

# PH8500 Portable pH Meter

## User Manual



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## 1 **Introduction**

Thank you for purchasing PH8500 portable pH meter.

This product is a great combination of advanced electronics technology, sensor technology, and software design, made for general water solution applications such as water treatment, environmental monitoring, pools and spas, hydroponics, aquaculture, education, beverage making, cooling tower, etc., especially ideal for field use. In order to use and maintain the instrument properly, please read the manual thoroughly before use.

### 1.1 **Basic Features**

- The microprocessor-based portable meter features automatic calibration, automatic temperature compensation, function set-up, self-diagnostics, due calibration reminding, calibration date checking, automatic power-off and low voltage display.
- Meet GLP, clock display, manual storage and automatic timing storage, USB port.
- The meter's digital filter improves measurement speed and accuracy. There is reading stability display.
- The package includes portable case, meter, electrode, standard solutions, soaking solutions, and all accessories, convenient to use in field.
- The meter is dust proof and waterproof, meeting the IP57 rating.

### 1.2 **pH Measurement Features**

- 1-3 points automatic calibration, the meter provides calibration guide and automatic checking function.
- The meter is able to recognize pH standard buffer solutions automatically. There are three options of standard buffer solution: USA series, NIST series and customer-defined solution.
- The meter provides three kinds of reading stability criteria.

## 2 **Specifications**

### 2.1 **Main Specifications**

	Specifications	
pH	Measuring Range	(-2.00 ~ 16.00) pH
	Resolution	0.1/0.01 pH
	Accuracy	±0.01pH ±1 digit
	Temperature compensation	(0 ~ 100) °C (manual or automatic)
mV	Measuring Range	±1,999mV
	Resolution	±200 mV:0.1mV;others:1 mV
	Accuracy	±0.1% F.S ±1 digit
Temperature	Measuring Range	-10~110°C

	Resolution	0.1℃
	Accuracy	±0.5℃±1 digit

## 2.2 Other specifications:

Data storage	500 groups
Storage content	Serial number, date, time, measuring value, measuring unit and temperature value
Output	USB
Power	AA batteries × 3 (1.5V× 3)
IP rating	IP57 waterproof and dust proof
Dimension & Weight	Meter: (86×196×33 ) mm / 335 g
	Portable case: (330×270×82 ) mm /1.3 kg

## 3 Instrument Description

### 3.1 LCD Display:

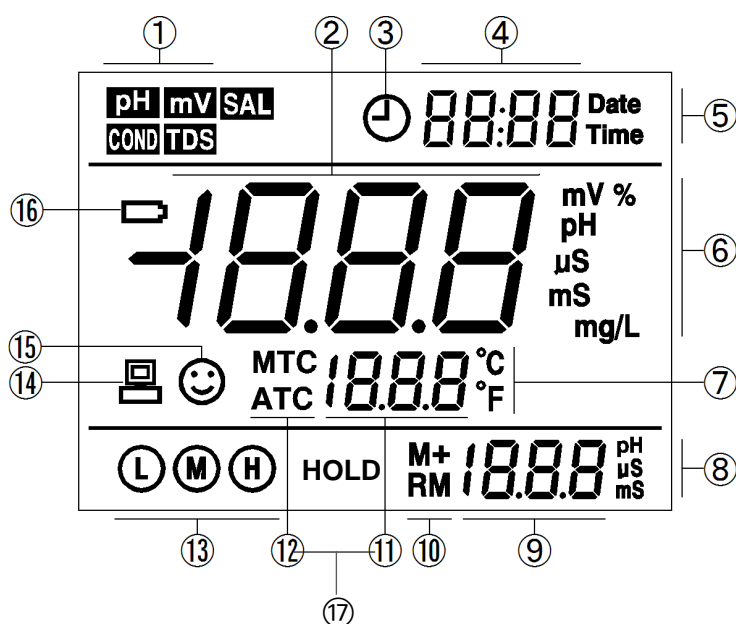


Diagram-2

- (1) — Measuring mode icons
- (2) — Measurement reading
- (3) — Timing storage icon. When this icon appears, the meter is in the automatic storage mode
- (4) — Date and time, or prompts of special display mode
- (5) — Units of date and time
- (6) — Units of measurement

- (7) — Temperature units
- (8) — Units of calibration value
- (9) — Standard calibration value, the serial number for storage and recall, and prompts of special display mode
- (10) — Storage and recall icons,  
M+ — Measurement to be stored icon, RM — Reading to be recalled icon
- (11) — Temperature value, and prompts of special display mode
- (12) — Temperature compensation icons; ATC — automatic temperature compensation,  
MTC — manual temperature compensation
- (13) — Calibration guide icon
- (14) — USB icon, when this icon appears, the meter connects the computer
- (15) — Stability icon of readings
- (16) — Low battery icon, when this icon appears, please renew the battery
- (17) — Auto. Hold icon of readings

## 3.2 Keypad Functions

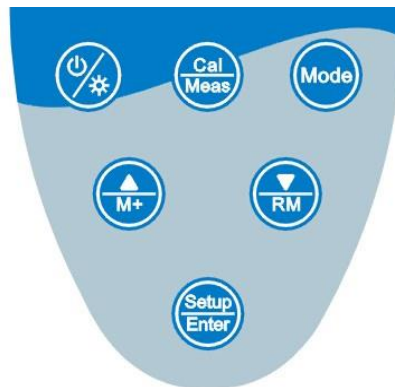



Diagram-3

### 3.2.1. Keypad operations

Short press <1.5 seconds , Long press >1.5 seconds.

Turn on the meter: press  to turn on the meter.

Turn off the meter: In the measurement mode, press  and hold for 2 seconds to turn off the meter.










**Notes:** In the calibration mode or the parameter set-up mode, pressing  is invalid. Please press  key to return to the measurement mode, then press  to turn off the meter.

Chart – 1 Keypad operations and descriptions

Keypad	Operations	Descriptions
	Short press	<ul style="list-style-type: none"> <li>● In the power-off mode, press this key to turn on the meter;</li> <li>● In the measurement mode, press this key to turn on or turn off the backlight display.</li> </ul>
	Long press	<ul style="list-style-type: none"> <li>● In the measurement mode, press and hold this key for 2 seconds to turn off the meter.</li> </ul>
	Short press	<p>Select measurement parameter:</p> <ul style="list-style-type: none"> <li>● <b>pH</b> → <b>mV</b></li> </ul>
	Short press	<ul style="list-style-type: none"> <li>● In the measurement mode, press this key to enter in the calibration mode;</li> <li>● In the auto. hold mode (HOLD), recall mode (RM) or other mode, press this key to return to the measurement mode,</li> </ul>
	Short press	<ul style="list-style-type: none"> <li>● In the measurement mode, press this key to enter in the parameter setup main menu;</li> <li>● In the calibration mode, press this key to make calibration;</li> <li>● In the parameter set-up mode, press this key to select programs;</li> <li>● In the recall mode (RM), press this key to return to the measurement Mode.</li> </ul>
	Short/ long press	<ul style="list-style-type: none"> <li>● In the measurement mode, long press to enter manual temperature compensation mode, long press this key or short press to increase temperature value;</li> <li>● In the measurement mode, press this key to store the measuring value;</li> <li>● In the recall mode (RM), short press this key to change the storage serial number, press and hold this key to change the number quickly;</li> <li>● In the parameter set-up mode, press this key to change the serial number of the main menu and the sub-menu;</li> <li>● In the sub-menu mode, press this key to change parameters and setup.</li> </ul>
	Short/ long press	<ul style="list-style-type: none"> <li>● In the measurement mode, long press to enter manual temperature compensation mode, long press this key or short press to decrease temperature value;</li> <li>● In the measurement mode, press this key to recall the last stored value;</li> <li>● In the recall mode (RM), press momentarily this key to change the storage serial number, press and hold this key to change the number quickly;</li> <li>● In the parameter set-up mode, press this key to change the serial number of the main menu and the sub-menu;</li> <li>● In the sub-menu mode, press this key to change parameters and setup.</li> </ul>


