

# USER'S GUIDE



## **SAL-1700** **PSU / SG / ppt / TEMP METER**



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## OVERVIEW

Thank you for purchasing the Professional Series SAL-1700 Meter. The SAL-1700 is an advanced waterproof combo meter with superior accuracy. The meter measures four parameters: PSU, SG, ppt and temperature. The meter incorporates automatic temperature compensation (ATC) to accommodate for discrepancies in temperature that would naturally occur. The meter also features digital calibration for easy and precise calibration that will yield better results.

## CONTACT INFORMATION

If you have any problems or questions regarding your meter, please contact HM Digital, Inc

HM Digital, Inc.  
Los Angeles, CA USA

Info@HMDigital.com  
HMDigital.com  
1-800-383-2777

## SPECIFICATIONS

**PSU Range:** 0.0 ~ 55.0

**SG Range:** 1.000 ~ 1.042

**ppt Range:** 0.0 ~ 105.0

**Temperature Range:** 0.0 ~ 99.9°C; 32.0~211.8°F

**Resolution:**

PSU: 0.1

SG: 0.001

ppt: 0.1

Temp: 0.1 °C/°F

**Accuracy:**

PSU: ± 2.0

SG: ± 0.002

ppt: ± 2.0(0.0~55.1) / ±5.0(55.1~100.0)

Temp: ± 0.5 °C/°F

**Temperature Compensation:** Automatic (ATC) to 25°C (ATC range: 0-40°C)

**Calibration:** ppt digital calibration by push button (to any point within the range)

**Auto Shut-Off:** After 1 minutes

**Probe:** Detachable electrodes

**Display:** LCD panel

**Housing:** Water resistance (splash proof)

**Power source:** 2 x AAA batteries

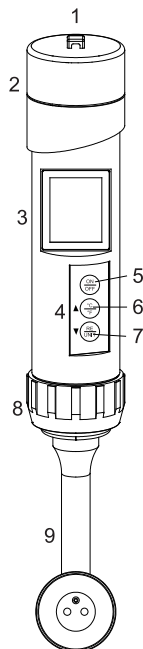
**Dimensions:** 21.6 x 3.4 x 3.4 cm (8.5 x 1.3 x 1.3 inches)

**Weight:** 100g (3.5 oz) with batteries

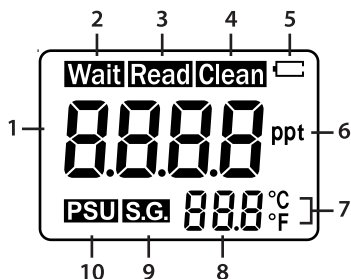
## HOUSING AND SCREEN DESCRIPTION

### Housing

1. Lanyard hook
2. Battery compartment
3. LCD display
4. Button panel
5. Power/Enter button
6. Temperature unit button
7. Measurement unit button
8. Sensor locking ring
9. Detachable sensor (Part # SP-C7)



### LCD Display



1. Measurement
2. Wait indicator (measuring)
3. Read indicator (result)
4. Clean indicator (Clean Sensor)
5. Low battery indicator
6. ppt unit indicator
7. Temperature unit indicator
8. Temperature measurement
9. SG unit indicator
10. PSU unit indicator

The screen's backlit function is always turned on when using the meter.

**SWITCHING BETWEEN THE MODES:** To switch between the modes press the 'RE/UNIT' (bottom button) on the meter.

## TAKING MEASUREMENTS

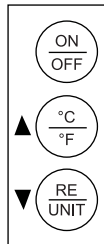
The SAL-1700 can take measurement in PSU, SG, ppt and temperature. Please make sure to read the Switching modes section to ensure that your meter displays the desired readings.

### Measurement

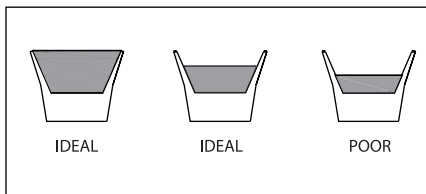
1. Remove the cap.
2. Press the power button. The display will activate.
3. To change the mode, press and hold the "RE / UNIT" button  
The unit will cycle through the three possible modes:

PSU → SG → ppt

4. Release the "RE / UNIT" button when the display shows the desired mode.
5. Dip the Meter into the water sample or solution to be tested.
6. Lightly swirl the meter and pull out the spoon shaped sensor.  
make sure there is enough solutions in the spoon and no trapped air bubbles.
7. The meter will display a reading almost immediately. Keep the meter steady until the reading stabilizes (approx. 30 seconds) for an accurate reading.
8. After use, press the power button to turn the meter off.
9. Shake any excess water off the meter. For best results, rinse with distilled or deionized water after each usage and wipe with a tissue.



To ensure accurate measurement, sufficient volume of sample solution should be filled in the sensor spoon.



