

Instruction Manual

PH / ION 510

Bench pH / ION / mV Meter



ENGLISH


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1 INTRODUCTION

This manual contains the operating features of this meter. At some points this manual will refer to our website www.eutechinst.com, for further explanation and background information, it will be indicated with this symbol: 

On this website you can also find additional information regarding applications, measuring theories and hints & tips. At the final page of this manual you can find information about the specifications of this meter, warranty issues and how to return your product to us.

2 DISPLAY AND KEYPAD FUNCTIONS

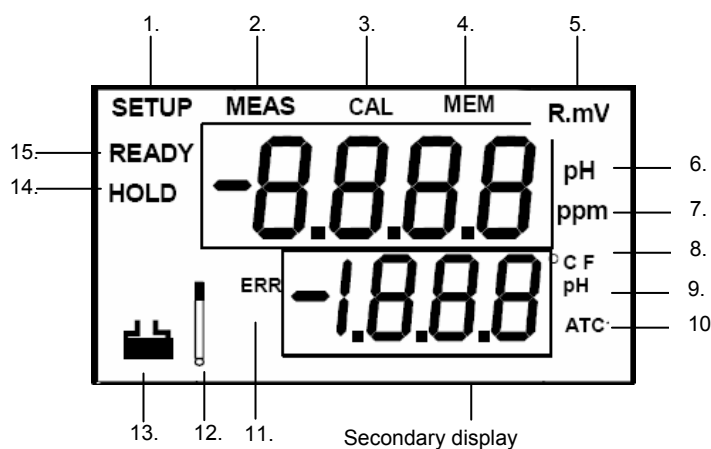
2.1 Display

The LCD has a primary and secondary display.

- The primary display shows the measured values.
- The secondary display shows the measured temperature.

The display also shows error messages, keypad functions and program functions. It has the following indicators:

1. **SETUP** - Setup mode
2. **MEAS** – Measurement mode
3. **CAL** - Calibration mode
4. **MEM** - Memory recall mode
5. **R.mV** – Relative mV
6. **pH – pH mode**
7. **ppm** - Parts per million
8. **°C°F** – Temperature
9. **pH Buffer indicator**
10. **ATC** – Automatic Temperature Compensation
11. **ERR** - Error
12. Electrode
13. Calibration solution
14. **HOLD** – Hold
15. **READY** – Read



2.2 Keypad

Some button has several functions depending on its mode of operation.

KEY	Function
ON / OFF	ON/OFF - Powers on and shuts off the meter. The meter will start in the measurement mode it was in when last switched off.
CAL / MEAS	Toggles between the measurement and calibration modes of the meter. In SETUP mode, pressing CAL/MEAS key returns to the measurement mode.
HOLD	HOLD - Activates/Deactivates freezing of the reading while in measurement mode.
MI/▲ MR/▼	In Measurement mode: Press MI/▲ to store values with its corresponding temperature values in the memory. Press MR/▼ to retrieve data from memory. In Calibration mode: Press to scroll calibration values. In SETUP mode: Press to scroll setup subgroup.
MODE	MODE Selects the measurement or calibration mode
ENTER	ENTER: Press to confirm values in Calibration mode and selections in SETUP mode.

3 PREPARATION

3.1 Connecting the Electrode and Temperature Probe

The meter uses any standard pH, ORP, or ISE electrode with BNC connector. For Automatic Temperature Compensation (ATC), the meter requires a temperature probe with a phono jack connector. Use either:

- Electrode with BNC connector and separate temperature probe with phono jack connector (PH5-TEM01P/ 35613-05).
- A "3-in-1" combination pH electrode with temperature probe

3.1.1 Connecting pH, ORP or ISE electrode

1. Slide the probe's BNC connector over the meter's BNC connector socket.
2. Rotate and push the connector clockwise until it locks.
3. To remove electrode, push and rotate the connector counter-clockwise and pull it away from the meter.

3.1.2 Connecting temperature probe

1. Insert the phono jack connector of the electrode to the connector on the meter.
2. To remove pull away gently for a complete removal.

CAUTION: Do not pull on the electrode cord to avoid internal wire breakages.

3.2 Connecting the AC/DC Adapter

The AC/DC adapter must be unplugged. Ensure that main voltage matches the adapter. Slide the AC/DC adapter jack into the socket marked DC of the meter. AC/DC adapter specifications: Input Voltage: 110 or 220 V • Output Voltage: 9 VDC • Current: 500 mA.

NOTE: Ensure the input voltage matches your adapter before connection.

