SX811-SS

Portable pH Meter for Food Testing

Instruction Manual

IP57
WATERPROOF

APERA INSTRUMENTS, LLC

www.aperainst.com

1 Brief Introduction

Thank you for purchasing SX811-SS portable food pH meter.

This device is a perfect combination of advanced electrical, sensor technology and software design. The meter is equipped with LabSen753 spear pH electrode, suitable for testing meat, bread, friuit, and dairy products such as cheese, yogurt and other solid or semi-solid food sample's pH value. It could also be used for testing soil and regular aqueous solution.

1.1 Features

- This microprocessor-based meter features Automatic calibration, automatic temperature compensation, menu set-up, calibration reminder, calibration date checking, automatic powe off and low battery warning.
- GLP data management，clock display, manual storage and automatic timing storage, USB port and power outage data protection, your data is safe even with a dead battery.
- Advanced digital processing technology improvs meter responding time and accuracy. There are reading stability display mode and automatic lock-up display mode.
- IP57 waterproof, operable under extreme conditons. Powered by 2 AA batteries or USB connection to other power source. Solid and durable case，accessories are included.
- 1-3 points automatic calibration, calibration guide and self diagnose.
- Automatically recongnize pH standard buffer solutions. There are three series of standard buffer solutions to choose from: USA series，NIST series, and Chinese series. There is also customer-defined solution calibration.

1.2 Features of the LabSen753 spear pH electrode

- Food grade stainless steel casing, solid and durable；

- Using solid electrolyte as reference solution, it does not contanminate testing samples, suitable for testing of samples that are rich in fat and proteins.
- Special notice：

a) Electrode needs to be soaked in Polymer solution when not in use，do not store the electrode in dry environment. Polymer solution (50ml) is provided with the meter.

b) To prevent damaging the electrode, please bore a hole in harder samples and then insert the electrode into the hole for testing.

c) In order to prevent rusting, please do not scratch the stainless steel casing of the electrode with sharp object or sand paper.

2 Technical Specifications

2.1 Meter's Technical Specs

	Technical Specs	
pH	Range	-2.00 to 19.99 pH
	Resolution	0.01/0.1 pH
	Accuracy	±0.01 pH ±1 digit
	Temperature Compensation	0 to 100 ˚C (Auto or Manual)
mV	Range	-1999 mV - 0 - 1999 mV
	Resolution	- 200 mV - 0 - 200 mV: 0.1 mV; Remaining: 1 mV
	Accuracy	±0.1% F.S ±1 digit
Temp.	Range	0 to 100˚C
	Resolution	0.1˚C
	Accuracy	±0.5˚C ±1 digit

2.2 Others

Data Storage	500 groups

Storage Content	Numbering, date, time, measurement, unit, temperature
Output	USB
Power	AA Batteries * 3 / DC5V (USB port)
IP Ranking	IP57 dust-proof and waterproof
Dimensions & Weight	Meter: (88×170×33) mm/ 313g With case：(360×270×76) mm/ 1.6kg

2.3 Electrode Technical Specs

Housing Material	Food grade stainless steel
Temperature sensor	Yes
Junction	Single Junction Ceramic
Reference Electrode	Long-Life Reference System
Electrolyte	Polymer
Shape of glass membrane	Spear
Range	0 to 14 pH
Temperature Range	0 to 80℃
Connector	BNC and RCA

3 Instrument Description

3.1 LCD Display

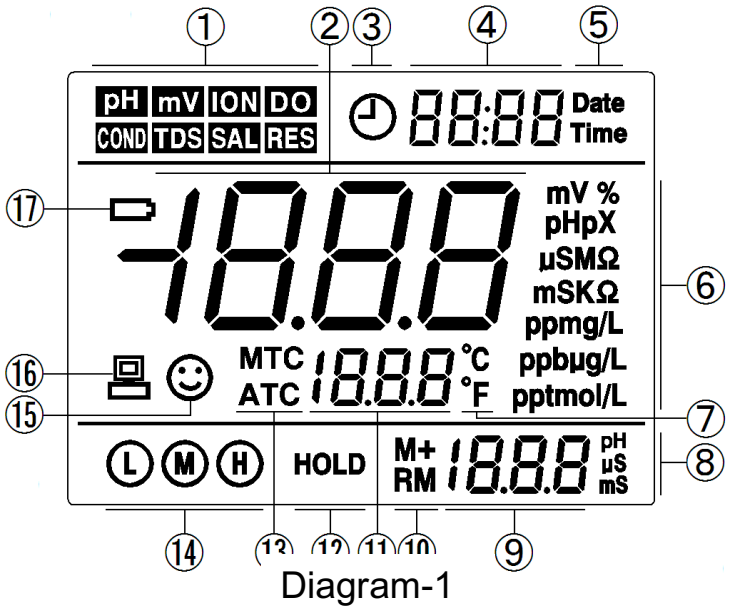


Diagram-1

(1) — Measurement mode icons

(2) — Measurement value

(3) — Timing storage icon. When this icon appears, the meter is in the automatic storage mode

(4) — Date and time display value, and prompts of special display mode

(5) — Units of Date and time

(6) — Units of measurement

(7) — Temperature units (°C and °F)

(8) — Units of pH and conductivity calibration value

(9) — pH and conductivity calibration value, the numbering 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) — Automatic reading lock-up icon

(13) — Temperature compensation icons

ATC — automatic temperature compensation, MTC — manual temperature compensation

(14) — Calibration guide icon

(15) — Stability icon of readings

(16) — USB icon，when this icon appears, the meter connects the computer

(17) — Low battery icon, when this icon appears, please renew the battery

3.2 Keypad

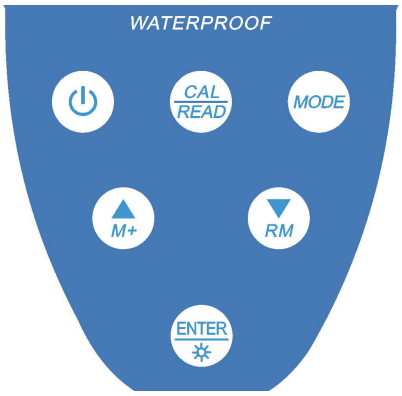


Diagram-2

3.2.1. Keypad operations

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

3.2.2. Turn on the meter

Press ⏻ to turn on the meter: LCD full display → display the measurement mode (backlight for one minute).