### 3.3 Meter Socket

Electrode socket displays as Chart – 2. USB socket displays as Chart– 3.

Chart – 2 Sockets for meters

Models	Photos	Description
PH8500 pH meter		<ul style="list-style-type: none"> <li>● BNC socket (right) — connect pH electrode or ORP electrode,</li> <li>● RCA socket (middle) — connect temperature probe</li> </ul>

Chart – 3 USB socket

Functions	Connect to meter	Description
USB communication		<ul style="list-style-type: none"> <li>● The meter has USB communication function, connecting the meter to a computer by USB cable with the installation of PC-Link software (Windows-based computer only, included in a flash drive)</li> </ul>

### 3.4 Display Mode

#### 3.4.1 Reading stability display mode

When the measuring value is stable, smiley icon ☺ appears on LCD, see Diagram – 4. If the ☺ icon does not appear or flash, please do not record the reading value or make calibration until the measuring value is stable. Per parameter P1.3, there are 3 criteria for stability standard: **nor** (Normal), **Hi** (High) and **Lo** (Low). The factory default is set “Normal”.

“High” is set for stability over a longer time, “Low” is set for stability over a shorter time. User can select suitable stability criteria according to different testing requirement.

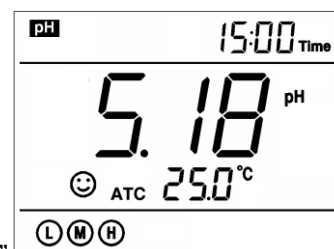



Diagram - 4

#### 3.4.2. Automatic lock-up display mode

Select On from parameter P3.6 to turn on automatic lock-up display function.

When the reading value stabilizes more than 10 seconds, the meter locks the measuring value automatically and displays HOLD icon, see Diagram – 5.

In the HOLD mode, press  to release lock-up.

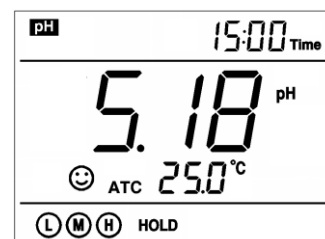



Diagram - 5

### 3.5 Store, Recall and Clear Data

#### 3.5.1. Manual storage

When the measurement is stable, short press  key, **M+** icon and storage serial number appear on LCD, storing measuring information, see Diagram – 6.

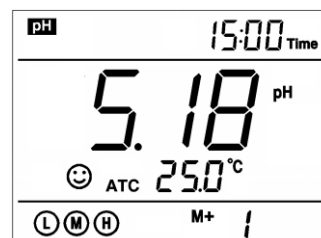







Diagram - 6

#### 3.5.2. Automatic timing storage

Set the storage timing (eg. 3 minutes) in parameter setting P3.3,  icon appears on LCD and the meter enters the timing storage mode. When short press  key,  key flashes and the first measuring value is stored. After 3 minutes, the 2<sup>nd</sup> measuring value is stored. See Diagram – 7: the meter stores automatically eight measuring values. When short press  key,  icon stops flashing and the meter stops automatic storage. In automatic storage mode, manual storage does not work. Set time 0 in parameter setting P3.3 to exit from the automatic storage mode.

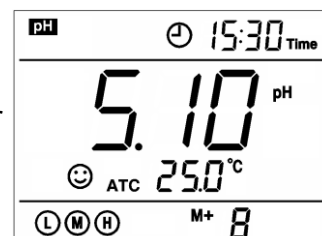








Diagram - 7

#### 3.5.3. Recall stored data

In the measurement mode, press  key to recall the last stored measuring value. See Diagram – 8: display RM icon and storage serial number. Continue pressing  key and  key to recall successively the stored measuring value. Press and hold  key and  key to recall the stored measuring value quickly. Press  to return to measuring mode.

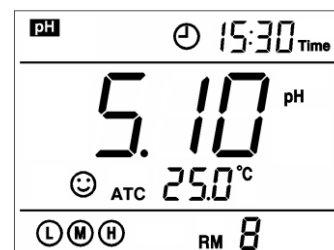


Diagram - 8






#### 3.5.4. Clear stored data

Select YES per parameter P3.6 to clear all stored value, refer to Section 7.5.

### 3.6 Auto. Power-off

The meter will be power-off after the meter stops operation for 20 minutes. To set automatic power off time in parameter setting P3.7

### 3.7 Manual Temperature Compensation (MTC)

When the temperature probe is not connected to the meter, press and hold  key or  key, temperature value flashes, then press (or press and hold)  key or  key to change the temperature value, and press  key to confirm.

## 4 pH Measurement

### 4.1 pH Electrode Information

The meter connects to 201T-F plastic three-in-one combination pH electrode with built-in temperature sensor, with automatic temperature compensation function. Electrode housing is made of polycarbonate engineering plastics, which is corrosion and impact resistant. The BNC socket of electrode connects pH



socket. RCA socket connects temperature socket. When dipping pH electrode in the solution, please stir the solution briefly to eliminate any air bubbles and allow it to stay in the solution until the reading is stable.




**Note:** The 201T-F Combination Glass pH/temp. Electrode is only suitable for general water solutions' pH measurement. For special applications such as low ion concentration or complex solutions, please refer to **Section 9** to find the most suitable pH electrode model.

## 4.2 pH Calibration Consideration

### 4.2.1. Standard buffer solution

The meter uses two series of standard buffer solution: USA series and NIST series, each series consists of 5 groups solution, icons see Chart - 4









Chart - 4 pH standard buffer solution series

Calibration guide icons		pH standard buffer solution series	
		USA series (USA)	NIST series (NIS)
Three-point calibration		1.68 pH and 4.00 pH	1.68 pH and 4.01 pH
		7.00 pH	6.86pH
		10.01 pH and 12.45 pH	9.18 pH and 12.45 pH

### 4.2.2. Three-point calibration

The instrument can perform 1-3 points calibration. The first point calibration must be 7.00 pH (or 6.86 pH) standard solution, then select other standard solution to perform the second and the third point calibration, see Chart-5.

