

# Operation Manual

## PTBTX2™ APP

*For use with ULTRAPENx2™ Pocket Testers  
(with Comm Firmware 2.x)  
and Your iOS™ or Android™ Mobile Devices*



**MYRON L<sup>®</sup>**  
**COMPANY**  
Water Quality Instrumentation  
Accuracy • Reliability • Simplicity

***PLEASE NOTE:***

Because of our commitment to product improvement, the substance and style of this manual may change. When changes are made, the updated manual is posted for download in PDF format from the Myron L<sup>®</sup> Company Website: **[www.myronl.com](http://www.myronl.com)**.

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## INTRODUCTION

The Myron L<sup>®</sup> Company ULTRAPENX2, Bluetooth<sup>®</sup> enabled pocket testers are designed to be extremely accurate, fast and simple to use in diverse water quality applications when paired with a mobile device. A free App provides easy-to-read displays and user-intuitive Graphical User Interface (GUI). The Bluetooth wireless connection means that there are no bothersome wires getting in the way when moving quickly between samples and that the paired mobile device can be located safely away from liquids.

Advanced features include: Automatic temperature compensation; stable microprocessor-based circuitry and a rugged, waterproof housing.

Available Models:

- PTBT1 – Conductivity, Total Dissolved Solids (TDS), Salinity, and Temperature measurement.
- PTBT2 – pH and Temperature measurement.
- PTBT3 – ORP & Temperature measurement.
- PTBT4 – Free Chlorine Equivalent (FC<sup>E™</sup>) & Temperature measurement.
- PTBT5 – Dissolved Oxygen & Temperature measurement.
- PTBT6 – Nitrate (as NO<sub>3</sub><sup>-</sup>-N or NO<sub>3</sub><sup>-</sup>), mV and Temperature measurement.

Using the mobile device's touch screen:

- Initiate Measurements and Calibrations.
- Each ULTRAPENX2 can be given a unique name so it is easily identifiable no matter what mobile device is used with it.
- Measurement locations can be programmed as:
  - GPS locations that are automatically selected when the user is close to a specific measurement local, or;
  - Non-GPS locations for applications where test sites are too close together for the GPS to differentiate.
- Measurements can be saved to the mobile device's memory including measurement data, ULTRAPENX2 settings, date and time, sample temperature, ULTRAPENX2 name and measurement location.
- Records can be exported via the mobile device's email function as either .csv, .xls, or .xlsx formatted files.
- Recorded measurements can be sorted and filtered to select a subset of records that can then be emailed or deleted without affecting other records stored in memory.



**WARNING!** These products can expose you to chemicals including Di(2-ethylhexyl) phthalate (DEHP), which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

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*App Store® is a registered trademark of Apple, Inc.*

*Android™ and Google Play™ are trademarks of Google Inc.*

*Bluetooth® is a registered trademark of Bluetooth SIG Inc.*



## 1. General Statements:

- Throughout this manual the term “menu” will be used for any list of options presented to the user, including:
  - Android Context Menus.
  - iOS Picker Wheels.

## 2. Minimum System Requirements:

Mobile device running:

- Apple iOS 10.0 or later.
- Android™ OS 7.0 or later.

## 3. To Download the Mobile App:

PTBTX2™ is a free App.



On the



- If the App store search feature doesn't find this App, make sure your App Store search parameters are set to search for iPhone Apps and **NOT** iPad apps.
  - Although this is classified as an iPhone App, it has been fully tested on and runs on all Apple iOS devices, including iPad and iPad Mini.
- Tap the **+GET** button.
- Tap the **INSTALL** button.



On the



- Tap the App icon.
- Tap the **INSTALL** button.

# ULTRAPENx2 INSTRUMENTS – FEATURES AND SPECIFICATIONS

This section describes:

- Basic Features and Layout of the ULTRAPENx2 pocket testers.

## 4. ULTRAPENx2 PTBT1

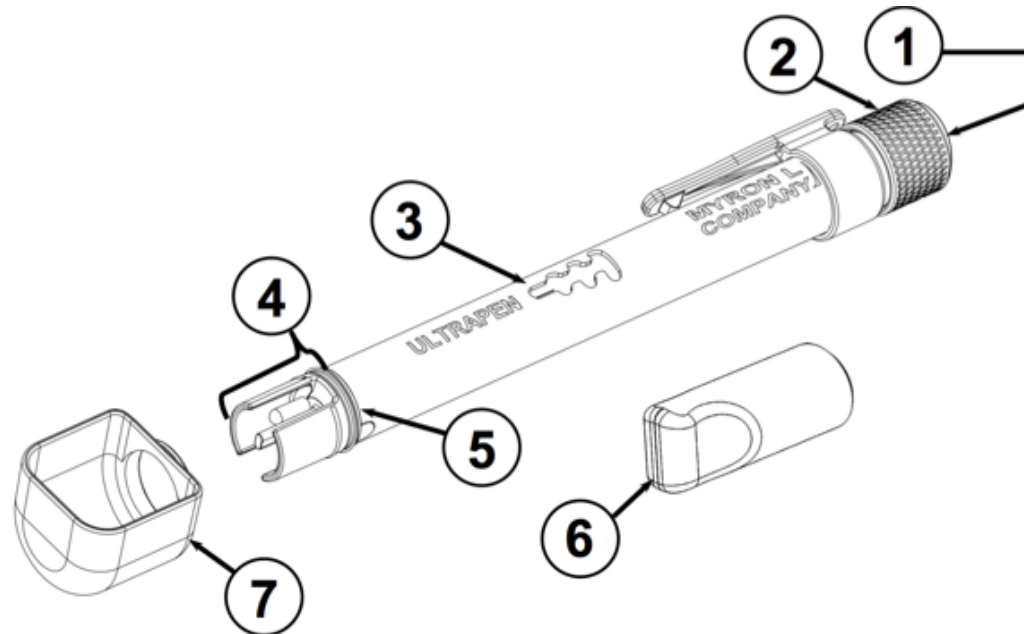


Figure 4-1

### PTBT1 (Conductivity, TDS and Salinity) Features

1. **Pen Button** – Press to turn ON and place it in Standby mode.
2. **Battery Cap** – Unscrew to change battery.
3. **LED Indicator** – Flashes rapidly when the PTBT1 is measuring and once every 5 seconds when the PTBT1 is in Standby mode.
4. **Conductivity Cell** – Includes electrodes that inject electrical current into test sample and contains flux field in a defined area to accurately measure conductivity.
5. **Cap Stop** – Pushing the protective cap beyond the cap stop may damage the cell.
6. **Protective Cap** – Protects the cell from damage while not in use.
  - To remove the cap, wiggle it side to side while pulling gently.
7. **Scoop** – Contains sample solution for measurement when sampling from a vertical stream. Refer to the section titled “Using the Scoop”.

## 5. ULTRAPENx2 PTBT2

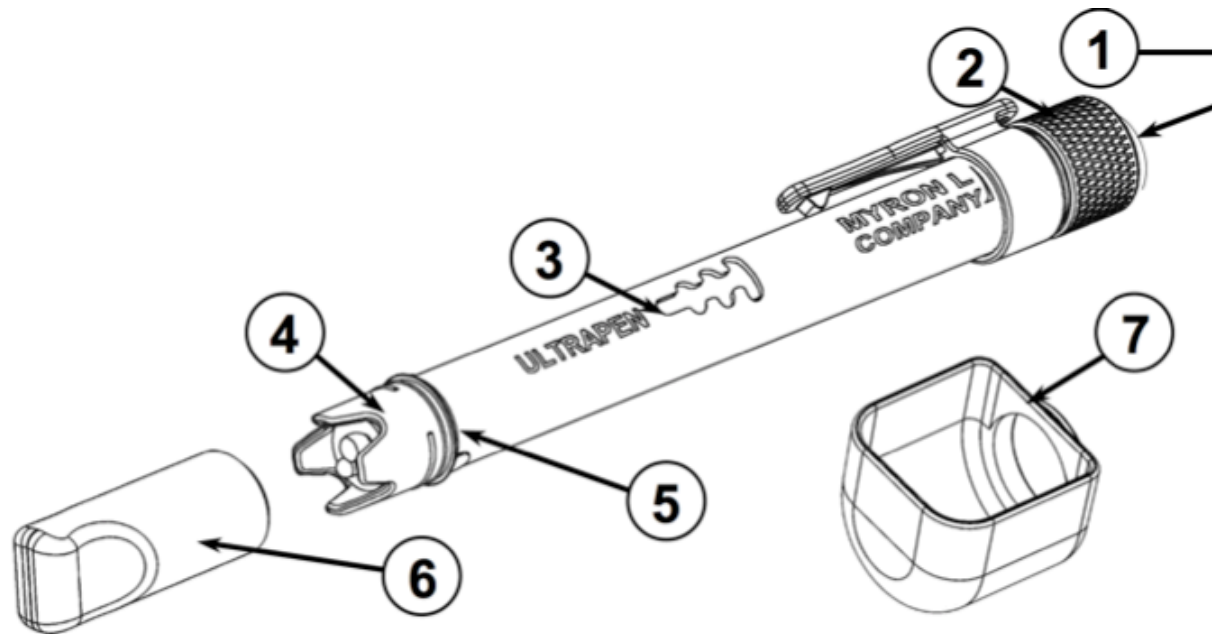


Figure 5-1

### PTBT2 (pH and Temperature) Features

1. **Pen Button** – Press to turn PTBT2 ON and place it in Standby mode.
2. **Battery Cap** – Unscrew to change battery.
3. **LED Indicator Light** – Flashes rapidly when the PTBT2 is measuring and once every 5 seconds when the PTBT2 is in Standby mode.
4. **pH Sensor** – Includes pH sensor to measure hydrogen ion concentration of solution and thermistor to measure temperature.
5. **Cap Stop** – Pushing the protective cap beyond the cap stop may damage the sensor.
6. **Protective / Hydration Cap** – Protects the sensor from damage and holds MLC Storage Solution to preserve the sensor functionality.
  - To remove the cap, wiggle it side to side while pulling gently on the cap.
  - Use caution not to spill solution or accidentally pull the sensor from the PTBT2 body.
  - To replace, fill the cap half full ONLY with storage solution. Wiggle the cap side to side while pushing it onto the PTBT2.
    - Be careful, excess solution may squirt out.
7. **Scoop** – Contains sample solution for measurement when sampling from a vertical stream. Refer to the section titled “Using the Scoop”.

**NOTE:** The formation of KCl crystals around the Protective/Hydration cap is normal and will not affect the sensor life, performance, or accuracy provided they are rinsed off with water prior to use.

## 6. ULTRAPENx2 PTBT3

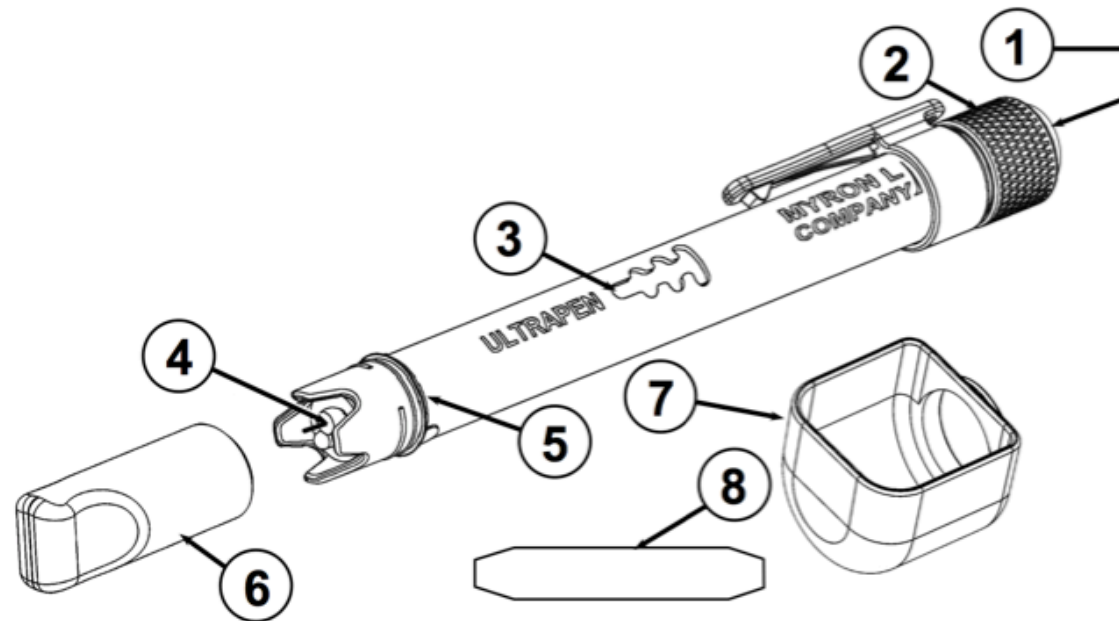


Figure 6-1

### PTBT3 (Oxidation-Reduction Potential and Temperature) Features

1. **Pen Button** – Press to turn PTBT3 ON and place it in Standby mode.
2. **Battery Cap** – Unscrew to change battery.
3. **LED Indicator Light** – Flashes rapidly when the PTBT3 is measuring and once every 5 seconds when the PTBT3 is in Standby mode.
4. **ORP Sensor** – Measures Oxidation-Reduction Potential or redox of solution.
5. **Cap Stop** – Pushing the protective cap beyond the cap stop could damage the sensor.
6. **Protective / Hydration Cap** – Protects sensor from damage and holds MLC Storage Solution to preserve the sensor functionality.
  - To remove the cap, wiggle it side to side while pulling gently.
  - Use caution not to spill solution or accidentally pull the sensor from the PTBT3 body.
  - To replace, fill the cap half full ONLY with storage solution. Wiggle the cap side to side while pushing it onto the PTBT3.
    - Be careful, excess solution may squirt out.
7. **Scoop** – Contains sample solution for measurement when sampling from a vertical stream. Refer to the section titled “Using the Scoop”.
8. **ORP Electrode Cleaning Paper** – Used for deep cleaning the platinum electrode.
  - The sensor must be reconditioned after deep cleaning (see Section 71 below).

## 7. ULTRAPENx2 PTBT4

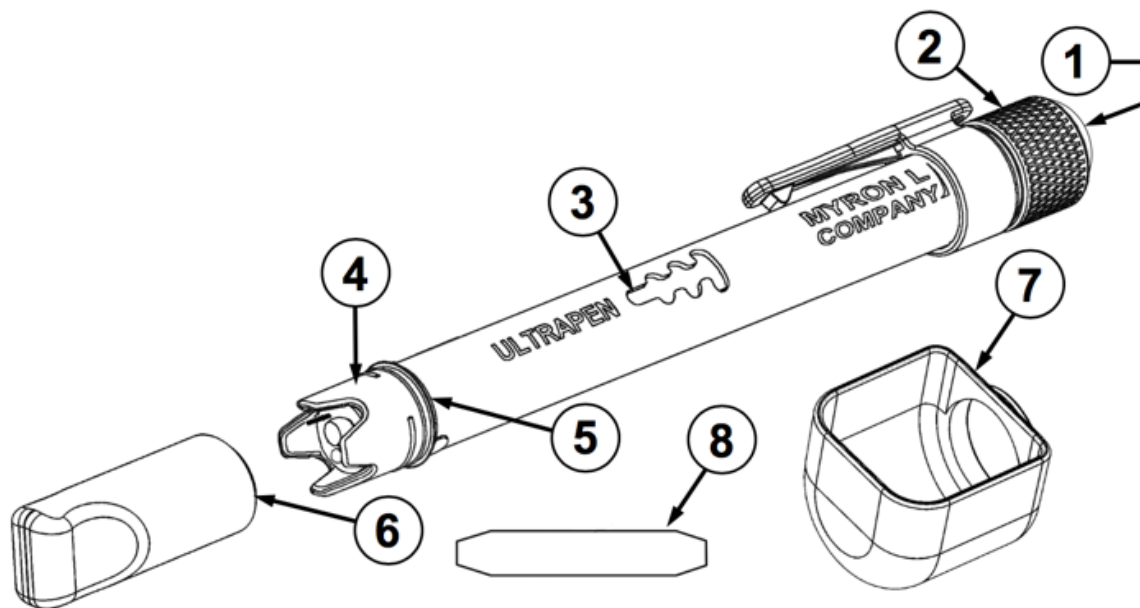


Figure 7-1

### PTBT4 (Free Chlorine Equivalent and Temperature) Features

1. **Pen Button** – Press to turn PTBT4 ON and place it in Standby mode.
2. **Battery Cap** – Unscrew to change battery.
3. **LED Indicator Light** – Flashes rapidly when the PTBT4 is measuring and once every 5 seconds when the PTBT4 is in Standby mode.
4. **FC<sup>E</sup> Sensor** – A combination pH and ORP sensor for measuring Free Chlorine Equivalent FC<sup>E</sup> and a thermistor for Temperature measurement.
5. **Cap Stop** – Pushing the protective cap beyond the cap stop could damage the sensor.
6. **Protective / Hydration Cap** Protects sensor from damage and holds MLC Storage Solution to preserve the sensor functionality.
  - To remove the cap, wiggle it side to side while pulling gently.
  - Use caution not to spill solution or accidentally pull the sensor from the PTBT4 body.
  - To replace, fill the cap half full ONLY with storage solution. Wiggle the cap side to side while pushing it onto the PTBT4.
    - Be careful, excess solution may squirt out.
7. **Scoop** – Contains sample solution for measurement when sampling from a vertical stream. Refer to the section titled “Using the Scoop”.
8. **Electrode Cleaning Paper** – Used for deep cleaning the platinum ORP electrode.
  - The sensor must be reconditioned after deep cleaning similarly to the ORP sensor of the PTBT3 (see Section 71 below).