3.2.3. Turn off the meter

Only in the measurement mode, press ⏻ to turn off the meter.

Note: In the calibration mode or the parameter set-up mode, pressing ⏻ is invalid. Please ENTER ⏻

press key to return to the measurement mode, then press to turn off the meter.

Table – 1 Keypad operations and descriptions

Keypad	Operations	Descriptions
⏻	Short press	● Press this key to turn on or turn off the meter.
MODE	Short press	Select measurement parameters: ● pH meter: pH → mV ,
	Long press	● In measurement mode, press this key to enter main menu.
CAL/READ	Short press	● In measurement mode, press this key to enter in calibration mode, ● In recall mode (RM), press this key to return to measurement mode, ● Cancel any operation to return to measurement mode.
ENTER ✲	Short press	● In measurement mode, press this key to turn on or turn off backlight, ● In calibration mode, press this key to conduct calibration, ● In main menu, press this key to enter submenu, ● In submenu, press this key to enter parameter set-up mode, ● In parameter set-up mode, press this key to confirm parameters.
	Long press	● In pH measurement mode, press and hold this key to change the resolution repeatedly: 0.01→ 0.1pH
▲ M+ ▼ RM	Short/ long press	● In the mode of manual temperature compensation (MTC), when press and hold this key, the temperature value flashes, then press this key to change the temperature value, and press ENTER ✲ to confirm, ● In measurement mode, press ▲ M+ to store the measuring value, press ▼ RM to recall the stored measuring value, ● In recall mode (RM), short press this key to change the storage numberings, press and hold this key to change the number quickly, ● In the main menu and submenu mode, press this key to change the numbering of the main menu and the submenu, ● In the parameter set-up mode, press this key to select parameters.

3.3 Display mode

3.3.1 Reading stability display mode

When the measuring value is stable, smiley icon ☺ appears on LCD, see Diagram – 5. If ☺ icon does not appear or flash, please do not get the reading value or make calibration until the measuring value is stable.

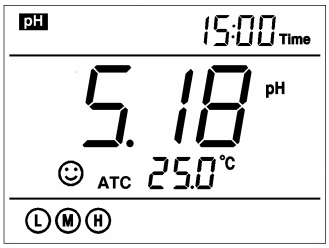


Diagram - 3

3.3.2 Automatic lock-up display mode

Select **On** from parameter P4.6 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 – 6. In the **HOLD** mode, press (CAL READ) to release lock-up.

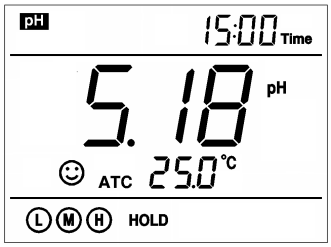


Diagram - 4

3.4 Data storage, recall, and delete

3.4.1 Manual storage

When the measurement is stable, press (M+) key, the meter displays **M+** icon and storage serial number on LCD, storing measuring information, see Diagram – 7: the meter stores the first group of the measuring value.

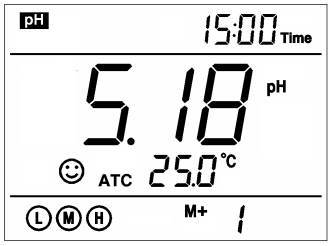


Diagram - 5

3.4.2 Automatic timing storage

Set the storage timing (eg. 3 minutes) from parameter P4.1, ◴ icon appears on LCD and the meter enters into the timing storage mode. When press (M+) key, ◴ icon flashes and the first measuring value is stored. After 3 minutes, the 2nd measuring value is stored. See Diagram – 8: the meter stores automatically eight measuring values. When press (M+) key, ◴ icon stops flashing and the meter stops automatic storage. In automatic storage mode, manual storage does not work. Set time 0 from parameter P4.1 to exit from the automatic storage mode.

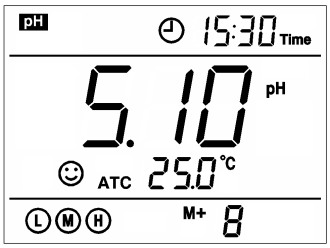


Diagram - 6

3.4.3 Recall stored value

In the measurement mode, press (RM) key to recall the last stored measuring value. See Diagram – 9: display **RM** icon and storage serial number. Continue pressing (M+) key and (RM) key to recall successively the stored measuring value. Press and hold (M+) key and (RM) key to recall quickly the stored measuring value.

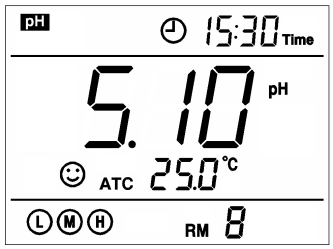


Diagram - 7

3.4.4 Clear stored value

Select **YES** from parameter P4.5 to clear all stored value, refer to the item 6.4.

4 pH Measurement

4.1 Information regarding pH Calibration

4.1.1 Standard Buffer Solution

The meter adopts 3 series of standard buffer solutions: USA, CH, and NIST. They can be selected in parameter P1.1 (see 6.3) as showed in Table-2

Table-2

Calibration icon		pH standard buffer series		
		USA	CH	NIST
3-Point calibration	(L)	1.68 and 4.00 pH	1.68 and 4.00 pH	1.68 and 4.01 pH
	(M)	7.00 pH	6.86 pH	6.86 pH
	(H)	10.01 pH	9.18 pH	9.18 pH

4.1.2 3-Point Calibration

The meter can adopt 1 to 3 points' calibration. The 1st point must be using 7.00 pH (or 6.86 pH) buffer solution, and then choose other buffers to do 2nd point and 3rd point. Please refer to Table-3 for details. In the process of calibration, the slope of acidity range and alkalinity range will be displayed.