Chart - 5 Three-point calibration mode

	USA standard	NIST standard	Icons	Suited range
One-point calibration	7.00 pH	6.86 pH		Accuracy $\leq \pm 0.1\text{pH}$
Two-point calibration	7.00 pH $\rightarrow$ 4.00 or 1.68pH	6.86 pH $\rightarrow$ 4.01 or 1.68pH	 	Range < 7.00pH
	7.00 pH $\rightarrow$ 10.01 or 12.45pH	6.86 pH $\rightarrow$ 9.18 or 12.45pH	 	Range > 7.00pH
Three-point calibration	7.00pH $\rightarrow$ 4.00 or 1.68pH $\rightarrow$ 10.01 or 12.45pH	6.86pH $\rightarrow$ 4.01 or 1.68pH $\rightarrow$ 9.18 or 12.45pH	  	Wide Range

### 4.2.3. Calibration frequency

Calibration frequency depends on the sample, the electrode performance, and the required accuracy. For high accuracy measurements ( $\leq \pm 0.03\text{pH}$ ), the meter should be calibrated immediately before taking a measurement. For general accuracy ( $\geq \pm 0.1\text{pH}$ ), the meter can be calibrated and used for approximately one week before the next calibration. The meter must be re-calibrated in the following situations:

- (a) New probe, or probe that is unused for a long period of time
- (b) After measuring acids ( $\text{pH} < 2$ ) or alkaline solutions ( $\text{pH} > 12$ )

(c) After measuring a solution that contains fluoride or a concentrated organic solution

(d) If the solution's temperature differs greatly from the calibration solution temperature

#### 4.2.4. Due calibration

Preset calibration interval (begin from the date of last calibration) to remind due calibration in a preset period in parameter setting P1.4 (Section 7.3). During due calibration, **Er5** icon appears on LCD (see Diagram – 9). The meter can not continue operation and **Er5** icon disappears until the calibration is done, or when select “No” in parameter setting P1.4.

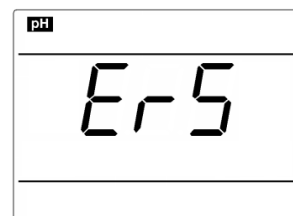



Diagram - 9




#### 4.2.5. Check calibration date

Check the date and time of last calibration to decide whether new calibration is needed. Please refer to parameter setting P1.5 (Section 7.3).

### 4.3 pH Calibration (take three-point calibration as an example)

#### 4.3.1. The 1<sup>st</sup> point calibration

a) Press  key to enter the calibration mode, CAL 1 flashes at the top right of LCD and “7.00 pH” flashes at the bottom right of LCD, indicating using pH 7.00 buffer solution to make the 1<sup>st</sup> point calibration.

b) Rinse pH electrode in distilled or deionized water, allow it to dry, and submerge it in pH7.00 buffer solution. Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. LCD displays stable , press  to finish 1<sup>st</sup> point calibration, meter goes to measurement mode, the bottom left of LCD indicating , See Diagram – 10.

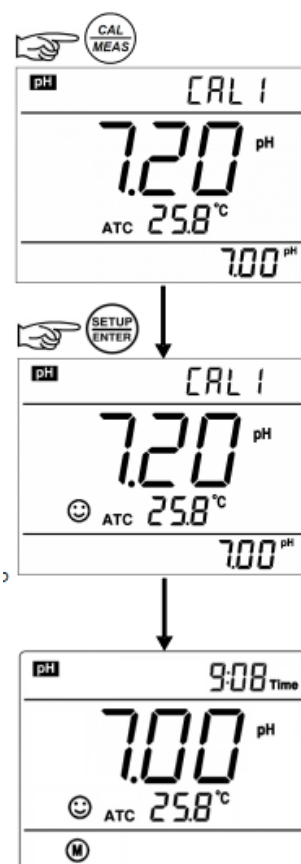











Diagram - 10

#### 4.3.2. The 2<sup>nd</sup> point calibration





Press  key to enter the calibration mode, CAL 2 flashes at the top right of LCD, indicating make the 2<sup>nd</sup> point calibration. rinse pH electrode in distilled or deionized water, allow it to dry, submerge it in pH4.00 buffer solution, Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. The meter's display will show scanning and locking process of calibration buffer solution at the bottom right of LCD. When the meter locks 4.00 pH, stable icon  displays and stays on LCD. Press the  key to calibrate the meter. electrode slope of acidity range display after calibration is done, the 2<sup>nd</sup> point calibration finished, meter goes to measurement mode, the bottom left of LCD indicating  .

#### 4.3.3. The 3<sup>rd</sup> point calibration

Press  key to enter the calibration mode, CAL 3 flashes at the top right of LCD indicating make the 3<sup>rd</sup> point calibration. Rinse pH electrode in distilled or deionized water, allow it to dry, submerge it in pH10.01 buffer solution, Stir the solution briefly and allow it to stay in the buffer solution until the reading is stabilized. The meter's display will show scanning and locking process of calibration buffer solution at the bottom right of LCD. When the meter locks 10.01pH, stable icon  displays and stays on LCD. Press key  to calibrate the meter. Electrode slope of acidity range display after calibration is done. After the 3<sup>rd</sup> point calibration is completed, meter goes to measurement mode, the bottom left of LCD indicating .

#### Notes:






(a) The meter can perform 1-3 points calibration. When the 1<sup>st</sup> point calibration is done, the meter will enter measurement mode of one-point calibration. Two-point and three-point calibration are in the same manner.






(b) During the calibration process, if measuring value is not stable yet (when  does not stay on and the key  is pressed, then **Er 2** will display. (See chart – 5). To solve the problem, simply wait for  to stay on the screen before pressing .

(c) To exit from the calibration mode, press  key.





### 4.4 Customer-defined Calibration (take 1.60 pH and 6.50 pH calibration solution as an example)

4.4.1. Select **CUS** from parameter setting P1.1 (please refer to Section 7.3 for customer-defined solution). The meter enters Customer-defined calibration mode.

4.4.2. Rinse pH electrode in distilled or deionized water, allow it to dry, and submerge it in pH1.60 buffer solution. Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. When LCD displays the stable measuring value and  icon, press  key and the measuring value flashes. **CAL1** flashes at the top right of LCD, indicating 1<sup>st</sup> point calibration of customer-defined solution. Press  key or  key to adjust the measuring value to 1.60, then press  key to calibrate the meter. After calibration is done, meter goes to measurement mode.

4.4.3. Rinse pH electrode in distilled or deionized water, allow it to dry, and submerge it in pH 6.50 buffer solution. Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. When LCD displays the stable measuring value and  icon, press  key and the measuring value flashes. **CAL 2** flashes at the top right of LCD, indicating 2<sup>nd</sup> point calibration of customer-defined solution, press  key or  key to adjust the measurement value to 6.50, then press  key to calibrate the meter. After calibration is done, the meter returns to the measurement mode.