## 8. ULTRAPENx2 PTBT5

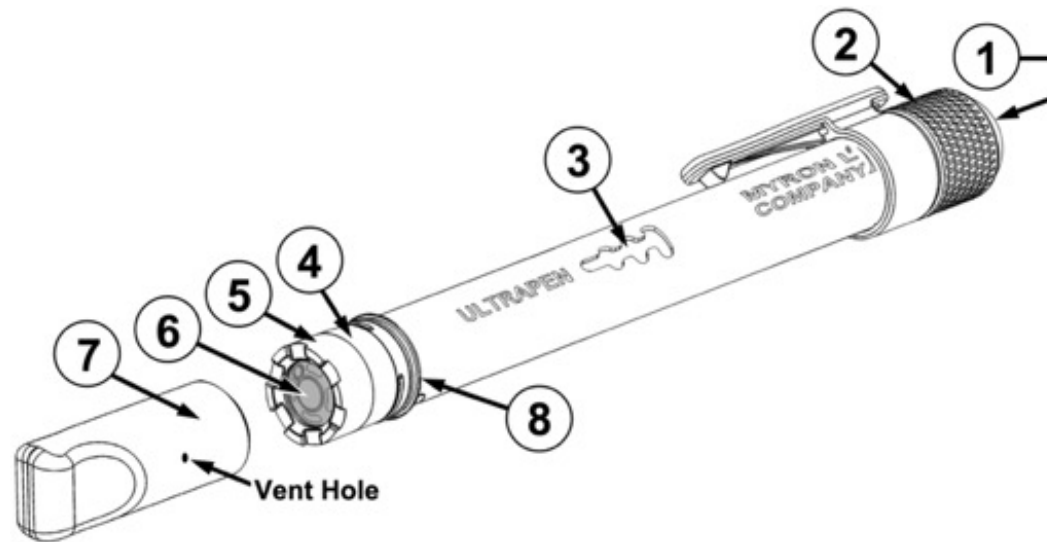


Figure 8-1

### PTBT5 (Dissolved Oxygen and Temperature) Features

1. **Pen Button** – Press to turn PTBT5 ON and place it in Standby mode.
2. **Battery Cap** – Unscrew to change battery.
3. **LED Indicator Light** – Flashes rapidly when the PTBT5 is measuring and once every 5 seconds when the PTBT5 is in Standby mode.
4. **DO sensor Body** – Contains electrodes and reagent for Dissolved Oxygen and Temperature measurements.
5. **DO Sensor Cap** – Holds replaceable DO sensor membrane in place.
6. **DO Membrane**– Permeable Membrane through which Dissolved Oxygen passes.
7. **Protective / Hydration Cap** – Protects sensor from damage and holds water-saturated air when performing an AIR calibration.
  - To remove the cap, wiggle it side to side while pulling gently.
  - Use caution not to spill solution or accidentally pull the sensor from the PTBT5 body.
  - Short Term Storage ( ≤ 1 month):
    - The sensor should be kept moist with the hydration cap containing a sponge moistened with DI, RO or distilled water.
    - Replace cap by wiggling it side to side while pushing it onto the PTBT5. **DO NOT TWIST!**
  - Long Term Storage ( > 1 month):
    - See Section 73 below.
8. **Cap Stop** – Pushing the protective cap beyond the cap stop could damage the sensor.

## 9. ULTRAPENx2 PTBT6

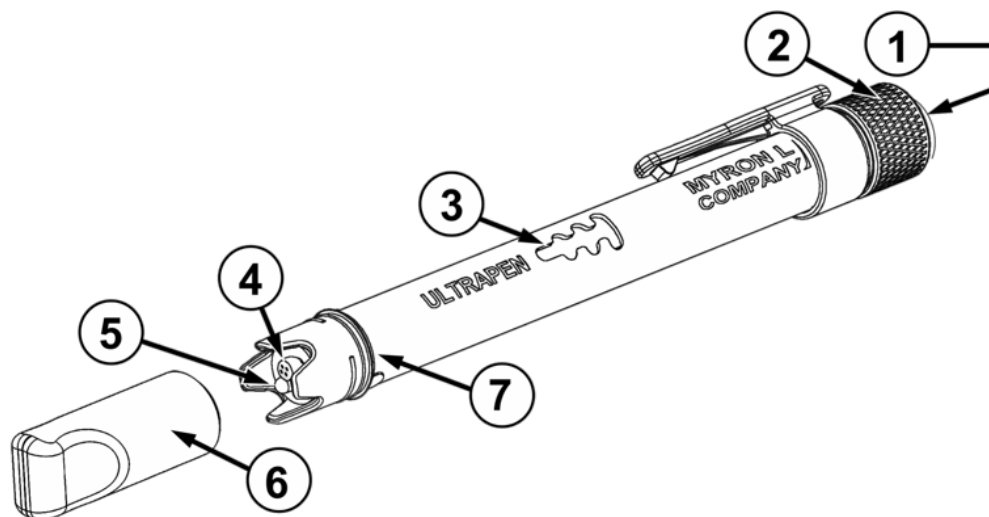


Figure 9-1


### PTBT6 (Nitrate and Temperature) Features

1. **Pen Button** – Press to turn PTBT6 ON and place it in Standby mode.
2. **Battery Cap** – Unscrew to change battery.
3. **LED Indicator Light** – Flashes rapidly when the PTBT6 is measuring and once every 5 seconds when the PTBT6 is in Standby mode.
4. **ISE ELECTRODE** – Contains the Nitrate ISE membrane.
5. **THERMISTOR** – Measures temperature of sample solution.
6. **Protective Cap** – Protects sensor from damage and holds prepared 100 ppm reference solution to preserve the sensor functionality when stored for a short time.
  - To remove the cap, wiggle it side to side while pulling gently.
  - Use caution not to spill solution or accidentally pull the sensor from the PTBT6 body.
  - Short term storage ( $\leq 3$  days):
    - Keep the sensor in the protective cap filled half-full with 100 ppm referenced solution.
      - **DO NOT** store the PTBT6 with the cap filled with reference solution mixed with Nitrate Interference Suppression Buffer (NISBSOL).
    - Replace cap by wiggling it side to side while pushing it onto the PTBT6
      - Be careful, excess solution may squirt out.
  - Long term storage ( $> 3$  days):
    - See Section 74 below.
7. **Cap Stop** – Pushing the protective cap beyond the cap stop could damage the sensor.

## 10. Specification Tables

**Table 1: PTBT1 (Conductivity, TDS, Salinity) Specifications**

*The PTBTX2 App requires a mobile device running either iOS 10.0 or later; or Android 7.0 or later.*


Measurement Range:	1 - 9999 $\mu$ S or ppm (0.0010 - 9.999 ppt salinity)
Accuracy (After Wet Calibration):	$\pm$ 1% of reading
Repeatability:	< 1000 $\mu$ S or ppm $\pm$ 1 Count $\geq$ 1000 $\mu$ S or ppm $\pm$ 0.3% of reading
Resolution:	Conductivity and TDS: 0.1 for 1.0 - 99.9 $\mu$ S or ppm; 1 for 100 - 9999 $\mu$ S or ppm Salinity: 0.0001 for 0.0010 - 0.0999 ppt; 0.001 for 0.100 - 9.999 ppt Temperature: 0.1 $^{\circ}$ C or $^{\circ}$ F
Time to Reading Stabilization:	10 - 20 seconds
Power Consumption:	Active Mode: 30 – 140 mA Sleep Mode: 2 $\mu$ A
Temperature Measurement Range:	0 – 71 $^{\circ}$ C or 32 – 160 $^{\circ}$ F
Temperature Accuracy:	$\pm$ 0.1 $^{\circ}$ C
Temperature Compensation:	Automatic to 25 $^{\circ}$ C
Physical Dimensions:	17.15 cm L x 1.59 cm D or 6.75 in. L x .625 in. D
Weight:	54 g or 1.9 oz.
Case Material:	Anodized Aircraft Aluminum with Protective Coating
Battery Type:	One N-type, Alkaline, 1.5 V
Calibration Solutions:	1800 $\mu$ S KCl; 3000 ppm 442 <sup>TM</sup> (2027 ppm NaCl) Reference Solutions
Operating/Storage Temperature:	0 – 55 $^{\circ}$ C or 32 – 131 $^{\circ}$ F
Enclosure Rating:	IP67 and NEMA 6
 EN61236-1: 2006 - Annex A: 2008	Electrostatic discharge to case of instrument may cause PTBT1 to spontaneously power on. In this case, the PTBT1 will power off after several seconds.
FCC ID: T7VPAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in FCC public Notice DA00-1407.
Canada (IC), license: IC: 216Q-PAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in RSS-GEN.



# Operation Manual – ULTRAPENx2 Instruments – Features and Specifications

**Table 2: PTBT2 (pH) Specifications**


*The PTBTX2 App requires a mobile device running either iOS 10.0 or later; or Android 7.0 or later.*

Measurement Range:	0.00 – 14.00 pH
Accuracy (After Wet Calibration):	± 0.01 pH
Repeatability:	± 0.01 pH
Resolution:	0.01 pH; Temperature: 0.1 °C or 0.1 °F
Time to Reading Stabilization:	10 - 30 seconds
Power Consumption:	Active Mode: 30-140 mA Sleep Mode: 2 µA
Temperature Measurement Range:	0 – 71 °C or 32 – 160 °F
Temperature Accuracy:	± 0.1 °C
Temperature Compensation:	Automatic to 25 °C
Physical Dimensions:	17.15 cm L x 1.59 cm D or 6.75 in. L x .625 in. D
Weight:	54 g or 1.9 oz.
Case Material:	Anodized Aircraft Aluminum with Protective Coating
Battery Type:	One N-type, Alkaline, 1.5 V
Calibration Solutions:	4.0 pH, 7.0 pH and 10.0 pH Buffer Solutions
Operating/Storage Temperature:	0 – 55 °C or 32 – 131 °F
Enclosure Rating:	IP67 and NEMA 6
 EN61236-1: 2006 - Annex A: 2008	Electrostatic discharge to case of instrument may cause the PTBT2 to spontaneously power on. In this case, the PTBT2 will power off after several seconds.
FCC ID: T7VPAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in FCC public Notice DA00-1407.
Canada (IC), license: IC: 216Q-PAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in RSS-GEN.

# Operation Manual – ULTRAPENx2 Instruments – Features and Specifications

**Table 3: PTBT3 (ORP) Specifications**


*The PTBTX2 App requires a mobile device running either iOS 10.0 or later; or Android 7.0 or later.*

Measurement Range:	-1000mV to +1000mV
Accuracy (After Wet Cal):	± 10 mV
Resolution:	ORP: 1 mV Temperature: 0.1 °C or 0.1 °F
Time to Reading Stabilization:	10 - 45 seconds
Power Consumption:	Active Mode 30-140 mA Sleep Mode 2 µA
Temperature Measurement Range:	0 – 71 °C or 32 – 160 °F
Temperature Accuracy:	± 0.1 °C
Temperature Compensation:	Automatic in Calibration Mode From 15 °C to 30 °C
Physical Dimensions:	17.15 cm L x 1.59 cm D or 6.75 in. L x .625 in. D
Weight:	54 g or 1.9 oz.
Case Material:	Anodized Aircraft Aluminum with Protective Coating
Battery Type:	One N-type, Alkaline 1.5 V
Calibration Solutions:	80.0 mV Quinhydrone, 260.0 mV Quinhydrone or 470.0 mV Light's Solution
Operating/Storage Temperature:	0 – 55 °C or 32 – 131 °F
Enclosure, Rating:	IP67 and NEMA 6
 EN61236-1: 2006-Annex A: 2008;	Electrostatic discharge to case of instrument may cause PTBT3 to spontaneously power on. In this case, the PTBT3 will power off after several seconds.
FCC ID: T7VPAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in FCC public Notice DA00-1407.
Canada (IC), license: IC: 216Q-PAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in RSS-GEN.

# Operation Manual – ULTRAPENx2 Instruments – Features and Specifications


**Table 4: PTBT4 (FC<sup>E</sup>) Specifications**

*The PTBTX2 App requires a mobile device running either iOS 10.0 or later; or Android 7.0 or later.*

Measurement Range:	0.00 ppm – 10.00 ppm
FC <sup>E</sup> Accuracy	5.00 ppm ±0.3 ppm, ≥ 5.00ppm ±0.5 ppm
Resolution:	FC <sup>E</sup> : 0.01 ppm    Temperature: 0.1 °C or 0.1 °F
Time to Stable Reading:	10 – 120 seconds
Power Consumption:	Active Mode 30 – 140 mA, Sleep Mode 2 µA
Temperature Measurement Range:	0 – 71 °C or 32 – 160 °F
Temperature Accuracy:	± 0.1 °C
Temperature Compensation:	Automatic in Calibration Mode From 15 °C to 30 °C
Physical Dimensions:	17.15 cm L x 1.59 cm D or 6.75 in. L x .625 in. D
Weight:	54 g or 1.9 oz.
Case Material:	Anodized Aircraft Aluminum with Protective Coating
Battery Type:	One N-type, Alkaline 1.5 V
Calibration Standard Solutions:	pH: 4.0 pH, 7.0 pH and/or 10.0 pH Buffer Solutions ORP: 80.0 mV Quinhydrone, 260.0 mV Quinhydrone or 470.0 mV Light's Solution
Operating/Storage Temperature:	0 – 55 °C or 32 – 131 °F
Enclosure, Rating:	IP67 and NEMA 6
 EN61236-1: 2006-Annex A: 2008;	Electrostatic discharge to case of instrument may cause PTBT4 to spontaneously power on. In this case, the PTBT4 will power off after several seconds.
FCC ID: T7VPAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in FCC public Notice DA00-1407.
Canada (IC), license: IC: 216Q-PAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in RSS-GEN.

