TRANS INSTRUMENTS
for the professionals

WalkLAB
Professional pH Meter
HP 9010

Operations Manual

INTRODUCTION

Your purchase of this professional pH meter marks a step forward for you into the field of precision measurement. Although this meter is a complex and delicate instrument, its usability will allow many years of use if proper operating techniques are observe and practice.

1. FEATURES:

- Multiple display of pH, mV and temperature
- Automatic buffer recognition with built in ISO and NIST standard
- Manual setting of customize pH buffer standard
- Up to 5 points calibration
- Auto-lock / automatic-endpoint detection function
- 99 memory with real time clock recording
- RS232 online data logging to PC (sold separately)

2. CONTENT:

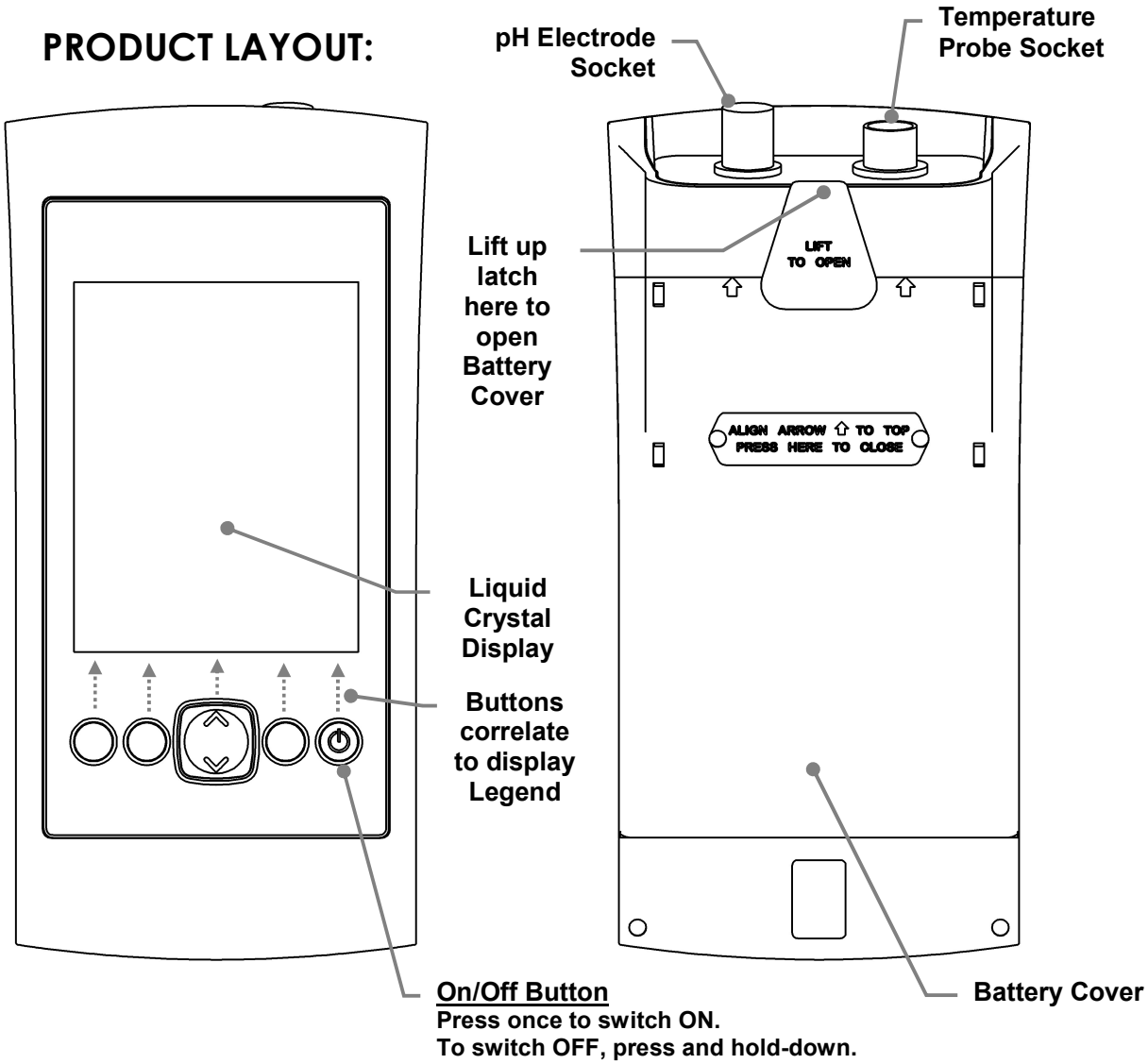
Carefully unpack the box. It should contain the following items:

a. Main unit
b. Combination pH electrode
c. Temperature probe
d. Calibration buffer solution pH7.00 & pH4.01 of 90ml each.
e. Operations manual