#### Notes:

a) For manual temperature compensation ( temperature probe is plugged in RCA socket), when is pressed, temperature value flashes. Press  key or  key to adjust the temperature value, and then press  key, pH measuring value flashes.

b) The meter can perform 1-2 points customer-defined calibration. When the 1<sup>st</sup> point calibration is done, the meter goes to measurement mode automatically. Same in customer-defined 2<sup>nd</sup> point calibration.

c) The value set in “Customer-defined” is at a fixed temperature. The meter is suggested to perform calibration and measurement at the same temperature to avoid large error. The meter cannot automatically recognize customer-defined calibration solution.

## 4.5 Sample Test

4.5.1. Rinse pH electrode in distilled or deionized water, allow it to dry, and submerge it in sample solution. Stir the solution briefly and allow it to stay in the sample solution until the stable value and 😊 icon appears on LCD, get the reading which is pH value of sample solution, please refer to Diagram-11 for calibration and measurement process of pH meter.

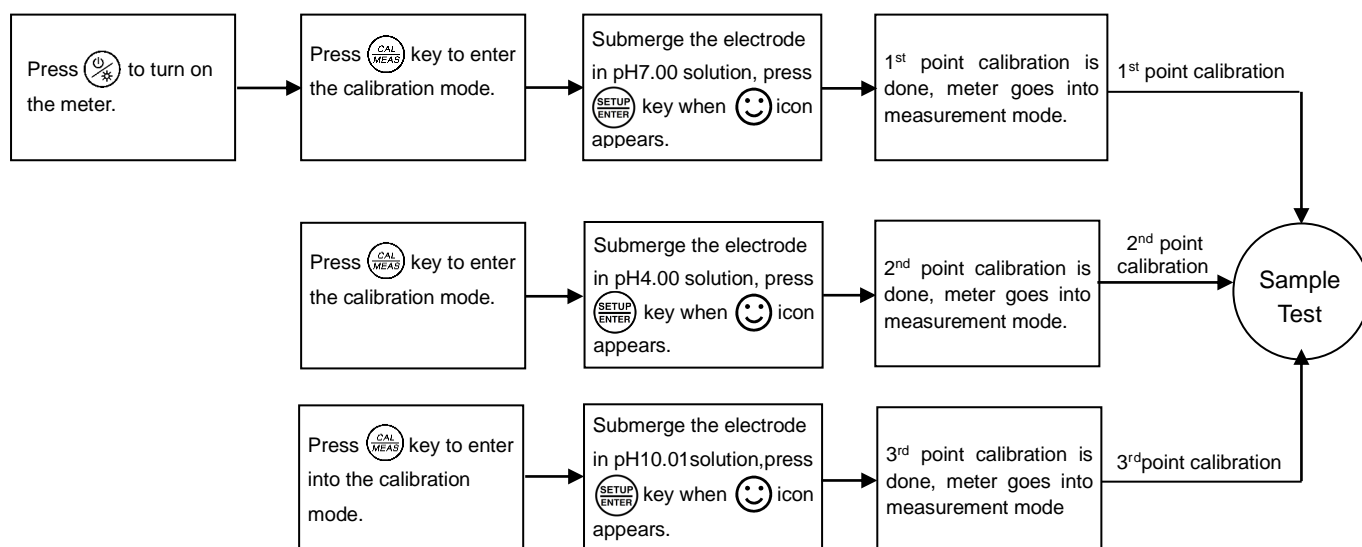



Diagram – 11 Calibration and measurement process of pH meter

## 4.5.2. Self-diagnosis information

During the process of calibration and measurement, the meter has self-diagnosis functions, indicating the relative information as below, please refer to Chart – 6.

Chart – 6 Self-diagnosis information of pH measurement mode

Display Icons	Contents	Checking
<i>Er 1</i>	Wrong pH buffer solution or the buffer solution out of range.	1.Check whether pH buffer solution is correct. 2.Check whether the meter connects the electrode properly. 3.Check whether the electrode is damaged.
<i>Er 2</i>	Press (SETUP/ENTER) key when measuring value is not stable during calibration.	Press (SETUP/ENTER) key after 😊 icon appears and stays on screen.
<i>Er 3</i>	During calibration, the measuring value is not stable for ≥3min.	1.Check whether there are bubbles in glass bulb. 2.Replace with a new pH electrode.
<i>Er 4</i>	pH electrode performance error (zero potential <-60mV or >60mV, slope <75%)	1.Check whether there are bubbles in glass bulb. 2.Check whether pH buffer solution is correct. 3.Replace with new pH electrode.

Er5	Enter in pre-set due calibration date reminder	Press  key to perform calibration or cancel due calibration setup per parameter P1.4
-----	--	---

#### 4.5.3. pH temperature principle

Please note that the closer the temperature of the sample solution is to the calibration solution, the more accurate will be the readings.

#### 4.5.4. Factory default setting

For factory default setting, please refer to parameter P1.6 (Section 7.3). all calibration data is deleted and the meter restores to the theory value (zero electric potential of pH is 7.00, the slope is 100%). Some functions restore to the original value (refer to Appendix-I). When calibration or measurement fails, please restore the meter to factory default setting and then perform re-calibration or measurement. Please note once set the factory default, all the data deleted will irretrievable.

## 4.6 pH Electrode Maintenance

#### 4.6.1. Daily maintenance

The soaking solution contained in the supplied protective bottle is used to maintain activation in the glass bulb and junction. Loosen the capsule, remove the electrode and rinse in distilled or deionized water before taking a measurement. Insert the electrode and tighten the capsule after measurements to prevent the solution from leaking. If the soaking solution is turbid or moldy, replace the solution. The soaking/storage solution is 3M KCL (SKU: A11107). Using other brand's storage solution might cause potential damage to the electrode.

The electrode should not be stored in distilled or deionized water, protein solution or acid fluoride solution. In addition, do not soak the electrode in organic silicon lipids. For best accuracy, always keep the meter clean and dry, especially the meter's electrode socket. Clean with medical cotton and alcohol if necessary.

#### 4.6.2. Calibration buffer solution

For calibration accuracy, the pH of the standard buffer solution must be reliable. The buffer solution should be refreshed often, especially after heavy use.

#### 4.6.3. Protect glass bulb

The sensitive glass bulb at the front of the combination electrode should not come in contact with hard surfaces. Scratches or cracks on the electrode will cause inaccurate readings. Before and after each measurement, wash the electrode with distilled or deionized water and then throw off the excess water on the electrode. Do not clean the glass bulb with a tissue for it will affect the stability of the electrode potential and increase the response time. The electrode should be thoroughly cleaned if a sample sticks to the electrode. Use a solvent if the solution does not appear clean after washing.

#### 4.6.4. Renew glass bulb

Electrodes that have been used over a long period of time, will become aged. Submerge the electrode in 0.1 mol/L hydrochloric acid for 24 hours, then wash the electrode in distilled or deionized water, then

submerge it in soaking solution for 24 hours. The method to prepare 0.1mol/L hydrochloric acid: dilute 9mL hydrochloric acid in distilled or deionized water to 1000mL. For serious passivation, submerge the bulb in 4% HF (hydrofluoric acid) for 3-5 seconds, and wash it in distilled or deionized water, then submerge it in the soaking solution for 24 hours to renew it.)

