

## ExStik® Waterproof pH Meters Models PH100 and PH110



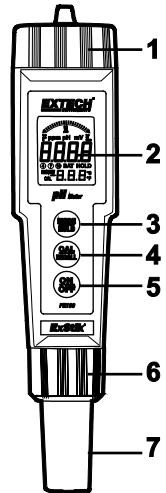
## Introduction

Thank you for selecting the Extech model PH100 and/or the model PH110 (refillable) meter. This instrument is designed for high accuracy pH testing. This device is shipped fully tested and calibrated and, with proper use, will provide years of reliable service. Please visit our website to check for the latest version and translations of this user manual and customer support.

## ExStik Description

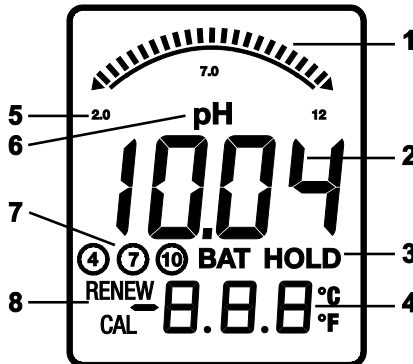
### Front Panel Controls

1. Battery compartment cap
  2. LCD
  3. MODE / HOLD button
  4. CAL / RECALL button
  5. ON/OFF button
  6. Electrode collar
  7. Electrode
- (Protective Electrode cap with sponge not shown)



### Display

1. Bar graph reading
2. Measurement reading
3. BAT (low battery) and HOLD (data hold) indicators
4. Temperature display
5. Bar graph scale designations
6. Units of measure
7. Calibration indicators
8. RENEW and CAL indicators



### CAUTIONS

- This meter is for measuring pH in a liquid solution. The pH membrane is made of fragile pH glass. Do not touch the membrane or press it onto a hard surface.
- If testing food, test a sample, only, and then discard the sample. Test the surface of the sample only, do not place or press the meter directly into the sample.
- This meter is not for use on concrete.
- Remove the batteries, keeping them away from children, when storing the meter for longer than three months.

# Overview

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## pH Overview

pH is a unit of measure (ranging from 0 to 14pH) indicating the degree of acidity or alkalinity of a solution. pH tests are the most performed measurements in water analysis, reporting the negative log of the hydrogen ion activity of a solution which is an indicator of acidity or alkalinity. Solutions with a pH lower than 7 are considered acidic, solutions with a pH higher than 7 are known as bases, and solutions with a pH of exactly 7 are neutral.

The pH scale is logarithmic so, for example, if sample 'A' is 1 pH less than Sample 'B', then Sample 'A' is 10 times more acidic than Sample 'B'. A 1 pH difference represents a ten-fold difference in acidity.

## Getting Started

- For new meters, remove the battery cap and then remove the battery insulating strip.
- Remove the cap from the bottom of the ExStik to expose the electrode glass surface and reference junction.
- Before first use or after extended storage, soak the electrode (with its cap removed) in a pH 4 solution for about 10 minutes.
- White KCL crystals may be present in the cap. These crystals will dissolve in the soak, or they can be simply rinsed with tap water.
- Always calibrate close to the expected measurement value.
- A sponge is in the electrode protective cap. Keep this sponge soaked with a pH 4 solution to preserve Electrode life during storage.

## Replacing Electrodes

The ExStik is shipped with an electrode attached. Electrode life is limited and is dependent on (among other factors) frequency of use and care. If the electrode needs to be replaced, follow these steps for removing and connecting electrodes. Note that the PH110 has a refillable electrode.

1. To remove an electrode, unscrew and completely remove the electrode retaining collar.
2. Gently rock the electrode from side to side, pulling it away from the meter, until it disconnects.
3. To attach an electrode, carefully plug the electrode into the meter socket (note that the electrode connector is keyed, ensuring proper connection).
4. Secure the electrode by tightly turning the collar in place (a rubber gasket seals the electrode with the meter).

## Automatic Electrode Recognition

When the ExStik is switched ON, it recognizes the type of electrode that is connected and displays the appropriate unit of measure. Attach electrode before switching ON the ExStik.

## Powering the ExStik

If the batteries are weak, the **BAT** indicator appears. Press the ON/OFF key to switch ON/OFF the ExStik. The auto power off feature switched OFF the ExStik automatically after 10 minutes of inactivity.

# Operation

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## Overview

When the electrode is placed in a solution, the main display and bar graph indicate the pH reading while the lower display indicates temperature (readings flash until they have stabilized). The bar graph is 'center zero', i.e. at pH 7 there is no display. As the pH rises, the bar moves from the center to the right. If the pH drops, the bar moves from the center to the left.

