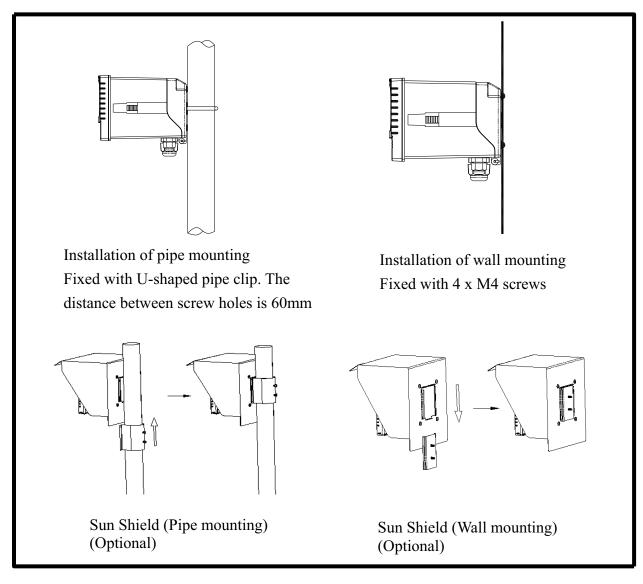
2.1 Transmitter installation: This Transmitter can be installed through panel mounting, wall mounting and pipe mounting.

Installation of panel mounting: First, prepare a square hole of 93 x 93mm on the panel box, and then insert the controller directly into the panel box. Insert the accessorial mounting bracket from the rear, and make it be fixed in to pickup groove.

2.2 Illustration of panel mounting:

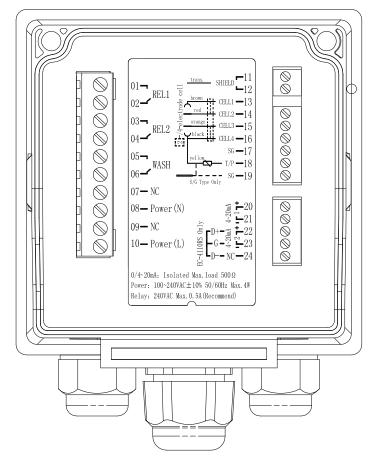


2.3 Illustration of Wall mounting and pipe mounting

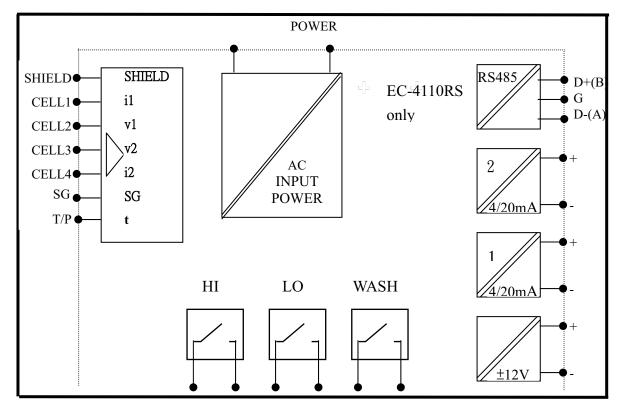


3. Overview of Conductivity transmitter EC-4110

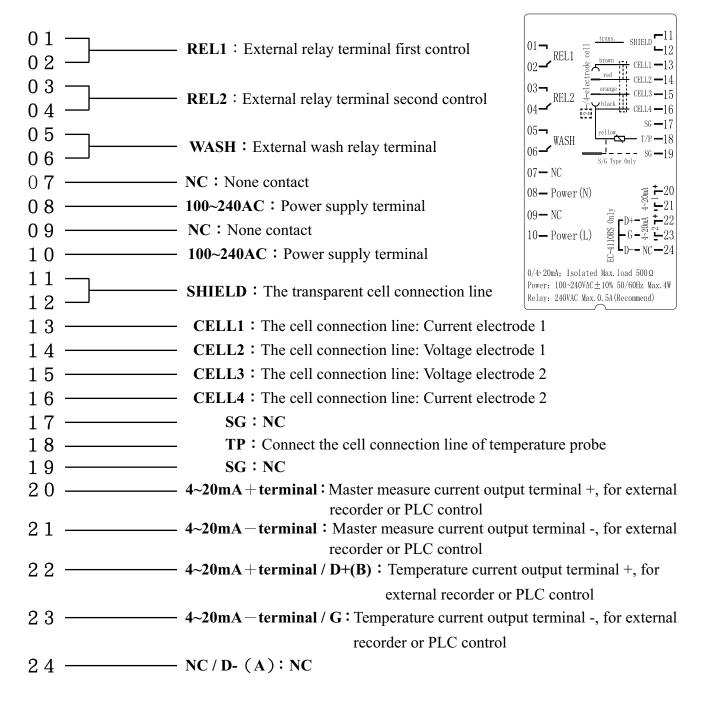
3.1 Illustration of rear panel:



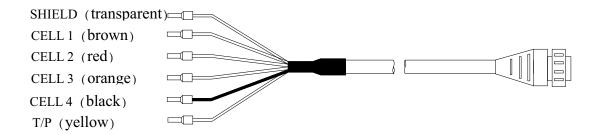
3.2 Illustration of terminal function:



3.3 Description of terminal function:



3.4 Wiring of cable

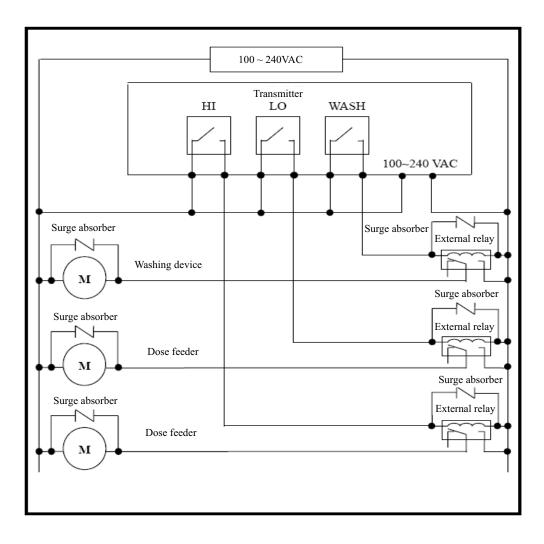


3.5 Circuit of cable

	SUNTEX Conductivity Cell			Others
Terminal sign	2 Electrode Cell 8-221/8-222/8-223 4-Electrode Cell 8-241/8-241-01/8-242	Fixed Cable Resistivity Cell 8-11-3 8-11-4	Fixed Cable Conductivity Cell 8-12-6 8-12-7	Please read the instruction of the cells
SHIELD	Transparent line	Net line	Net line	SHIELD
CELL 1	Brown line	Short with	Short with	Current electrode 1
CELL 2	Red line	transparent line	transparent line	Voltage electrode 1
CELL 3	Orange line	Short with white	Short with	Voltage electrode 2
CELL 4	Black line	line	green line	Current electrode 2
T/P	Yellow line	Yellow line	Red line	T/P(the other side for CELL 4

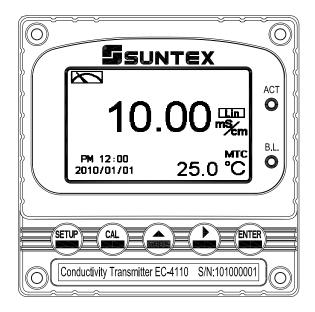
Note: If use other brand's two electrode cell, the circuit of cable is the same with that for 8-11-3 or 8-12-6 cell.