#### 4.6.5. Clean contaminated glass bulb and junction (see Chart – 7)

Chart – 7 Clean contaminated glass bulb and junction



Contamination	Cleaning Solutions
General tough contaminants	Apera Electrode Cleaning Solution (SKU: AI1166)
Organic lipid	Dilute detergent (weak alkaline)
Resin macromolecule	Dilute alcohol, acetone, ether
Proteinic sediment	Apera Electrode Cleaning Solution (SKU: AI1166)
Paints	Dilute bleach, peroxide

#### Notes:

The 201T-F electrode housing is polycarbonate. When using cleaning solutions, take precautions with carbon tetrachloride, trichlorethylene, tetrahydrofuran, acetone, etc. as these will dissolve the housing and invalidate the electrode.

## 5 mV Measurement

### 5.1 ORP Measurement

Press  key, and switch the meter to mV measurement mode. Connect 301Pt-C ORP electrode (SKU: AI1303, sold separately) and dip it in sample solution, stir the solution briefly and allow it to stay in the solution until  icon appears and get the reading which is ORP value. ORP is in short for Oxidation Reduction Potential. The unit is mV.

### 5.2 Notes:

5.2.1. ORP measurement does not require calibration. When the user is not sure about ORP electrode quality or measuring value, use ORP standard solution to test mV value and see whether ORP electrode or meter works properly.

#### 5.2.2. Clean and activate ORP electrode




After the electrode has been used over long period of time, the platinum surface will get contaminated and will lead to inaccurate measurements and slow responses. Please refer to the following methods to clean and activate ORP electrode:

- For inorganic pollutants, submerge the electrode in 0.1mol/L dilute hydrochloric acid for 30 minutes, then wash it in distilled or deionized water, then submerge it in the soaking solution for 6 hours.
- For organic or lipid pollutants, clean the platinum surface with detergent, then wash it in distilled or deionized water, then submerge it in the soaking solution for 6 hours.

(c) For heavily polluted platinum surface on which there is an oxidation film, polish the platinum surface with toothpaste, then wash it in distilled or deionized water, then submerge it in the soaking solution for 6 hours.

## 6 Parameter Setting




### 6.1 Main Menu

In the measurement mode, press  key to enter in P1.0, then press  or  to switch to main menu: P1.0→P3.0. Please refer to Diagram – 14.

P1.0: pH parameter setting;

P3.0: Basic parameter setting.

### 6.2 Sub-Menu

6.2.1. In P1.0 mode, press  key to enter in sub-menu P1.1 of pH parameter setting, then press  and  key to switch among sub-menu: P1.1→P1.2→P1.3→P1.4→P1.5→P1.6, See Diagram–14.




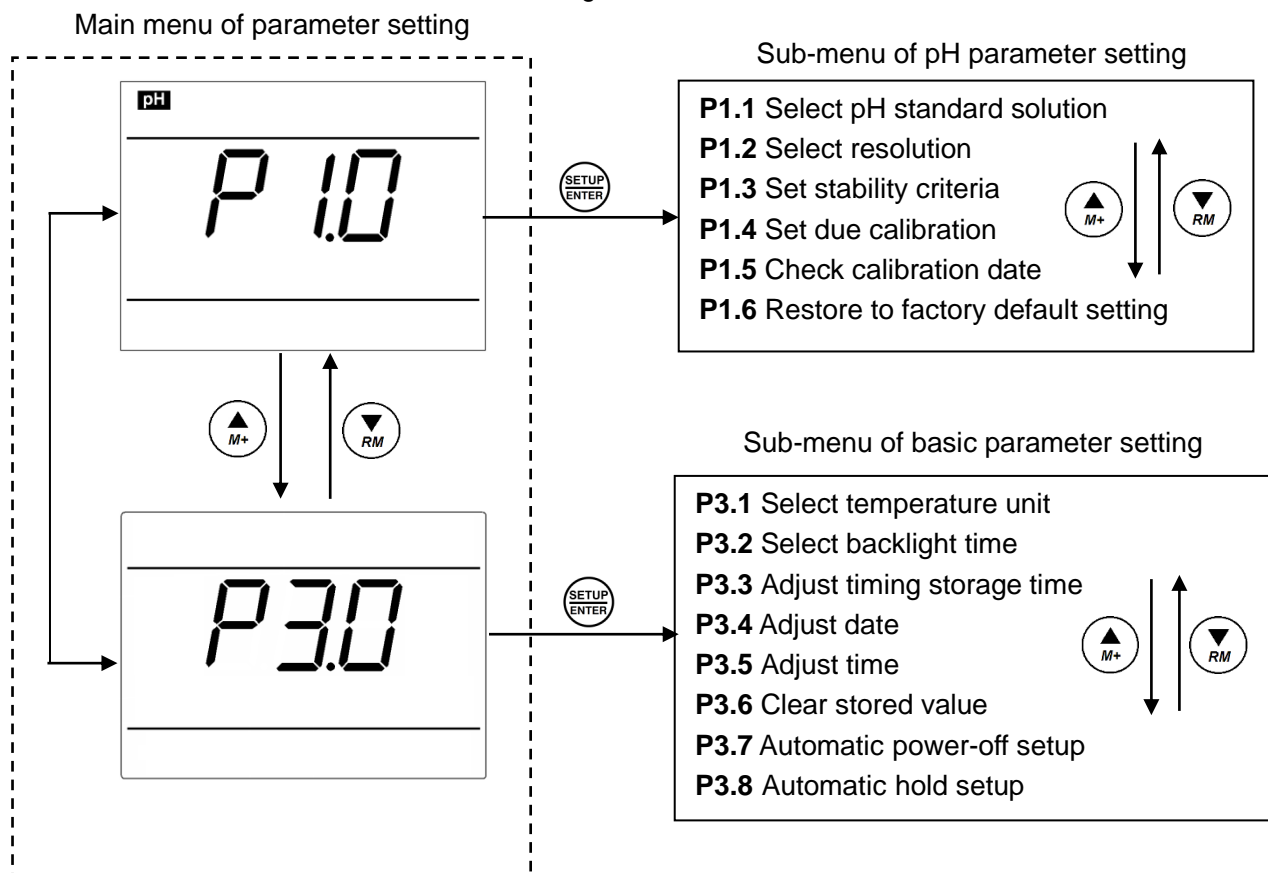
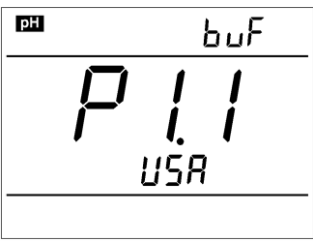