**Table 5: PTBT5 (DO) Specifications**


*The PTBTX2 App requires a mobile device running either iOS 10.0 or later; or Android 7.0 or later.*

	<b>DO Concentration</b>	<b>DO Saturation</b>	<b>Temperature</b>
<b>Ranges</b>	0-20 ppm	0-200%	0-71°C / 32-160°F
<b>Accuracy<sup>1</sup></b>	±0.2 ppm or ±2% of the reading, whichever is greater (up to 40°C)	0.0% to ≤ 100.0%: ± 20 counts; >100%: ± 2% of the reading.	± 0.1°C
<b>Resolution</b>	0.01 ppm	0.1%	0.1°C/F
Altitude Adjustment:	0 ft. to 15,000 ft. in increments of 100 ft.		
Salinity Adjustment:	0 - 50 ppt in increments of 1 ppt		
Time to Reading Stabilization:	10 - 180 seconds		
Power Consumption:	Active Mode: 30 - 140 mA Sleep Mode: 2 µA		
Temperature Compensation for Membrane permeability	Temperature Compensation for Membrane permeability: Automatic		
Physical Dimensions:	17.15 cm L x 1.59 cm D or 6.75 in. L x .625 in. D		
Weight:	54 g or 1.94 oz.		
Case Material:	Case Material: Anodized Aircraft Aluminum with Protective Coating		
Battery Type:	N type, Alkaline 1.5 V		
Calibration Methods:	Water Saturated <b>AIR</b> or Air Saturated <b>WATER</b> or Zero DO ( <i>with DOSOL Calibration Solution</i> )		
Operating / Storage Temperature:	0-55°C / 32-131°F		
Enclosure, Rating:	IP67 and NEMA 6		
 EN61236-1: 2006-Annex A: 2008;	Electrostatic discharge to case of instrument may cause PTBT5 to spontaneously power on. In this case, the PTBT5 will power off after several seconds.		
FCC ID: T7VPAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in FCC public Notice DA00-1407.		
Canada (IC), license: IC: 216Q-PAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in RSS-GEN.		
<sup>1</sup> Accuracy after Temperature Controlled, Full Calibration.			

# Operation Manual – ULTRAPENx2 Instruments – Features and Specifications

**Table 6: PTBT6 (Nitrate) Specifications**

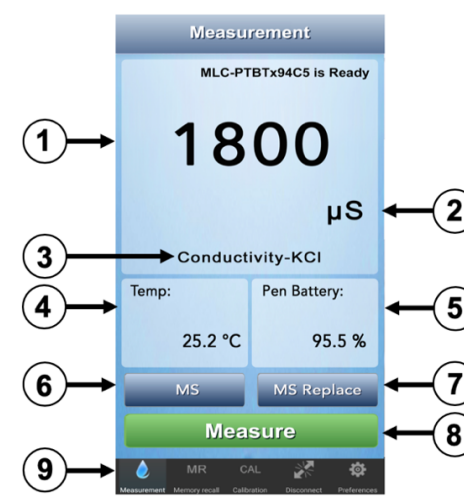
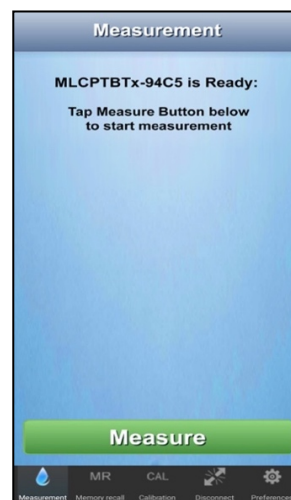
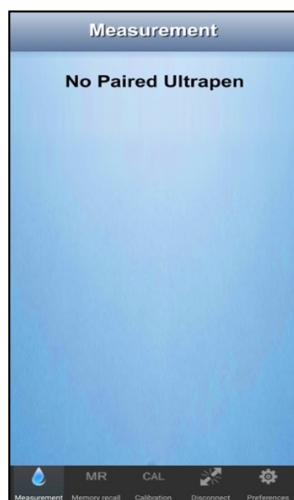
*The PTBTX2 App requires a mobile device running either iOS 10.0 or later; or Android 7.0 or later.*

	<b>NO<sub>3</sub><sup>-</sup> -N (nitrate as nitrogen)</b>	<b>NO<sub>3</sub><sup>-</sup> (nitrate)</b>	<b>Temperature</b>
<b>Ranges</b>	1-1400 ppm	4.4-6200 ppm	0-71°C / 32-160°F
<b>Accuracy<sup>1</sup></b>	±10% of the reading	±10% of the reading	± 0.1°C
<b>Resolution</b>	0.1 ppm	0.1 ppm	0.1°C/F
Time to Reading Stabilization:	10 - 180 seconds		
Power Consumption:	Active Mode: 30 - 140 mA, Sleep Mode: 2 µA		
Temperature Compensation	Temperature Compensation for Membrane permeability: Automatic		
Physical Dimensions:	17.15 cm L x 1.59 cm D or 6.75 in. L x .625 in. D		
Weight:	54 g or 1.94 oz.		
Case Material:	Case Material: Anodized Aircraft Aluminum with Protective Coating		
Battery Type:	N type, Alkaline 1.5 V		
Calibration Methods:	1 ppm, 10 ppm, 100 ppm and 1000 ppm Nitrate Reference Solutions		
Operating / Storage Temperature:	0-55°C / 32-131°F		
Enclosure, Rating:	IP67 and NEMA 6		
 EN61236-1: 2006-Annex A: 2008;	Electrostatic discharge to case of instrument may cause PTBT6 to spontaneously power on. In this case, the PTBT6 will power off after several seconds.		
FCC ID: T7VPAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in FCC public Notice DA00-1407.		
Canada (IC), license: IC: 216Q-PAN17	The Bluetooth transceiver device meets the requirements for modular transmitter approval as detailed in RSS-GEN.		
<sup>1</sup> Accuracy of measuring reference solutions after Temperature Controlled 2-Point Calibration with one order of concentration difference.			
<sup>2</sup> For extended life of the sensor, store the PTBT6 in a cool location (5-25°C). DO NOT FREEZE!			

# BASIC INTERFACE

## 11. Main Measurement Screen

The Measurement screen is the screen that appears when the App is Opened and the screen that displays the results of measurements.



1. If there is no Connected and Paired ULTRAPENx2, this screen will appear.

2. If this screen appears, press the PEN BUTTON on the back of the ULTRAPENx2 to wake it up.

3. When this screen appears, tap the GREEN **MEASURE** button to start a measurement.

4. This screen appears once a measurement is completed.

### KEY

1. **Measurement Value Field** – Displays the measured value of the solution.
2. **Units of Measure** – Displays correct units for chosen measurement type.
3. **Measurement type** – Displays the Measurement type (e.g. pH or ORP). For PTBT1 ONLY, it displays the Solution setting.
4. **Solution Temperature** – Measured temperature of the solution.
5. **ULTRAPENx2 Battery Level** – Displays the current charge level of the ULTRAPENx2's battery.
  - Flashes RED when ULTRAPENx2 battery is  $\leq 25\%$ .
  - Replace the battery **IMMEDIATELY!**
6. **Memory Store button (MS)** – Tap here to record the measurement in the App's database.
7. **Memory Replace button (MS REPLACE)** – Tap here to replace a previously stored measurement with data from a new measurement.
8. **Measure Button** – Appears when ULTRAPENx2 is ready to take a measurement. Tap this button to start a measurement.
9. **Feature Navigation Bar** – these buttons activate various App features.

## 12. Feature Navigation Bar

This bar appears at the bottom of all screens. The buttons in this bar are used to navigate between the various main functional sections of the application.

- The graphic of the button corresponding to the currently active functional section of the App will switch from WHITE to BLUE.



- The Feature Navigation Bar contains the following buttons:

### Measurement:

Tapping this button returns the application to the main Measurement screen.

### Memory Recall (MR):

Tapping this button opens a list of previously stored data records. This list may be used to:

- View individual data records.
- Add notes to data records.
- Sort and filter the list to only show specific sets of records.

### Calibration (CAL):



Tap this button to open the Calibration module of the App.

- ULTRAPENX2 Calibrations should always be performed using Myron L<sup>®</sup> Company standard solutions and Buffers.
  - Calibration constants derived from these calibrations are stored in the ULTRAPENX2's memory and are applied to subsequent measurements.
- Use the FAC CAL feature to erase stored calibration constants and return an ULTRAPENX2 to its original Factory Calibration settings.
  - FAC CAL does not account for changes in the cell's / sensor's current condition.

### Connect/Disconnect:

Tapping this button takes you to a screen that allows you to Pair / Unpair and Connect / Disconnect an ULTRAPENX2 to the App or change the pairing / connection to a different Ultra ULTRAPENX2 pen.

- This is a context sensitive button. Whenever an ULTRAPENX2 is currently connected and paired to the PTBTX2 App:
  - The button name changes to Disconnect.

- The Feature Navigation Bar button symbol changes from  to 

### Preferences:

Tapping this button opens the main Settings section of the App where the user is able to:

- Change settings for the currently Connected / Paired ULTRAPENx2 including:
  - Rename it.
  - Select a Solution(only applies to PTBT1).
  - Select LIVE or HOLD Measurement(only applies to PTBT2 though PTBT6).
  - Displays the ULTRAPENx2 firmware revision.
- Set application preferences, including (this does not require an active connection to an ULTRAPENx2):
  - Override the mobile device's Screen Lock or Sleep **ONLY** while the PTBTX2 App is active.
    - This DOES NOT change the native setting of the mobile device.
    - When the PTBTX2 App is closed or inactive, the mobile device's screen lock feature will function normally.
  - Program measurement locations.
  - Select a file format for emailing/exporting data.
  - Select date and time formats.
  - Chose which version of the ULTRAPENx2 you wish the Demo Pen feature to emulate.
  - Choose between displaying Temperature data as either °C or °F.
- Access Help files by opening the device's default browser and opening the Myron L<sup>®</sup> Company web page where they can be found.
- Access the About page (displays the current revision of the PTBTX2 App).



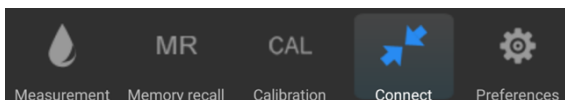
## PAIRING TO AND UNPAIRING FROM AN ULTRAPENX2

**WARNING!** Each ULTRAPENX2 can only be connected and paired to ONE mobile device at a time!

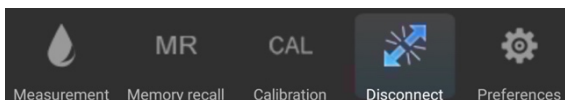
- ALWAYS disconnect / unpair from the current mobile device BEFORE connecting / pairing to another mobile device.
  - It is not necessary to delete the ULTRAPENX2 from the Connect / Disconnect screen.

### 13. Connect / Disconnect Screen

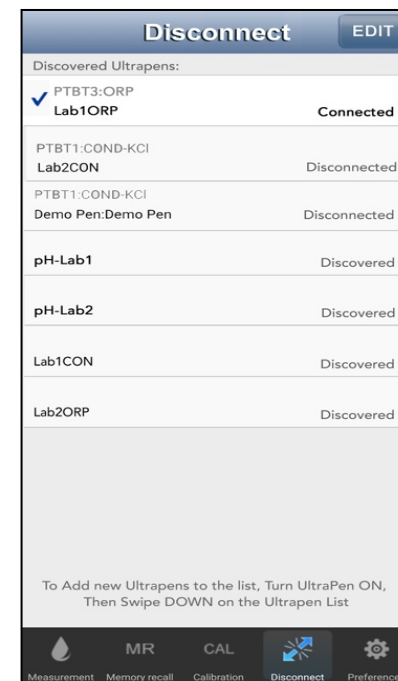
The Feature Navigation Bar includes a **CONNECT** button. Tapping this button opens a screen that is used to pair the ULTRAPENX2 pen with the mobile device and connect it to the App.



- The label and graphic of this button as well as the title of the screen will switch to say **DISCONNECT** when an ULTRAPENX2 is currently paired to the App.



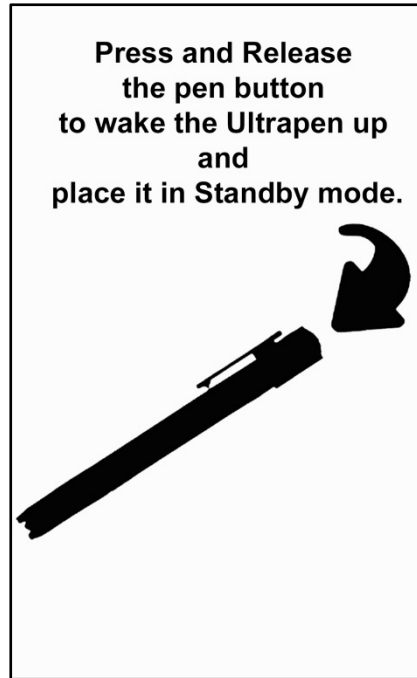
- This screen lists:
  - The Demo Pen: This is a simulated ULTRAPENX2 that can be used to explore the Features and Functions of the App without having to connect to an actual ULTRAPENX2.
  - The currently **Connected** / **Paired** ULTRAPENX2.
  - **Disconnected**: ULTRAPENX2's that have previously been, but no longer are connected and paired to the App.
  - **Discovered**: ULTRAPENX2's that have been found by the App, but have not yet been connected and paired.



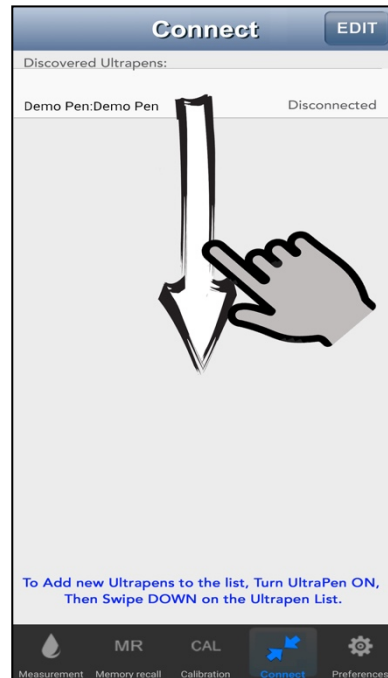
## 14. Pairing an ULTRAPENx2 to the Mobile Device

To pair and connect the ULTRAPENx2 to your mobile device:

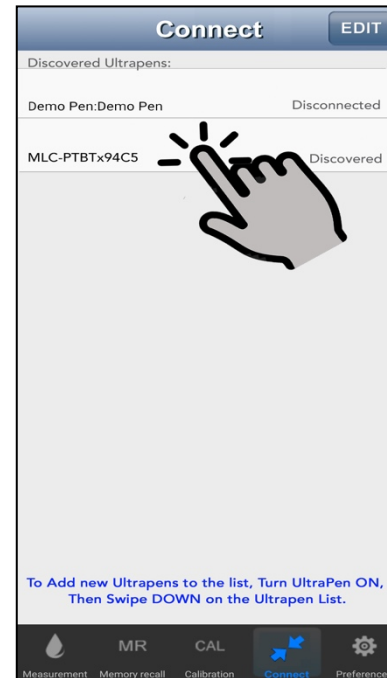
1. Make sure that the ULTRAPENx2 to which you wish to pair is not paired to any other mobile device.



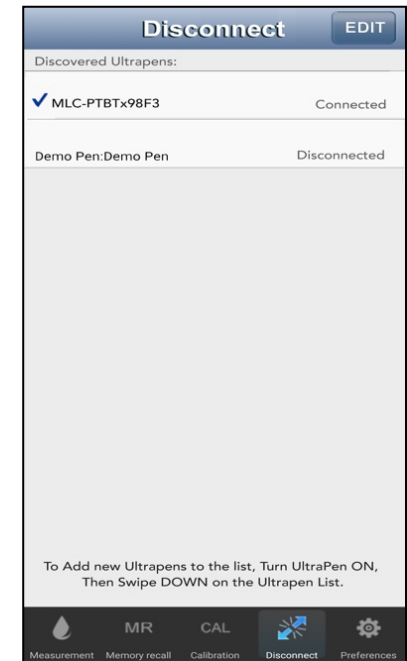
2. Turn the ULTRAPENx2 on then tap the **CONNECT** / **DISCONNECT** button on the Feature Navigation Bar.



3. Swipe DOWN on the Connect / Disconnect screen.  
The New ULTRAPENx2 will appear on the List.  
A green gem may appear to the left of the ULTRAPENx2's Name, indicating the Pen is awake and in Standby mode.