3.6 Illustration of electrical connection:



4. Configuration:

4.1 Illustration of front panel:



4.2 Keypad:

In order to prevent inappropriate operation by others, before the parameter setting and calibration, the operation applies multi-keys, and coding protection if necessary. Description of the key functions is in the following:



: In the parameter set-up mode, pressing this key allows you exit parameter set-up mode and back to Measurement mode.



: In the Calibration mode, pressing this key allows you exit Calibration mode and back to Measurement mode.



- : 1. In the parameter set-up mode and Calibration mode, pressing this key to select leftward or change to another page.
 - 2. When adjusting value, press this key to increase the value.



: 1. In the parameter set-up mode and Calibration mode, pressing this key to select rightward or change to another page.



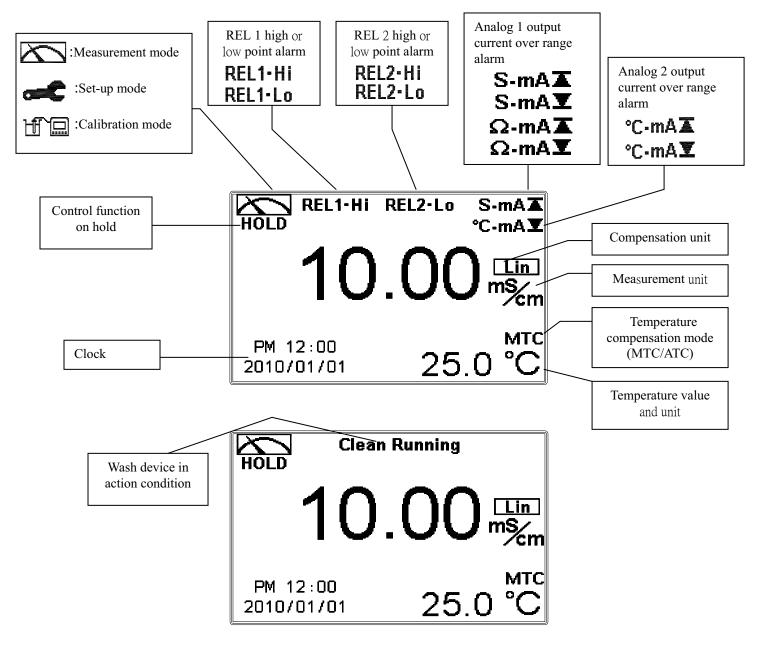
- 2. When adjusting value, press this key to decrease the value.
- : Key for confirmation; pressing this key is essential when modifying data value or selecting the parameter setting items in the window.

4.3 LED indicators:

ACT : Washing device operation indicator and controlling operation indicator (Relay 1 \ Relay 2)

B.L.: Light sensor; in the automatic display backlit mode, the lamp will light or go out as the change of environmental brightness.

4.4 Display:



- Note: 1. When the wash device is turned on, the display shows and twinkles the description, "Clean Running". At the same time, the ACT indicator LED lights up, and the transmitter automatically turns off Relay 1 and Relay 2 function. After finishing cleaning, the Relay 1 and Relay 2 will automatically back to normal status.
 - 2. When Relay 1 which is set in high setting point is in action, the display shows and twinkles the description, "REL 1_Hi", and ACT indicator LED lights up. When Relay 1 which is set in low setting point is in action, the display shows and twinkles the description, "REL 1_Lo", and ACT indicator LED lights up.
 - 3.When Relay 2 which is set in high setting point is in action, the display shows and twinkles the description, "REL 2_Hi", and ACT indicator LED lights up. When Relay 2 which is set in low setting point is in action, the display shows and twinkles the description, "REL 2_Lo", and ACT indicator LED lights up.
 - 4. When under measurement mode, if the temperature compensation mode is set in MTC (Manual adjustment), press or to adjust the MTC temperature manual.

5. Operation

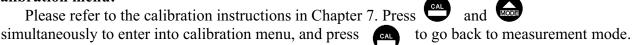
5.1 Measurement mode:

After all electrical connections are finished and tested, connect the instrument to the power supply and turn it on. The transmitter will automatically entering measurement mode with the factory default settings or the last settings from user.

5.2 Set-up menu:

Please refer to the set-up instructions in Chapter 6. Press and simultaneously to enter into set-up menu, and press stop to go press to back to measurement mode.

5.3 Calibration menu:



5.4 Shortcuts: In the measurement mode, if selecting MTC for temperature compensation mode, you may press and to adjust MTC temperature value.

5.5 Reset:

5.5.1 Master reset:

Measurement mode: Conductivity, Auto-Range Temperature compensation: MTC 25 °C Temperature Coefficient: Lin, 2.00% Relay 1 : High point alarm: AUTO, SP1= 100.0mS , DB=10.0mS Relay 2 : Low point alarm: AUTO, SP2 =10.0 mS , DB= 1.00 mS Wash time: OFF Analog 1 current output (Cond/Res) : 4~20 mA , 0.00~199.9mS Analog 2 current output (Temp) : (Temp) : 4~20 mA , 0~100.0°C Display backlit: OFF Contrast: 0 Code: OFF Date & Time : 2010/1/1 00:00:00 Auto back: Auto, 3 minutes

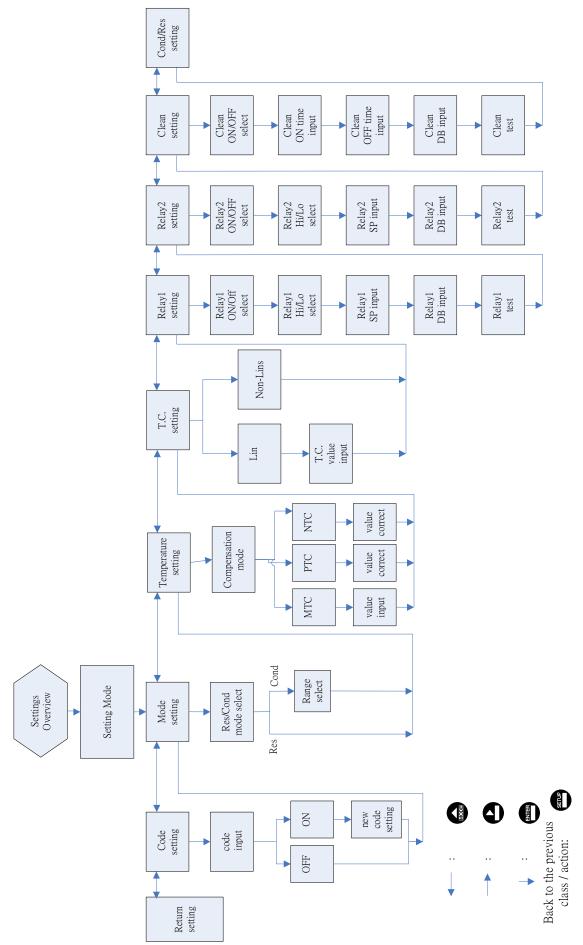
5.5.2 Calibration reset:

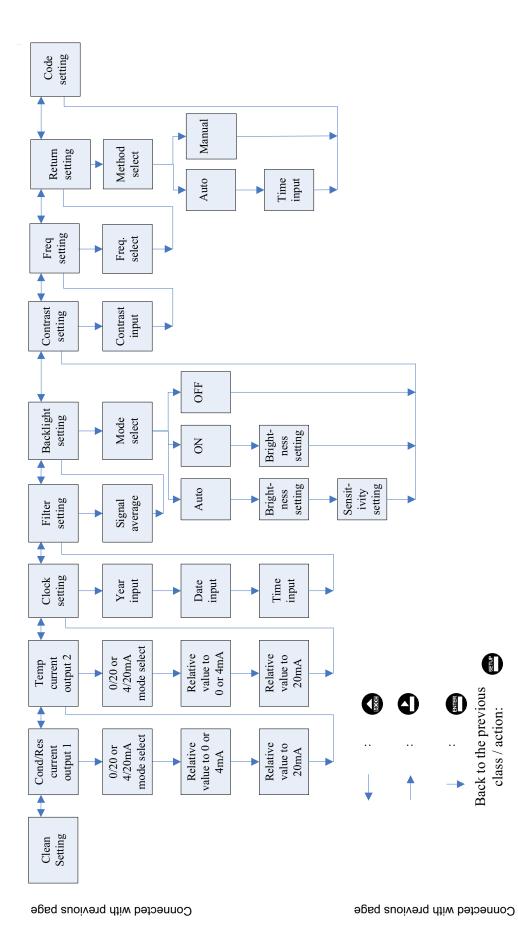
Cal Time : 2010/01/01 Cal Type : No Cal Cell Constant : 0.5000 Cal Temp. : none Auto back: Auto, 3 minutes

Note: The factory default of calibration presetting is "No Cal", and the cell constant setting is "0.5000". It means that the user has not calibrated the sensor with the transmitter yet. When selecting standard solution to finish calibration, the display shows cell constant of the cell and the value of the standard solution.

6. Settings

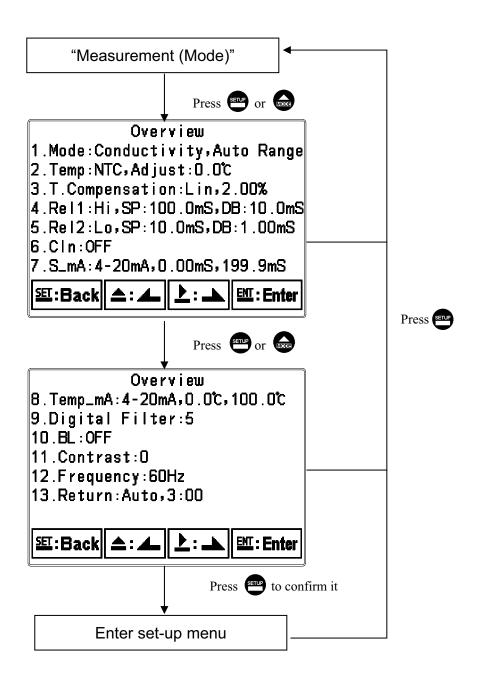
Block diagram of settings 1:





6.1 Entry of set-up menu

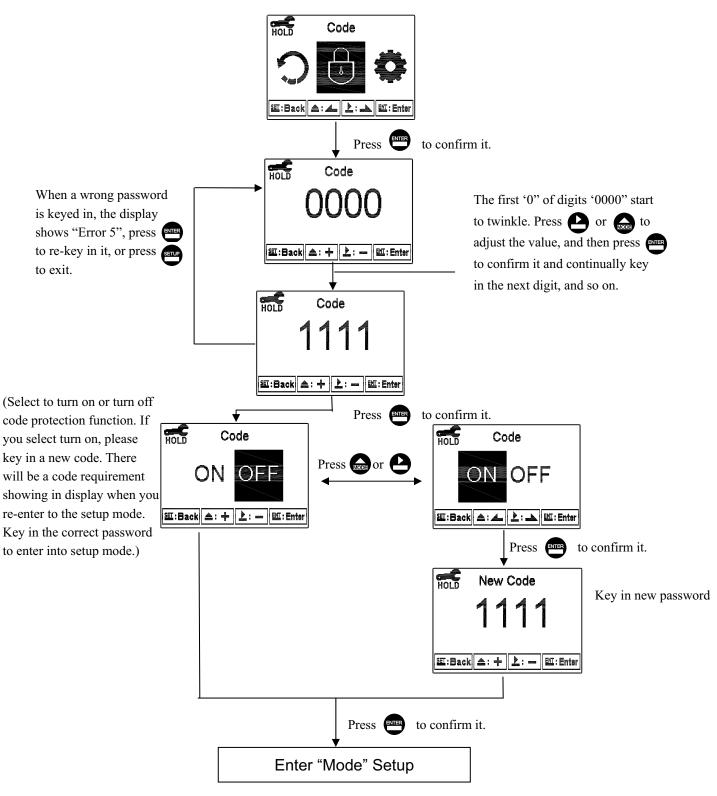
In the measurement mode, pressing the two keys and simultaneously allows you enter the overview of current setting, and press to enter the set-up mode to modify the setting if necessary.



6.2 Security code of settings:

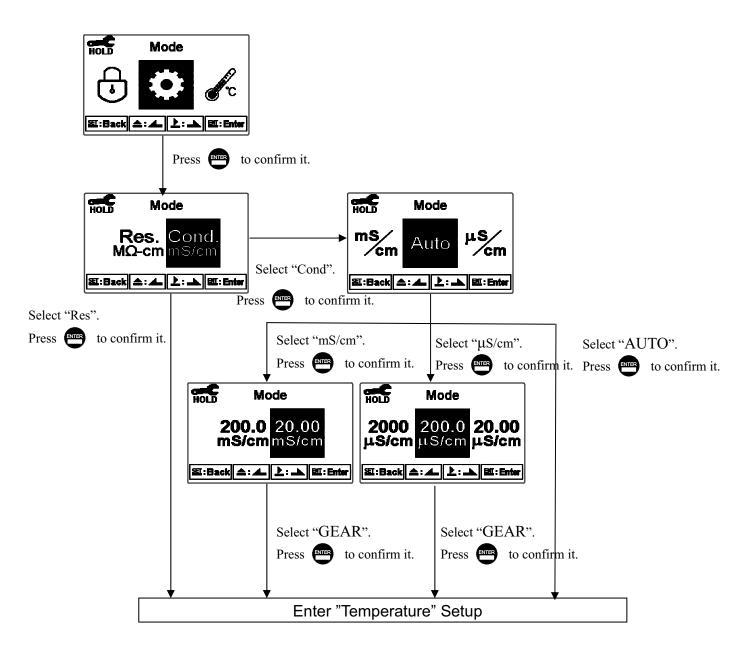
After entering set-up mode, select "code" item, press est to enter into code procedure. The code pre-setting is 1111.

Note: The code of setting mode is prior to the code for calibration. That means that the code of setting mode can be used for the code of calibration mode.