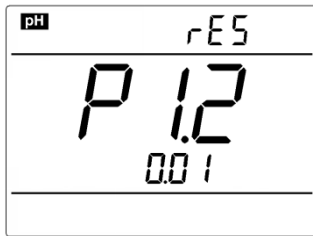





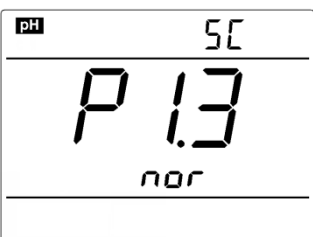





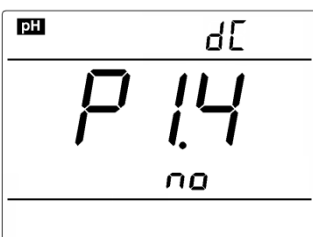











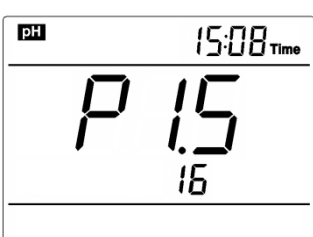


6.2.2. In P3.0 mode, press  key to enter in sub-menu P3.1 of TDS parameter setting, then press  and  key to switch among sub-menu: P3.1→P3.2→P3.3→P3.4→P3.5→P3.6→P3.7→P3.8, See Diagram – 14 below.

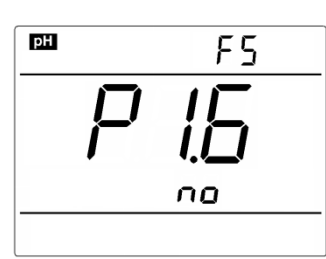




Diagram – 14



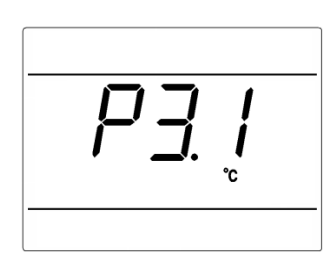






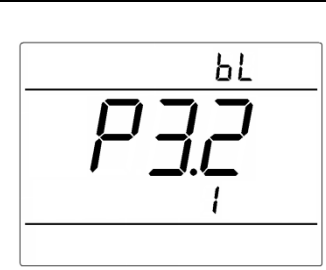





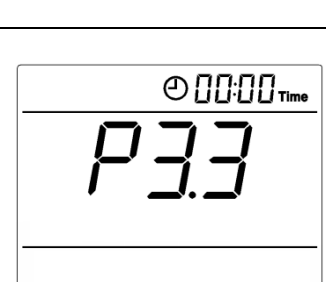







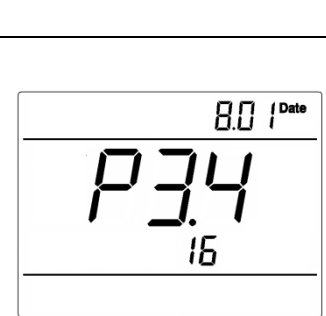








### 6.3 Sub-Menu of pH Parameter Setting (press or key to switch)

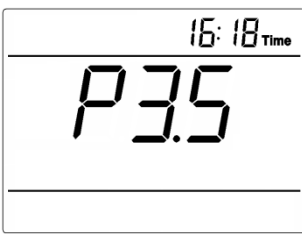







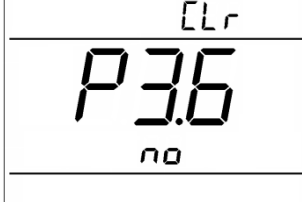





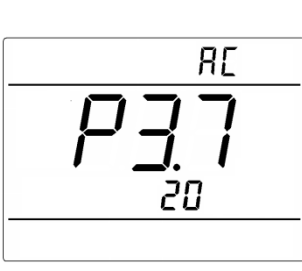





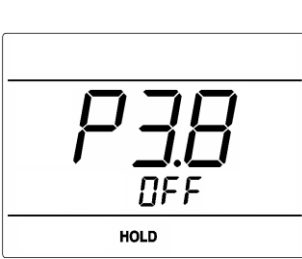




	<p><b>P1.1 – Select pH standard solution (USA-NIST-CUS)</b></p> <ol style="list-style-type: none"> <li>1. In measurement mode, press  key to enter in P1.0, press  to enter in P1.1.</li> <li>2. When  key is pressed, <b>USA</b> flashes, press  key to select USA→nIS→CUS, press  to confirm. USA-USA series; nIS-NIST series; CUS- customer-defined.</li> <li>3. After confirming parameter, press  key to enter in P1.2 mode, or press  key to return to the measurement mode.</li> </ol>
	<p><b>P1.2 – Select resolution (0.01 – 0.1)</b></p> <ol style="list-style-type: none"> <li>1. When  key is pressed, <b>0.01</b> flashes, then press  key to select 0.01→0.1, press  key to confirm.</li> <li>2. After confirming parameter, press  key to enter in P1.3 mode, or press  key to return to the measurement mode.</li> </ol>
	<p><b>P1.3 – Set stability criteria (Normal – High – Low)</b></p> <ol style="list-style-type: none"> <li>1. Press  key, <b>nor</b> flashes. Press  key to select nor→HI→Lo, press  to confirm. Nor – Normal, Hi – High, Lo – Low.</li> <li>2. After confirming parameter, Press  key to enter in P1.4 mode, or press  key to return to the measurement mode.</li> </ol>
	<p><b>P1.4 – Set due calibration (No – H00 – D00)</b></p> <ol style="list-style-type: none"> <li>1. Press  key, <b>no</b> flashes, then press  key to select <b>no</b>→H00→d00. Press  to confirm.</li> <li>2. When <b>H</b> flashes, press  key, <b>00</b> flashes. Press  key to adjust hours (0~99 hours), press  key to confirm; When <b>D</b> flashes. press  key, <b>00</b> flashes. Press  key to adjust days (0~99 days), press  to confirm.</li> <li>3. After confirming parameter, press  key to enter in P1.5 mode, or press  key to return to the measurement mode.</li> </ol>
	<p><b>P1.5 - Check the time and date of the last calibration</b></p> <ol style="list-style-type: none"> <li>1. The time and date of calibration displays alternately at top right of LCD (Date display: Month – Day), the number in the LCD middle displays Year (Year 2016).</li> <li>2. Press  key to enter in P1.6 mode, or press  key to return to the measurement mode.</li> </ol>



	<p><b>P1.6 – Restore to factory default setting (NO – Yes)</b></p> <ol style="list-style-type: none"> <li>1. Press  key, <b>no</b> flashes, then press  key to select no → YES, Press  key to confirm, the meter returns to the measurement mode. No – not restore to factory default setting, Yes – restore to factory default setting.</li> <li>2. Press  key to return to the measurement mode.</li> </ol>
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#### 6.4 Sub-menu of Basic Parameter Setting (press key or key to switch)