### Temperature Measurements

The temperature reading is always displayed on the LCD panel during measurement mode and is shown simultaneously for all readings. It is not shown when the meter is in calibration mode. The default reading for the meter is in Celsius.

1. Turn on the Meter.
2. The temperature reading is always displayed on the LCD screen (except in calibration and reset mode) and can be used to take air or liquid temperature measurements.
3. To measure the temperature of a water sample or solution, dip the meter into it. The temperature reading will change immediately (unless the liquid is at room temperature). For very hot or cold liquids, the reading may take slightly longer to stabilize.

**NOTE** - Due to the characteristic of the sensor, it is not recommended to use your meter as a thermometer in very hot or very cold liquids. Do not keep the meter in very hot or cold liquids for extended periods of time.

## CALIBRATION

The SAL-1700 is factory calibrated. The meter will retain its calibration for a very long time, but there may be cases when it is necessary to recalibrate the meter. Additionally, though factory calibration will be suitable for most applications, it may be necessary to recalibrate the meter for more accurate results.

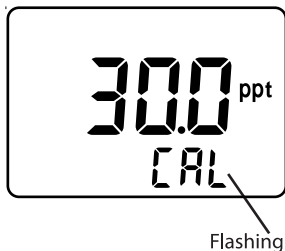
**When to recalibrate the SAL-1700:** You will need to recalibrate if the factory calibration isn't suitable for your application (see above) or if the calibration has shifted. This can happen based on time, usage or care of the meter. The only method of determining and check the SAL-1700 is calibrated properly is to obtain a bottle of laboratory-certified TDS calibration solution and check the meter against the solution value. The SAL-1700 can be calibrated to any brand or value TDS Calibration Solution within the meter's range. Always calibrate to a fresh solution.

The SAL-1700 features digital calibration. To recalibrate the meter:

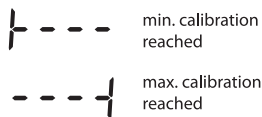
1. Turn the meter on by pressing the power button.
2. Make sure the meter is in the mode that match the solution. If not, change the mode accordingly.
3. Dip the meter into a laboratory-certified calibration solution. make sure there is enough solutions in the spoon and no trapped air bubbles.

*NOTE- If the measurement matches the calibration solution value, then your SAL-1700 is already properly calibrated. Stop here!*

4. Press and hold the 'TEMP/CAL' button. The temperature display will change to a 'CAL' image.
5. The meter will automatically adjust to a reading within a range of the calibration solution.
6. Change the reading so that it matches the calibration solution. For example, if your calibration solution is 30 ppt adjust the current reading until reads '30'. To increase the reading, press the 'UP' button (°C/°F). To decrease the reading, press the 'DOWN' button (RE/UNIT).



*NOTE- If the calibration reading is lowered or raised to the minimum or maximum level within the range, the screen will display the 'minimum calibration reached' icon or 'maximum calibration reached' icon, respectively. Note that this occurs only within the range of the solution the meter is currently in. When 'CAL' does not flash, it means calibration is in the middle of the range. The meter does not restrict calibration.*



7. To set the calibration, press the power button once. You will see a flashing image on the screen that says "CAL". After flashing a few times, The flashing image will change to "END". (If the "END" image does not flash on the screen, the meter has not been properly calibrated).
8. Your meter is now recalibrated.

### **Temperature Calibration**

1. You must have a correct thermometer next to the SAL-1700.
2. With the SAL-1700 in the air, press and hold power and "°C/°F" button together for 5 seconds. The meter will enter temperature calibration mode.
3. Adjust to the correct temperature by pressing the 'UP' or 'DOWN' buttons.
4. Once correct, click the power button. The temperature will flash and the screen will flash C...CA...CAL.
5. The screen will briefly display "End" and then revert to measurement mode. It is now calibrated.

## CARE, MAINTENANCE & TECHNIQUES

The SAL-1700 requires very little maintenance. You may need to change the batteries or clean the unit including the electrodes from time to time. In addition, please note these general techniques:

1. Do not store the unit in high temperature or direct sunlight.
2. After repeated usage in high TDS water, it is advised to clean the electrodes to prevent residue build-up.
3. For best results, make sure there is enough solutions in the spoon and no trapped air bubbles..
4. Water volume, air bubbles, and temperature may affect the reading.
5. Do not keep the meter in very hot water for extended periods of time.
6. If testing two water samples in a wide range, make sure to rinse the electrodes with DI or distilled water or alcohol after each test to ensure accurate readings and prevent a build-up of TDS on the electrodes.
7. The SAL-1700 is waterproof. However, prior to completely submersing the meter into a water, always ensure the black probe gasket ring and battery compartment are secured tightly. the warranty does not cover water damage due to parts that are not secured properly.