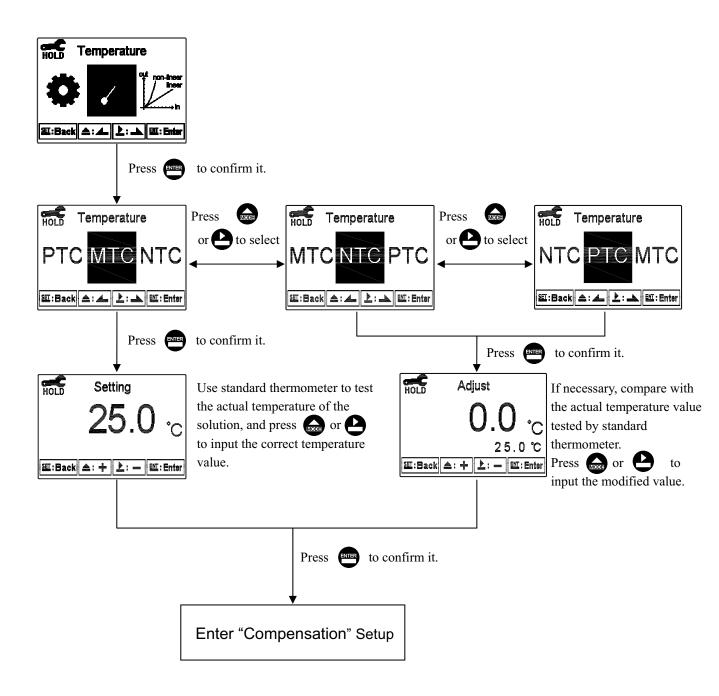


6.3 Mode

Enter setup of "Mode". Select between "Conductivity (Cond)" or "Resistivity (Res)" measurement. If select "Conductivity", then the range limit needs to be selected from AUTO, 20.00µS, 200.0µS, 2000µS, 20.00mS or 200.0mS.



6.4 Temperature



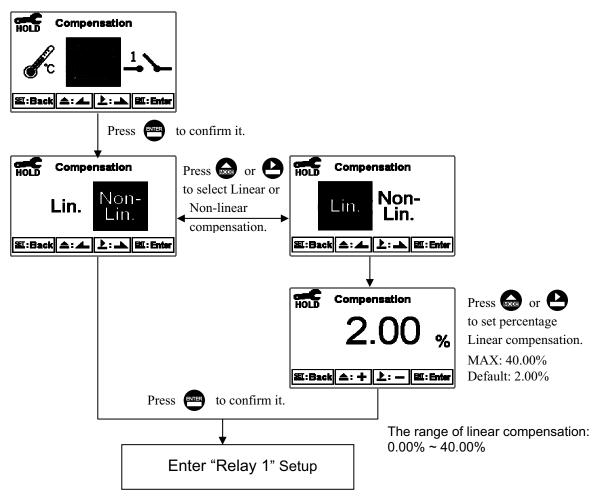
6.5 Compensation

Enter setup of compensation mode, and select Linear Compensation or Non-linear compensation mode. According your measurement need for temperature coefficient, you may select linear (Lin), non-linear (nLin), or non-compensated (Lin 0.00%). Normally, select linear compensation for conductivity measurement(Cond), and select non-linear compensation for Resistivity measurement.

Temperature coefficient (hereinafter referred to as TC): Conductivity of solution increase with temperature rise. The relationship is as follows:

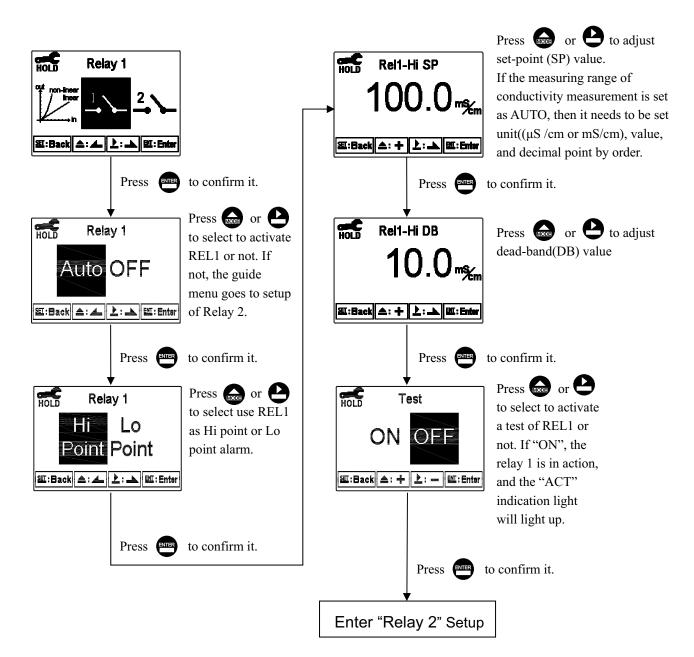
C ₂₅	Conductivity at 25°C	Formula 1:Ct = C ₂₅ { 1+α(T-25) }
Ct	Conductivity at T°C	1011101111111111111111111111111111111
Т	Measured solution temperature	Formula 2 : α= (Ct−C ₂₅) / { C ₂₅ (T−25)}
α	Temperature compensation	$10111012 \cdot 0 - (01 025) / (025(1-23))$

How to get TC of solution: For obtaining higher accuracy of measurement, you may calculate the TC value according to the formulas above and set an appropriate TC value for the instrument. Take an example for 0.01N KCl. Set the TC of the instrument to non-compensated (Lin, 0.00%), and control the temperature at 25°C and at 20°C. C₂₅ means the measurement value at 25°C(Such as C₂₅ = 1413µS). Ct means the measurement value at 20°C(Such as C₂₅ = 1278µS). According to the formulas above, $\alpha = 1.91\%$.



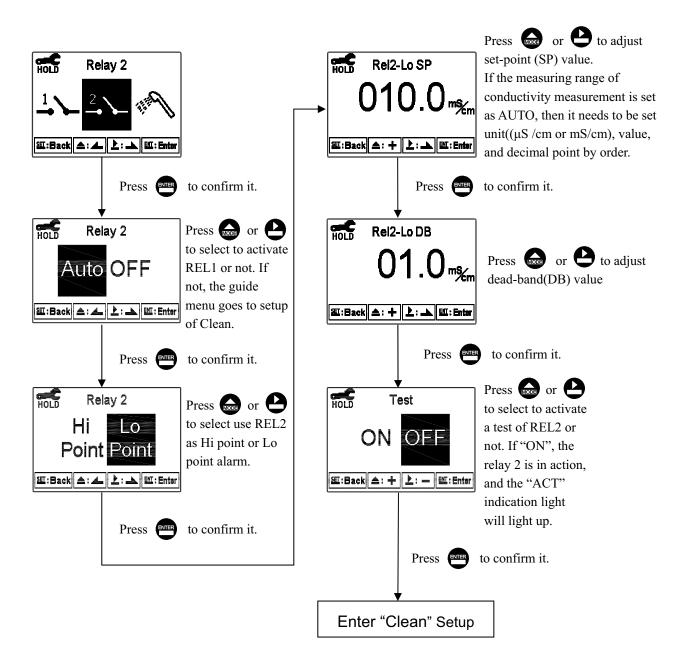
6.6 Relay 1

Enter setup of Relay 1. Select the item to turn on or turn of the relay 1 function. If you select to turn on the relay 1, then select for using relay 1 as "Hi set-point" alarm or "Low set-point" alarm. Set the value of set-point (SP) and dead-band (DB). The range for set-point is $00.00M\Omega \sim 19.99 M\Omega / 00.00 \mu s \sim 1999 mS$; while the range for DB is $00.00M\Omega \sim 2.00 M\Omega / 00.00 \mu s \sim 19.99 mS$. (The measurement unit is depending on the use of measuring range)