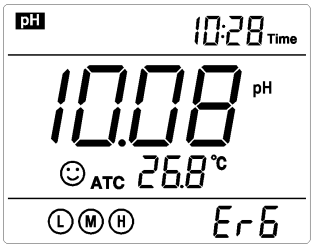
Table-3 Calibration Mode

	CH	USA	NIS	Calibration icon	When to adopt
1-Point Calibration	6.86 pH	7.00 pH	6.86 pH	(M)	accuracy≤ ±0.1 pH
2-Point Calibration	6.86 pH and 4.00/1.68 pH	7.00 pH and 4.00/1.68 pH	6.86 pH and 4.01/1.68 pH	(L)(M)	0 to 7.00 pH
	6.86 pH and 9.18 pH	7.00 pH and 10.01 pH	6.86 pH and 9.18 pH	(M)(H)	7.00 to 14.00 pH
3-Point Calibration	6.86pH, 4.00/ 1.68 pH, and 9.18 pH	7.00pH, 4.00/ 1.68 pH and 10.01 pH	6.86pH, 4.01/ 1.68pH, 9.18 pH	(L)(M)(H)	0 to 14.00 pH

4.1.3 How often to calibrate

The frequency that you need to calibrate your meter depends on the tested samples, performace of electrodes, and the requirement of the accuracy. For High-Accuracy meaustements (≤ ±0.02pH), the meter should be calibrated before test every time; For ordinary-accuracy Measurements (≥±0.1pH), once calibrated, the meter can be used for about a week or longer.

4.1.4 Calibration reminder



Graph-8

Preset the interval between calibrations (starting from the time when you set it), and then the meter will remind you to calibrate at the end of that interval. For detailes, please see P1.2 (6.3). When the preset time is reached, Er6 icon will be displayed at the lower right corner of the LCD (as showed in graph-8). At the time, the meter can still be operated. It is just reminding you to do calibration in order to ensure its accuracy. After calibration, the Er6 icon will disappear; To make it disappear, users can also choose NO in P1.2 in parameter setting.

4.1.5 Check calibration time

In this mode, users can see the date and time of last calibration so as to help them determine if there is need to calibrate. For details, please see parameter setting P1.3 (6.3)

4.1.6 Change temperature manually

When temperature electrode is not connected, long press (RM) or (M+) the temperature will flash, and then short press or long press (M+) or (RM) to change temperature, press (ENTER) to confirm.

4.2 pH Calibration (use 3-point as an example)

1) Press (CAL READ) to enter calibration mode. CAL1 icon will flash in the upper right corner of the LCD. 7.00 pH will flash in the lower right corner of the LCD, reminding you to use pH 7.00 buffer to conduct 1st point of calibration.

2) Use distilled water to rinse off electrode and then dry it. Dip it into pH 7.00 buffer solution, stir gently and let it stand still and wait for the reading to become stable. In the lower right corner of LCD, the process of auto recognizing the buffer solution will be displayed. Pressing (ENTER) before the buffer is recognized will generate Er2 (please refer to table 6).

3) When the meter locks 7.00 pH, stable ☺ icon displays on LCD. Press (ENTER) key to calibrate the meter. **End** icon appears after calibration is done. The 1st point calibration is finished. In the meanwhile, CAL2 will flash at the upper right corner, and 4.00 pH & 10.01 pH will flash alternately at the bottom right, indicating using pH4.00 or pH10.01 buffer solution to make the 2nd point calibration.

4) Take out pH electrode, rinse it in distilled water, dry it, and dip it into pH 4.00 buffer solution. Stir the solution gently and let stand still in the buffer solution until a stable reading is reached. The meter's display will show the recognition process of calibration buffer solution at the lower right of LCD. When the meter recognizes 4.00 pH, stable ☺ icon displays on LCD.
Press (ENTER) key to calibrate the meter. End icon and electrode slope of acidity range display after calibration is done. In the meanwhile, CL3 will flash at the upper right corner of the LCD, and 10.01 pH will flash at the lower right, indicating using pH10.01 buffer solution to make the 3rd point calibration.

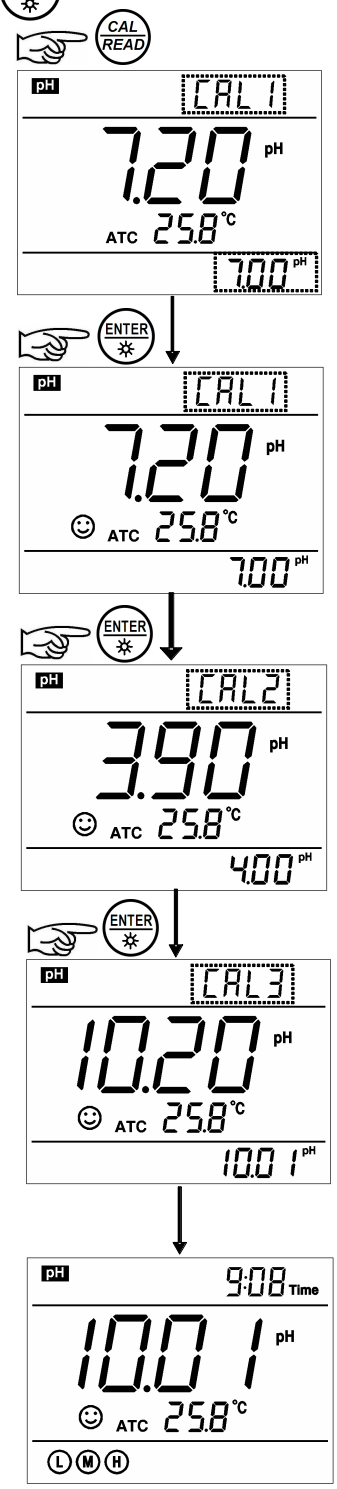


Diagram - 11

5) Take out pH electrode, rinse it in distilled water, dry it, and dip it into pH 10.01 buffer solution. Stir the solution gently and let it stand still in the buffer solution until a stable reading is reached. The meter's display will show recognition process of calibration buffer solution at the bottom right of LCD. When the meter recognizes 10.01 pH, stable ☺ icon displays on LCD. Press (ENTER) key to calibrate the meter. End icon and electrode slope of alkalinity range display after calibration is done. The meter returns to the

measurement mode, displays stable measuring value and calibration guide icons. Please see Diagram–11 for the above calibration process.