3. SPECIFICATION:

	pH	mV		Temperature
Range	-2 to 16 pH	±700.0mV	±2,000mV	0 to 120°C
Resolution	0.01pH	0.1mV	1mV	0.1°C
Accuracy	±0.02pH	±0.5mV	±2mV	±0.1 °C ±0.5°C (Probe)
Calibration	Min. 2 point, Max. 5 point			
Buffer Recognition	up to 60°C or 95°C depending on buffer type			
Automatic Temperature Compensation	pH electrode temperature error compensation 0 to 120°C			
Memory	99 data with real time clock			
Power source	4 x 1.5Volt AAA size battery			
Operating temperature	5 to 40°C			
Storage temperature	-20 to 60°C			
Operating humidity	Up to 95% RH			

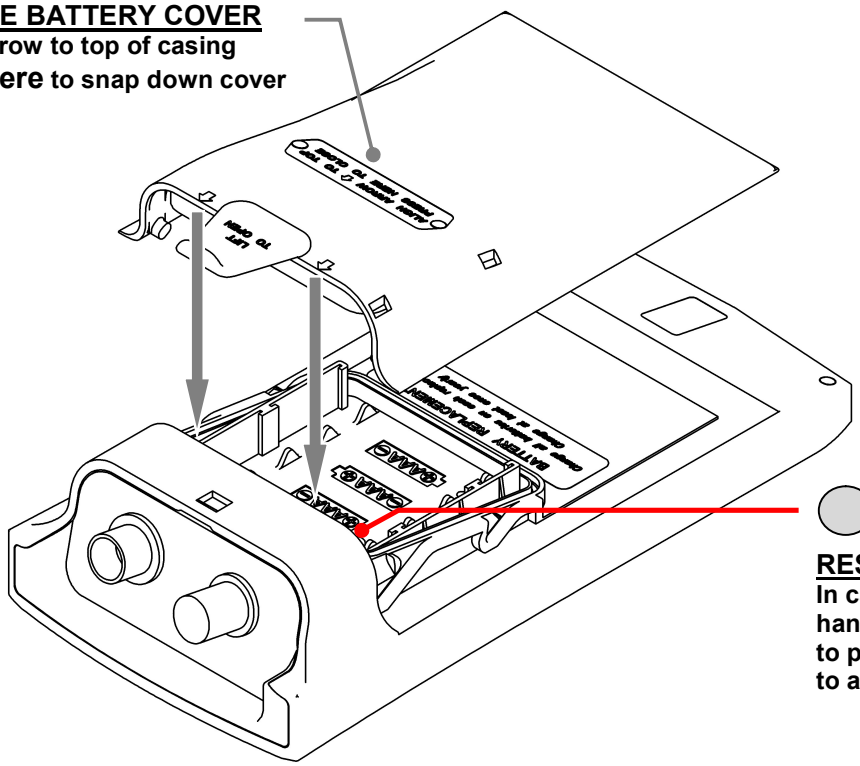
4. PRODUCT LAYOUT:



TO CLOSE BATTERY COVER

1 Align arrow to top of casing

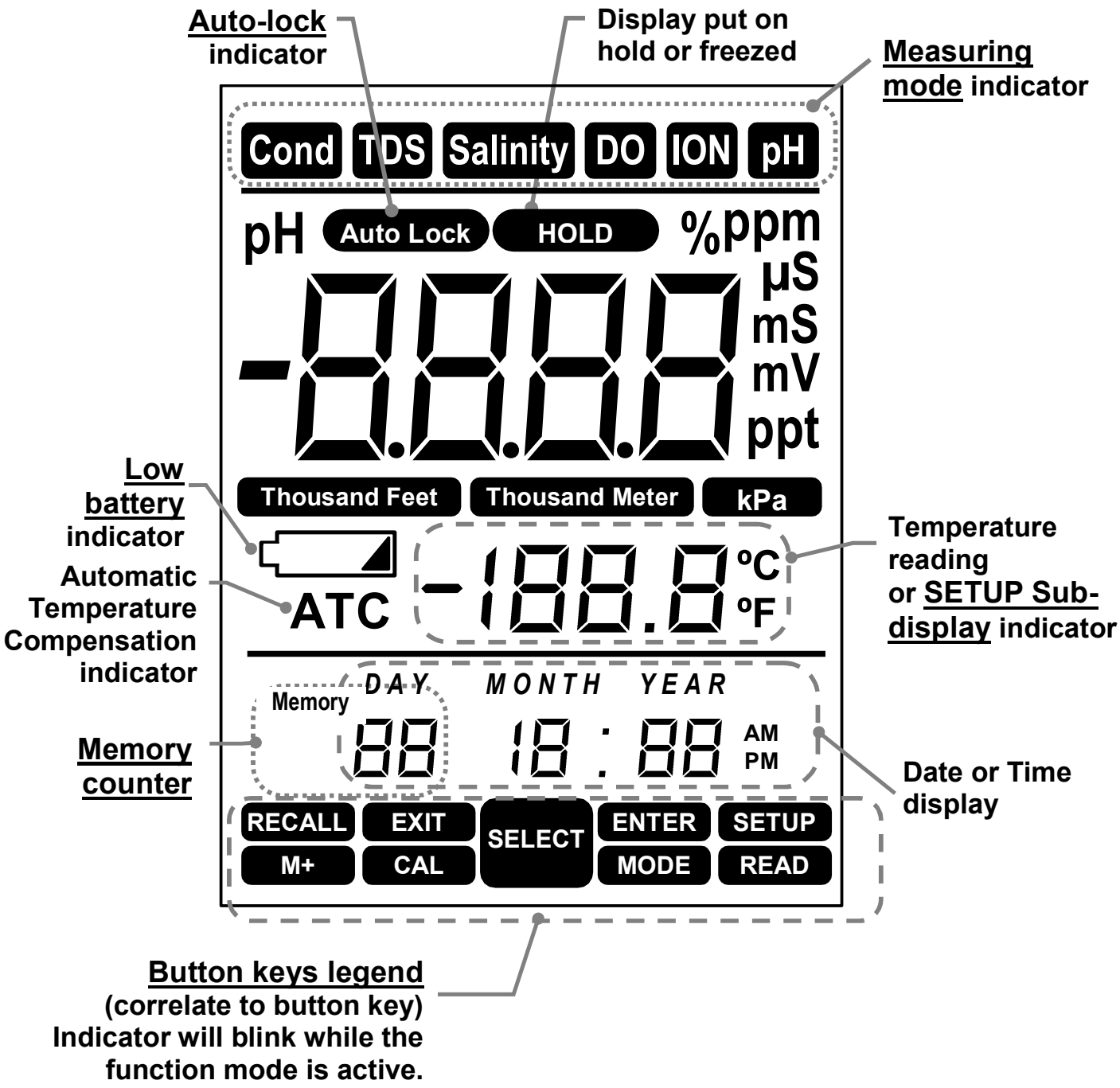
2 Press **here** to snap down cover



RESET BUTTON

In case of software hang, use a ball pen tip to press on the button to activate master reset

5. DISPLAY PANEL:



6 SETTING UP THE UNIT:

6.1 Before you begin using the unit, it is important to define your measuring requirements. This will allow the unit to display accurately on the condition of sample that is measured.

6.2 While the unit is switched ON, press the **SELECT** button once and the **Button Keys Legend** will show **SETUP** appear.

6.3 Press the **SETUP** key to enter setup mode.

6.4 Display will show **SETUP** blinking, indicating you are in setup mode.

6.5 Press the **SELECT** button **up** to move to next setting or **down** to the previous setting parameter displayed on screen.

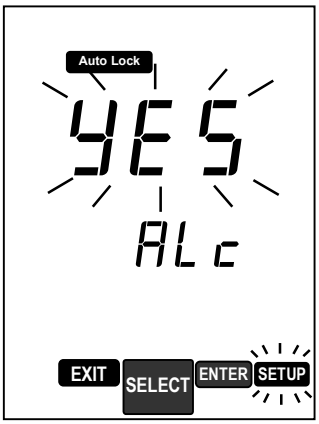
6.6 After setting, meter will retain the info until you reset them.

6.7 Below are the description for each setting parameter:

**** Anytime during setup, press EXIT to cancel the setting.***

ALC - AUTO LOCK SETTING

Auto-lock feature allows the meter to automatically sense a stabilized reading and locks the endpoint reading. Factory preset is YES.

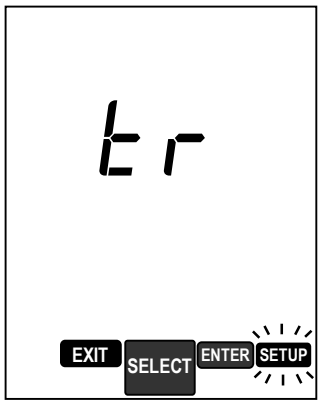


1. Press the **ENTER** key to set; display will show YES blinking.
2. Press the **SELECT** key **up** or **down** to choose between YES and no
3. Press the **ENTER** key to confirm.
4. Press the **SELECT** key **up** for next setting.

tr - DATA TRANSMISSION TO PC

(Note: will not appear if no data saved)

This setting allows you to download saved memory data to PC via the RS232 connector & CD software kit ***(connector & software kit sold separately)***.



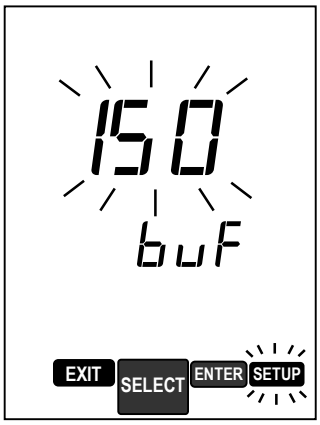
1. Download the software and run on PC.
2. Follow the CD instructions to setup software and PC connection with RS232 connector.
3. Press the **ENTER** key and display will alternate between tr and oUt, indicate transfer in progress.
4. When display return to tr, transfer completed. Check the PC for the transferred file.
5. Press the **SELECT** key **up** for next setting.

buF - CALIBATION BUFFER STANDARDS

This setting allows you to select ISO, NIST or customized buffer standard. Factory preset is ISO standard.

