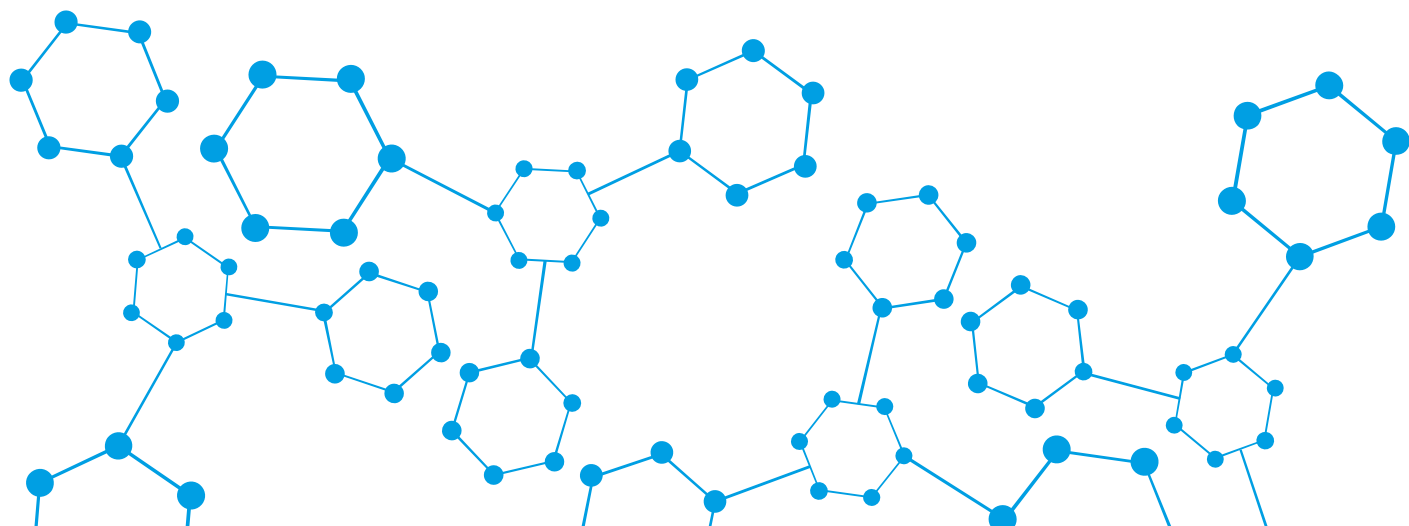




SLS Lab Pro Hydron pH Meter Manual



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Chapter 1

Introduction



WARNING: Unauthorized repair of your unit will invalidate your warranty.

Thank you for purchasing the pH benchtop meter. These microprocessor-based meters are economical and simple to use. The design incorporates a large LCD for clear viewing and offers a small footprint to conserve space. The pH meter measures pH, mV (ORP) and temperature in °C or °F. Each meter includes a convenient slide-out card for quick reference.

1.1 Intended Use

1.1.1 Intended Use:

This device is a benchtop laboratory meter intended for use in a typical, indoor, controlled, laboratory environment. This device should only be used in accordance with these instructions.

1.1.2 Non-Intended Use:

This device is not a Medical Device. It is not intended to be used to diagnose, treat, cure, or prevent disease.

1.1.3 Safety:



CAUTION: Before using or maintaining this product, please be sure to read the manual carefully. Failure to follow these instructions may cause the product to malfunction.



CAUTION: Use this product only in the way described in the product literature and in this manual. Before using it, verify that this product is suitable for its intended use. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



CAUTION: Do not modify system components. Use OEM exact replacement equipment or parts. Before use, confirm that the product has not been altered in any way.

1.1.4 Power Connection:

- Unpack the power supply provided with your meter
- Select the appropriate plug attachment for connecting to an AC power outlet
- Attach to power supply and ensure it is properly seated in the power supply
- Connect the power supply to a nearby electrical outlet
- Connect the power supply output connector to the power supply input connector on the rear panel of the meter
- You are now ready to turn on the meter

1.2 Cleaning Instructions (Meter Only)








Wipe the exterior surfaces (except the display panel) using a lint free cloth dampened in clear water.