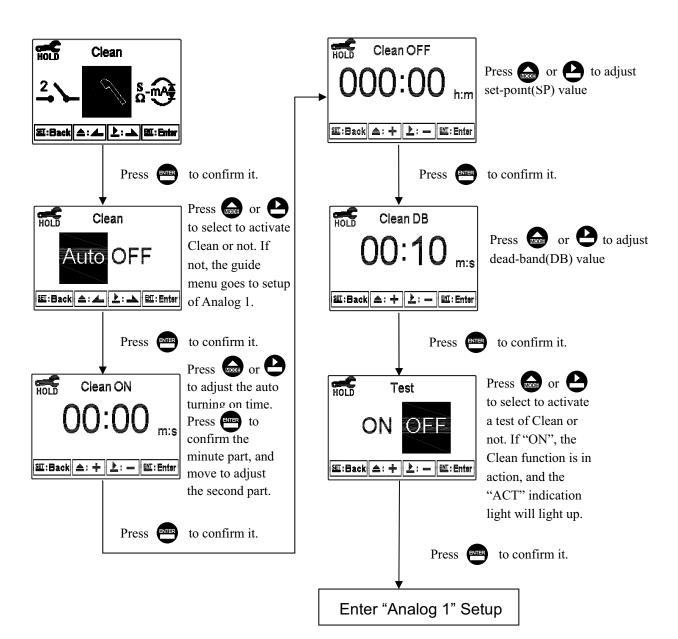
6.7 Relay 2

Enter setup of Relay 2. Select the item to turn on or turn of the relay 2 function. If you select to turn on the relay 2, then select for using relay 2 as "Hi set-point" alarm or "Low set-point" alarm. Set the value of set-point (SP) and dead-band (DB). The range for set-point is $00.00M\Omega \sim 19.99 M\Omega / 00.00 \mu s \sim 1999 mS$; while the range for DB is $00.00M\Omega \sim 2.00 M\Omega / 00.00 \mu s \sim 19.99 mS$. (The measurement unit is depending on the use of measuring range)



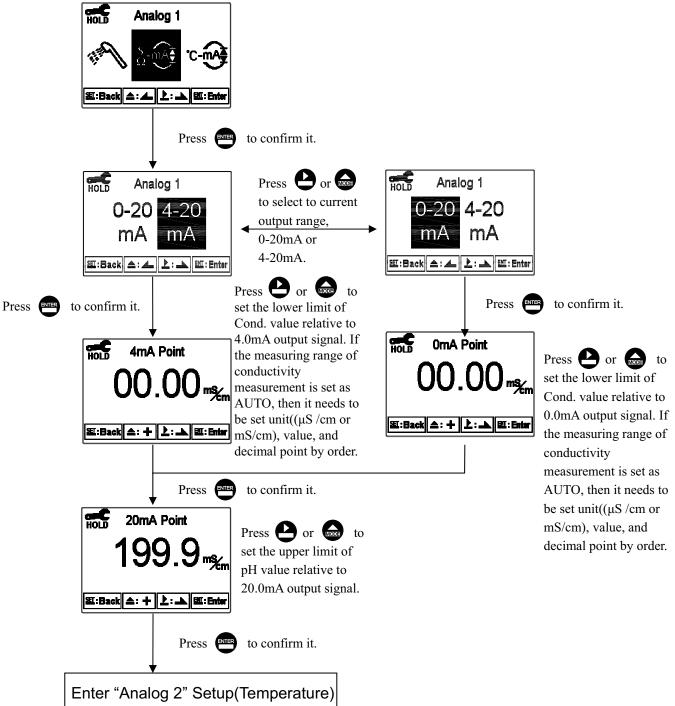
6.8 Clean

Enter setup of "Clean" function. Select the icon to turn on or turn off the clean function. If you select "Auto" turning on, and set the timer of the clean function including automatically turning on time and turning off time, and set the bead-band value(DB). Note: When the clean function is turned on, if any value is set to be 0, the instrument will automatically turn off this function.



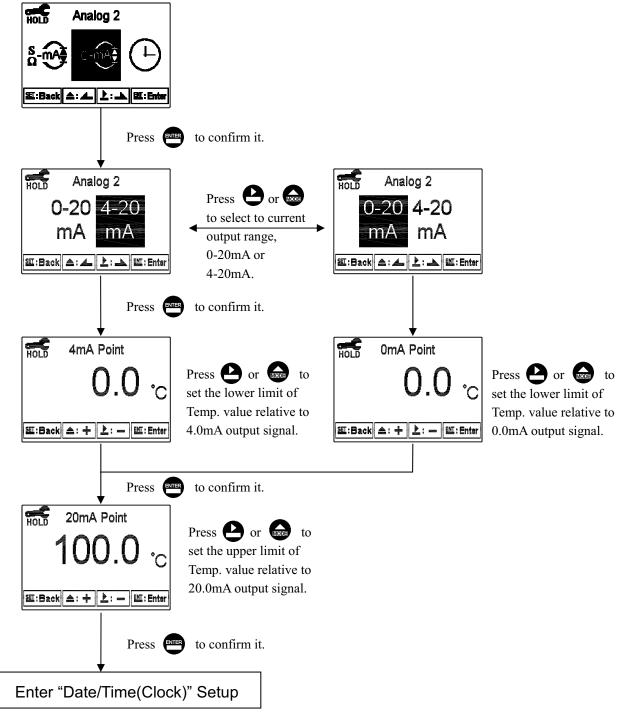
6.9 Analog output 1 (Cond/Res):

Enter setup of Analog 1. Select 0~20mA or 4~20mA current output. Set the related value to the range of Cond./Res. measurement. If the range of the Cond./Res. measurement is set smaller, the resolution of current output is higher. When the measurement value exceeds the upper limit of setting range, the current output remains at around 22mA. When the measurement value exceeds the lower limit of setting range, the current output remains at 0mA under 0~20mA mode, or the current output remains at around 2mA under 4~20mA mode. The phenomenon can be used as a judgment reference of abnormality. If under HOLD status, the current output will remain at last current output value before the HOLD status is activated.



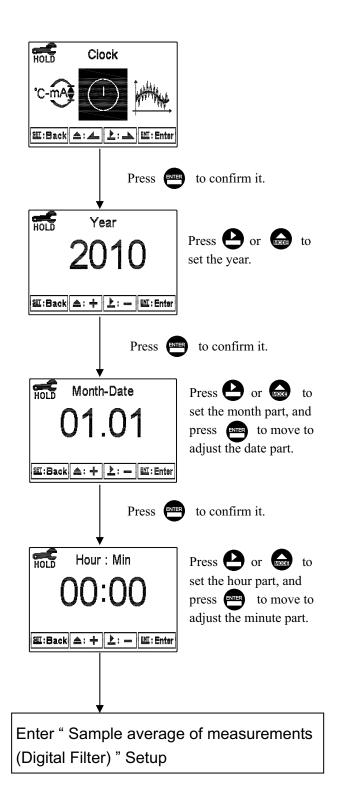
6.10 Analog output 2 (Temperature):

Enter setup of Analog 2. Select 0~20mA or 4~20mA current output. Set the related value to the range of temperature measurement. If the range or the temperature measurement is smaller, the resolution of current output is higher. When the measurement value exceeds the upper limit of setting range, the current output remains at around 22mA. When the measurement value exceeds the lower limit of setting range, the current output remains at 0mA under 0~20mA mode, or the current output remains at around 2mA under 4~20mA mode. The phenomenon can be used as a judgment reference of abnormality. If under HOLD status, the current output will remain at last current output value before the HOLD status is activated.