ISO (ISO)buffer standards are pH1.68, 7.00, 4.01, 10.01, 12.45 and **NIST** (NIST) buffer standards are pH1.68, 4.01, 6.86, 9.18 and 12.45, which are preset in this meter, and will be automatically recognized during calibration.

Select **customize** (CuSt) if you have other standards other than standard buffer solutions.



1. Press the **ENTER** key to set; display will show ISO blinking.
2. Press the **SELECT** key **up** or **down** to select from ISO, NIST or CuSt and press the **ENTER** key to confirm.
3. Press the **SELECT** key **up** for next setting.

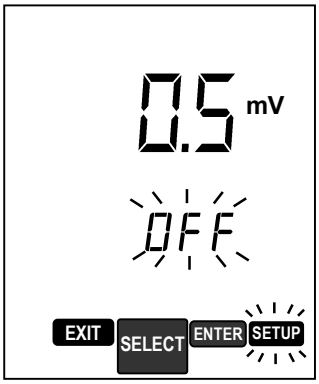
StAt Prb - PROBE ELECTRODE STATUS

This setting allows you to review the last calibration information about the electrode conditions.

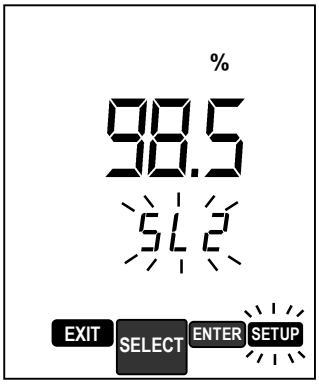
A good pH electrode should have an Offset value no greater than ±60mV and a Slope value of above 75% and below 115%. Otherwise, the electrode should be replaced.

There are 5 calibration points for review as follow:

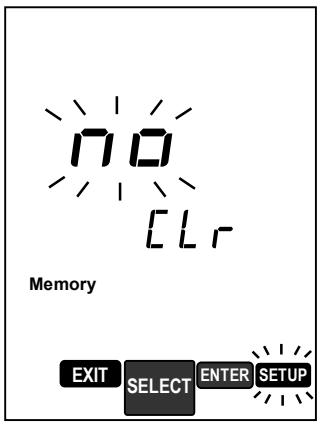
	Displayed Value	Calibration Point within range
OFF	Offset in mV	pH7.00
SL 1	% of slope	pH 7.00 to 4.01
SL2	% of slope	pH 7.00 to 10.01
SL3	% of slope	pH 4.01 to -2.00
SL4	% of slope	pH 10.01 to 16.00



1. Press the **ENTER** key to set; display will show the mV value with OFF blinking.
2. Press the **SELECT** key **up** to review Slope point 1, display will show the % of slope with SL 1 below.
3. Press the **SELECT** key **up** sequentially to review all the rest of slope value 2, 3, 4 and then back to Offset in a cyclical mode.
4. When finish, press the **EXIT** key once followed by the **SELECT** key **up** for next setting.



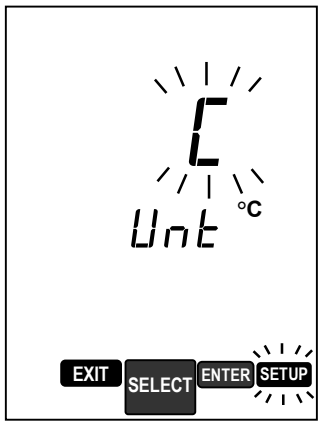
CLr - CLEAR SAVED MEMORY



This setting will clear all saved memory in the unit.

1 Press the **ENTER** key to set; display will show no blinking.
2. Press the **SELECT** key **up** or **down** to choose between YES and no.
3. Choose Yes to clear, press the **ENTER** key to confirm.
4 Press the **SELECT** key **up** for next setting.

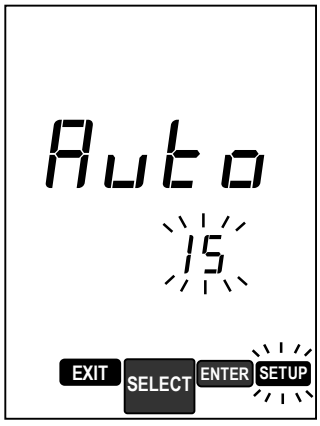
Unt - TEMPERATURE UNIT OF MEASUREMENT



This setting allows you to set the unit of measurement for temperature between Celcius and Fahrenheit. Factory preset is in Celcius.