Wipe the display panel with a clean microfiber cloth dampened with clear water taking caution to wipe lightly to avoid scratching the meter display.

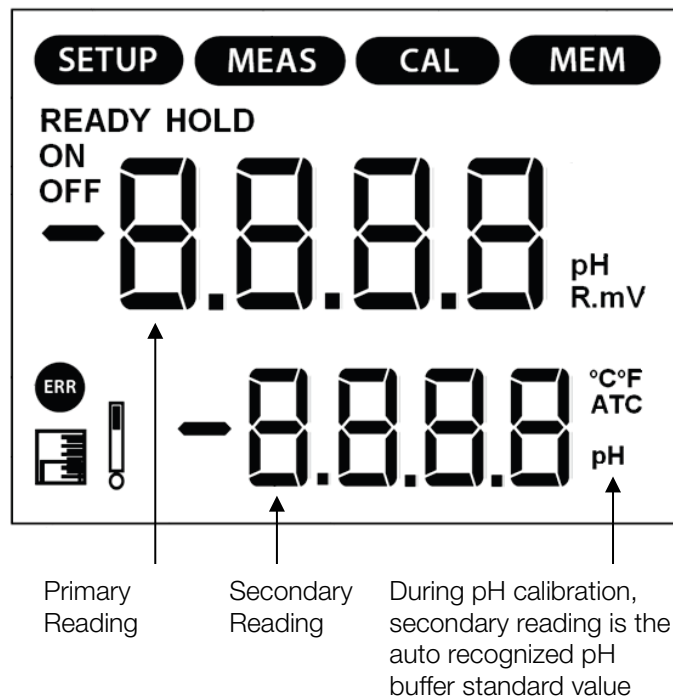
Chapter 2








Getting Started

2.1 Keypad Functions

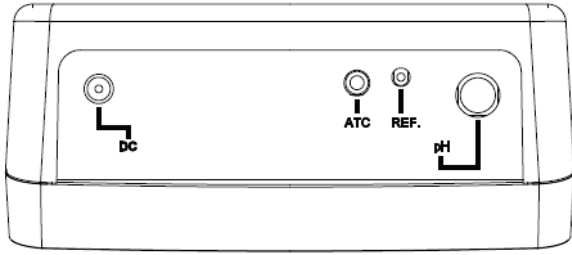
Icon	Function
	Powers the meter on and off. Upon power on, the meter automatically begins in the mode that was last used. Calibration and memory values are retained even if meter is unplugged.
	Toggle between available measurement modes: pH/temperature or mV/temperature. Also used to switch from pH to temperature during pH calibration mode. Press and hold for 5 seconds to enter SETUP mode.
	Toggles between measurement and calibration modes. In SETUP mode, returns user to the measurement mode.
	MI (Memory Insert) stores values into memory. ▲ Increase value. Scroll up in SETUP mode.
	MR (Memory Recall) recalls values from memory ▼ Decrease value. Scroll down in SETUP mode.
	Freezes measured reading. Press again to resume live reading.
	Confirms calibration values in CAL mode. Confirms selections in SETUP mode. View recalled values in memory mode.

2.2 Display Functions



Icon	Function
	Setup Mode
	Measurement Mode
	Calibration Mode
	Memory Mode or when data is stored into memory
READY	Measured value is stable
HOLD	Measured value is held
ON OFF	In SETUP mode, select Auto Hold ON, Ready ON or Ready OFF
	Error or invalid key pressed
	Prompts user to select buffer
	Electrode error when appears with ERR
pH R.mV °C°F	Current measurement unit / mode of operation
ATC	Automatic Temperature Compensation is active

2.3 Meter Connections



Input	Function
pH	BNC connection for pH or ORP (redox) electrodes
REF	Pin connection for half-cell reference electrodes; requires separate half-cell BNC electrode Note: REF is not commonly used and is not required
ATC	For Automatic Temperature Compensation electrode
DC	Power supply

Chapter 3

Setup Functions

Use the SETUP mode to customize your instrument operation. During measurement, press and hold the **MODE** key for 5 seconds to enter the SETUP mode.