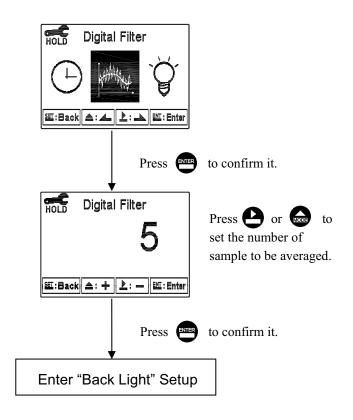
6.11 Date/Time(Clock)

Enter setup of Date/Time(Clock). Set the "Year", "Month", "Date", "Hour", and "Minute" time. Note: The clock needs to be reset once encounters power failure.



6.12 Sample average of measurements (Digital Filter)

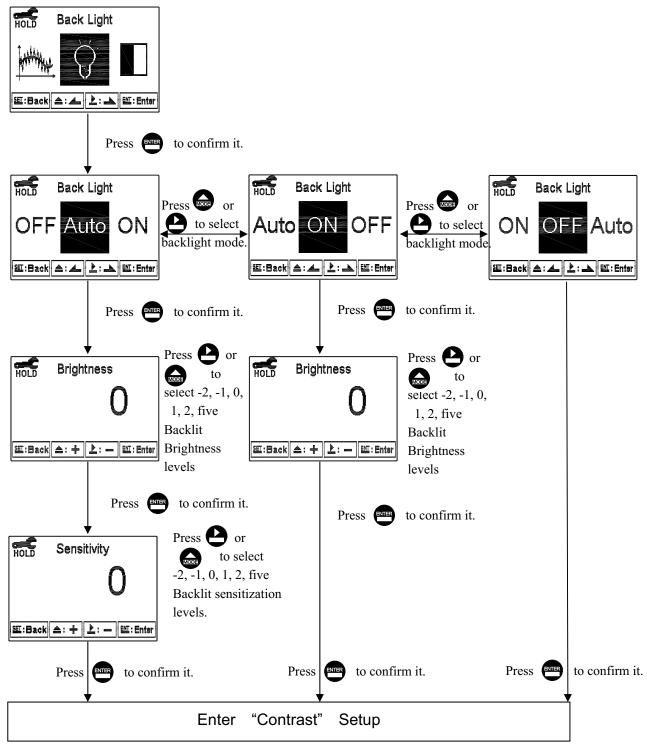
Enter the setup of Digital filter. You may select the number of sample to be averaged each time to become a reading which is gradually counted in order to increase the stability of measurement.



6.13 Backlight settings

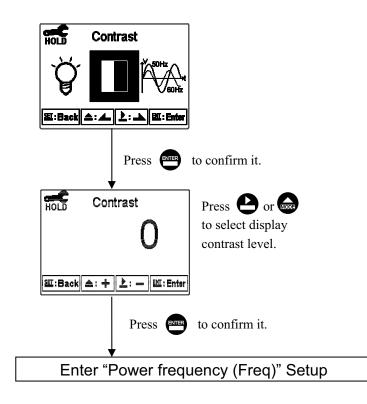
Enter setup of backlight display. According to your need, you can set the brightness of display(-2~2, dark~ bright) and sensitivity of the sensitization sensor(-2~2, insensitive~ sensitive). Under AUTO or OFF mode, there is a touch-on function which means if press any key the display backlight function acts, and then if there is no-pressing during 5 seconds it goes back to original setting status.

ON: Backlight light up OFF: Backlight turns off & Touch-on mode AUTO: According to ambient condition turn on & off automatically & Touch-on mode



6.14 Contrast settings

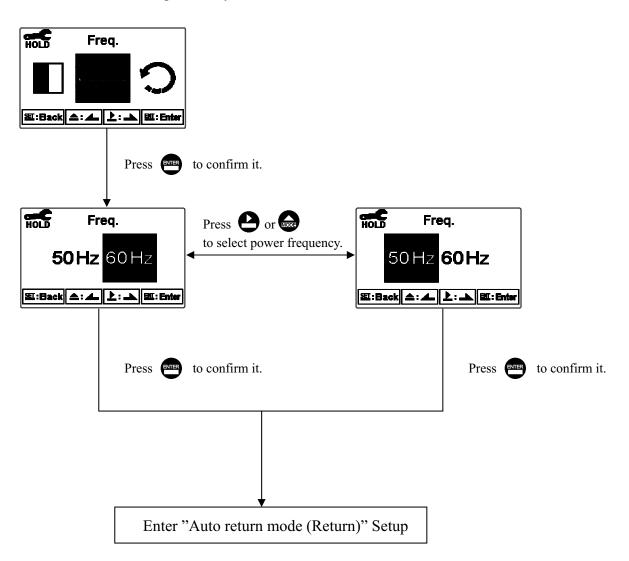
Enter setup of display contrast. You can set the contrast of display according to your need.



6.15 Power frequency (Freq.)

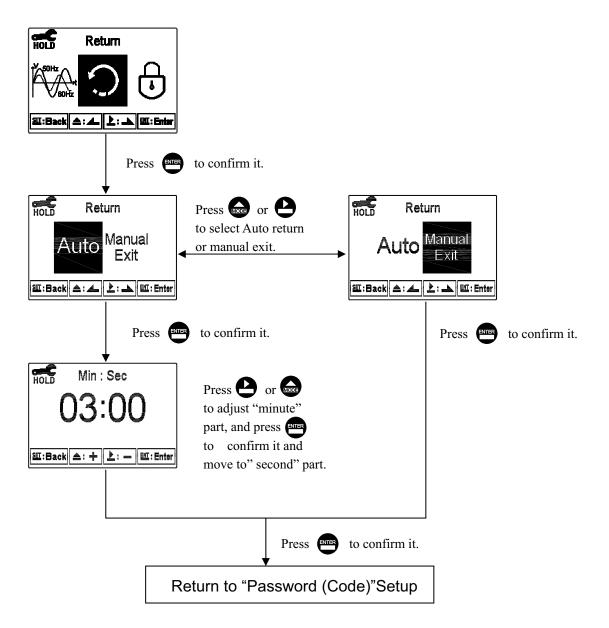
Enter setup of power frequency. You may select power frequency setting of the instrument 50Hz or 60Hz according to the local power frequency.

Note: This setting significantly affects the normal measurement of instrument, thus, be sure to make the setting correctly.