1. Press the **ENTER** key to set; display will show C blinking.
2. Press the **SELECT** key **up** or **down** to choose between C and F
3. Press the **ENTER** key to confirm.
4. Press the **SELECT** key **up** for next setting.

Auto oFF - AUTO-OFF TIME SETTING

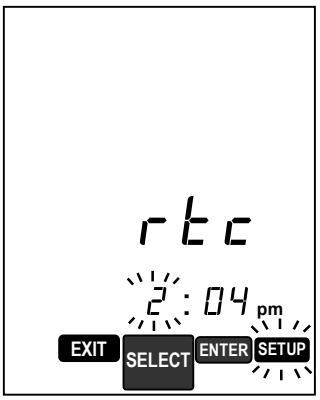


This setting allow you set the time to automatically shutoff the unit to power save. This feature is good if you want the meter to make prolong measurement or continuous display.

1. Press the **ENTER** key to set; display will show 15 blinking.
2. Press the **SELECT** key **up** or **down** to scroll between no, 15minutes, 30 minutes or 60 minutes.
3. Select no will disable auto-shutoff feature.
4. Press the **ENTER** key to confirm.
5. Press the **SELECT** key **up** for next setting.

rtc - REAL TIME CLOCK

This setting allows you to change the date and time on the meter.



1. Press the **ENTER** key to begin setting; display will show clock with hour digit blinking.
2. Press the **SELECT** key **up** or **down** to scroll digit.
3. Press the **ENTER** key to confirm or move to set Minute then Day, Month and Year on each instance. While digit is blinking, repeat step 2~3 to set digit.
4. After setting Year and **ENTER**, clock is up to date.
5. Press the **SELECT** key **up** for next setting.

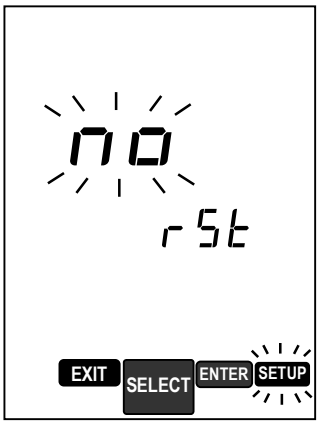
rSt - MASTER RESET

This setting allows you to reset the unit to the original factory's default.

Original factory default:

Buffer Standard= 150

Auto Shutoff = 15 minutes



1. Press the **ENTER** key to set; display will show no blinking.
2. Press the **SELECT** key **up** or **down** to choose between YES and no
3. Press the **ENTER** key to confirm.
4. Press the **SELECT** key **up** to repeat from beginning or **EXIT** key to return to measuring mode.

7. CALIBRATION:

**** Calibration should be performed as frequently as possible to ensure accurate measurement, depending on the frequency of tests performed. Additional calibration solution should be purchased for future needs.***

7.1 Prepare standard solutions of at least 2 calibration points. If measurements are to be made in the acidic range, select 2 points between pH-2 to 7. If measurements are made in the alkaline range, then select between pH7 to 16. If full range is required, calibrate at least 3 to 5 calibration points between pH-2 to 16.

7.2 Buffer standard must be set during **SETUP** in page 6, bUF.

7.3 Standard solutions are in 3 groups of standards – ISO, Nist and custom standards.

ISO buffer standards are pH1.68, 7.00, 4.01, 10.01 and 12.45

NIST buffer standards are pH1.68, 4.01, 6.86, 9.18 and 12.45

Custom standards are defines manually for each buffer standard.

7.4 Do keep in mind that buffer all standards are specifies at 25°C. Calibration value should set to the exact value as the buffer's solution value correlate to its current temperature.

Calibration with ISO Standard

7.5 Make sure the unit is properly installed and electrode connected.

7.6 This meter can automatically recognize the ISO Standard buffer solution. You will need at least 2 buffer solutions. ***Always begin with "Offset" calibration first***.

7.7 Rinse the pH electrodes and temperature probe in distilled-water then dip it in the buffer solution, first in the offset buffer (pH7.00) then subsequently each of the slope buffer solution.

Always rinses the electrode with distilled water before and after each test. This is to prevent solution carry over or cross contamination. Standard solutions must maintain highest purity; otherwise the meter's accuracy could be compromised.

7.8 Press **CAL** key for 2 seconds and display will show the 7.00 and **CAL** blinking, indicating it is in calibration mode.