3.3 Connecting the Electrode Holder

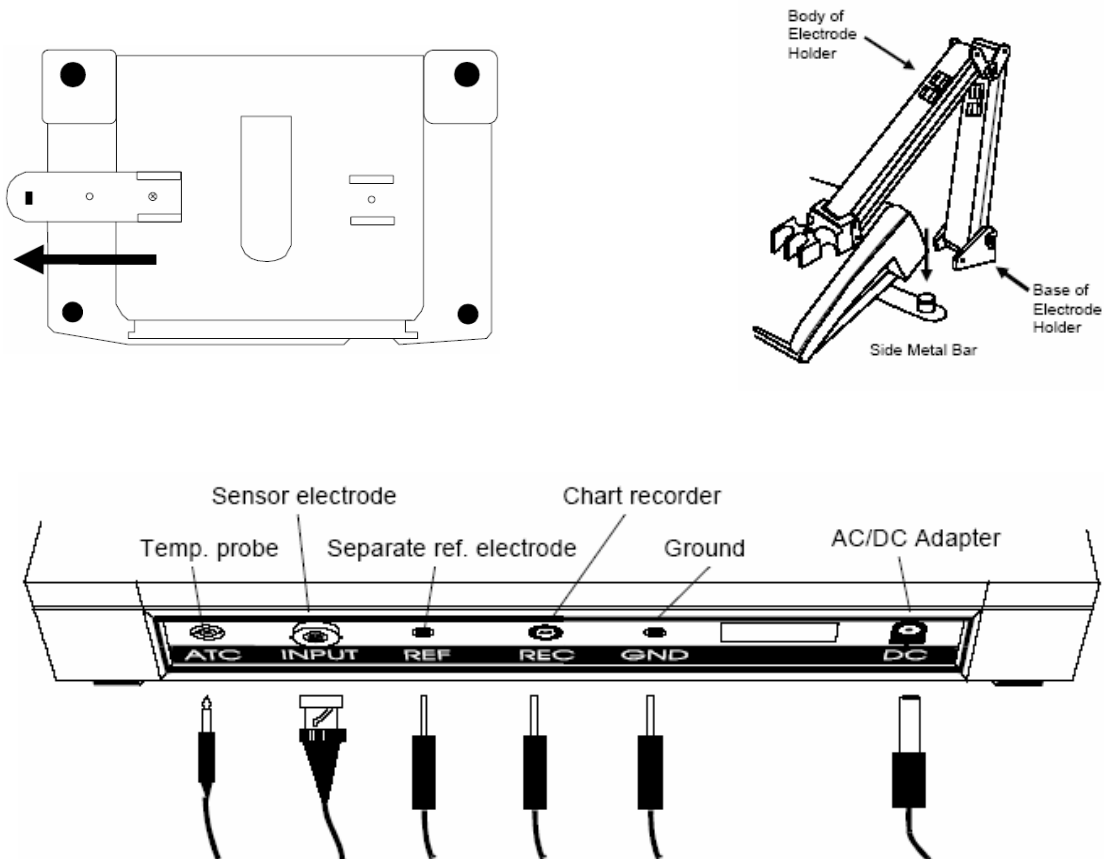
This meter's base plate has a side metal bar for a swivel electrode holder. The holder can be mounted on either right or left side of the meter.

To position the electrode arm:

Use a screwdriver to remove the screw holding the side bar. Line up the side bar with the second screw slot. Use the earlier removed screw to secure the side bar.

To install the electrode arm to the meter:

Align the slot of the arm with the metal rod at the metal side bar. Push it down until it fully sits into position.



4 CALIBRATION

4.1 Important Information on Meter Calibration

When re-calibrating, old pH, Rel mV, mV and ION calibration points are replaced on a point by point basis. **Example:** if previous calibration was at pH 4.01, 7.00, and 10.01, and you re-calibrated pH 7.00 only, the old calibration data at pH 4.01 and pH 10.01 will be retained.

To completely re-calibrate, or after replacing the probe, it is best to reset the meter to factory defaults and re-calibrate at all points.

4.2 Preparing the Meter for Calibration

Before starting calibration, make sure you are in the correct measurement mode. For best results, select a standard value close to the sample value you are measuring.

4.3 Temperature Calibration

The temperature sensor is factory calibrated. Calibrate your sensor only if you suspect temperature errors may have occurred over a long period of time or if you have a replacement probe.

1. Connect the temperature sensor.
2. Switch the meter on. ATC will appear at the bottom right-hand corner of the LCD.
3. Press MODE to select pH mode.
4. Press CAL/MEAS. The CAL indicator appears.
5. Press MODE to enter temperature calibration mode.
6. Dip the electrode into a solution of known temperature (i.e. a temperature bath). Allow time for the built-in temperature sensor to stabilize.
7. Scroll with MI/▲ or MR/▼ to set the correct temperature value (i.e. the temperature of the temperature bath).
8. Press ENTER to confirm. The meter will be calibrated and return to the measurement mode.