4. Tap the Line showing the New ULTRAPENx2.

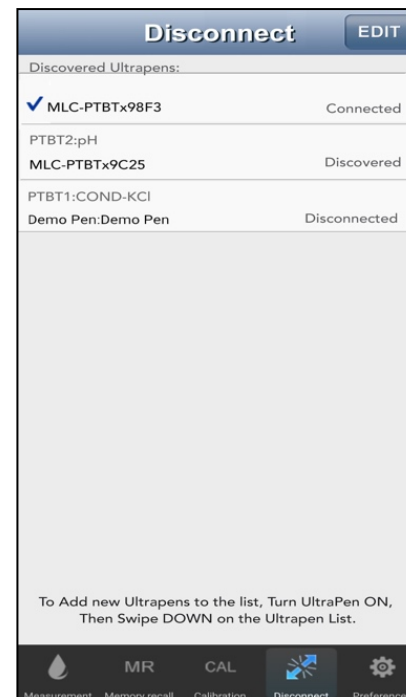
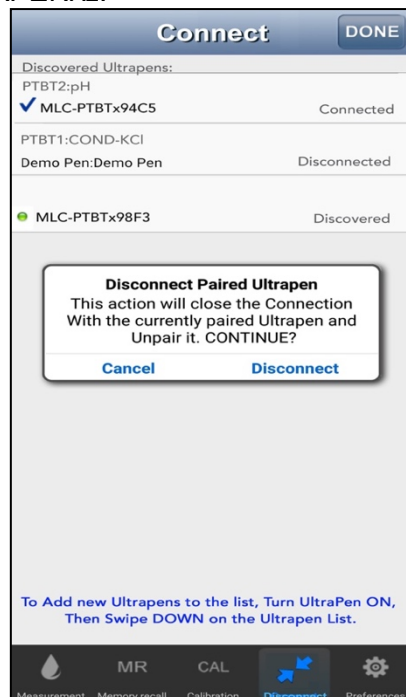
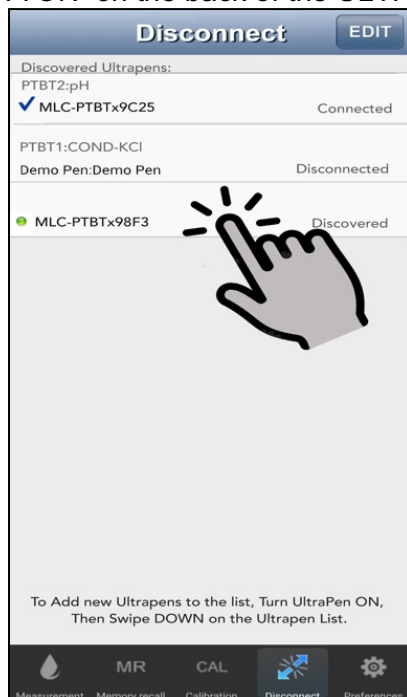
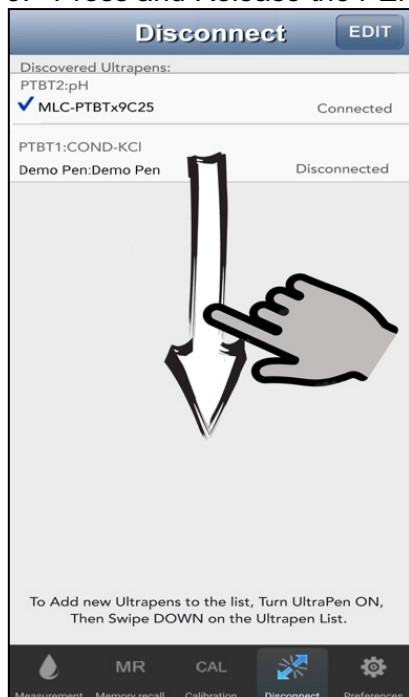


5. When the Connection Process is completed; the ULTRAPENx2 will move to the top of the list.  
Its status will change to "Connected".  
A blue checkmark will appear next to the Pen Name.

**NOTE:** If this is the first time this ULTRAPENx2 has been connected to this mobile device, the Pen Type may not appear until **AFTER** a measurement or calibration is performed with the ULTRAPENx2.

## 15. Switching to a Different ULTRAPENx2

1. Make sure that the ULTRAPENx2 to which you wish to pair is not paired to any other mobile device.
2. Tap the **CONNECT / DISCONNECT** button on the Feature Navigation Bar.
3. Press and Release the PEN BUTTON on the back of the ULTRAPENx2.



4. Swipe DOWN on the Connect / Disconnect screen.  
The New ULTRAPENx2 will appear on the List.  
A green gem may appear to the left of the ULTRAPENx2 Name, indicating the Pen is awake and in Standby mode.
5. Tap the Line showing the New ULTRAPENx2.
6. A dialogue Box will appear.  
Tap the **DISCONNECT** button.  
Tapping the **CANCEL** button leaves the connection unchanged.
7. When the connection process is completed; the new ULTRAPENx2 will move to the top of the list.  
Its status will change to "Connected".  
A blue checkmark will appear next to the Name.

**NOTE:** In Step 4 above, if the Connected / Paired ULTRAPENx2 is ON (in standby mode), the App will refresh the connection.

- An alert dialogue box will appear saying, "Connecting ...".
- Once this is completed, the dialogue box will disappear and you may proceed to step 5, above.

## 16. Correcting Connection Problems

Sometimes your mobile device and the ULTRAPENX2 may have problems connecting. Below are the most common connectivity issues and how to fix them.

### **ULTRAPENx2 will not appear on the Connect / Disconnect Screen**

1. Close the PTBTX2 App.
1. Check the status of the mobile device's Bluetooth feature. If it is OFF turn it ON.
2. Make sure the ULTRAPENX2 is ON and in Standby mode.
1. Reopen the PTBTX2 App.
2. Open the Connect / Disconnect screen.
3. Swipe Down on the Connect / Disconnect screen to start a search for available ULTRAPENX2's.
4. The ULTRAPENX2 should appear on the list.
5. Tap that line on the Ultrapen list.

### **ULTRAPENx2 will not appear on the Connect / Disconnect Screen, but Device's Bluetooth is ON**

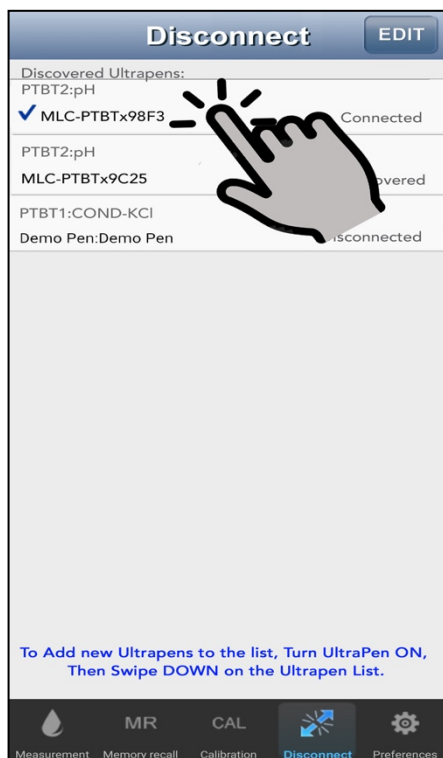
1. Close the PTBTX2 App.
2. Turn OFF the mobile device.
3. Make sure the ULTRAPENX2 is ON and in Standby mode.
4. Restart the mobile device.
5. Reopen the PTBTX2 App.
6. If the mobile device asks you if it should allow the PTBTX2 App access to the device's Bluetooth, say YES / OK.
7. Tap the **CONNECT / DISCONNECT** button in the Feature Navigation Bar.
8. When the **CONNECT / DISCONNECT** screen opens, swipe Down to start a search of available ULTRAPENX2's.
9. The ULTRAPENX2 should appear on the list. A green gem should appear to the left of the new ULTRAPENX2.
10. Tap that line on the ULTRAPENX2 list.

## 17. Unpairing an ULTRAPENx2

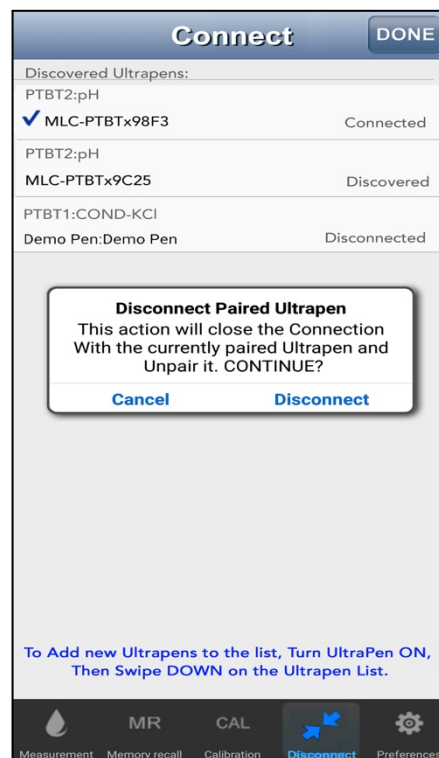
Once successfully paired with the App, the ULTRAPENx2:

- Stays paired until it is manually unpaired by the user.
- Will remain on the list until removed by the user.

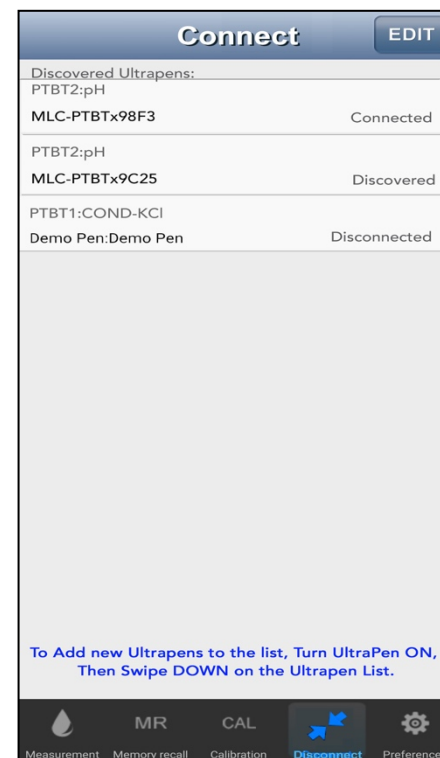
### Unpairing / Disconnecting an ULTRAPENx2



1. Tap the Line showing the Connected ULTRAPENx2.



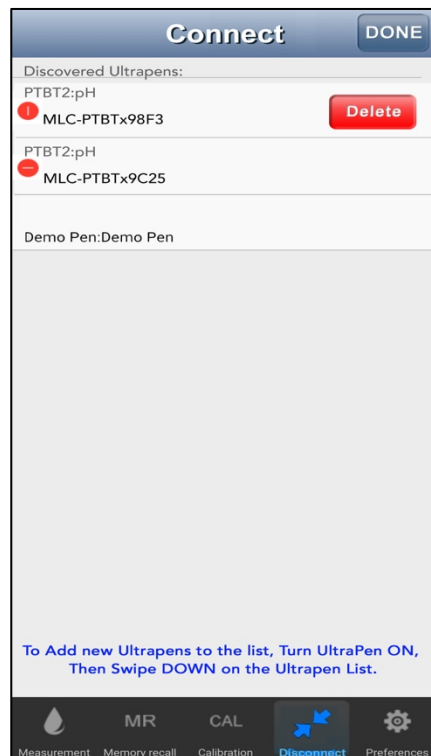
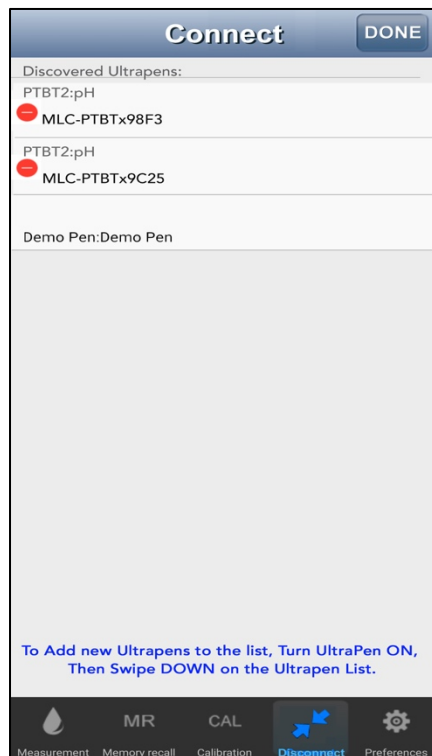
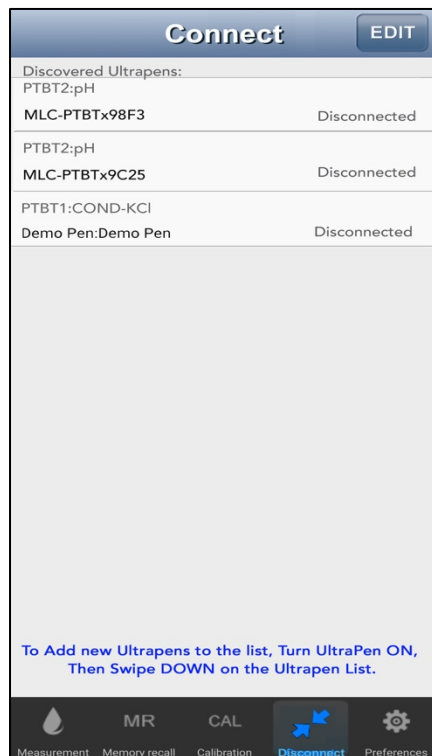
2. A dialogue Box will appear.  
Tap the **DISCONNECT** button.  
Tapping the **CANCEL** button leaves the connection / pairing unchanged.



3. When the Disconnection Process is completed.  
Its status will change to "Disconnected".  
The blue checkmark will disappear.  
The title and Feature Navigation Bar button will change to say "Connect".

## 18. Deleting an ULTRAPENx2 from the Pen List

1. Tap the **CONNECT / DISCONNECT** button on the Feature Navigation Bar to switch to the Connect / Disconnect screen.



2. Tap the **EDIT** button in the top right corner of the screen.

3. Tap the small red circle that appears to the left of the ULTRAPENx2 name you want to delete.

4. Tap the **RED DELETE** button that appears to the right of the ULTRAPENx2 name.

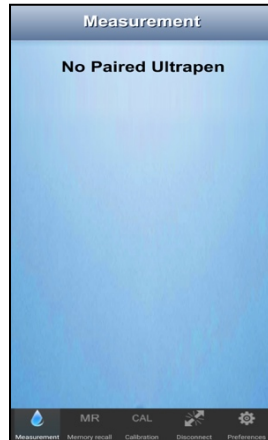
5. The ULTRAPENx2 will disappear from the list.

6. Tap the **DONE** button at the top right of the screen.

# ULTRAPENx2 MEASUREMENTS

## 19. Making Measurements – General Notes

1. Turn on the PTBTX2 App.



- Before you take a reading, make sure the ULTRAPENx2 is Paired / Connected to the App and that the sensor is clean and calibrated.
- The sample solution must also be within the specified measurement range.
- Keep all foreign material away from the sample to avoid contamination.
- **NOTE:** If you need to test a vertical stream of solution, use the scoop (see the section on Using the Scoop).

2. If there is no Connected / Paired ULTRAPENx2, this screen will appear. See the Section 14 above for instructions on connecting an ULTRAPENx2 to the PTBTX2 App.

3. If this screen appears, press the PEN BUTTON on the back of the connected ULTRAPENx2 to wake it up and place it in Standby mode.