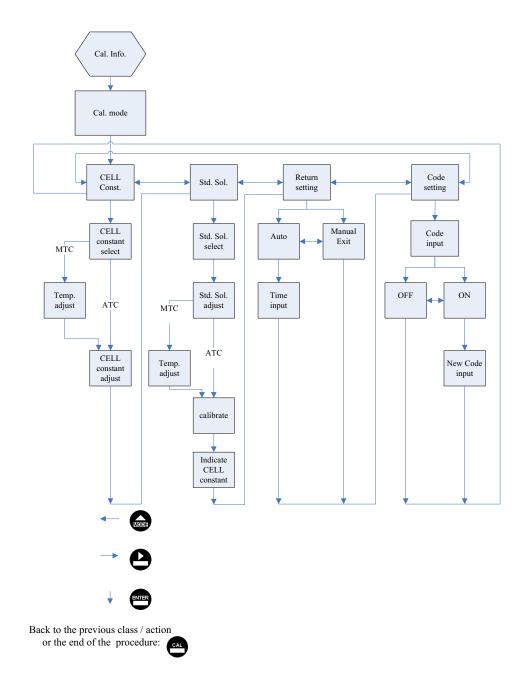
6.16 Return

Enter setup of auto return mode (Return) to set the function that the instrument automatically exit the setup menu after a period of time without pressing any key. The "Manual Exit" means that it needs to exit setup menu manually, while "Auto" means that the display automatically exit the setup menu and back to measurement mode after a period of time without pressing any key.



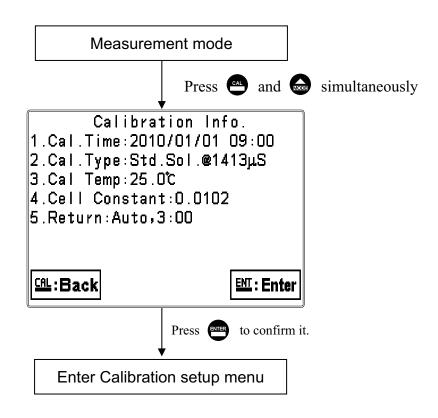
7. Calibration

Block diagram of Calibration



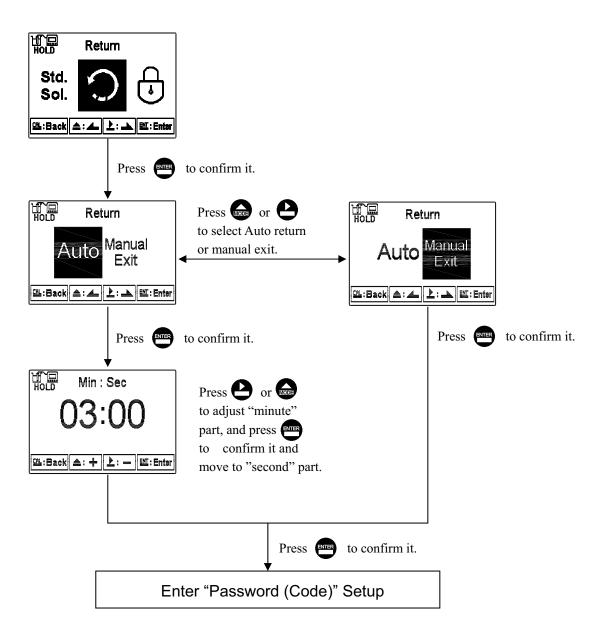
7.1 Entry of calibration menu

In the measurement mode, pressing the two keys and simultaneously allows you enter the Calibration Information. If you do not need to re-calibrate the measurement system, press to go back to measurement mode. If you need to re-calibrate the system, press to enter to the calibration setup menu.



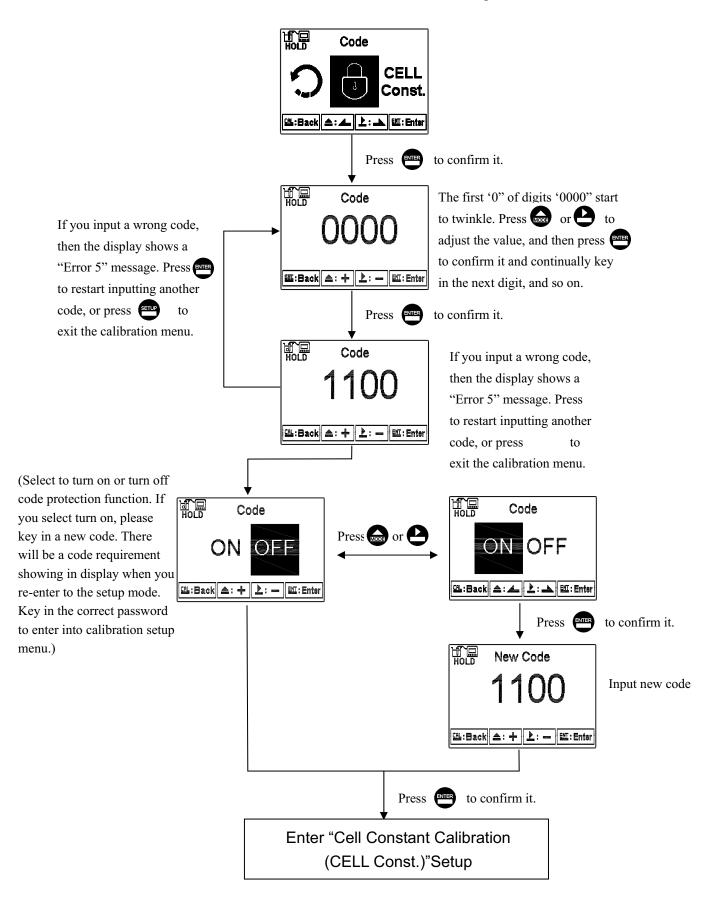
7.2 Return

Enter setup of auto return mode (Return) to set the function that the instrument automatically exit the setup menu after a period of time without pressing any key. The "Manual Exit" means that it needs to exit calibration setup menu manually, while "Auto" means that the display automatically exit the calibration setup menu and back to measurement mode after a period of time without pressing any key. Note: the return function of setup menu and calibration setup menu are independent settings.



7.3 Security password of calibration (Code)

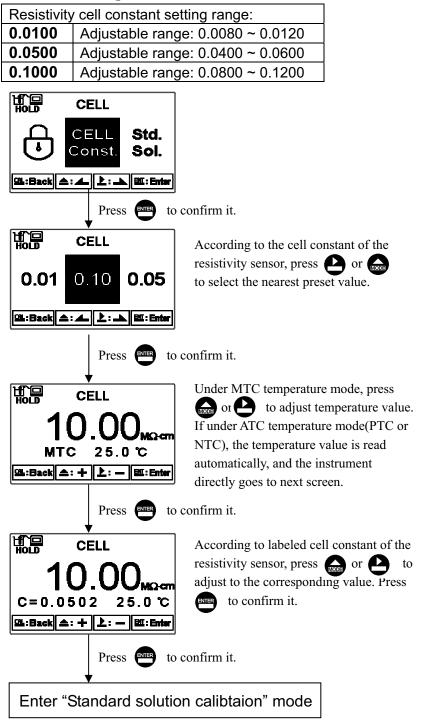
Select the Code (password) icon after entering calibration setup mode. Select to activate code function or not. The default Calibration setting code is "1100".



7.4 Cell constant calibration (CELL Const.)

7.4.1 Resistivity (Res)

Enter setup of cell constant to directly set cell constant. Press \bigcirc or \bigcirc to select the preset value to near an appropriate one. There are three sets of preset value (0.01, 0.05, 0.10). Select the most appropriate cell constant value and press \bigcirc to confirm it and enter to the next screen. At the time, the cell constant starts to twinkle. Press \bigcirc or \bigcirc to adjust the cell constant value. Correct the measurement value to known standard solution value by adjust cell constant, or set the known cell constant directly. Press \bigcirc to confirm it.