Press the ▲/MI or ▼/MR keys to change programs or change options.

Press the **ENTER** key to select the program or confirm selection.

Press the **CAL/MEAS** key to go back a level or to return to measurement mode.

3.1 P1.0 CAL (Calibration)

Press the **ENTER** key to view each stored calibration point.

3.2 P2.0 ELE (Electrode Information)

Press the **ENTER** key to view mV offset (OFS) in mV and pH modes only.

Press the **ENTER** key to view % slope (SLP) in pH mode only.

Last Display Mode	Electrode Property	
	Offset	Slope
pH	In mV	%
mV	In mV	---

Note: When multiple slopes exist, the slope that is available to view will depend on the measured value before entering SETUP mode.

For example, if pH calibration values pH 4.01, 7.00 and 10.01 were completed, there will be two slope values; one that corresponds to pH values below 7.00 and another that corresponds to pH values above 7.00. If the measured pH value was 5.23 when setup mode was entered, the pH slope that corresponds to values lower than 7.00 will be available to view. If no calibration is stored, the offset will be 0.0 mV and the slope is 100%.

3.3 P3.0 ConF (Configuration)

Press the **ENTER** key.

3.4 P3.1 rdY (Ready / Stability Indicator)

Press the **ENTER** key.

Press the ▲/MI or ▼/MR keys to choose READY “On”, READY “OFF” or Auto HOLD.

Press the **ENTER** key to confirm.

3.5 P3.2 °C°F (Celsius Or Fahrenheit)

Press the **ENTER** key.

Press the ▲/MI or ▼/MR keys to select °C or °F.

Press the **ENTER** key to confirm.

3.6 P3.3 buFF (pH Buffers & Calibration Points)

Press the **ENTER** key.

Press the ▲/MI or ▼/MR keys to select “USA” or “NIST” buffer group (pH mode only).

Press the ▲/MI or ▼/MR keys to select number of calibration points (pH and ion modes).

Press the **ENTER** key to confirm.

3.7 P4.0 rSt (Reset)

Press the **ENTER** key.

Press the ▲/MI or ▼/MR keys to select “Yes” or “No”.

If “Yes”, press the ▲/MI or ▼/MR keys to select “Cal” (calibration reset only) or “Fct” (complete reset to factory default settings).

Press the **ENTER** key to confirm.

3.8 P5.0 CLr (Clear Memory)

Press the **ENTER** key.

Press the ▲/MI or ▼/MR keys to select “Yes” (erase memory) or “No”.

Press the **ENTER** key to confirm.

Chapter 4

Calibration

4.1 pH Calibration

For best results, periodic calibration with known accurate standards is recommended. Calibrate with standards that bracket your intended measuring range while including a neutral standard (pH 7.00 or 6.86). For example, if you expect to measure samples from pH 6.2 to pH 9.5, calibration with 4.01, 7.00, and 10.01 will work well. Calibrate with up to 5 buffers. The non-volatile memory retains all calibration values upon meter shut down.

The following calibration standards are automatically recognized.

USA buffer group: 1.68, 4.01, 7.00, 10.01, 12.45

NIST buffer group: 1.68, 4.01, 6.86, 9.18, 12.45

See **Section 5.6** to change the buffer group.

1. Press the **MODE** key as needed to select pH.
2. Dip the pH electrode into pH buffer and press the **CAL/MEAS** key. The secondary display will lock on the appropriate buffer value. Provide stirring for best results. When the **READY** indicator appears, press the **ENTER** key to accept. The primary reading will flash briefly before the secondary display begins scrolling the remaining available buffers.
3. Rinse the pH electrode then dip into the next pH buffer. The secondary display will lock on the appropriate buffer value. When the **READY** indicator appears, press the **ENTER** key to accept. The primary reading will flash briefly then display the percent efficiency (slope) before the secondary display begins scrolling the remaining available buffers.
4. To calibrate another buffer repeat step 3 or press the **CAL/MEAS** key to return to the measurement mode.