Note: To exit without confirming the temperature calibration value, press CAL/MEAS.

Note: The maximum temperature offset is $\pm 5^{\circ}\text{C}$ from original reading.

4.4 Selecting buffer sets and number of pH calibration points

The meter can be calibrated up to 5 points with USA or NIST buffers only. The meter automatically recognizes and calibrates to the standard buffer values.

The pH buffers have the following values: USA: 1.68, 4.01, 7.00, 10.01, & 12.45 / NIST: 1.68, 4.01, 6.86, 9.18, & 12.45.

4.4.1 Selecting number of pH calibration points and pH Buffer sets (P3.0)

pH Calibration can be preformed at: 2, 3, 4, or 5 points. It lets the meter scroll through the calibration points more quickly if you regularly calibrate at less than 5 points.

1. Switch the meter off.
2. Press and hold **MODE**.
3. Press **ON** to switch on the meter. Release **MODE**. Display shows "bUF"
4. Press MI/▲ or MR/▼ until you view P3.0 [bUF].
5. Press ENTER until you view P.3.0
6. Press MI/▲ or MR/▼ to select USA or NIST buffers.
7. Press ENTER to confirm.
8. Press MI/▲ or MR/▼ to select 2, 3, 4, or 5 point.
9. Press ENTER to confirm.
10. Press CAL/MEAS to return to measurement mode.

4.5 Calibration

Note pH: Perform at least a 2-point pH calibration using standard buffers that bracket (one above, one below) the sample range. A 1-point calibration can be performed, but make sure that the buffer is close to the measured sample value.

Note ION: Calibration can be preformed at: 2, or 3 points (0.10, 1.0, 10.0, 100.0 ppm).

Note ION: After the meter is switched off, the calibration data will be lost.

Note mV: Calibration can be preformed at: 1 points.

1. Pour a known pH, ISE or mV buffer into a clean, dry container.
2. Press ON to switch on the meter.
3. Press MODE to select the correct mode (if necessary).
4. Rinse the electrode with distilled water and blot it dry if necessary.
5. Dip the electrode and temperature probe into the buffer. Swirl gently and wait for reading to stabilize.
6. Press CAL. The display shows "CAL".
 - a. For pH calibration : proceed with step 7
 - b. For ION calibration : Use MI/▲ or MR/▼ to select the desired calibration point
 - c. For mV calibration : Press MI/▲ or MR/▼ to adjust the reading
7. Press ENTER to confirm, the LCD will blink momentarily.
8. For 2 or more-point calibration, repeat step 4 to 7 with other buffers.

Note: To exit without confirming the calibration value, press CAL/MEAS.

5 MEASUREMENT

5.1 Temperature Compensation

Measurements can be taken with automatic (ATC) or manual (MTC) temperature compensation. If there is no temperature sensor attached the default MTC setting is 25 °C. You can manually set the temperature.

5.2 Automatic Temperature Compensation (ATC)

Plug the temperature probe into the meter. The ATC indicator will light up on the LCD.

Note: The probe must be submerged in the measuring liquid.

5.3 Manual Temperature Compensation (MTC)

IMPORTANT: For manual compensation, you must disconnect the temperature probe.

1. Switch the meter on.
2. Press MODE to select pH mode.
3. Press CAL/MEAS. The CAL indicator will appear
4. Press MODE. The primary display shows the current setting, the secondary display shows 25 °C (77 °F) or its last set value.
5. Press MI/▲ or MR/▼ to offset the temperature to your preferred settings.
6. Press ENTER to confirm and to return to measurement mode.

Note: Press CAL/MEAS at step 6 to exit without confirming.

5.4 Taking Measurements

1. Rinse the probe with de-ionized or distilled water. If the pH electrode has dehydrated, soak it for 30 minutes in electrode storage solution or 2M – 4M KCl solution.
2. Switch the meter on.
3. Dip the probe into the sample. The sensor or the glass bulb of the electrode must be completely immersed. Stir the probe gently to create a homogeneous sample.
4. Allow time for the reading to stabilize.
5. Press MODE to toggle between pH, mV (or Rel mV) or ION(if necessary)

5.5 HOLD Function

Lets you freeze the display and hold the measured value.

1. Press HOLD/ENTER to hold a measurement. "HOLD" will appear on the display.
2. Press HOLD/ENTER again to release the held value.

Note: If the meter is shut off the HOLD value will be lost. For longer storage, use the memory functions.

6 MEMORY FUNCTION

The meter stores up to 100 sets of data. Sets include pH, mV (or Rel. mV), temperature and ION (ION6).

6.1 Memory Input

1. Press MI/▲ during measurement to input data into the memory. MEM, "StO" and memory number will appear for a moment.
2. If necessary, measure the next sample solution and press MI/▲ key to input the next data into the memory.