6) During the calibration process, press CAL/READ key to exit from the calibration mode. The meter can perform one-point, two-point and three-point calibration. Calibration guide icons appear on LCD.

4.3 Customized Calibration

(take 1.60pH and 6.50pH calibration solution as an example)

1) Select **CUS** from parameter P1.1 (please refer to Item 8.3 for customer-defined solution). The meter enters into Customer-defined calibration mode. When press CAL/READ key, the meter's display shows a blinking **CAL1** icon at the top right of LCD, indicating the meter enters into the 1st point customer-defined calibration.

2) Rinse pH electrode in pure 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 ENTER key and the measuring value flashes. Press M+ key or RM key to adjust the measuring value to 1.60, then press ENTER key to calibrate the meter. After calibration is done, LCD at the top right shows blinking CAL2 icon, indicating the meter enters into the 2nd point customer-defined calibration.

3) Rinse pH electrode in pure 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 ENTER key and the measuring value flashes. Press M+ key or RM key to adjust the measurement value to 6.50, then press ENTER key to calibrate the meter. After calibration is done, the meter returns to the measurement mode. For customer-defined calibration, LCD does not show electrode calibration guide icons.

Note: For manual temperature compensation (MTC), when press ENTER key, the temperature value flashes. Press M+ key or RM key to adjust the temperature value, and then press ENTER key, pH measuring value flashes.

4) Notes

(a) The meter can perform 1-2 point customer-defined calibration. When the 1st point calibration is done, press CAL/READ key, the meter exits from calibration mode. This is one-point customer-defined calibration. When the 2nd point calibration is done, the meter returns to the measurement mode automatically.

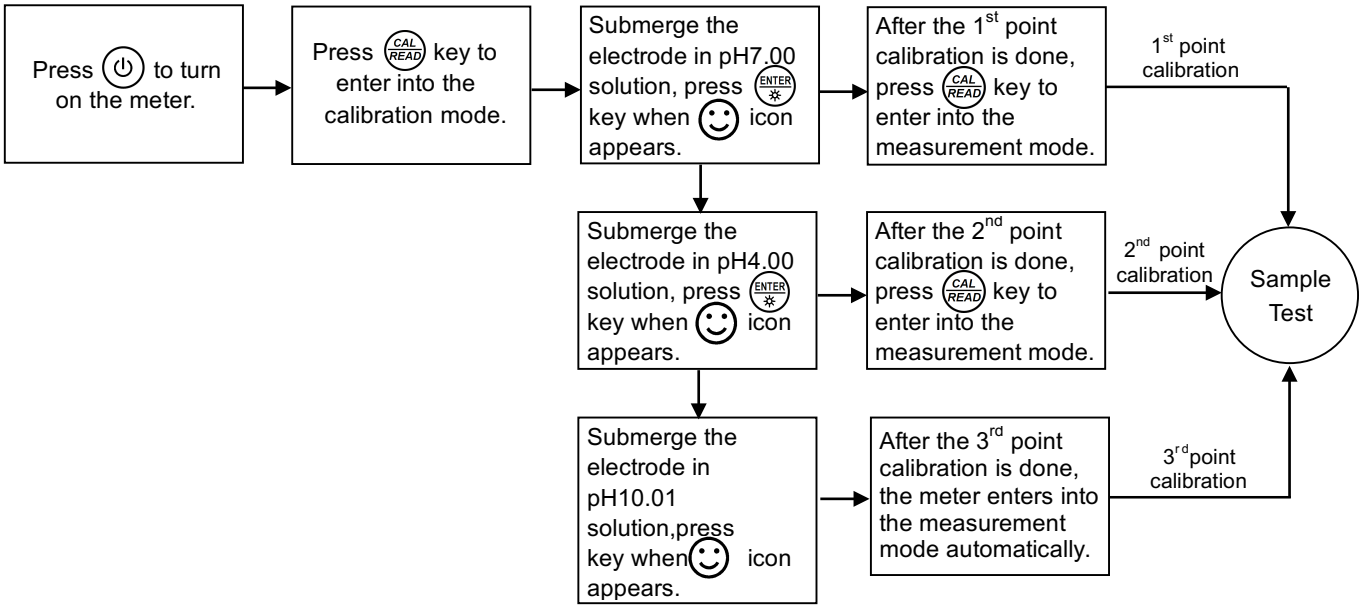
(b) The value set in "Customer-defined" is at a fixed temperature. The meter is suggested to perform calibration and measurement at the same temperature to avoid large error. The meter cannot recognize customer-defined calibration solution.

4.4 Sample test

1) Rinse pH electrode in distilled water, dry it, and dip it in sample solution. Stir the solution gently and let ☺

it stand still 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-12 for calibration and measurement process of pH meter.

Diagram – 12 Calibration and measurement process of pH meter



2) pH measurement of pure water

The meter is able to set up pH measurement mode of pure water with temperature compensation for pH value from parameter setup P1.5 (please see Item 8.3). "**PU-1**" icon displays at the right top of LCD, please refer to Diagram – 13.

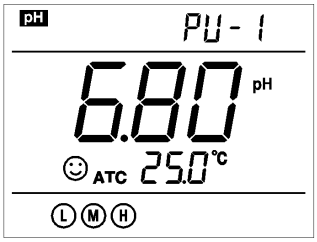


Diagram - 13

3) pH measurement of pure water mixed with ammonia

The meter is able to set up pH measurement mode of pure water mixed with ammonia with temperature compensation for pH value from parameter setup P1.6 (please see Item 8.3). "**PU-2**" icon displays at the right top of LCD, please refer to Diagram – 14.