Note: The meter will automatically return to measurement mode upon successful completion of the number of specified calibration points. To specify a different number of pH calibration points, see **Section 5.6**.

Additional Notes:

- A single point (offset) calibration is only allowed with pH 7.00 or pH 6.86 buffers.
- When the first calibration value is accepted during a new calibration, all prior calibration values are erased.
- Press the **CAL/MEAS** key at any time to abort calibration and return to measurement mode.

4.2 Temperature Calibration

The thermistor sensor used for automatic temperature compensation and measurement is both accurate and stable, so frequent calibration is not required. Temperature calibration is recommended upon ATC electrode replacement, whenever the temperature reading is suspect, or if matching against a certified thermometer is desired.

1. Connect the temperature probe to the meter and place into a solution with a known accurate temperature such as a constant temperature bath. **Note:** To adjust the manual temperature compensation (MTC) value, do not connect the temperature probe.
2. Press the **MODE** key as needed to select pH or mV/R.mV.
3. Press the **CAL/MEAS** key followed by the **MODE** key. The primary display shows the measured temperature while the secondary display shows the factory default temperature.
4. Adjust the temperature using the **▲/MI** or **▼/MR** keys. Press the **ENTER** key to accept or the **CAL/MEAS** key to cancel. The meter allows an adjustable maximum value of $\pm 5^{\circ}\text{C}$ (or $\pm 9^{\circ}\text{F}$) from the factory default temperature.

4.3 Millivolt (mV) Offset Adjustment

Oxidization Reduction Potential (ORP or Redox) is not a precise measurement but is useful as a relative indicator. As such, mV offset adjustment is not meant to enhance accuracy, but rather to make readings comparable to a reference. Commercial ORP solutions are often used as a check standard in which a meter/electrode system are verified to be close to a given value, instead of being used as a calibration standard in which adjustments are made to match the ORP value.

1. Connect an ORP electrode and press the **MODE** key as needed to select mV or R.mV.
2. Dip the ORP electrode into a solution with a known mV value (i.e. Zobel, Light's, quinhydrone, or iodide triiodide) and stir.
3. Press the **CAL/MEAS** key when the reading is stable. The primary display shows the relative millivolt value (R.mV) while the secondary display shows the factory default mV value.
4. Adjust the R.mV value using the **▲/MI** or **▼/MR** keys. Press the **ENTER** key to accept or the **CAL/MEAS** key to cancel. The meter allows an adjustable maximum value of ± 150 mV from the factory default mV value.

Note: When an offset has been stored successfully, R.mV replaces mV.

Chapter 5

Storing and Recalling Data

The pH meter can retain up to 100 points into memory for later retrieval.

1. In the measurement mode, press the ▲/MI key to insert the measured value into memory. The stored memory location value (StO) is briefly displayed.
2. To recall data from memory, press the ▼/MR key. The location of the most recent stored data is displayed first. Press the ▲/MI or ▼/MR keys to select the location of the desired data, then press the **ENTER** key to accept.
3. Press the **ENTER** key to return to the stored data location. Press the **CAL/MEAS** key to return to measurement mode. To erase stored data, see **Section 5.8**.

Chapter 6

Troubleshooting Guide

Problem	Cause	Solution
Ur (Under range) Or (Over range)	Measured value is out of range.	
	Electrodes not connected.	Make sure electrode is connected.
	Electrode clogged, dirty or broken.	Clean or replace electrode.
	Meter not calibrated.	Recalibrate the meter.
	Wrong temp value.	Treat samples to bring within meter measuring range.
		Reset meter.