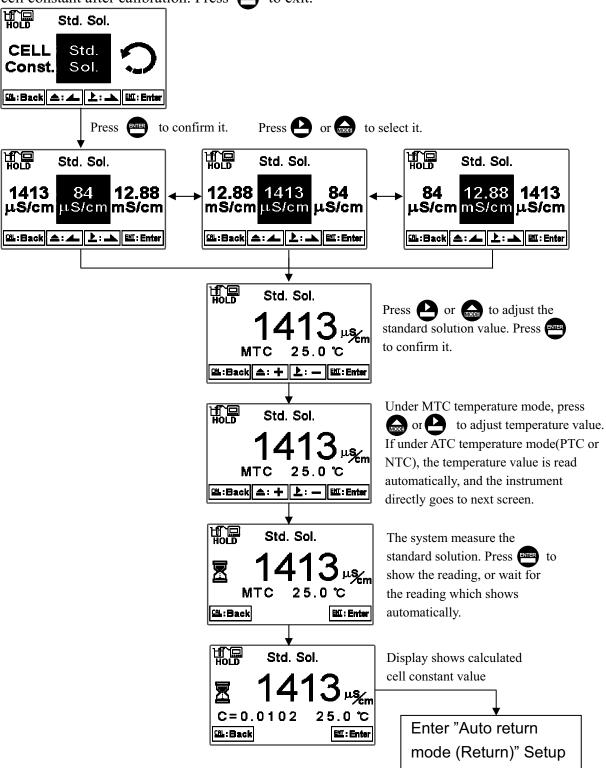
7.4.2 Conductivity (Cond)

Enter setup of cell constant to directly set cell constant. Press \bigcirc or \bigcirc to select the preset value to near an appropriate one. There are four sets of preset value $(0.01 \cdot 0.10 \cdot 0.50 \cdot 10.00)$. Select the most appropriate cell constant value and press to confirm it and enter to the next screen. At the time, the cell constant starts to twinkle. Press \bigcirc or \bigcirc to adjust the cell constant value. Correct the measurement value to known standard solution value by adjust cell constant, or set the known cell constant directly. Press \bigcirc to confirm it.

	•		
Conductiv	Conductivity cell constant setting range:		
0.0100	Adjustable range: $0.0080 \sim 0.1200$		
0.1000	Adjustable range: $0.0400 \sim 0.6000$		
0.500	Adjustable range: $0.0800 \sim 1.999$		
10.00	Adjustable range		
HOLD	CELL		
	CELL Std.		
	Const. Sol.		
원:Back 스:	: 🚣 上 : 📥 🖽 : Enter		
		a	
	Press $$ to c	onfirm it.	
HOLD	CELL	According to the cell constant of the	
HOLD		resistivity sensor, press \mathbf{P} or \mathbf{k}	
10.0	0.50 0.10	to select the nearest preset value.	
10.0	0.00 0.10	F THE F	
ے اللہ:Back	: 👍 上 : 🔺 🖾 : Enter		
	Press E to c	onfirm it.	
	•		
	CELL	Under MTC temperature mode, press	
1	$\cap \cap \cap$	or to adjust temperature value.	
		If under ATC temperature mode(PTC or	
MT(C 25.0 °C	NTC), the temperature value is read	
🕮 : Back 🛋	:+ 上:- :Enter	automatically, and the instrument	
		directly goes to next screen.	
	Press EVER to c	onfirm it.	
H D			
HOLD	CELL	According to labeled cell constant of the	
11	0.00 ms/m	conductivity sensor, press or	
C=0.52	2 4114	to adjust to the corresponding value.	
Sill:Back		Press ever confirm it.	
Press EVER to confirm it.			
Press even to confirm it.			
Entor	"Standard solut	ion calibtaion" mode	
	Enter "Standard solution calibtaion" mode		

7.5 Standard solution calibration (Std. Sol.)

Applying known standard solution for calibration is only suitable for conductivity measurement mode. Press \bigcirc or \bigcirc to select from preset standard solution value. There are three preset value from 84.0µS/cm, 1413µS/cm, to 12.88mS/cm. After selecting proper preset value, put the cleaned conductivity sensor into standard solution, and press \bigcirc to enter the calibration screen. At the time, the conductivity value can be adjusted according to standard solution value. Press \bigcirc to initiate the calibration. The display shows the sign \mathbf{x} , and it starts the auto calibration procedure. After finishing calibration, the display automatically shows the cell constant after calibration. Press \bigcirc to exit.

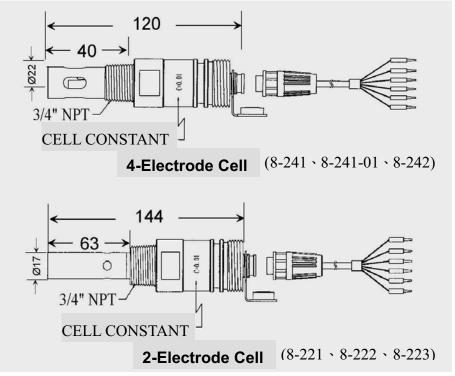


8. Error messages (Error code)

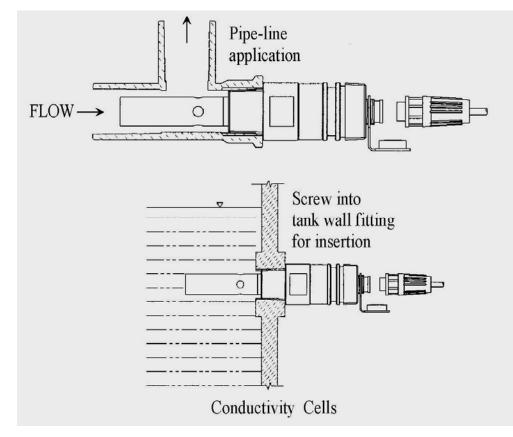
Messages	Reason	Dispositions	
Error9	Serious error that does not permit any further measuring	Please call service engineer.	
Error3	Wrong password	Re-enter a password	
Error2	Cell constant of the electrode exceeds the upper or lower limit	 Replace with new standard solution Maintain the electrode or change a new electrode, and make another calibration 	
Error1	The readout is unstable when calibration	 Replace with new standard solution Maintain the electrode or change a new electrode, and make another calibration 	

9. Installation of cells

9.1 Appearance of cells

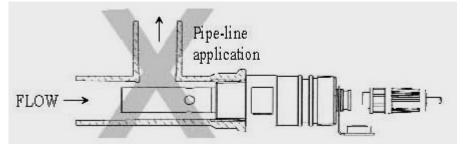


9.2 Correct installation

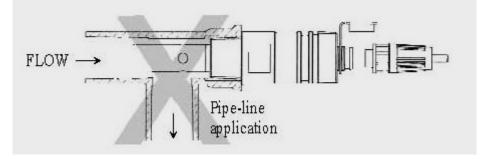


9.3 Incorrect installation

9.3 .1 Insufficient immersion: The installation is easy to result in stagnant water inside the cell and thus lead to measurement error.



9.3.2 Insufficient water flow: The installation is prone to error measurement due to insufficient water flow.



9.3.3 Insufficient immersion: The installation is easy to result in stagnant water inside the cell and thus lead to measurement error.