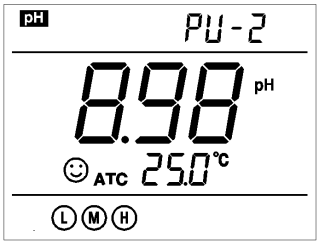


Diagram - 14

Note: In parameter setup, either "PU-1" or "PU-2" measurement mode can be selected, but both can not work at the same time.

4) 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
Er 1	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.
Er2	Press ENTER key when measuring value is not stable during calibration.	Press ENTER key when ☺ icon appears.
Er3	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.
Er4	pH electrode zero electric potential out of range（<-60mV or >60mV）	1.Check whether there are bubbles in glass bulb. 2.Check whether pH buffer solution is correct. 3.Replace with new pH electrode.
Er5	pH electrode slope out of range （<85% or >110%）	
Er6	Enter in pre-set due calibration to remind calibration	Press CAL READ key to perform calibration or cancel due calibration setup from parameter P1.2.

5) pH temperature principle

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

6) Factory default setting

For factory default setting, please refer to parameter P1.6 (Item 8.3). Per parameter P1.6, 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 not be retrievable.

5 mV measurement

5.1 ORP measurement

Press MODE key, and switch the meter to mV measurement mode. Connect ORP electrode (need purchase it separately) and dip it in sample solution, stir the solution briefly and allow it to stay in the solution until ☺ icon appears get the reading which is ORP value.

ORP means Oxidation Reduction Potential. The unit is mV.

5.2 Notes of ORP measurement

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.

2) Clean and activate ORP electrode

After the electrode has been used over a long period of time, the platinum surface will get polluted which causes inaccurate measurement and slow response. Please refer to the following methods to clean and activate ORP electrode:

(a) For inorganic pollutant, submerge the electrode in 0.1mol/L dilute hydrochloric acid for 30 minutes, then wash it in pure water, then submerge it in the soaking solution for 6 hours.

(b) For organic or lipid pollutant, clean the platinum surface with detergent, then wash it in pure water, then submerge it in the soaking solution for 6 hours.

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

6 Parameter Setup

6.1 Main menu

In the measurement mode, press and hold MODE key to enter in mode P1.0, then press or M+ to RM to switch among main menu: P1.0→P2.0→P3.0→P4.0. Please refer to Diagram – 20.

P1.0: pH parameter setup menu,

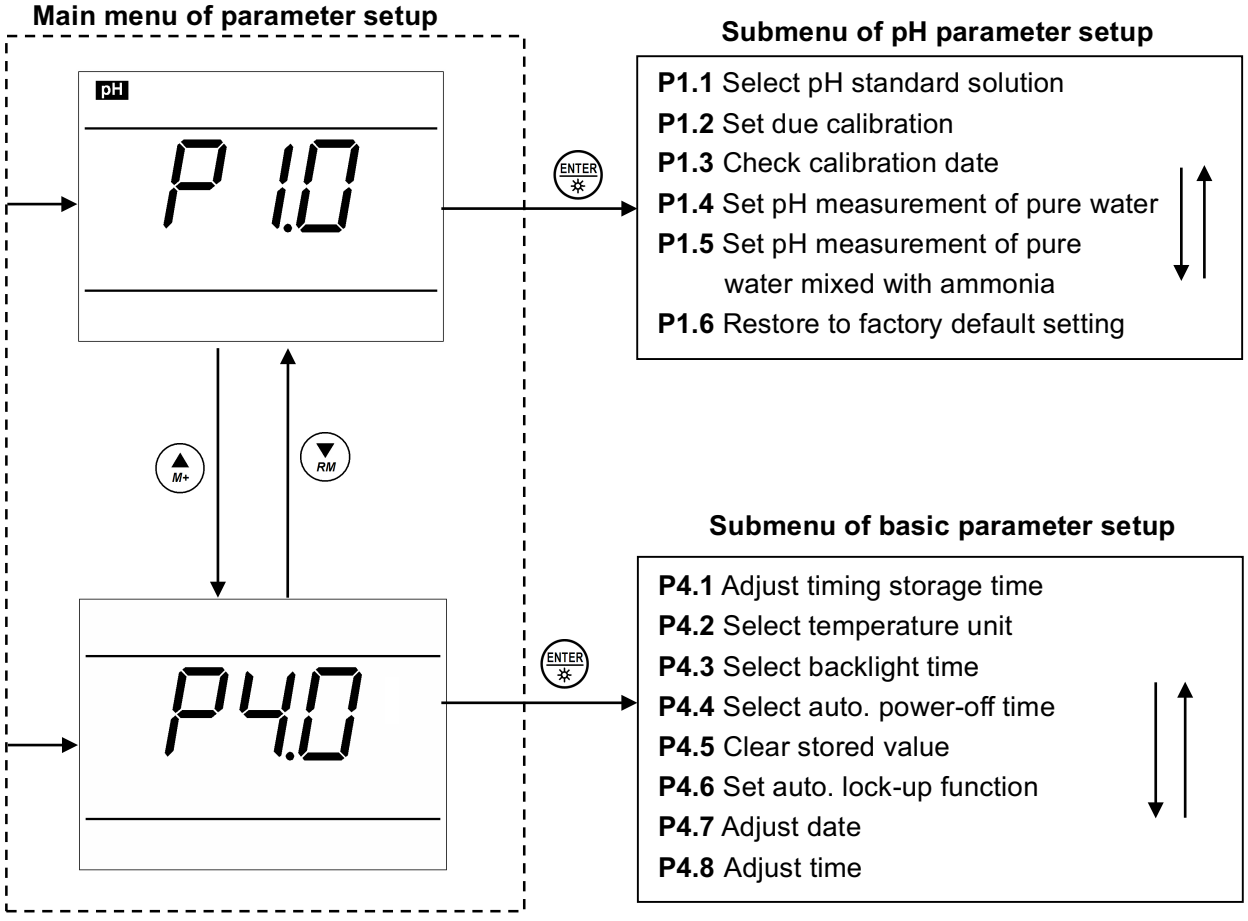
P4.0: Basic parameter setup menu.