Problem	Cause	Solution
No display	Main power not switched on.	Switch on the power supply.
	AC adapter not inserted properly.	Re-insert AC adapter and press POWER key.
Unstable reading	Insufficient solution in electrode.	Fill electrode with fill solution.
	Broken electrode.	Replace electrode.
	External noise or induction (for example, electrical noise from nearby motor).	Remove or switch off interfering device.
	Dirty electrode.	Clean and rehydrate the electrode.
Slow response	Dirty electrode.	Clean and rehydrate the electrode.
Meter not responding to key press	HOLD mode in operation.	Press the HOLD key to deactivate. Use SETUP mode to disable Auto Hold.
	Bad keypad.	Contact Support.
From any screen "ERR" icon shown	Invalid key: key does not work in the current operation mode.	Press alternate key. Select valid buttons depending on mode.
pH CAL mode "ERR" icon shown	Calibration attempted using only 1-point that was not pH 7.00 or pH 6.86.	Recalibrate using 2 or more pH points or use pH 7.00 or use pH 6.86.
"ERR" icon shown with Electrode icon	Calibration error.	Buffer value does not match value displayed or electrode is disconnected or failing. Use fresh buffer solutions. Check electrode connection. Clean and recondition electrode. Replace electrode.

Chapter 7

Specifications

7.1 Meter Specifications

pH Range	-2.00 to 16.00 pH
pH Resolution	0.01 pH
pH Accuracy	±0.01 pH
pH Calibration Points	Up to 5 points with Auto-Buffer Recognition
pH Buffer Options	USA: pH 1.68, 4.01, 7.00, 10.01, 12.45 NIST: pH 1.68, 4.01, 6.86, 9.18, 12.45
Slope Display	Yes (with offset)
mV Range	±2000 mV
mV Resolution	0.1 mV (±199.9 mV), 1 mV beyond ±200 mV
mV Accuracy	±0.2 mV (±199.9 mV), ±2 mV beyond ±200 mV
mV Offset Adjustment	Up to ±150 mV
Temperature Range	0.0 to 100.0 °C 32.0 to 212.0 °F
Temperature Resolution	0.1 °C / 0.1 °F
Temperature Accuracy	±0.3 °C ±0.5 °F (0 to 70 °C)
Temperature Compensation	Automatic or Manual (0 to 100 °C, 32 to 212 °F)
Temperature Calibration	Offset in 0.1 ° increments; Offset range: ±5.0 °C, ±9.0 °F
Memory	100 data sets
Inputs	BNC, ATC, Reference (Half-cell)
Certifications	CE, UKCA, cTUVus, FCC Class A
Power	AC/DC 9V, 6W Adapter (100/240 VAC, 50-60Hz)
Weight	0.65 kg, 1.4 lbs.

7.1.1 Environmental Conditions

Environmental Conditions	Indoors
Altitude	Up to 2,000 Meters
Temperature	5°C to 45°C
Relative Humidity	0 to 80%RH
Mains Fluctuation	±10% of range (100-240VAC)
Installation Category	II
Pollution Degree	2
Protection Class	III
Storage Temperature	5°C to 45°C

7.2 Warranty

This meter is supplied with a warranty against significant deviations in material and workmanship for a period of three (3) years from date of purchase.

If repair or adjustment is necessary and has not been the result of abuse or misuse within the designated period, please return – freight pre-paid – and correction will be made without charge.

Out of warranty products will be repaired on a charged basis.

The warranty on your instrument shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer
- Unauthorized modification or misuse
- Operation outside of the environment specifications of the products

Chapter 8

Regulatory Compliance

European Union



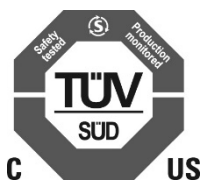
The European voltage models of this product meet all the applicable requirements of the European Directives and therefore display the CE Marking. These Directives include those captured in the EU Declaration of Conformity. The most current EU Declaration of Conformity may be obtained from the manufacturer.

UK Conformity Assessed



The European voltage models of this product meet all the applicable requirements of the UK Conformity Assessed and therefore display the UKCA Marking.

Product Safety



This product family has been tested to applicable product standards by TÜV SUD a Nationally Recognized Test Laboratory (NRTL).

Electromagnetic Compatibility

FCC Statement (USA)



Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian ISED IC Notice

This ISM digital apparatus complies with Canadian ICES-001.

Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Environmental Compliance

REACH - Europe

We are committed to meeting all compliance obligations to evaluate, communicate, and register any Substances of Very High Concern (SVHC), and finding alternates where appropriate.