## pH Calibration (1, 2, or 3 points)

A two-point calibration with a buffer of 7 plus 4 or 10 (whichever is nearest to the expected sample value) is always recommended. A one-point calibration is also valid (choose the value closest to the expected sample value). For best accuracy, calibrate at the sample temperature.

1. Place the electrode into a buffer solution (4, 7, or 10) and short press the CAL key. pH 7 should be calibrated first, then 4 and/or 10 pH.
2. The ExStik automatically recognizes the solution and calibrates to that value. Note: If the solution is inaccurate more than 1pH from the 4, 7, or 10pH standard, the ExStik will assume an error and abort the calibration. CAL and END will be displayed.
3. During calibration, the pH reading flashes on the main display.
4. When calibration is complete, the ExStik automatically displays '**END**' and returns to the normal operation mode.
5. The appropriate circled indicator ④, ⑦, or ⑩ will appear when a calibration has been completed. The calibration data is stored until a new calibration is performed.
6. For a two or three-point calibration, repeat steps 1-4.

**Note:** Always turn OFF the meter and then ON before calibrating to allow sufficient time to complete the calibrations during one power cycle. If the meter switches OFF during calibration the calibrations remain valid, but new calibrations are needed to switch OFF the circled indicators.

**Note:** The Automatic Temperature Compensation (ATC) circuit is not active during calibration. To ensure accuracy, maintain a calibration buffer temperature of 77°F (25°C).

## Meter Reset

If the meter fails to calibrate or if it displays -1, reset the meter and re-calibrate.

1. Turn OFF the meter.
2. Remove the battery cartridge from the top of the meter.
3. Press the power button for 10 seconds.
4. Re-insert the batteries and switch ON the meter.
5. Re-calibrate the meter.

## Changing the Displayed Temperature Units

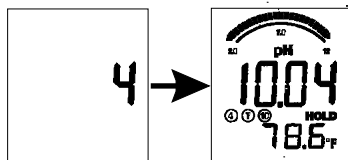
Long press the CAL button for approx. 3 seconds. The °C or °F icon will change first and the numerical temperature value will change after the button is released. If the Calibration mode is accidentally accessed '**CAL**' appears (in this case, switch OFF the ExStik and start again).

## Data Hold

Short press the MODE button to freeze the current reading. The **HOLD** icon will appear along with the held reading. The held reading will also be stored in memory. Short press the MODE key to return to normal operation.

## 15-Storing Readings into Memory

1. Short press the MODE button to store a reading. The LCD will briefly display the memory location number and then the value stored (Data Hold will activate).
2. Short press MODE again to return to normal operation.
3. Repeat step 1 to store the next reading and so on.
4. After 15 readings are stored the ExStik will return to memory location 1 and start overwriting existing data.



## Recalling Stored Readings

Note: Check that the **HOLD** symbol is not displayed. If it is, exit the HOLD function by short pressing the MODE button.

1. Short press the CAL button and then press the MODE button immediately after **CAL** is displayed; the storage location number (1 through 15) will flash. If the CAL mode is accidentally accessed (display flashing), press the CAL button again to exit.
2. The last reading stored will be displayed first. To advance through the stored readings, short press the MODE button. The location number is displayed first, followed by the reading stored in that location.
3. To exit the recall mode, short press the CAL button to return to normal operation.

## CAL Reminder Display

When the ExStik is turned ON in the pH mode for the 15th time without recalibration, the '**CAL**' icon appears, indicating that calibration may be required. Some applications may require recalibration of the electrode more frequently than others. The **CAL** display is simply a reminder and will turn off when the pH electrode is recalibrated.

## RENEW Display

A flashing '**RENEW**' warning indicates that the probe may be nearing the end of its useful life. If cleaning or recalibration does not cause the **RENEW** icon to disappear, replace the electrode. The **RENEW** display appears when the output of the pH electrode fails a diagnostic test.

## Making a Measurement

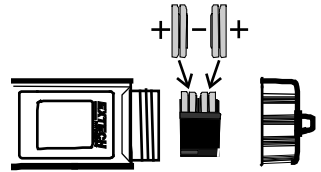
Place the calibrated meter into a sample solution. The display will flash while the meter is making the measurement. When the display stops flashing, the measured pH value is displayed. It may require an additional 10 to 15 seconds to stabilize. If the display does not stop flashing, the meter or electrode is defective.

## Measurement Considerations

- If the meter appears to be locked (display frozen), the Data Hold mode may have been inadvertently accessed. Press the MODE button or turn OFF the meter and restart.
- If the meter is still locked, remove the batteries, press the power button for 10 seconds, and reinsert the batteries.
- When the batteries are removed, all stored readings will be erased, and the pH calibration data will be cleared (factory calibration will be retained).



# Battery Replacement

1. Remove the battery cap by turning it counterclockwise while applying downward pressure.
2. Replace the four (4) 2032 batteries observing correct polarity.
3. Secure the battery compartment cap before use.