	<p><b>P3.1 – Select temperature unit (°C—°F).</b></p> <ol style="list-style-type: none"> <li>1. In P3.0 mode, press  key enter P3.1, see left diagram.</li> <li>2. Press  key, <b>°C</b> flashes, press  to select °C → °F, then press  key to confirm,</li> <li>3. After confirming the parameter, press  key to enter in P3.2 mode. or press  key to return to the measurement mode.</li> </ol>
	<p><b>P3.2 – Select backlight timing (1-2-3-On)</b></p> <ol style="list-style-type: none"> <li>1. When press  key, <b>1</b> flashes, then press  key to select 1→2→3 →On. When the parameter flashes, press  key to confirm. Select On to turn on the back light, the time unit is minute.</li> <li>2. After confirming the parameter, press  key to enter in P3.3 mode or press  key to return to the measurement mode.</li> </ol>
	<p><b>P3.3 – Adjust timing storage time</b></p> <ol style="list-style-type: none"> <li>1. When  key is pressed, <b>:00</b> flashes, press  key and  key to adjust Timing (0~59), press  key, <b>00:</b> flashes: adjust hours (0-99), press  to confirm.</li> <li>2. After confirming the parameter, press  key to enter in P3.4 mode or press  key to return to the measurement mode.</li> </ol>
	<p><b>P3.4. – Adjust date</b></p> <ol style="list-style-type: none"> <li>1. When  key is pressed, <b>Month</b> flashes, then press  and <b>Date</b> flashes, then press  and <b>Year</b> flashes. When the number flashes, press  key or  key to adjust date, then press  to confirm.</li> <li>2. After confirming the above parameters (the numbers stop blinking), press  key to enter in P3.5 mode or press  key to return to the measurement mode.</li> </ol>

	<p><b>P3.5. – Adjust time</b></p> <ol style="list-style-type: none"> <li>When  key is pressed, <b>Hour</b> flashes, then press  and <b>Minute</b> flashes. When the number flashes, press  key and  key to adjust time, then press  to confirm.</li> <li>After confirming date, press  key to enter in P3.6 mode or press key  to return to the measurement mode.</li> </ol>
	<p><b>P3.6. – Clear all storage value (No—Yes)</b></p> <ol style="list-style-type: none"> <li>When  key is pressed, <b>No</b> flashes, then press  key to select No—Yes, press  key to confirm. No: not delete, Yes: Delete.</li> <li>After confirming the parameter, press  key to enter mode P3.7 or press  key to return to the measurement mode.</li> </ol>
	<p><b>P3.7 – Automatic power-off setup (10→20→30→On)</b></p> <ol style="list-style-type: none"> <li>Press  key, <b>On</b> flashes, press  key to select 10→20→30→On, press  key to confirm. On – turn off automatic power-off, Time unit is minutes.</li> <li>After confirming the parameter, press  key to enter P3.8 or press  to return to the measurement mode.</li> </ol>
	<p><b>P3.8 – Set automatic lock-up function (Off→On)</b></p> <ol style="list-style-type: none"> <li>Press  key, <b>OFF</b> flashes, then press  key to select OFF→On, press  key to confirm. Off: not set, On: set (the reading is automatically locked when stabilizes &gt; 10 seconds.)</li> <li>After confirming the parameter, press  key to enter measurement mode.</li> </ol>

## 7 USB Communication

### 7.1 Software Requirement

The meter uses “PC-Link” software connected to via USB port. The recommended requirement for the computer are: Personal computer (Microsoft Excel 2000 or the version of higher rank) which can operate Windows XP operation system, PC – IBM compatible with XT and CD-ROM driver, USB communication port.

## 7.2 Software Interface

Software interface: see Diagram-15.

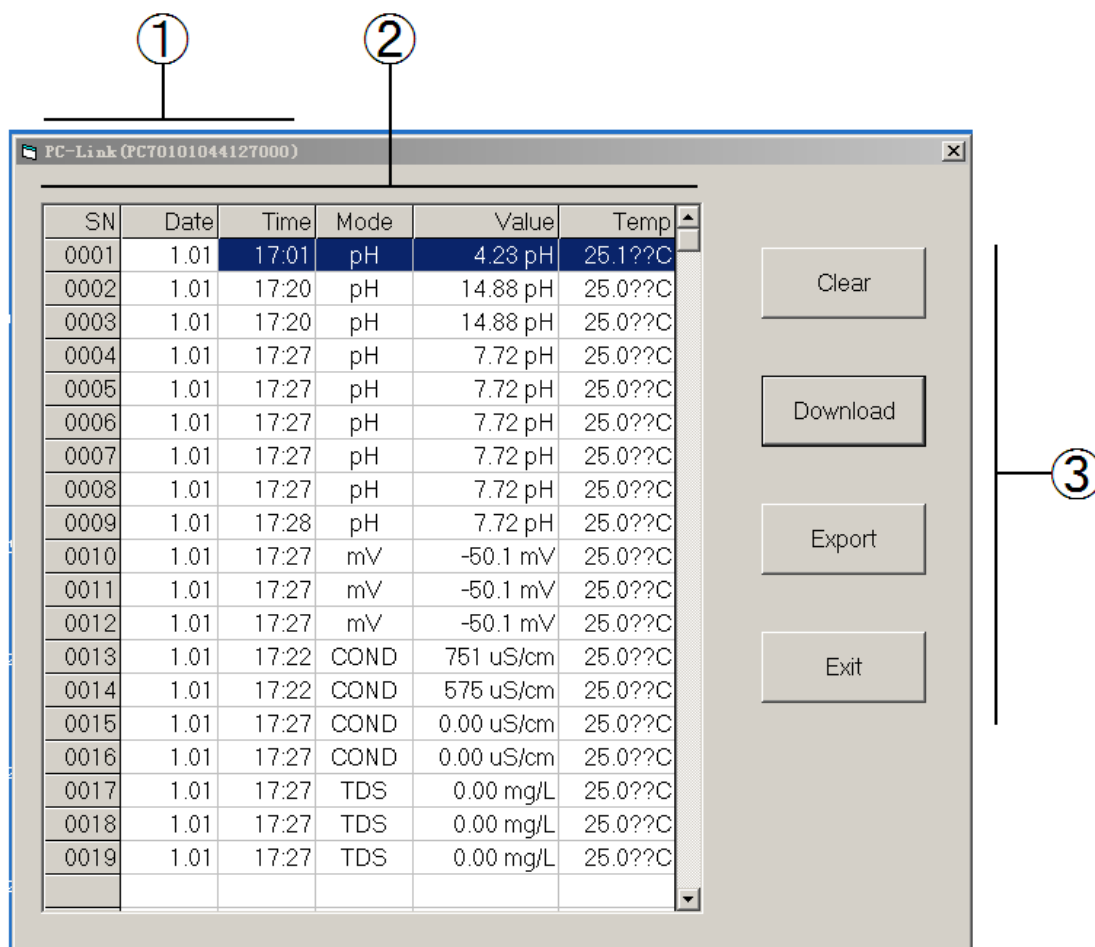


Diagram -15

① — Meter serial number

② — Stored value

③ — Keys

Clear — press this key to clear the data

Download — press this key to download the data from the meter to the computer

Export — press this key to export the stored value to Microsoft Excel file

Exit — press this key, PC-Link program exits from the computer interface

## 7.3 Install Software

Please follow the steps as below to load PC-Link to the computer:

Open "PC-Link" file→double click "Setup" program → click "OK"→ click icons (see Diagram – 16) → click "Continue"→ click "Confirm".