RoHS - Europe

We are determined to reduce the impact we have on the environment, and so can declare that this product fully complies with the European Parliament's RoHS2 (Restriction of Hazardous Substances) Directive 2011/65/EU, with respect to all the following substances:

- Lead (0,1 %)
- Mercury (0,1 %)
- Cadmium (0,01 %)
- Hexavalent chromium (0,1 %)
- Polybrominated biphenyls (PBB) (0,1 %)
- Polybrominated diphenyl ethers (PBDE) (0,1 %)

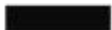
Our compliance is witnessed by written declaration from our suppliers and/or component testing. This confirms that any potential trace contamination levels of the substances listed above are below the maximum level set by the latest

regulations or are exempt due to their application.

WEEE Compliance



WEEE Compliance. This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EU. It is marked with the following symbol.



WEEE Konformität. Dieses Produkt muss die EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2012/19/EU erfüllen. Das Produkt ist durch folgendes Symbol gekennzeichnet.

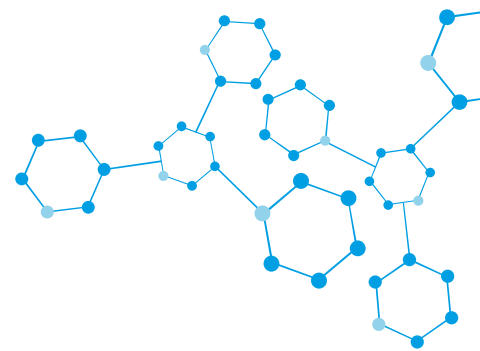


Conformità WEEE. Questo prodotto deve rispondere alla direttiva dell' Unione Europea 2012/19/EU in merito ai Rifiuti degli Apparecchi Elettrici ed Elettronici (WEEE). Rifiuti degli Apparecchi Elettrici ed Elettronici (WEEE), marcato col seguente simbolo.

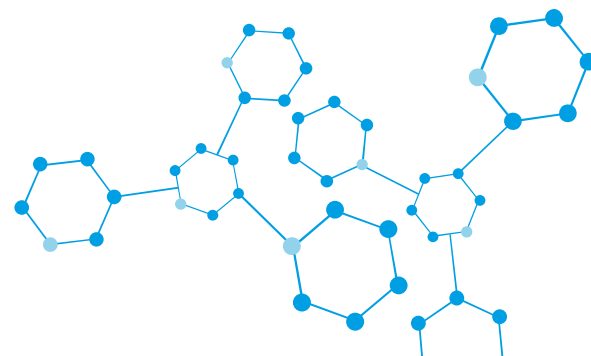
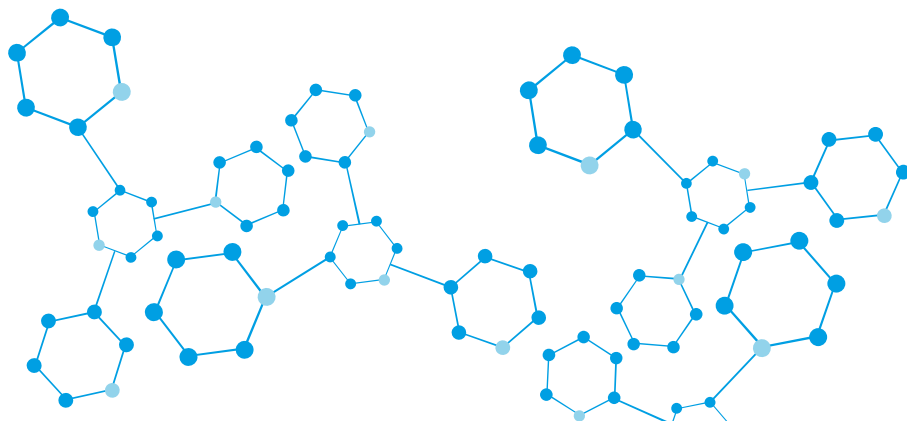


Conformité WEEE. Ce produit doit être conforme à la directive euro-péenne (2012/19/EU) des Déchets d'Equipements Electriques et Electroniques (DEEE). Il est marqué par le symbole suivant.

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