## 20. NOTES for SPECIFIC ULTRAPEN<sub>x2</sub> Models

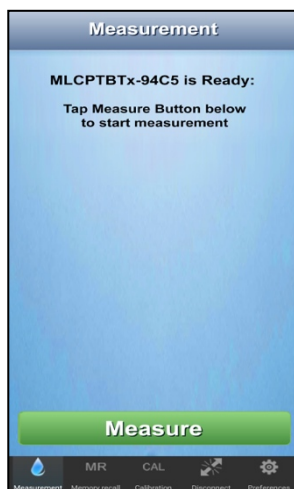
- ALL MODELS:
  - When measuring a solution at the extremes of the specified temperature or measurement range, allow the pocket testers to equilibrate by submerging the sensor/cell in the sample solution for at least 1-minute prior to taking a measurement.
    - Some applications may require a longer period for the sensor to completely equilibrate.
  - Basic instructions for operating and calibrating the ULTRAPEN<sub>x2</sub> are included with the pocket tester.
- PTBT3 and PTBT4:
  - When moving from sample solutions with high ionic strength to solutions with low ionic strength, allow the ULTRAPEN<sub>x2</sub> to equilibrate by submerging the sensor in the low ionic strength sample solution for 1-minute prior to taking a measurement.
- PTBT5:
  - Prior to making a measurement with your ULTRAPEN<sub>x2</sub> PTBT5, the DO sensor must be filled with electrolyte and allowed to stabilize for 2-4 hours.
  - Instructions included with the PTBT5 also describe how to prepare the sensor.
- PTBT6:
  - Prior to making a measurement with your ULTRAPEN<sub>x2</sub> PTBT6, the nitrate sensor must be preconditioned and each sample must be properly prepared.
  - Instructions included with the PTBT6 also describe how to condition the sensor and prepare the measurement sample.



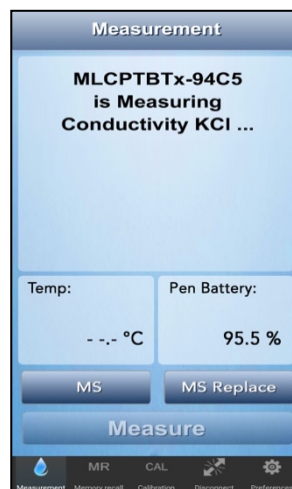
## 21. Making Measurements – HOLD mode

**NOTE:** For best results:

- Always have a separate container of Rinse Solution from the same sample you intend to measure.
  - Do not rest the sensor / cell on the bottom of the sample container.
1. Press and release the PEN BUTTON on the pocket tester to turn it ON and place the ULTRAPENX2 into Standby mode.
  2. Grasp the ULTRAPENX2 near the battery cap to avoid contaminating the sample.
  3. Rinse the sensor by swirling it around in fresh sample solution.
  4. Remove ULTRAPENX2 from the rinse solution and place it in the solution you want to measure.



5. When this screen appears, tap the GREEN **MEASURE** button.  
As the ULTRAPENX2 begins taking a measurement the ULTRAPENX2's LED will begin flashing rapidly.



6. Swirl the pen in the sample while the ULTRAPENX2 is measuring.  
Try to keep the sensor / cell at least 1-inch away from the sides or bottom of the container.



7. When the ULTRAPENX2 completes the measurement, the App will display the values.  
The Value will be held on the Measurement screen until:
  - a. The App is closed.
  - b. The Connected / Paired ULTRAPENX2 is disconnected.Tap the **MEASURE** button to start a new measurement.

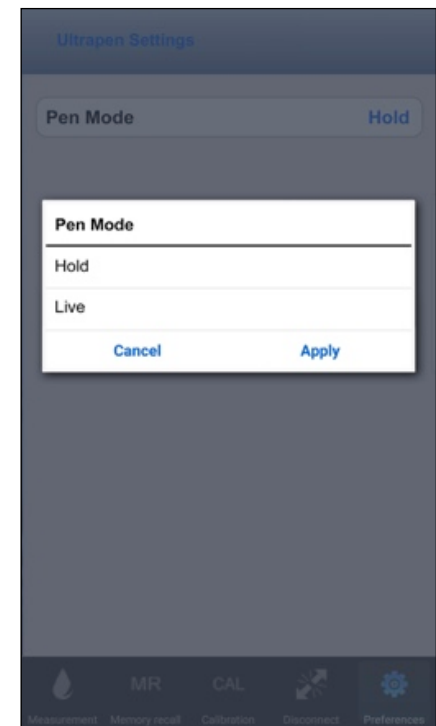
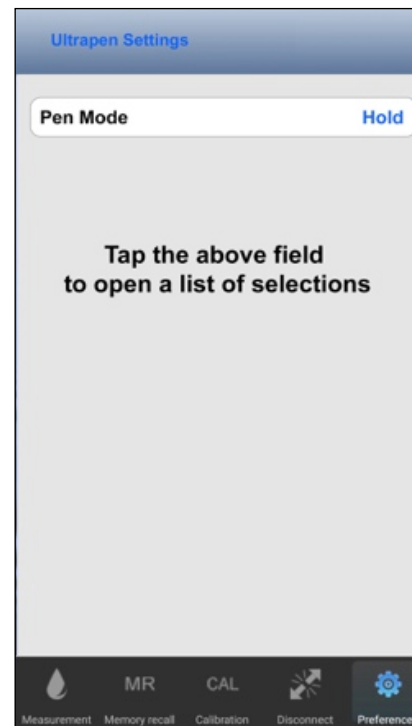
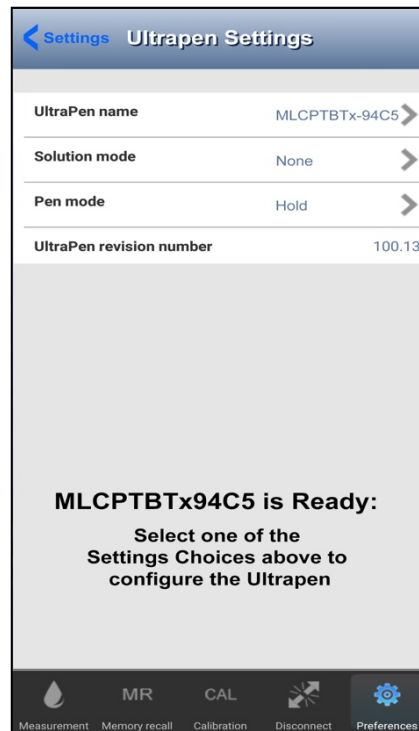
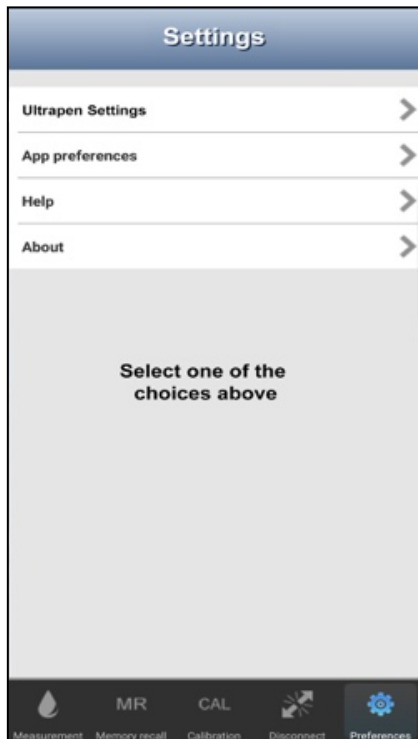
## 22. Making Measurements – LIVE Mode

In **LIVE** mode, the ULTRAPENX2 will continue taking new measurements and periodically sending them to the App which will update the Measurement screen with the most recent measurement.

### Switching from HOLD mode to LIVE mode

*(PTBT2 though PTBT6 ONLY)*

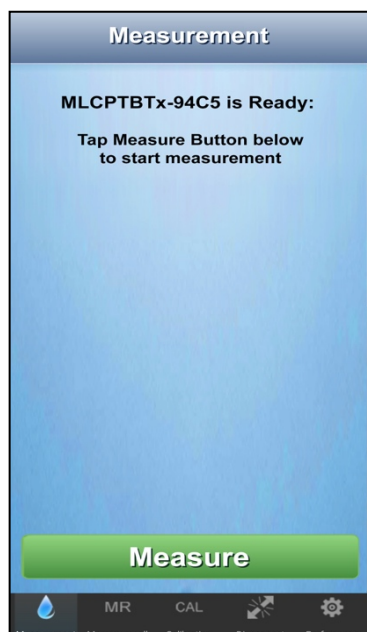
1. Press and release the PEN BUTTON on the pocket tester to turn it **ON** and place the ULTRAPENX2 into Standby mode.
2. Make sure it is Paired / Connected to the App.
3. Tap the **PREFERENCES BUTTON** in the Feature Navigation Bar.



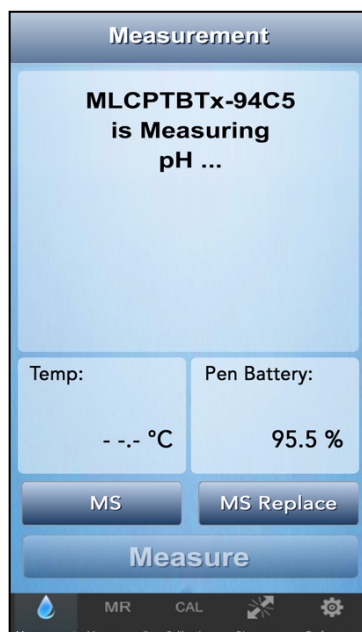
4. When this screen appears, tap the Line that says **Ultrapen Settings**.
5. Tap the Pen Mode line on the screen.
6. The App will display the current mode setting. Tap the Pen Mode field.
7. When the Pen Mode menu appears, select LIVE. Then tap **APPLY**.

## Starting and Ending LIVE mode Measurements (PTBT2 through PTBT6)

8. Press and release the PEN BUTTON on the ULTRAPENx2 Pocket Tester to turn it **ON** and place it into Standby mode.
  1. Tap the **MEASUREMENT BUTTON** in the Feature Navigation Bar.
  2. Grasp the ULTRAPENx2 near the battery cap to avoid contaminating the sample.
  3. Rinse the sensor by swirling it around in fresh sample solution.
  4. Remove ULTRAPENx2 from the rinse solution and place it in the solution you want to measure.



5. When this screen appears the, tap the GREEN **MEASURE** button.  
The ULTRAPENx2 will begin taking measurements.  
While the ULTRAPENx2 is taking measurements the ULTRAPENx2's LED will flash rapidly.



6. Swirl the pen in the sample while the ULTRAPENx2 is measuring.  
Try to keep the sensor / cell at least 1-inch away from the sides or the bottom of the container.



7. Once the ULTRAPENx2 begins sending measurements they will appear on the Measurement screen.  
Tap the BLUE button to manually stop LIVE mode.  
It will stop automatically after 5 minutes.



8. When the Live mode ends the App will display the final value.  
The value will be held on the Measure screen until:
  - a. The App is closed.
  - b. The Connected / Paired ULTRAPENx2 is disconnected.

- Tap the GREEN **MEASURE** button to start a new measurement.

## 23. Using the Scoop (PTBT1 though PTBT4 Only)

**NOTE:** If you cannot dip the pen in the sample solution or pour the sample into a clean container, use the scoop.

- For best results, we recommend calibrating the ULTRAPENX2 using the scoop before using it to make measurements.

To use the scoop:

- Slide the open end of the scoop over the ULTRAPENX2's cell / sensor shifting from side-to-side until the neck of the scoop is flush with the cap stop.
- Hold scoop under stream and perform the measurement as normal.
  - Avoid bubbles.
- To remove, pull the scoop off while shifting side-to-side.
  - If the sensor is not fully seated, reinstall per the sensor replacement instructions for that type of ULTRAPENX2 pen (see Section 75 below).

## THE MAIN SETTINGS SCREEN

To access the **Ultrapen Settings** tap on the **PREFERENCES BUTTON** on the Feature Navigation Bar.

- The Main Preferences screen will appear.
- There will be four selections:

### ULTRAPEN SETTINGS

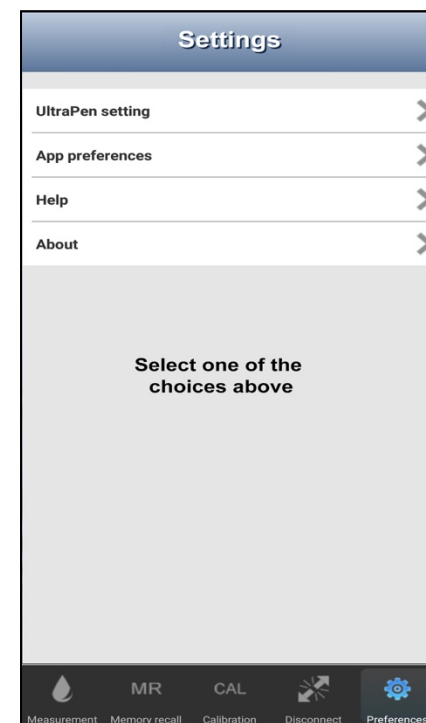
- **Ultrapen Name:** View and/or edit the Name by which an ULTRAPENX2 appears in data records and on the Connect screen list.
- **PTBT1: Solution Mode** – Allows you to select one of the following Temperature Compensation models.
  - Conductivity – KCl
  - TDS – 442™ (Myron L® Company Natural Water standard)
  - TDS – NaCl
  - Salinity – 442™
  - Salinity – NaCl
- **Pen Mode:** Sets the ULTRAPENX2 in HOLD mode or LIVE mode (PTBT2 though PTBT6 only).
  - **HOLD** mode waits for the ULTRAPENX2 to stabilize then reports a single reading.
  - **LIVE** mode allows the ULTRAPENX2 to take continuous readings, which are displayed on the Measurement screen, for a period of 5 minutes (unless it is turned off manually).
- **Ultrapen Revision number:** The revision of the ULTRAPENX2 firmware is displayed here.

### APPLICATION PREFERENCES

- **Mobile Device Screen Lock:** This feature allows the PTBTX2 App to continue running uninterrupted, without requiring you to constantly turn the mobile device's native Auto-Lock (iOS) or Screen Time Out (Android) feature ON and OFF.
- **Location:** The PTBTX2 App's Location feature allows you to include a location in stored data records.
  - Locations can be related to GPS positions or programmed manually.
- **Email Format:** Lets the user choose the format (.csv, .xls, .xlsx) in which data records are exported.
- **Date / Time Format:** Used to choose between 12 or 24-hour time format and several different formats for dates.
- **Temperature Units:** Used to choose between displaying temperature data as °C and °F.
- **Demo Pen Model:** The PTBTX2 App includes a simulated ULTRAPENX2 that is used to explore the features and functions of the App without having an actual ULTRAPENx2. Use this screen to select which type of ULTRAPENX2 to be simulated.