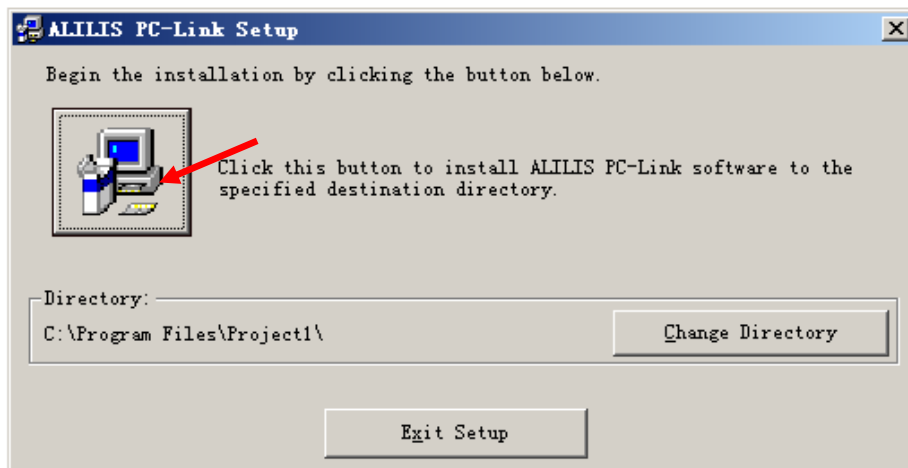



Diagram – 16

## 7.4 Automatic Connection Port

Connect USB cable to the meter and the computer, open PC-Link program, program interface shows on the computer, automatic connection is done after a few seconds.  Icon shows at the left bottom of LCD.

### Note:

**To reconnect after turn-off, please restart the software interface, as the computer can not recognize the software automatically.**


**Besides, this software only recognizes 1-16 port numbers. For other port numbers, please set in “device manager” of the computer.**

## 7.5 Operation Software

### 7.5.1. Upload the stored value

Press Download key, all the data stored in the meter is downloaded to the computer. pH, mV, COND and TDS are sorted in the program.

### 7.5.2. Real-time storage.

During operation, press  key to store or set timing storage. The measuring information is downloaded to the computer through USB and will not be stored in the meter. The stored data during operation is the same as the data shown on the meter.

### 7.5.3. Data processing

Press Export key to export the stored value to Microsoft Excel file to further analyze or print the stored data.

## 8 **What's in the Kit?**

No.	Include	Quantity
1	PH8500 portable pH meter	1 set
4	201T-F plastic three-in-on pH electrode	1 pc
6	pH standard buffer solution (4.00/7.00/10.01pH/50mL)	1 bottle each
8	PC-Link communication software flash drive	1 pc
9	USB communication cable	1 pc
10	Combined electrode clip	1 pc
11	Portable case	1 pc
12	Manual	1 book

## 9 **Recommended pH Electrodes for Different Applications**

Application	Ideal Apera pH Electrodes to Use with 850 Series Meter
General water solutions	201T-F, LabSen 211, LabSen 213
Beverage, beer, wine...	LabSen 211, LabSen 213
Cosmetics	LabSen 851-S
Corrosive solutions	LabSen 861
Culture medium	LabSen 823, LabSen 821, LabSen 851-S
Dairy products (milk, cream, yogurt, mayo, etc.)	LabSen 823, LabSen 821
High-Temperature solution	LabSen 861
Low-temperature solution	LabSen 881
Meat	LabSen 763
Micro-volume solution	LabSen 241-6, LabSen 241-3
Purified Water (Low ion concentration samples)	LabSen 803, LabSen 801
Soil	LabSen 553
Solid or semi-solid samples (cheese, rice, fruit, etc.)	LabSen 753, LabSen 751, LabSen 251
Strong acid samples	LabSen 831
Strong alkaline samples	LabSen 841
Surface test (skin, paper, carpet, etc.)	LabSen 371
TRIS buffer solutions	LabSen 211, LabSen 213, LabSen 221
Viscous liquid	LabSen851-S, LabSen 851-H
Wastewater, emulsion, complex and caustic solutions	LabSen 333, LabSen 331

## **10 Warranty**

We warrant this instrument to be free from defects in material and workmanship and agree to repair or replace free of charge, at the option of APERA INSTRUMENTS, LLC, any malfunctioned or damaged product attributable to the responsibility of APERA INSTRUMENTS, LLC for a period of **THREE YEARS for the instrument and SIX MONTHS for the probe from the delivery.**

This limited warranty does NOT cover any issues due to:

- Accidental damage
- Improper use
- Normal wear and tear
- Transportation
- Storage
- Failure to follow the product instructions
- Unauthorized maintenance, modifications, combination or use with any products, materials, processes, systems or other matter
- Unauthorized repair

## 11 Appendix I: Parameter Setting and Factory Default Setting

Modes	Prompts	Parameter setting items	Abbreviation	Description	Restore to factory default setting
P1.0 pH	P1.1	Select pH buffer solution	buF	USA – NIST – CUS	USA
	P1.2	Select resolution	rES	0.01 – 0.1	0.01
	P1.3	Set reading stability criteria	SC	Normal – High – Low	Normal
	P1.4	Set due calibration	dC	No – H00 – D00	No
	P1.5	Check the date of the last calibration	/	–	–
	P1.6	Restore factory default setting	FS	No – Yes	No
P3.0 Basic parameters	P3.1	Select temperature unit	/	°C – °F	°C
	P3.2	Select back light timing	BL	1 – 2 – 3 – On	1
	P3.3	Adjust storage timing	/	–	0:00
	P3.4	Adjust date	/	–	–
	P3.5	Adjust time	/	–	–
	P3.6	Clear stored data	CLr	No – Yes	No
	P3.7	Automatic Power-off setup	AC	10 – 20 – 30 – On	20
	P3.8	Auto. Hold	/	Off – On	Off

## 12 Appendix II: Abbreviation Glossary

Modes	Prompts	Code and abbreviation	In English	Description
P1.0 pH	P1.1	buF	Standard buffers	Standard buffer solution
	P1.2	rES	Resolution	Resolution
	P1.3	SC	Stability criteria	Reading stability
	P1.4	dC	Due Calibration	Remind due calibration
	P1.5	/	/	/
	P1.6	FS	Factory default setting	Factory default setting

P3.0 Basic parameters	P3.1	/	/	/
	P3.2	BL	Back light	Back light
	P3.3	/	/	/
	P3.4	/	/	/
	P3.5	/	/	/
	P3.6	CLr	Clear readings	Clear readings
	P3.7	AC	Auto. close	Auto. close
	P3.8	/	/	/

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