7.9 Value will vary according to solution's temperature listed below:

Temperature (°C)	ISO standard buffer solution				
	Slope 1.68	**Offset 7.00**	**Slope 4.01**	**Slope 10.01**	**Slope 12.45**
0	1.67	7.11	4.00	10.32	13.43
5	1.67	7.08	4.00	10.25	13.21
10	1.67	7.06	4.00	10.18	13.00
15	1.67	7.03	4.00	10.12	12.81
20	1.68	7.01	4.00	10.06	12.63
25	**1.68**	**7.00**	**4.01**	**10.01**	**12.45**
30	1.69	6.98	4.02	9.97	12.29
35	1.69	6.98	4.02	9.93	12.13
40	1.70	6.97	4.03	9.89	11.99
45	1.70	6.97	4.04	9.86	11.84
50	1.71	6.97	4.05	9.83	11.70
55	1.72	6.97	4.06		11.57
60	1.72	6.97	4.08		11.45
65	1.73	6.97	4.10		
70	1.74	6.98	4.12		
75	1.75	6.99	4.14		
80	1.77	7.00	4.16		
85	1.78	7.02	4.18		
90	1.80	7.03	4.21		
95	1.81	7.05	4.24		

7.10 If the meter does not recognize the buffer, it means the electrode could be defective or the buffer solution is wrong. Calibration cannot proceed until they are rectified.

7.11 When the meter beeps, Offset point is established.

7.12 Now 1.68, 4.01, 10.01 and 12.45 will alternate on main display.

7.13 Rinse the pH electrodes and temperature probe in distilled water, blot or shake dry then dip into next slope buffer solution.

7.14 When the meter recognizes the buffer, it displays in blinking mode.

7.15 If the value is different from that of the buffer solution then the electrode could be damage.

7.16 When the meter starts beeping, a Slope point is established. The remaining slope values will alternate on the main display.

7.17 Repeat step 7.13 to 7.16 sequentially up to 4 slope points.

7.18 ***At least 2 calibration points (offset & slope) must be established in each session of calibration. Otherwise, the whole calibration will not register.***

7.19 When calibration is completed, press **ENTER** to store all calibrated points and to return to normal measuring mode.

7.20 Anytime during calibration, press **EXIT** for 2 seconds will abort all.

Calibration with Nist Standard (if you have NIST buffer solution)

7.21 Make sure the unit is properly installed and electrode connected.

7.22 This meter can automatically recognize the Nist Standard buffer solution. You will need at least 2 buffer solutions. ***Always begin with "Offset" calibration first***.

7.23 Rinse the pH electrodes and temperature probe in distilled water then dip in the buffer solution, first on the Offset buffer (pH6.86) then subsequently on each slope buffer.

Always rinses the electrode with distilled water before and after each test. This is to prevent solution carry over or cross contamination. Standard solutions must maintain highest purity; otherwise the meter's accuracy could be compromised.

7.24 Press **CAL** key and display will show the 6.86 and **CAL** blinking, indicating it is in calibration mode.

7.25 Value will vary according to temperature listed below table:

Temperature (°C)	NIST standard buffer solution				
	Slope 1.68	**Slope 4.01**	**Offset 6.86**	**Slope 9.18**	**Slope 12.45**
0	1.67	4.01	6.98	9.47	13.43
5	1.67	4.00	6.95	9.38	13.21
10	1.67	4.00	6.92	9.32	13.00
15	1.67	4.00	6.90	9.27	12.81
20	1.68	4.00	6.88	9.22	12.63
25	**1.68**	**4.01**	**6.86**	**9.18**	**12.45**
30	1.69	4.01	6.85	9.14	12.29
35	1.69	4.02	6.84	9.10	12.13
40	1.70	4.03	6.84	9.07	11.99
45	1.70	4.04	6.83	9.04	11.84
50	1.71	4.06	6.83	9.01	11.70
55	1.72	4.06	6.83	8.99	11.57
60	1.72	4.08	6.84	8.96	11.45
65	1.73	4.10	6.84	8.94	
70	1.74	4.12	6.85	8.92	
75	1.75	4.14	6.85	8.90	
80	1.77	4.16	6.86	8.88	
85	1.78	4.18	6.87	8.87	
90	1.80	4.21	6.88	8.85	
95	1.81	4.24	6.89	8.83	

7.26 If the meter does not recognize the buffer, it means the electrode could be defective or the buffer solution is wrong. Calibration cannot proceed until they are rectified.

7.27 When the meter beeps, Offset point is established.

7.28 Now 1.68, 4.01, 9.18 and 12.45 will alternate on main display.

7.29 Rinse the pH electrodes and temperature probe in distilled water, blot or shake dry then dip into next slope buffer solution.

7.30 When the meter recognizes the buffer, it will appear blinking.

7.31 If the value is different from the buffer solution then the electrode could be damage.

7.32 Wait for meter to beep, Slope point is established.

7.33 The remaining buffer values will alternate on the main display.

7.34 Repeat step 7.29 to 7.33 sequentially up to 4 slope points.

7.35 ***At least 2 calibration points (offset & slope) must be established in each session of calibration. Otherwise, calibrated point will not register.***

7.36 When calibration is completed, press **ENTER** to store all calibrated points and return to normal reading mode.

7.37 Anytime during calibration, press **EXIT** for 2 seconds will abort all.

Calibration with Custom Standard

7.38 Make sure the unit is properly installed and electrode connected.

Always rinses the electrode with distilled water before and after each test. This is to prevent solution carry over or cross contamination. Standard solutions must maintain highest purity; otherwise the meter's accuracy could be compromised.