**HELP:** Opens a link to a Myron L® Company web page that includes a variety of downloadable instructions and manuals.

**ABOUT:** Basic information about this version of the App.

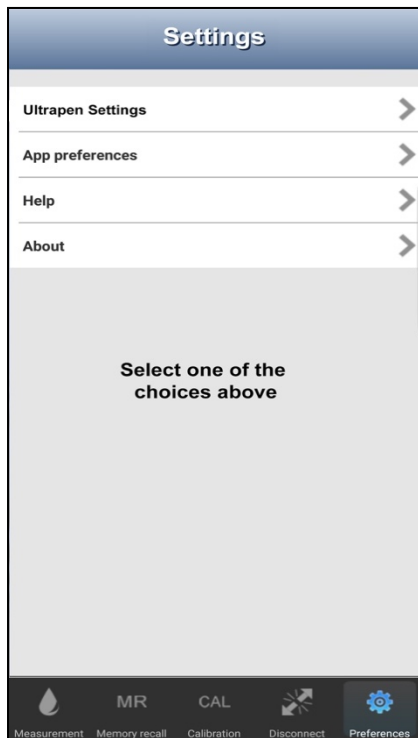


# ULTRAPENx2 SETTINGS

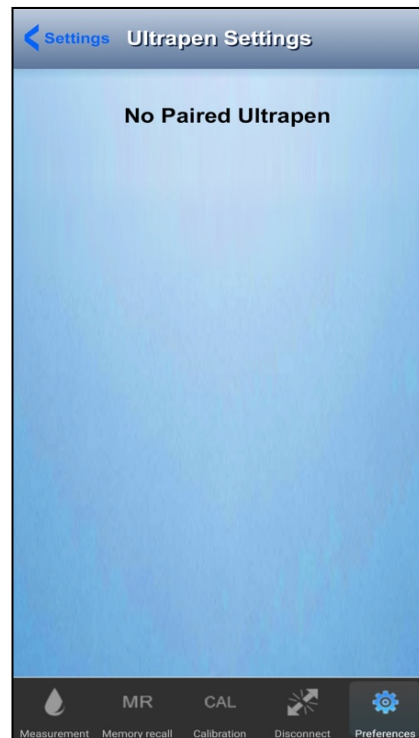
## 24. Accessing ULTRAPENx2 Settings

To access the ULTRAPENx2 Settings:

1. Tap the **PREFERENCES BUTTON** on the Feature Navigation Bar.



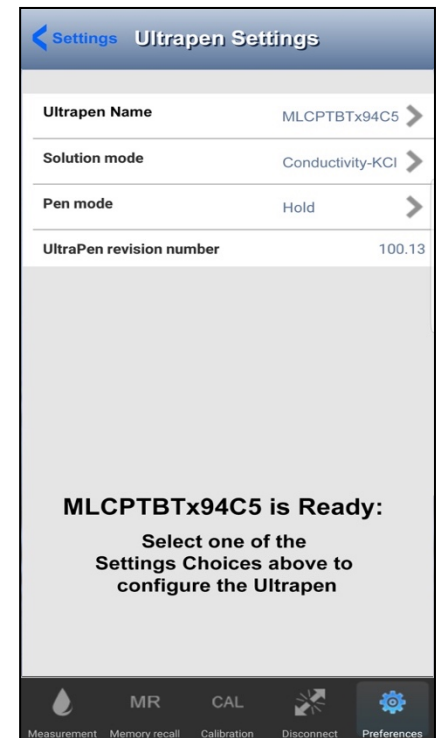
2. Tap the **Ultrapen Settings** line on the Main Settings screen.



3. If there is no Connected / Paired ULTRAPENx2, this screen will appear. See the Section 14 above for instructions on connecting an ULTRAPENx2 to the PTBTX2 App.



4. If this screen appears, press the PEN BUTTON on the back of the connected ULTRAPENx2 to wake it up and place it in Standby mode.



5. If this screen appears the ULTRAPENx2 is awake and standing by. Tap the line related to what setting you wish to change.

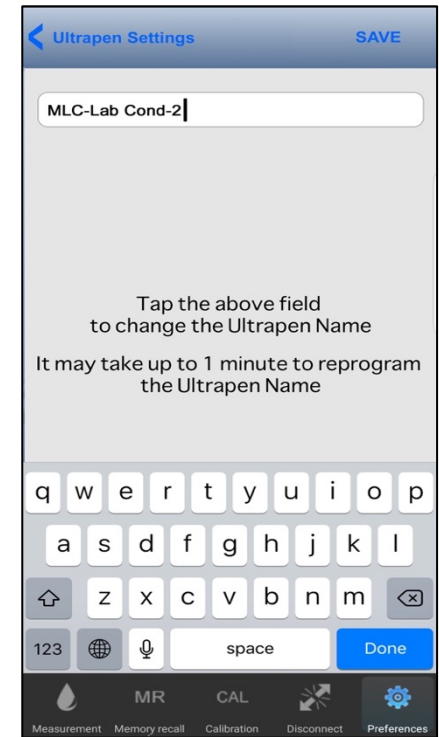
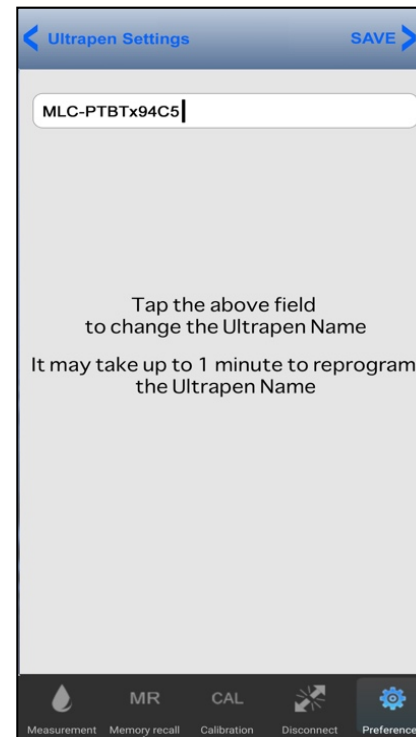
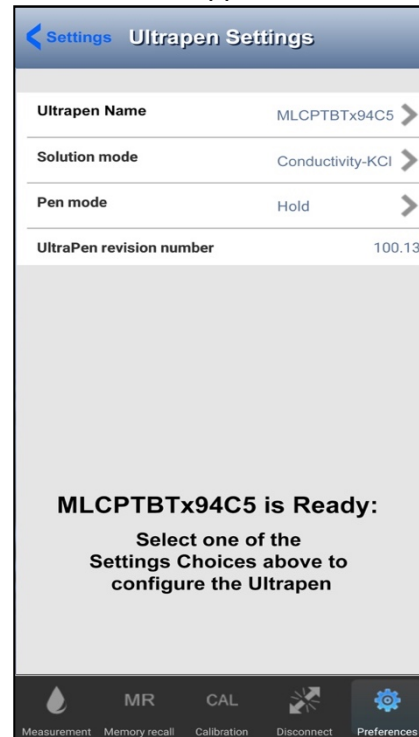
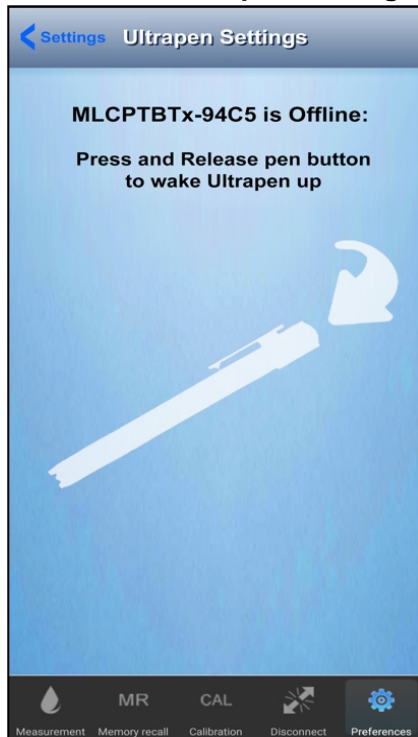
## 25. Changing the ULTRAPENx2 Name

All ULTRAPENx2 s have the default name “**MLC-PTBTx[4-digit Hexadecimal MAC Address]**”.

- **EXAMPLE: MLC-PTBTX94C5**

To change an ULTRAPENx2's name:

1. Tap on the **PREFERENCES BUTTON** on the Feature Navigation Bar.
2. Select **Ultrapen Settings** from the list that appears.

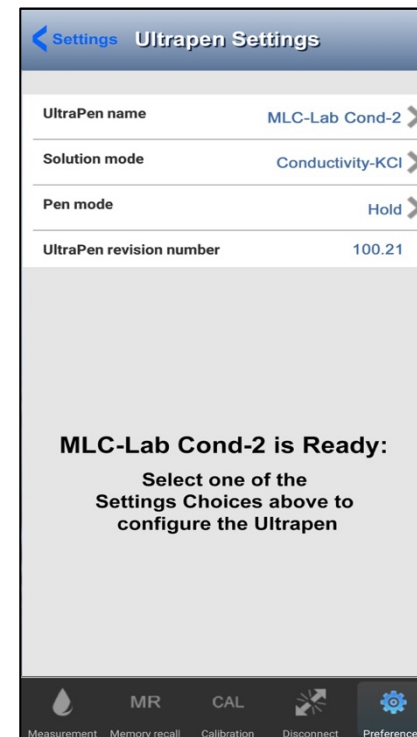
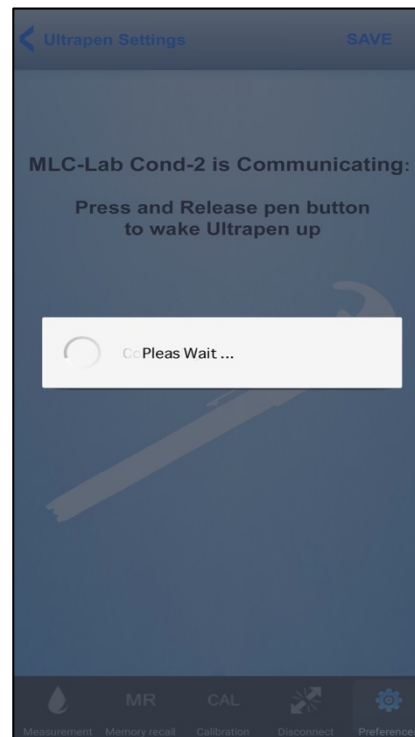
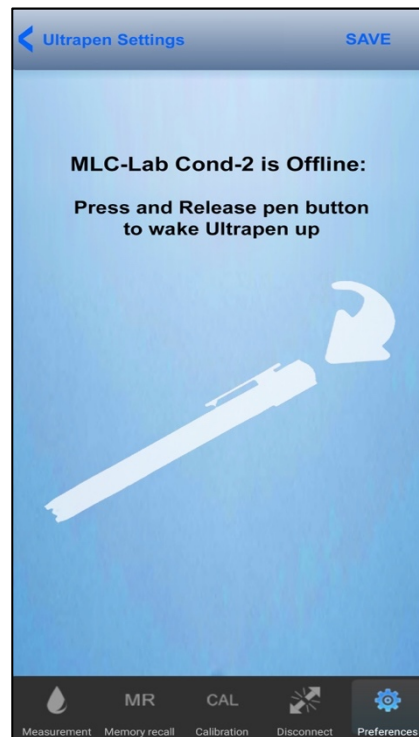
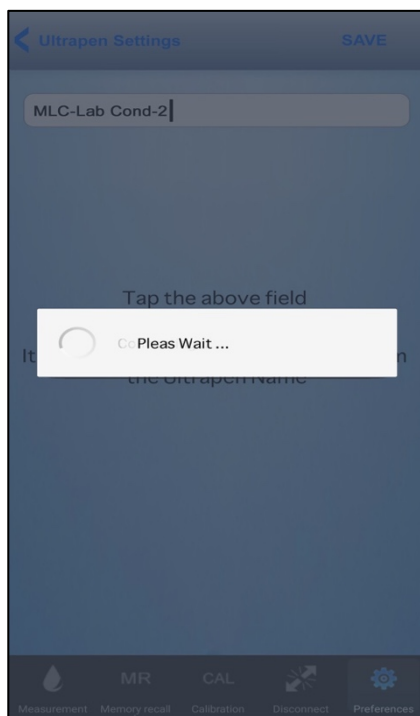


3. If this screen appears, press the **PEN BUTTON** on the back of the connected ULTRAPENx2 to wake it up and place it in Standby mode.
4. When this screen appears the ULTRAPENx2 is awake and standing by. Tap the Ultrapen Name line on the Ultrapen Settings screen.
5. Tap anywhere in the Name field to start the process for renaming the ULTRAPENx2. You will **NOT** be able to overwrite the MLC prefix.
6. Type the new Name into the field.
7. Tap the **SAVE** button at the top, right of the screen.

**NOTE: ONLY** alphanumeric characters (Upper and lower case), spaces, hyphens and underscores can be used. Max name length is  $\leq 13$  characters + the “MLC” prefix.



# Operation Manual – PTBTX2 App – ULTRAPENx2 Settings



8. The App will begin downloading the new Name to the ULTRAPENx2.

9. At some point the App will turn the ULTRAPENx2 OFF so that it can be reset with the new name.

**DO NOT interact with EITHER the ULTRAPENx2 or the App while this screen is displayed.**

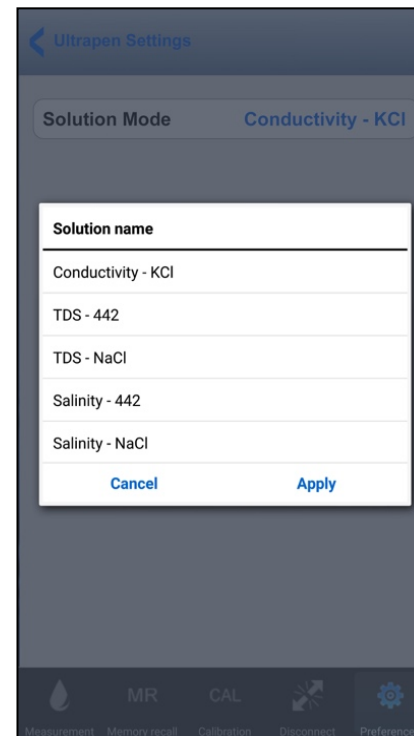
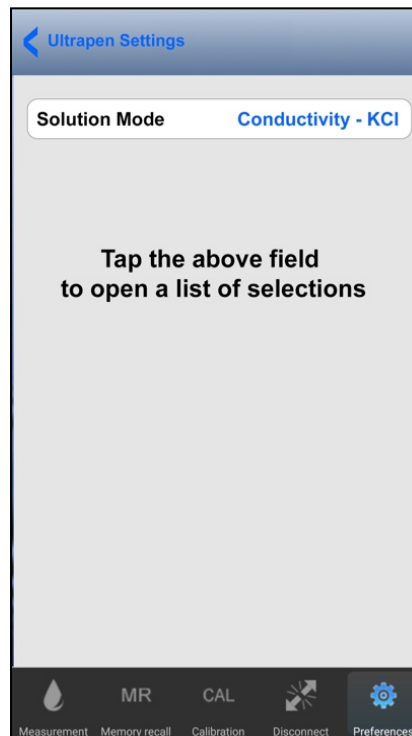
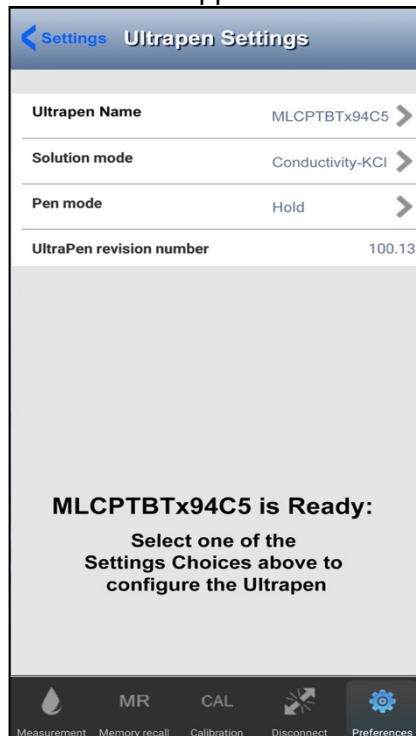
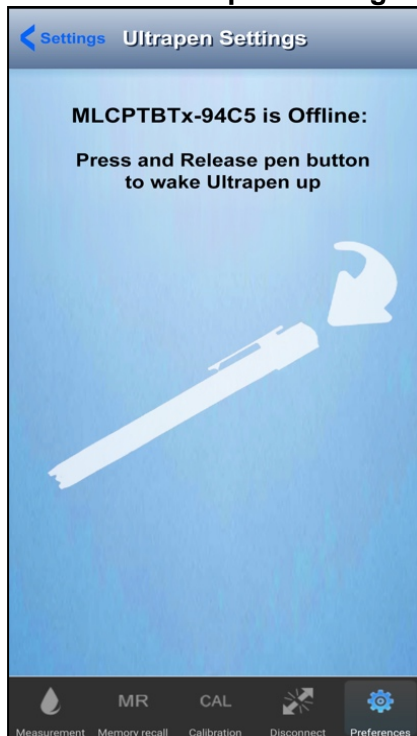
10. After approximately 1-5 seconds the App will turn the ULTRAPENx2 back ON and complete resetting the ULTRAPENx2's Name.

11. Once the Name change process is **complete**, the **Ultrapen Settings** screen will reappear and show the NEW Name.  
The entire process can take up to 1-minute to complete.