6.2 Submenu

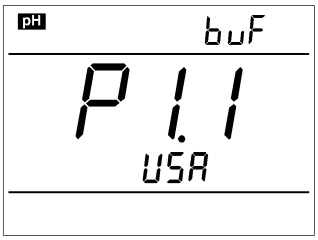
1) In P1.0 mode, press ENTER key to enter in submenu P1.1 of pH parameter setup, then press M+ and RM key to switch among submenu: P1.1→P1.2→…→P1.6, refer to Diagram – 20.

2) In P4.0 mode, press ENTER key to enter in submenu P4.1 of basic parameter setup, then press M+ and RM key to switch among submenu: P4.1→P4.2→…→P4.8, refer to Diagram – 20

Diagram -20

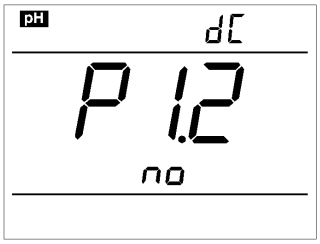


6.3 Submenu of pH parameter setup (press M+ or RM key to switch)



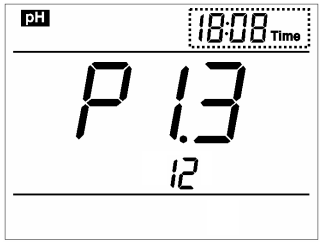
P1.1. – Select pH standard solution (USA-NIST-CUS-CH)

1. In P1.0 mode, press ENTER enter in P1.1 mode, refer to the left diagram.
2. When press ENTER key,**USA** flashes,then press M+ key, **NIST** flashes,etc. When parameter flashes, press ENTER to make confirmation(USA – USA series, NIS–NIST series, CUS–customer-defined, CH–Chinese series)
3. Press M+ key to enter in P1.2 mode, or press CAL/READ key to return to the measurement mode.



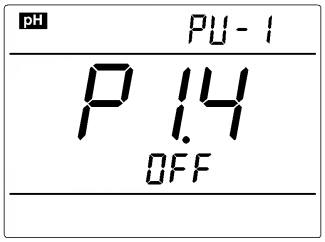
P1.2. – Set due calibration (NO – H00 – D00)

1. When press ENTER key, **No** flashes, then press M+ key, **H** flashes, then press M+ key, **D** flashes.
2. When **H** flashes, press ENTER key, **00** flashes. Press M+ key to adjust hours (0-99 hours), press ENTER key to confirm. When **D** flashes, press ENTER key, **00** flashes. Press M+ key to adjust days (0-99 days), press ENTER key to confirm. When **No** flashes, press ENTER to confirm.
3. After confirm parameter, press M+ key to enter in P1.3 mode, or press CAL/READ key to return to the measurement mode.



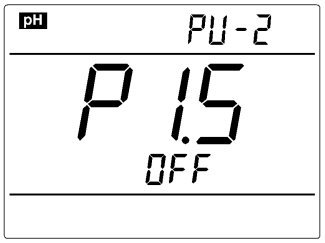
P1.3. – Check the time and date of the last calibration

1. The time and date of calibration displays alternately at right top of LCD (Date display: Month – Day), the number in the LCD middle displays Year (Year 2012).
2. Press M+ key to enter in P1.4 mode, or press CAL/READ key to return to the measurement mode.



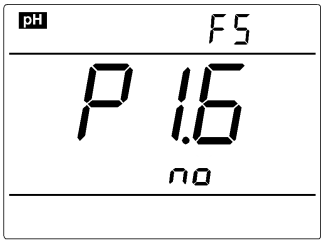
P1.4. – Set pH measurement of pure water (Off – On)

1. Press ENTER key, **Off** flashes, then press M+ key, **On** flashes, when parameter flashes, press ENTER key to confirm. **Off**–turn off temperature compensation, **On** – turn on temperature compensation.
2. After confirm parameter, press M+ key to enter in P1.5 mode, or press CAL/READ key to return to the measurement mode.



P1.5. – Set pH measurement of pure water with ammonia (Off – On)

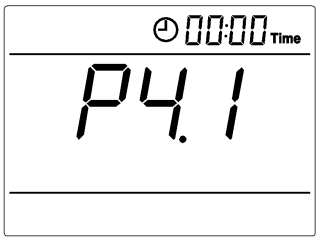
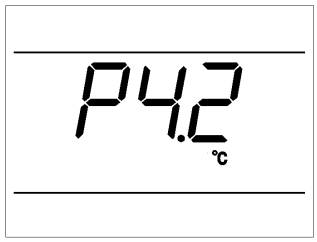
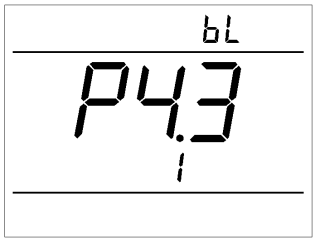
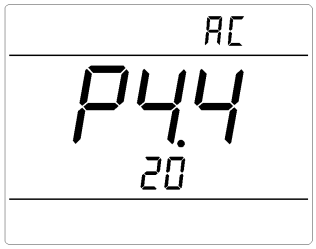
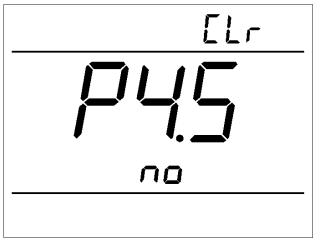
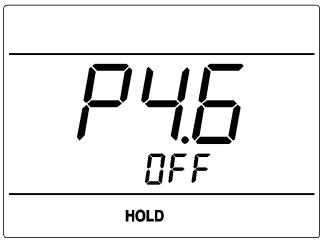
1. Press ENTER key, **Off** flashes, then press M+ key, **On** flashes, when parameter flashes, press ENTER key to confirm. **Off**–turn off temperature compensation, **On**–turn on temperature compensation.
2. After confirm parameter, press M+ key to enter in P1.6 mode, press CAL/READ key to return to the measurement mode.