7.39 Rinse the pH electrodes and temperature probe in distilled water and dip in the buffer solution. You will need at least two (2) buffers. ***Always begin with "Offset" calibration first***.

7.40 Press **CAL** and display will show 7.00 while **CAL** blinking, indicating it is in calibration mode.

7.41 Press the **SELECT** button up / down to adjust the value.

7.42 When the meter beeps, it means reading has stabilized and ready for calibration. Press **ENTER** to confirm to calibrate to the point.

7.43 A preset value of 1.40, 3.80, and 12.60 will now alternate requesting for a slope value.

7.44 Rinse the pH electrodes and temperature probe in distilled water, blot or shake dry then dip into next slope buffer solution.

7.45 The meter will recognize the nearest buffer value and will appear blinking while it beeps in wait of a complete action.

7.46 Press the **SELECT** button up or down to adjust to the Slope value of the solution.

7.47 Press **ENTER** to confirm set value, wait a while for an endpoint reading to establish and press it again to calibrate to the point.

7.48 The remaining slope values will alternate on the main display.

7.49 Repeat step 7.43 to 7.47 in sequence. You can calibrate up to 4 slope points.

7.50 ***At least 2 calibration point (offset & slope) must be established in each session of calibration. Otherwise, calibrated point will not register.***

7.51 When calibration is completed, press **EXIT** to resume measuring mode.

8 MAKING PH MEASUREMENT:

Measurement with Auto-Lock feature enabled:(see Page 4)

8.1 Always rinse the pH electrode and temperature probe with distilled-water before and after each test.

8.2 Dip the pH electrode and temperature probe in the test sample and press the **READ** button once.

8.3 Display will show current pH reading with **AutoLock** symbol blinking.

8.4 When the **AutoLock** sign stops with short beep, an endpoint reading is established. You can now record the reading.

8.5 Press the **READ** button for each new measurement.

Measurement with Auto-Lock feature disabled: (see Page 4)

8.6 When feature is disabled, meter will display readings continuously.

8.7 Press the **READ** button once to freeze displayed reading.

8.8 The **HOLD** symbol will appear. Press again will release display and resume continuous measurement.

Note on Measurements and Analysis:

Each type of liquid has its own pH value varies at different temperature. ATC measurement only compensates for the pH sensor's error, it does not compensate for the pH variation due to temperature fluctuation in the liquid. Therefore, each test should be made at the same temperature if possible or recorded with temperature reading for a comprehensive analysis.

pH measurement without ATC (Manual temperature compensation on sensor error)

8.9 If ATC is not required, disconnect the temperature probe. **ATC** symbol will not appear on screen and display will show the default temperature of 25°C.

8.10 You can also manually set the solution's temperature as follow:

8.11 Press the **READ** button start measuring, then ***press and hold down*** **MODE** button until temperature reading appears blinking.

8.12 While temperature digit is blinking. Press the **SELECT** button **up** or **down** to adjust the value to that of the solution.

8.13 Press **ENTER** to confirm the set value or **EXIT** to abort. Display will resume measuring mode.

9 MAKING REDOX(ORP) MEASUREMENT:

9.1 Disconnect and remove the pH electrode and temperature probe. Connect with a Redox/ORP electrode. Temperature has no effect on ORP readings and therefore is not require during measurement.

9.2 Rinse the sensor in distilled water then in the test liquid. Stir to remove bubbles and wait for a stabilized reading.

9.3 Press the **MODE** button once to switch display to **mV** reading.

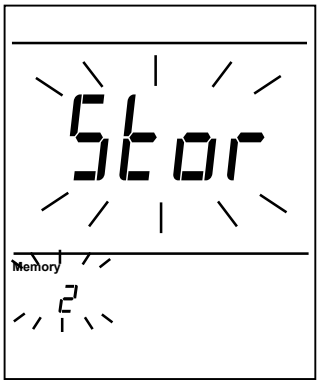
9.4 Press the **READ** button once and display will show **AutoLock** symbol blinking, indicating meter is sensing an endpoint reading.

9.5 When the **AutoLock** sign stops with short beep, an endpoint reading is established. You can now record the reading.

9.6 Depend on the liquid that is measured, some volatile liquid may take up to 20 minutes or even longer time to stabilize. Disable the Auto-lock (Page4) and Auto-Off (Page6) features. Then endpoint reading should determine by individual experience in each case.

DATA MEMORY:

9.7 This meter can save up to 99 data with time and clock with either pH or ORP measurements.



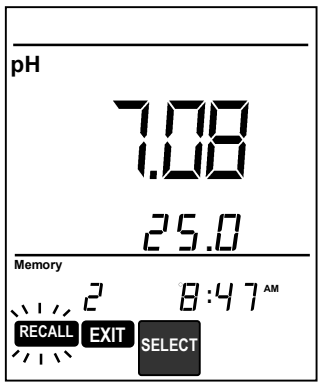
STORE MEMORY:

9.8 After a reading has established, press the **M+** button to save data into memory. Display will show Stor and memory counter blink briefly.