Note: If the memory is full the first value stored will be overwritten.

6.2 Memory Recall

1. Press MR/▼ once to retrieve the last reading stored.
2. Press ENTER to recall the reading
3. Press ENTER to return to the next memory location screen.
4. Press MI/▲ or MR/▼ to scroll to a specific memory location, press ENTER to select.
5. Press CAL/MEAS to exit Memory Recall.

Note: Readings stored in memory are retained even if the unit is turned off.

6.3 Memory Clear (P6.0)

1. Switch the meter off.
2. Press and hold **MODE**.
3. Press **ON** to switch on the meter. Release **MODE**.
4. Press MI/▲ or MR/▼ until P1.0. Display shows "CLr"
5. Press ENTER.
6. Press MI/▲ or MR/▼ to toggle between NO and YES. "NO" retains current memory, "YES" clears **all** memory.
7. Press ENTER to confirm selection
8. Press CAL/MEAS to return to measurement mode.

7 OTHER FUNCTIONS

7.1 Viewing Electrode Data (P2.0)

1. Switch the meter off.
2. Press and hold **MODE**.
3. Press **ON** to switch on the meter. Release **MODE**.
4. Press MI/▲ or MR/▼ until P2.0. Display shows "ELE"
5. Press ENTER.
6. When you have scrolled through all the electrode data, you will automatically return to the subgroup menu.
7. Press CAL/MEAS to return to measurement mode.

7.2 Reset to factory defaults (P7.0)

Resets all settings to the factory default.

1. Switch the meter off.
2. Press and hold **MODE**.
3. Press **ON** to switch on the meter. Release **MODE**.
4. Press MI/▲ or MR/▼ until you view parameter P4.0 (rSt).
5. Press ENTER.
6. Press MI/▲ or MR/▼ to select: NO retains current settings or YES clears all calibrations and its data.
7. Press ENTER to confirm and return to subgroup menu.
8. Press CAL/MEAS to return to measurement mode.

8 PROBE CARE AND MAINTENANCE

8.1 pH Electrodes

Clean the electrode every 1 to 3 months depending on the extent and condition of use.

Note: For specialty electrode care, consult the instruction manual of the electrode.

8.1.1 pH electrode storage

Always keep the pH bulb wet. For storage use the electrode storage bottle or rubber cap filled with electrode storage solution. You can store in a pH 4 buffer with 1/100 part of saturated KCl. Other pH buffers are OK, but NEVER use distilled water.

8.1.2 After measuring

1. Rinse the electrode in de-ionized water.
2. Store it as recommended above or as recommended by the manufacturer.
3. Rinse prior to use with de-ionized water and tap dry – never wipe electrode.

8.1.3 pH electrode cleaning

- **Salt deposits:** can be removed by immersing the electrode in tap water for 10 to 15 minutes.
- **Oil/Grease film:** wash electrode pH bulb gently in some detergent and water.
- **Protein deposits:** Prepare a 1% pepsin solution in 0.1 M of HCl. Set the electrode in the solution for five to ten minutes.

9 ERROR MESSAGES

Error message	Indicates	Possible cause	Corrective action
Er2	Too few calibration points	ION calibration with only 1 point	Recalibrate with 2 or more points
Er3	Slope error	ION calibration solution not in range of 15 to 90mV	Recalibrate with fresh solutions Replace electrode
Er4	Calibration points more than 1 decade apart	Calibration points more than 1 decade apart	Recalibration using calibration points 1 decade apart
Err indicator	Wrong keypad input	Wrong input in selected mode	Release key. Select valid operations depending on mode
Electrode indicator	Calibration error	Buffer value does not match value displayed or electrode is disconnected or faulty electrode	Use fresh buffer, check electrode connection, replace electrode
Ur or Or	Value is out of range	Electrode not connected Electrode dirty or broken Meter not calibrated Measurement is over or under range	Make sure electrode is connected Clean or replace electrode Recalibrate the meter Treat samples to bring them within the measuring range.

10 TROUBLESHOOTING

Problem	Possible cause	Solution
No display	a) AC outlet not switched on. b) AC adapter socket not inserted properly	a) Switch on power supply. b) Re-insert AC adapter socket.
Unstable readings	a) Air bubbles in electrode. b) Dirty electrode c) Electrode not deep enough in sample d) External noise pickup or induction caused by nearby electric motor e) Electrode guard not attached	a) Tap electrode to remove bubbles, move electrode away from bubbles present in sample b) Clean electrode, recalibrate c) Make sure sample entirely covers the electrode sensors d) Move or switch off interfering motor. e) Attach electrode guard
Slow response	a) Dirty / Oily electrode	a) Clean electrode