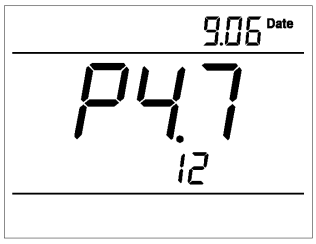
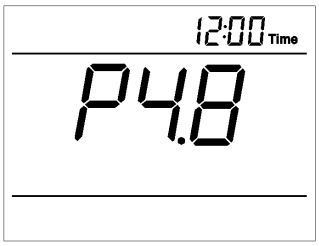


P1.6. – Restore to factory default setting (NO – Yes)

1. Press ENTER key, **No** flashes, then press M+ key, **Yes** flashes. Press ENTER key to confirm, the meter returns to the measurement mode. **No** – Not restore to factory default setting, **Yes** – restore to factory default setting.
2. When do not select **Yes**, press CAL/READ key to return to the measurement mode.

6.4 Submenu of basic parameter setup (press M+ key or RM key to switch)

	**P4.1. – Adjust timing storage time** 1. In mode P4.0, press ENTER key to enter in mode P4.1, refer to the left diagram: " **00:** ": hours (0-99), " **:00** ": minutes (0-59). 2. Press ENTER key, " **:00** " flashes, then press ENTER key, " **00:** " flashes. When the number flashes, press M+ key and RM key to adjust time and press ENTER key to confirm. 3. After confirm the parameter, press M+ key to enter in P4. 2 mode or press CAL/READ key to return to the measurement mode.
	**P4.2. – Select temperature unit (°C—°F).** 1. Press ENTER key, °C flashes, then press M+ key, °F flashes. When the parameter flashes, press ENTER key to confirm. 2. After confirm the parameter, press M+ key to enter in P4.3 mode or press CAL/READ key to return to the measurement mode.
	**P4.3. – Select backlight timing (1-2-3-On)** 1. When press ENTER key,"**1**" flashes, then press M+ key to select blinking 2→3→On. When the parameter flashes, press ENTER key to confirm. Select **On** to turn on the backlight, the time unit is minute. 2. After confirm the parameter, press M+ key to enter in P4.4 mode or press CAL/READ key to return to the measurement mode.
	**P4.4. – Select automatic power-off time (10-20-30-On)** 1. Press ENTER key, " **20** " flashes, then press M+ key to select blinking 30→On→10. When the parameter flashes, pres ENTER key to confirm. Select **On** to turn on the function, the unit is day. 2. After confirm the parameter, press M+ key to enter in P4.5 mode or press CAL/READ key to return to the measurement mode.
	**P4.5. – Clear all the stored value** 1. Press ENTER key, " **No** " flashes, then press M+ key " **Yes** " flashes. When the parameter flashes, press ENTER key to confirm. **No**: not delete, **Yes**: delete. 2. After confirm the parameter, press M+ to enter in P4.6 mode or press CAL/READ key to return to the measurement mode.
	**P4.6. – Set automatic lock-up function** 1. Press ENTER key, " **Off** " flashes, then press M+ key, " **On** " flashes. When the parameter flashes, press ENTER key to confirm. **Off**: not set, **On**: set (the reading is automatically locked when stabilizes＞10 seconds.) 2. After confirm the parameter, press M+ key to enter in P4.7 mode or press CAL/READ key to return to the measurement mode.

	**P4.7. – Adjust date** 1. Press (ENTER) key, "**Month**" flashes, then press (ENTER) key, "**Date**" flashes, then press (ENTER) key, "**Year**" flashes. When the number flashes, press (▲ M+) key or (▼ RM) key to adjust date, then press (ENTER) key to confirm. Date display: Month - Date 2. After confirm the parameter, press (▲ M+) key to enter in P4.8 mode or press (CAL READ) key to return to the measurement mode.
	**P4.8. – Adjust time** 1. Press (ENTER) key, "**Hour**" flashes, then press (ENTER) key, "**Minute**" flashes. When the number flashes, press (▲ M+) key and (▼ RM) key to adjust time, then press (ENTER) to confirm. 2. After confirm the parameter, press (CAL READ) key to to return to the measurement mode.

7 USB Communication

7.1 System Requirement

The meter uses "PC-Link" software with USB communication function. This software requires the computer to meet such requirement: 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: refer to.0 Diagram-21.