9.9 Data is stored and measuring mode resumes.

9.10 When memory is above 99, display will show **"FULL"** and data will not be saved. Please download data and clear memory to resume.

9.11 It is a good practice to download data daily.



RECALL MEMORY:

9.12 To review the saved data, press the **SELECT** button then press **RECALL** button.

9.13 Press the **SELECT** button **up** or **down** to review each saved data. Time and date will alternate.

9.14 When finish reviewing, press **EXIT** to return to normal measuring mode.

10 ONLINE DATA LOGGING TO PC: (SOLD SEPARATELY)

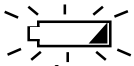
The USB Connection kit is sold separately. Full instruction is in the Readme.txt file of the attached CD.

11 MAINTENANCE:

11.1 The pH electrode is a vital part of the pH measuring system. Keeping the electrode in good condition will ensure higher accuracy. Follow the maintenance instructions attached with each type of electrode.

11.2 Always review the pH electrode status after calibration to determine if the electrode is suitable for the measuring requirements.

11.3 When the battery sign  appear permanently on the screen, it means the battery should be replace. Removed the battery cover and replace with 4 “AAA” batteries according to polarity.

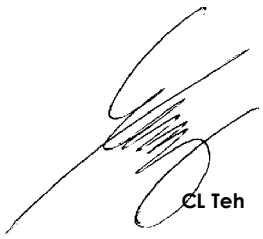
11.4 If the battery sign  appear blinking, it means the back-up battery should be replace. Return meter to your local agent for battery replacement.

12 TROUBLESHOOTING:

Error Code	Reason or cause	Remedy
- - - -	Inputs exceed measuring range	Measure liquid within specified range
ErLc Prob Readings drift or unstable, cannot auto-lock during Read or Cal.	1. Ground loop in solution 2. Electrode is clog or expired. 3. Electromagnetic interference 4. ORP measurement	1. Make measurement in a cup or container. 2. Check % of slope >75% or <115%, otherwise, replace electrode. 3. Move to another location to perform test. 4. Disable auto-lock (see 9.6)
Er t Prob	Temperature out of the buffer solution range during calibration	1. Measure liquid within specified range 2. Replace temperature probe.
Er 6 Prob Er 7 Prob	Offset calibration error 1. Wrong buffer type 2. Sensor damaged or expired	1. Use only pH7.00 or 6.86 solution. 2. Check Offset status to be within ±15mV. Replace with new electrode
Er 1 Prob Er 4 Prob Er 9 Prob Er 10 Prob Er 12 Prob	Slope calibration error 1. Sensor damaged, clogged or expired.	1. Check % of slope status to be within 75 to115%. Replace with new electrode.
Reading does not change	1. Broken pH glass sensor. 2. Hold function is activated.	1. Change new electrode. 2. Press **READ** button to release.
Wrong date & time	Backup battery has expired.	Contact your dealer to replace new ones.
All button fail	Software hang	Perform button Reset (see page 2 & 7)

CALIBRATION CERTIFICATE

Product: WalkLAB pH meter HP9010
Measuring range: 0 to 14 pH
Calibration point(s): 7.00, 4.01, 10.01
Test point(s): 7.00, 4.01, 10.01
Accuracy achieved: ±0.02 (Complete system, meter + probe)



Trans Instruments (S) Pte. Ltd. certified that the above products underwent stringent calibration in accordance with Trans Instruments product manufacturing standards and work procedures and the result of inspection or testing for calibration meets the product specifications above. The standard solutions use for the calibration procedure was tested by instrument which is traceable to the US National Institute for Standards & Technology standard, under ambient conditions.
This certificate validates the product at the point of production. A complete pH system will require regular calibration from time to time. A traceable pH Buffer solution should be used for continual re-calibration.

WARRANTY:

Trans Instruments (Singapore) Pte. Ltd., warranties this product for a period of 12 months for main unit and 3 months for electrode, probe or sensors from date of purchase; against all defects in material and workmanship.

This warranty does not apply to the abuse or misuse of the instrument. If repairs or adjustments are required, please return the defective product freight prepaid. Instrument within warranty will be repaired at no charge.

Make sure that the product is properly packed and insured against possible damage or loss in shipment. Purchase invoice **MUST** be accompanied in returned product or else warranty is considered void.

Please obtain authorization from Trans Instruments (Singapore) Pte Ltd. directly or through your local sales representatives prior to returning the product. Trans Instruments staff can be contacted at the following email address or through our webpage contacts:

sales@transinstruments.com http://www.transinstruments.com

TRANS INSTRUMENTS
(Singapore) Pte Ltd
email: sales@transinstruments.com
Website: www.transinstrumnets.com
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