## Battery Safety

- Remove and immediately recycle or dispose of used batteries according to local regulations, keeping the batteries away from children. Do NOT dispose of batteries in household trash or incinerate.
- Even used batteries can cause severe injury or death.
- Call a local poison control center for treatment information.
- This unit contains four (4) CR2032, 3.0 V, lithium batteries.
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, heat above 122°F (50°C), or incinerate. Doing so may result in injury due to venting, leakage, or explosion resulting in chemical burns.
- Ensure that the batteries are installed correctly according to correct polarity (+ and -).
- Do not mix old and new batteries, different brands or types of batteries, such as Alkaline, carbon-zinc, or rechargeable batteries.
- Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, keeping the batteries away from children.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time, according to local regulations.

 <b>WARNING</b>	
<ul style="list-style-type: none"><li>• <b>INGESTION HAZARD</b> : This product contains a button cell or coin battery.</li><li>• <b>DEATH</b> or serious injury can occur if ingested.</li><li>• A swallowed button cell or coin battery can cause <b>Internal Chemical Burns in as little as 2 hours.</b></li><li>• <b>KEEP</b> new and used batteries <b>OUT OF REACH</b> of <b>CHILDREN.</b></li><li>• <b>Seek immediate medical attention</b> if a battery is suspected to be swallowed or inserted inside any part of the body.</li></ul>	

## ***pH Electrode Refilling (pH110/115 refillable electrode only)***

The refillable electrode does not need to be detached from the body of the ExStik when refilling. The refillable electrode (PH115) has a removable reference junction (slotted) and the word REFILLABLE is printed on the side.

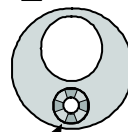
### **Removing the Reference Junction**

The removal tool supplied with the PH113 Refill Kit is used to remove the reference junction screw from the sensing surface of the electrode. If the reference junction does not have slots to accommodate the removal tool 'teeth', then the electrode is NOT refillable.

Holding the electrode upside down, unscrew and remove the reference junction using the removal tool.




**Junction removal tool**



**Reference junction**

### **Filling the Electrode**

1. Once the reference junction  is removed, gently shake all the older refill solution from the electrode.
2. Fill the electrode cavity completely with the refill solution that is supplied with the kit.
3. Replace the reference junction using the removal/installation tool (spare junctions are provided).

### **Filling Solution**

The supplied container includes 15 ml of filling solution. There is sufficient solution for 4 or 5 refills. Use only the supplied solution when refilling the electrode.

## Specifications

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Display	Multifunction LCD with bar graph
Operating conditions	32 to 122°F (0 to 50°C) / < 80% RH
Range and accuracy	0.00 to 14.00 / $\pm 0.01$ pH typical
Temp. compensation	Automatic from 32 to 194°F (0 to 90°C)
Temperature range	23 to 194°F (-5 to 90°C)
Temperature resolution	0.1° up to 99.9 then 1° thereafter
Temperature accuracy	$\pm 1.8^\circ\text{F}$ (1.0°C), from 23 to 122°F (-5 to 50°C) $\pm 5.4^\circ\text{F}$ (3.0°C), from 122 to 194°F (50 to 90°C)
Measurement memory	15 numbered readings
Power	Four (4) CR2032 button batteries
Low battery indication	' <b>BAT</b> ' appears
Auto power off (APO)	After 10 minutes of inactivity
Dimensions	1.4 x 6.8 x 1.6 in. (35.6 x 172.7 x 40.6 mm)
Weight	3.85 oz. (110 g)

## Optional Accessories

- Tripak buffers: 4, 7 & 10 pH capsules (6 each), two rinsing solutions (PH103)
- pH 4.01 buffer, pint (PH4-P)
- pH 7.00 buffer, pint (PH7-P)
- pH 10.00 buffer, pint (PH10-P)
- Spare pH electrode, non-refillable (PH105)
- Spare pH electrode, refillable (PH115)
- Electrode refill solution (PH113)
- Spare ORP electrode (RE305)
- Spare chlorine electrode (CL205)

**Note:** If the meter is to be converted for ORP or chlorine use, obtain the appropriate electrode.

## ***Two-year Warranty***

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*Teledyne FLIR warrants this Extech brand instrument to be free of defects in parts and workmanship for two years from date of shipment. To view the full warranty text please visit:*

<https://www.flir.com/support-center/warranty/instruments/extech-product-warranty/>

## ***Calibration and Repair Services***

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Teledyne FLIR offers calibration and repair services for the Extech brand products we sell. We offer NIST traceable calibration for most of our products.

## ***Customer Support***

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Local Telephone Support List: <https://support.flir.com/contact>

Return Material Authorization (RMA): <https://customer.flir.com/Home>

Customer Service: <https://support.flir.com/ContactService>

Technical Support: <https://support.flir.com>

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