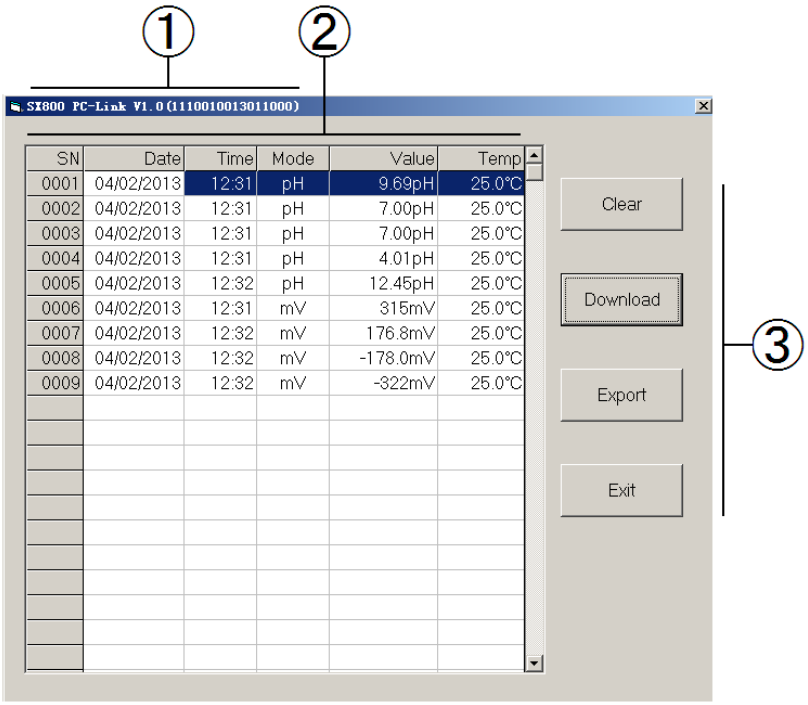


Diagram -21

1 — Meter serial number

2 — Stored value display area

3 — Keys

Clear — press this key to clear the data

Download — press this key to download the data from the meter to the computer, pH, mV, conductivity and dissolved oxygen are classified in the file.

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 Load software

Please follow the following steps to load PC-Link to the computer:

Open “PC-Link” file→double click “Setup” program → click “OK”→ click icons (refer to Diagram – 22) → click “Continue”→ click “Confirm”.

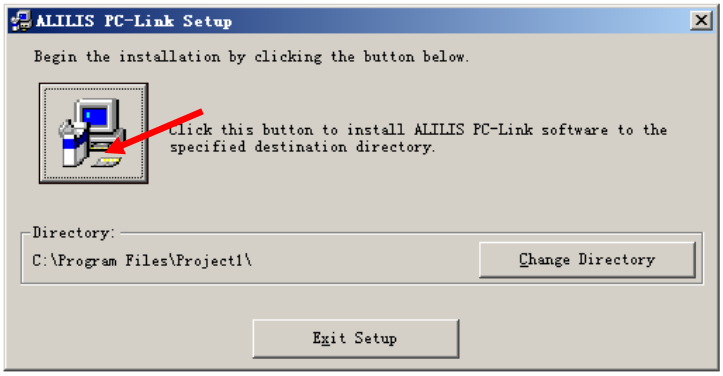


Diagram -22

7.4 Automatic connection port

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

Note: for re-connection after turn-off, the computer can not recognize the software automatically and please re-open the software interface.

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

7.5 Run software

Upload the stored value

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

7.6 Storage during operation

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.

7.7 Data processing

Press “**Export** ” key to export the stored value to Microsoft Excel file and then analyze or print the stored data.

8 What’s in the box

	Contents	Quantity
1	SX811-SS Portable pH Meter	1
2	LabSen753 Spear pH/ATC Electrode,	1
3	pH standard buffer (4.00pH/7.00pH/10.01pH /50mL each)	One of each
4	Polymer Electrode Storage solution (50 ml)	1
5	PC-Link Software disk	1
6	USB Cable	1
7	USB Adaptor (DC5V)	1
8	Carrying Case	1
9	Manual	1

9 Warranty

We warrant this instrument to be free from defects in material and workmanship and agrees to repair or replace free of charge, at option of APERA INSTRUMENTS, LLC, any malfunctioned or damaged product attributable to responsibility of APERA INSTRUMENTS, LLC for a period of **two years** from the delivery (a **six-month** limited warranty applies to probes). This warranty does not apply to defects resulting from actions such as misuse (violation of the instructions in this manual or operations in the manner not specified in this manual), improper maintenance, and unauthorized repairs. Warranty period is the time limit to provide free service for the products purchased by customers, not the service life of the tester or probe.

10 Appendix

10.1 Appendix I: Parameter setup and factory default setup

Modes	Prompts	Parameter setting items	Abbreviation	Description	Restore to factory default

					setup
P1.0 pH	P1.1	Select pH buffer solution	buF	USA－NIST－CUS－CH	—
	P1.2	Set due calibration	dC	No－H00－D00	No
	P1.3	Check the date of the last calibration	/	—	—
	P1.4	Set pH measurement mode of pure water	PU-1	Off－On	Off
	P1.5	Set pH measurement mode of pure water mixed with ammonia	PU-2	Off－On	Off
	P1.6	Restore factory default setting	FS	No－Yes	No
P4.0 Basic parameters	P4.1	Adjust storage timing	/	—	0:00
	P4.2	Select temperature unit	/	°C-°F	—
	P4.3	Select backlight time	bL	1－2－3－On	1
	P4.4	Select auto power-off time	AC	10－20－30－On	20
	P4.5	Clear stored value	CLr	No－Yes	No
	P4.6	Set up automatic lock-up function	/	Off—On	Off
	P4.7	Adjust date	/	—	—
	P4.8	Adjust time	/	—	—

10.2 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	dC	Due Calibration	Remind calibration
	P1.3	/		
	P1.4	PU-1	Pure water	Pure water
	P1.5	PU-2	Pure water mixed with ammonia	Pure water mixed with ammonia
	P1.6	FS	Factory default setting	Factory default setting
P4.0 Basic parameters	P4.1	/		
	P4.2	/		
	P4.3	bL	Backlight	Backlight
	P4.4	AC	Auto power-off	Auto power-off
	P4.5	CLr	Clear readings	Clear readings
	P4.6	/		
	P4.7	/		

	P4.8	/		
Others		CH	China	China
		USA	United States of America	United States of America
		n IS	Nist	Nist
		OFF	Off	Off
		On	On	On
		no	No	No
		YES	Yes	Yes

10.3 Appendix III: Self-diagnosis information

Icons	Self-diagnosis information	pH	Conductivity	DO
Er 1	Wrong pH buffer solution or the buffer solution out of range	√	√	√
Er2	Press ENTER key when measuring value is not stable during calibration.	√	√	√
Er3	During calibration, the measuring value is not stable for ≥3min.	√	√	
Er4	pH electrode zero electric potential out of range （<-60mV or >60mV）	√		
Er5	pH electrode slope out of range （<85% or >110%）	√		
Er6	Enter in pre-set calibration date to remind calibration	√	√	

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