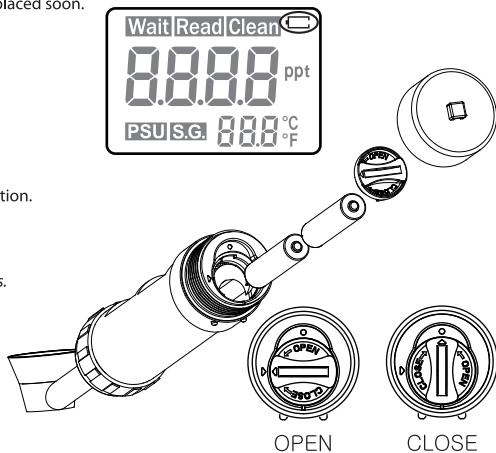
### Changing the batteries:

When the meter displays a flashing battery symbol, your batteries are getting weak and should be replaced soon.

To change the batteries:

1. Twist open the end cap on the top of the meter.
2. Twist the battery cap to the open position.
3. Remove the batteries.
4. Insert new batteries with the "+" side facing up.  
The meter uses 2 x AAA batteries.
5. Close the battery cap and turn to the close position.
6. Close and tighten the end cap to maintain waterproofness.

**NOTE:** Do not reverse the polarity of the batteries.  
This may short-circuit the meter.



### Cleaning:

To clean the unit, use a soft rag or towel. Wipe with water and a mild soap.

### Electrode Replacement:

If your probe has been damaged, you can purchase a new one without needing to purchase a new meter. To replace the probe:

1. Remove the black electrode locking ring by twisting it counter-clockwise.
2. Gently pull the probe off the unit.
3. Gently insert the new probe into the unit. Be sure to align the grooves and six pins properly.  
Never force the electrode into the unit!
4. Make sure the rubber ring is properly positioned on the electrode.
5. Screw the black locking ring back onto the unit by twisting it clockwise. Tighten.

## Message Symbols and Troubleshooting

You will see the corresponding message symbol(s) with the issues listed below:

| Problem                                                 | Error Message | Reason(s) and/or Potential Solution(s)                                         |
|---------------------------------------------------------|---------------|--------------------------------------------------------------------------------|
| The meter will not power on.                            |               | 1. Change the batteries.<br>2. Double-check the polarity of the batteries.     |
| Incorrect Readings.                                     |               | 1. Recalibrate the meter.<br>2. Switch modes.                                  |
| The ppt level is out of range (oor);                    | oor           | 1. (oor) The meter must be used within the specified range limits.             |
| The sensor has been disconnected or damaged internally; | ---- Err      | 1. (Error) Double-check the sensor is connected, or you may need a new sensor. |
| The temperature is out of range:                        | ---- oor      | 1. (Error) The meter must be used within the specified temperature limits.     |
| Residue on sensor.                                      | Clean         | 1. Check the condition of the sensor.<br>2. Rinse the sensor with clean water. |

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## **SAL-1700 LIMITED WARRANTY**

### **1. SAL-1700: One Year Limited Warranty**

### **2. Detachable Sensor (SP-C7): One Year Limited Warranty**

This HM Digital, Inc. ("the Company") product ("SAL-1700") is warranted to the purchaser against defective materials and workmanship for one (1) year from the date of purchase.

**\*\*From the date of purchase, sensor (SP-C7) is warranted for one (1) year to the purchaser against defective materials and workmanship\*\***

**What is covered:** Repair parts and labor, or replacement at the Company's discretion. Transportation Charges for repaired or new product to be returned to the purchaser.

**What is NOT covered:** Transportation charges for the defective products to be sent to the Company. Any consequential damages, incidental damages, or incidental expenses, including damages to property. This includes damages from abuse or improper maintenance such as tampering, wear and tear, water damage, or any other physical damage. The SAL-1700 is watertight and completely Submersible. However, please ensure that the battery compartment and probe gasket ring are firmly Tightened before submerging in water. The warranty does not cover water damage to the SAL-1700 due to parts not securely closed.

**To obtain warranty service**, please contact 800.383.2777 or email [Warranty@HMDigital.com](mailto:Warranty@HMDigital.com)

to receive further instructions. Before sending the product back to us, please include the following below,

- Your name
- Phone number/ Address
- Description of problem
- Proof of purchase, must include Date

***\* If a returned product does not include the above-mentioned items, the Company Reserves the right to refuse warranty service.***

**Implied Warranties:** Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to **ONE YEAR** from the date of purchase. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. To the extent any provision of this warranty is prohibited by federal and state law and cannot be preempted, it shall not be applicable. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

**NOTE:** Warranties are product-specific. Third-party products and products deemed by HM Digital as "accessories" are not covered under warranty. Third-party products include, but are not limited to, batteries and fittings. Accessories included, but not limited to, lanyards and product boxes.

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