## 26. Changing the PTBT1 Solution Mode

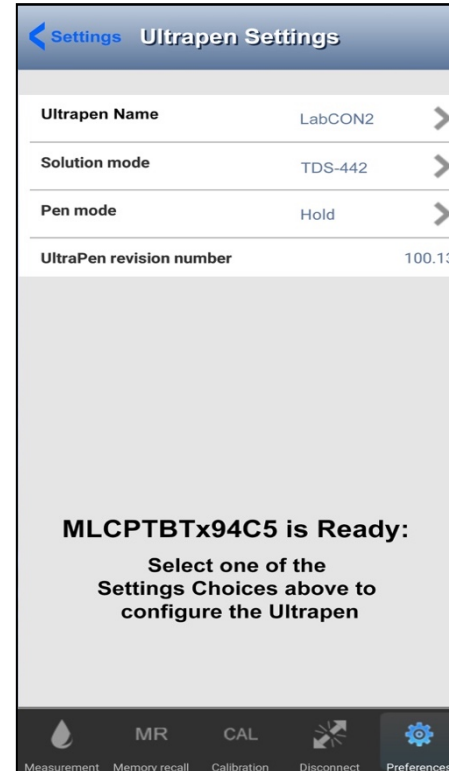
1. Tap on the **PREFERENCES** BUTTON on the Feature Navigation Bar.
2. Select **Ultrapen Settings** from the list that appears.



3. If this screen appears, press the PEN BUTTON on the back of the connected PTBT1 to wake it up and place it in Standby mode.
4. When this screen appears the ULTRAPENx2 is awake and standing by. Tap the Solution mode line on the Ultrapen Settings screen.
5. Tap anywhere in the Solution Mode field to open the Solution mode menu.
6. Select the desired Solution mode, then tap Apply.



7. The App will upload the new Solution mode Setting to the Connected / Paired PTBT1.

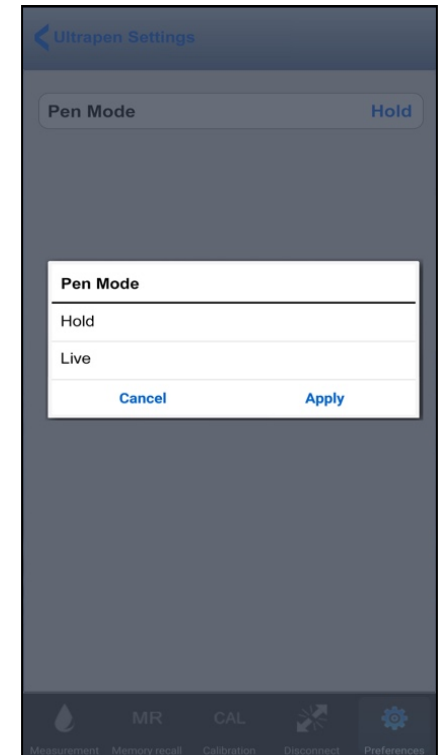
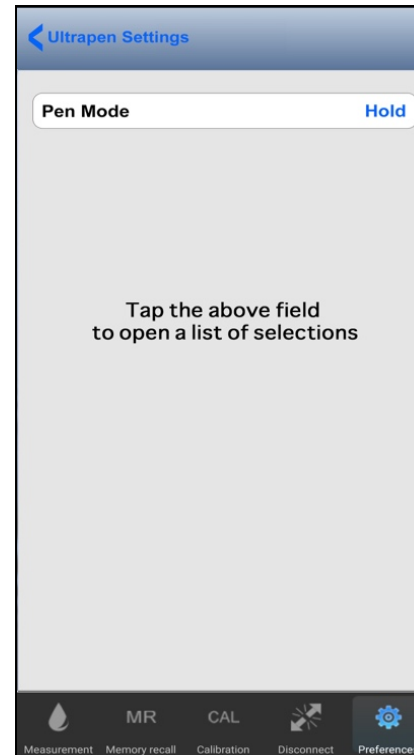
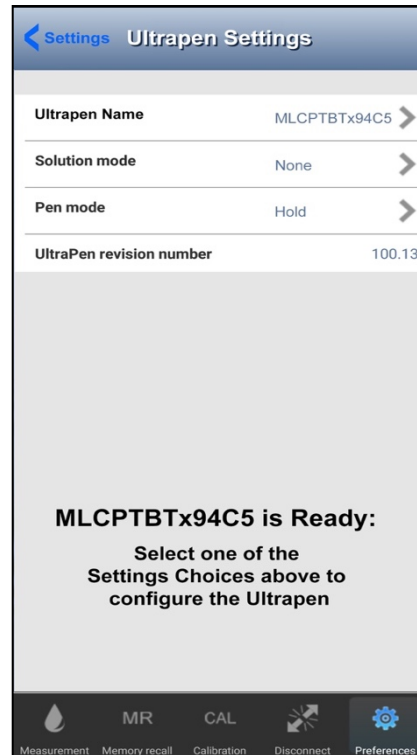
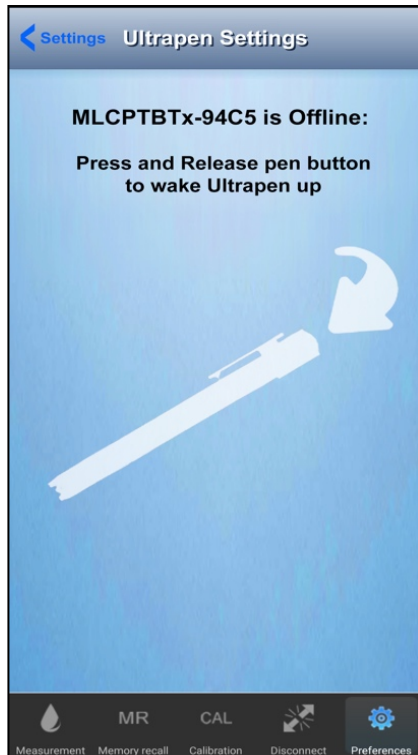


8. Once the Solution mode change process is complete, the **Ultrapen Settings** screen will reappear and show the NEW Solution mode setting.

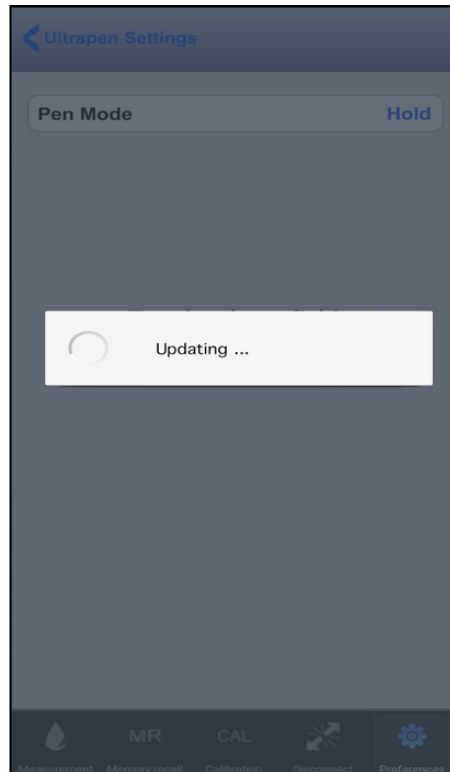
- Tap the **MEASUREMENT BUTTON** in the Feature Navigation Bar to return to the Measurement screen and take measurements.

## 27. Changing the PTBT2 through PTBT6 Pen Mode (LIVE / HOLD)

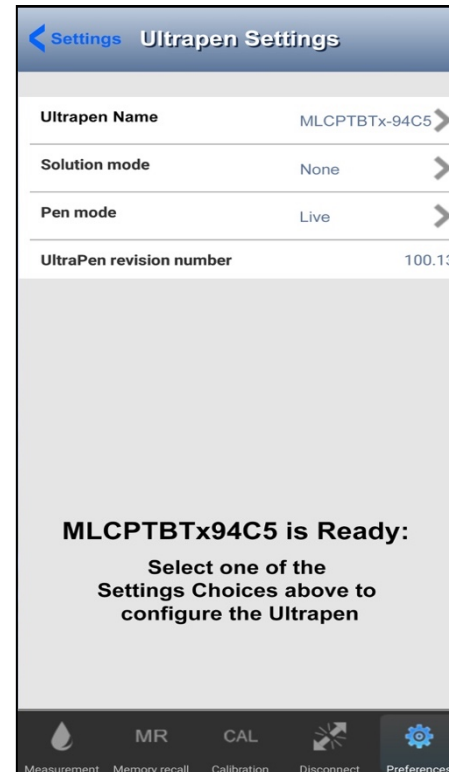
1. Tap on the **PREFERENCES BUTTON** on the Feature Navigation Bar.
2. Select **Ultrapen Settings** from the list that appears.



3. If this screen appears, press the **PEN BUTTON** on the back of the connected **ULTRAPENX2** to wake it up and place it in Standby mode.
4. When this screen appears the **ULTRAPENX2** is awake and standing by. Tap the Pen mode line on the Ultrapen Settings screen.
5. Tap anywhere in the Pen Mode field to open the Pen mode menu.
6. Select the desired Pen Mode, then tap Apply.



7. The App will upload the new Pen mode Setting to the Connected / Paired ULTRAPENx2.



8. Once the Pen mode change process is complete the **Ultrapen Settings** screen will reappear and show the NEW Pen mode.

- Tap the **MEASUREMENT BUTTON** in the Feature Navigation Bar to return to the Measurement screen and begin taking measurements.

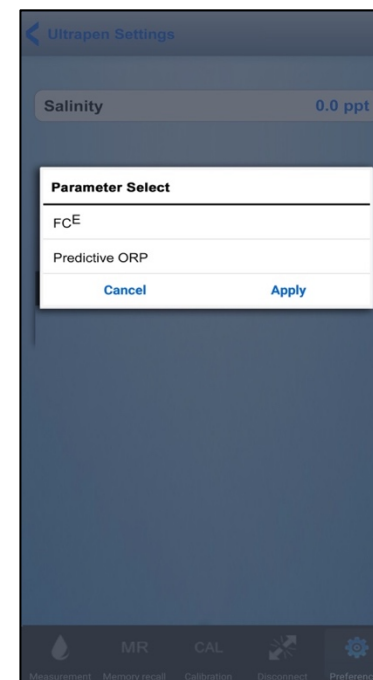
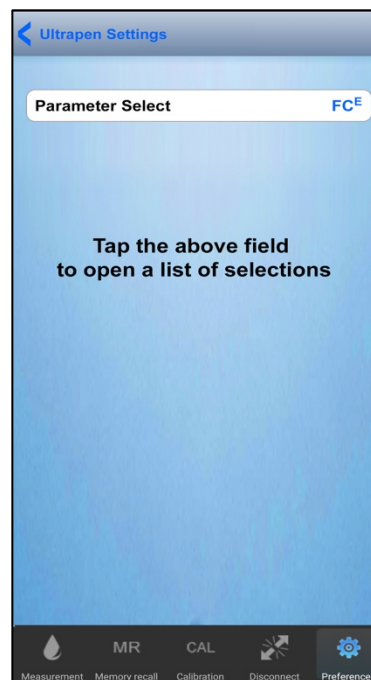
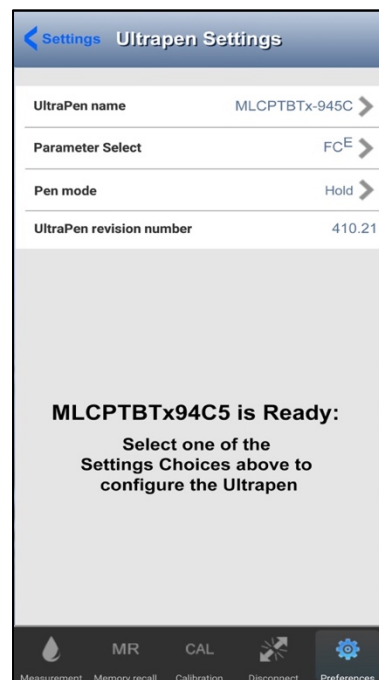
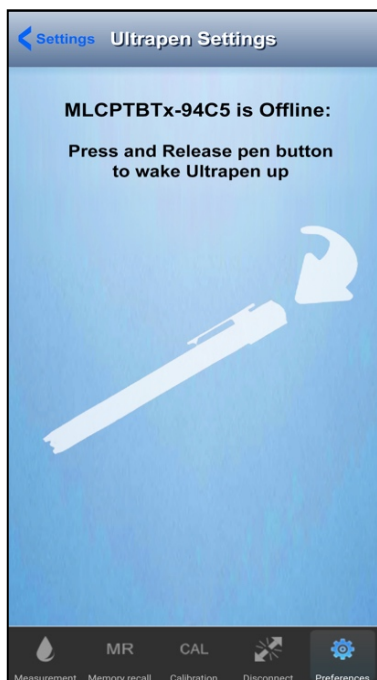
## 28. Changing the PTBT4 Measurement Parameter (FC<sup>E</sup> / ORP<sub>pr</sub>)

The PTBT4 can display measurement in two different parameters:

- FC<sup>E</sup> (Free Chlorine Equivalent): Displays the equivalent sterilization power of free available chlorine species in the sample as ppm.
- ORP<sub>pr</sub> (Predictive ORP): Displays ORP in mV using a Myron L<sup>®</sup> Company proprietary algorithm to calculate the final ORP measurement without waiting for the sensor to fully stabilize.

To change the Parameter Setting:

1. Tap on the **PREFERENCES BUTTON** on the Feature Navigation Bar.
2. Select **Ultrapen Settings** from the list that appears.



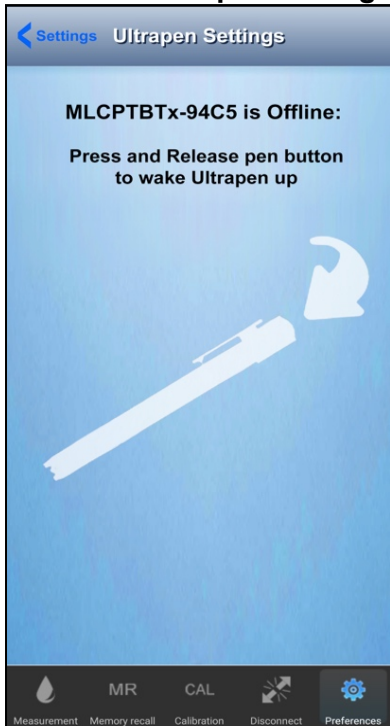
3. If this screen appears, press the PEN BUTTON on the back of the connected ULTRAPENx2 to wake it up and place it in Standby mode.
4. When this screen appears the ULTRAPENx2 is awake and standing by. Tap the Parameter Select line on the Ultrapen Settings screen.
5. Tap anywhere in the Parameter Select field to open the PTBT4 Parameter menu.
6. Select the desired Parameter, then tap Apply.

## 29. Changing the PTBT5 Measurement Parameter (DO ppm or DO %)

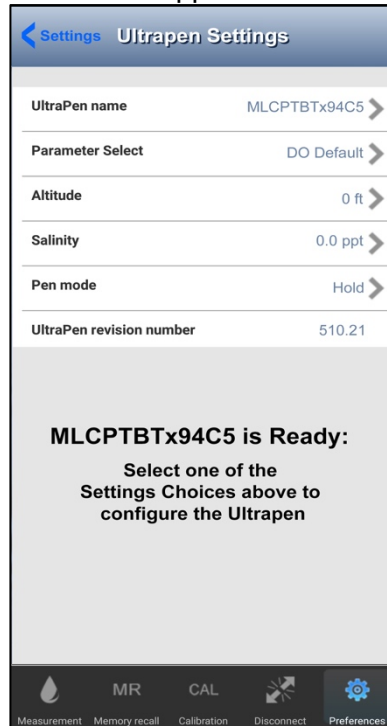
The PTBT5 can display measurements in three different ways:

- DEFAULT mode: Displays Dissolved oxygen as both Concentration (ppm) and Saturation (%).
- Concentration Only (ppm).
- Saturation Only (%).

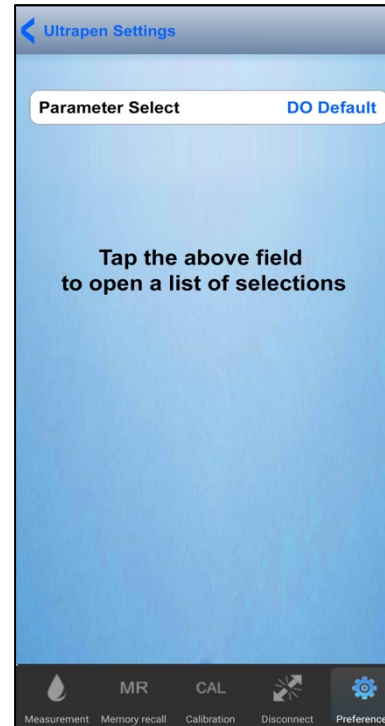
1. Tap on the **PREFERENCES BUTTON** on the Feature Navigation Bar.
2. Select **Ultrapen Settings** from the list that appears.



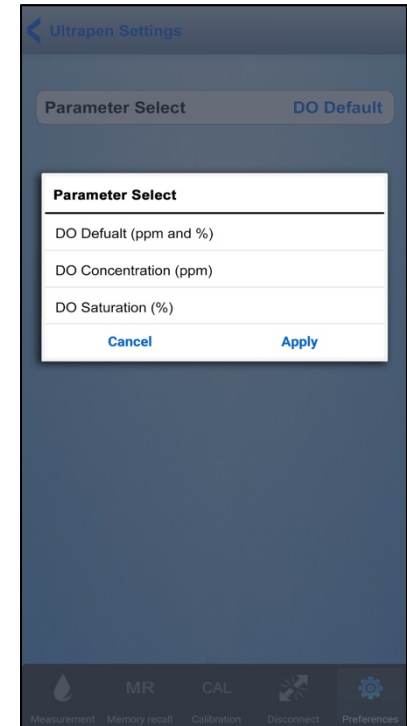
3. If this screen appears, press the PEN BUTTON on the back of the connected ULTRAPENX2 to wake it up and place it in Standby mode.



4. When this screen appears the ULTRAPENX2 is awake and standing by. Tap the Parameter Select line on the Ultrapen Settings screen.



5. Tap anywhere in the Parameter Select field to open the PTBT5 Parameter menu.



6. Select the desired Parameter, then tap Apply.

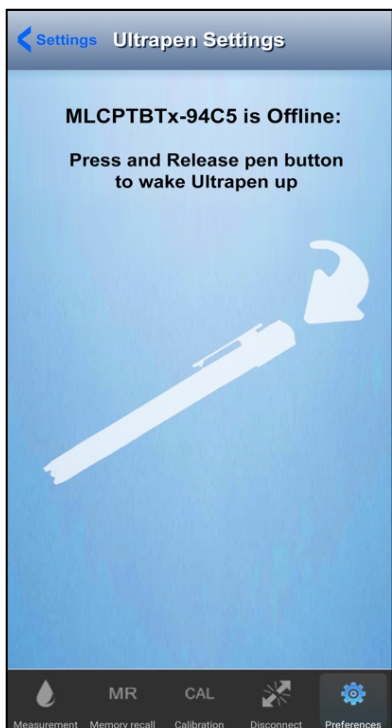


### 30. Changing the PTBT6 Measurement Parameter ( $\text{NO}_3^- \text{-N}$ , / $\text{NO}_3^-$ / mV)

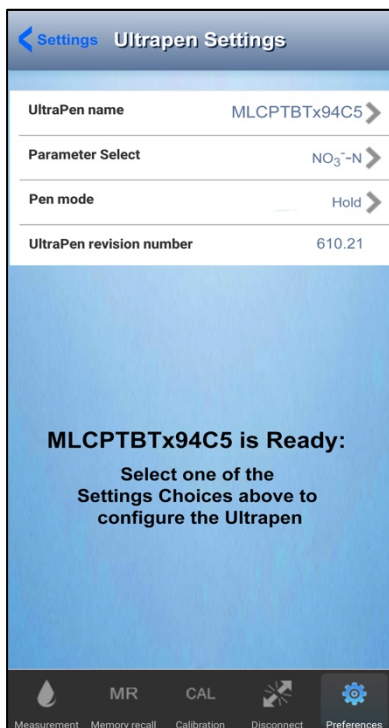
The PTBT6 can display measurements in three different parameters:

- $\text{NO}_3^- \text{-N}$  : Displays nitrate as nitrogen in parts per million (ppm).
- $\text{NO}_3^-$  : Displays nitrate in parts per million (ppm).
- mV: Displays the raw signal output of the nitrate sensor in millivolts.

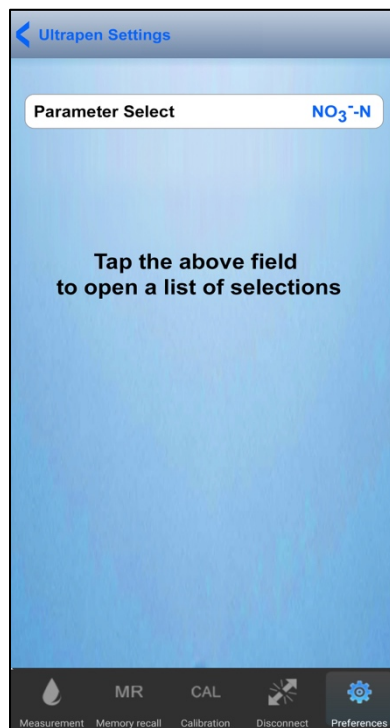
1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select **Ultrapen Settings** from the list that appears.



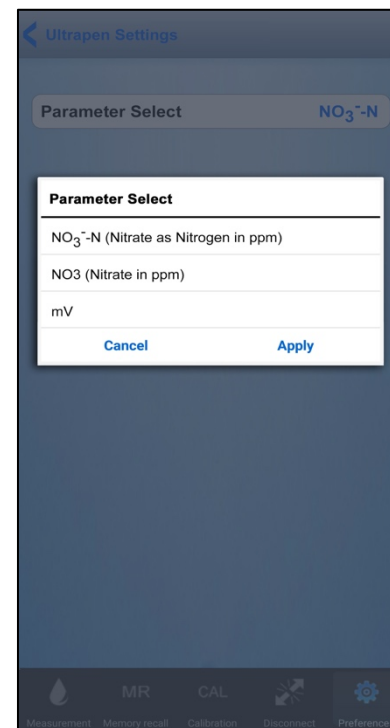
3. If this screen appears, press the PEN BUTTON on the back of the connected ULTRAPENX2 to wake it up and place it in Standby mode.



4. When this screen appears the ULTRAPENX2 is awake and standing by. Tap the Parameter Select line on the Ultrapen Settings screen.



5. Tap anywhere in the Parameter Select field to open the PTBT6 Parameter menu.



6. Select the desired Parameter, then tap Apply.

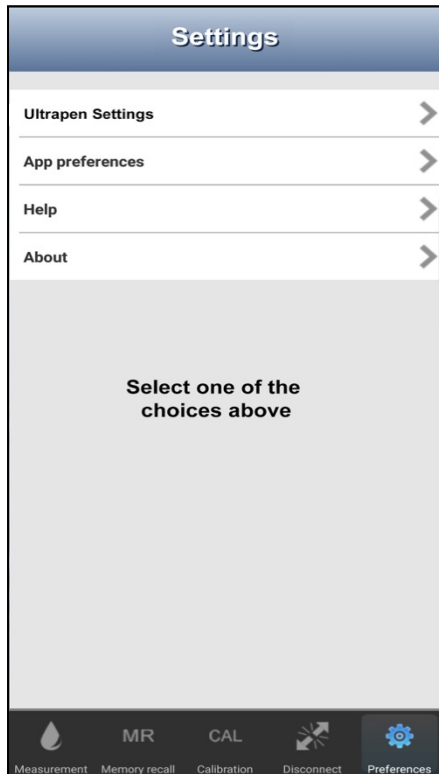
# PTBTX2 APP PREFERENCES

## 31. Accessing Application Preferences

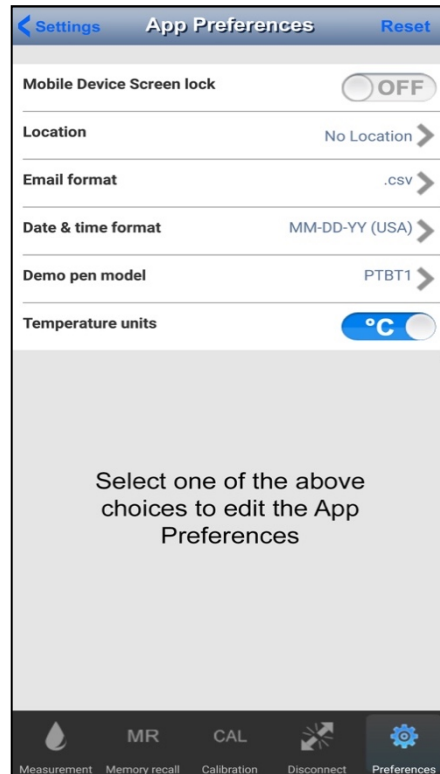
**NOTE:** There does NOT have to be a Connected / Paired ULTRAPENX2 to change Application Preferences.

To access the App Preferences:

1. Tap the **PREFERENCES** button on the Feature Navigation Bar.



2. The Main Settings screen will appear.
3. Select App Preferences from the list that appears.



4. The main Application Preferences screen will appear.

The Application Preferences section contains:

- **Mobile Device Screen Lock:** Allows you to override the mobile device's Screen Lock/Auto Off feature while the App is open.
- **Location:** Allows you to program and use a list of GPS related or manually programmed locations to be stored in data records.
- **Email format:** Opens a list of the email formats you can use to export data records (.csv, .xls, or .xlsx).
- **Date & Time format:** Opens a list of available Date and Time format options.
- **Demo pen model:** Allows the user to select the ULTRAPENX2 model for the simulated ULTRAPENX2 to emulate.
- **Temperature units:** Allows user to switch between Celsius (°C) and Fahrenheit (°F) temperature scales.



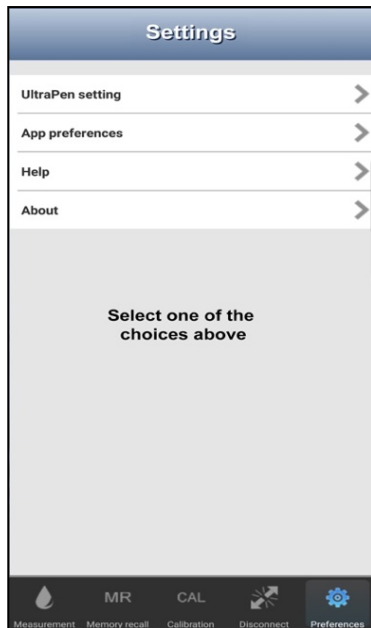
## 32. Turning the Mobile Device Screen Lock Switch ON / OFF

This feature in the OFF position causes the PTBTX2 App to continue running uninterrupted, without requiring you to constantly turn the mobile device's native Auto – Lock (iOS) or Screen Time Out (Android) feature ON and OFF.

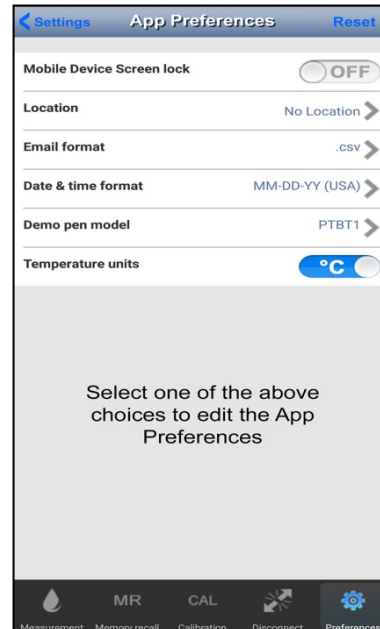
- The **DEFAULT** position of the Screen Lock switch is **OFF**.
  - This setting overrides the Mobile Device's Auto-Lock or Screen Time Out setting **ONLY** while the PTBTX2 App is functioning.
  - The PTBTX2 App will stay active and the mobile device's display will not dim or turn off.
  - It **DOES NOT** change the native setting of the mobile device.
    - When the PTBTX2 App is closed or inactive, the mobile device's Screen Lock feature will function normally.
    - The mobile device's display will DIM or turn OFF according to its native settings.

**NOTE:** There does NOT have to be a Connected / Paired ULTRAPENX2 to turn ON/OFF the Screen Lock feature.

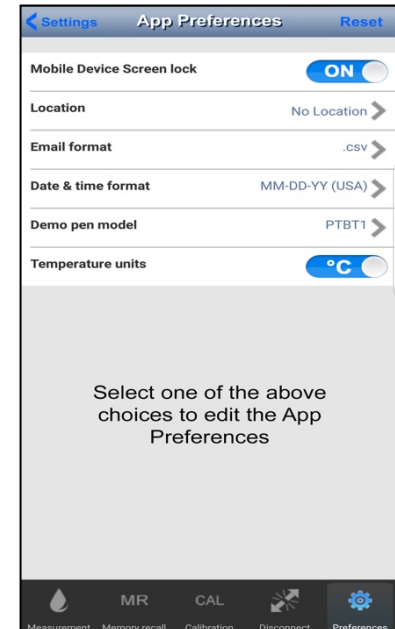
1. To access the App Preferences, tap on the **PREFERENCES** button on the Feature Navigation Bar.



2. The Main Settings screen will appear.
3. Select App Preferences from the list that appears.



4. The main App Preferences screen will appear.



5. Slide the Screen Lock Switch to **ON/OFF** as desired:

### 33. Changing the Email Format

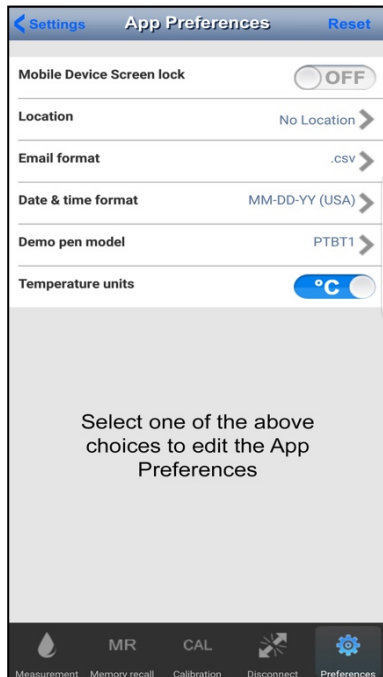
Data records may be exported from the PTBTX2 App via email in any one of the following file formats.

- .csv: Comma Separated Values format (Default). This file format should work with any spreadsheet application.
- .xlsx: File format for Microsoft Excel 2007 and later.
- .xls: File format for older Microsoft Excel versions.

NOTE for Regulatory Applications: .xlsx, .xls, and .csv file formats are not encrypted. Once data has been exported using one of these formats and loaded in a spreadsheet application, they may be altered or adulterated and cannot be considered secure.

**NOTE:** There does NOT have to be a Connected / Paired ULTRAPENX2 to change the Email format.

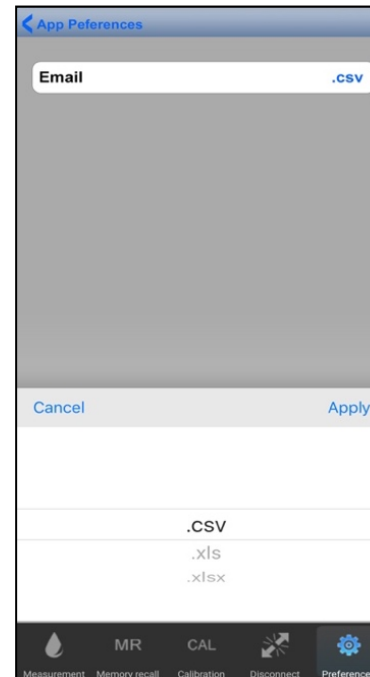
1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select **App Preferences** from the list that appears.



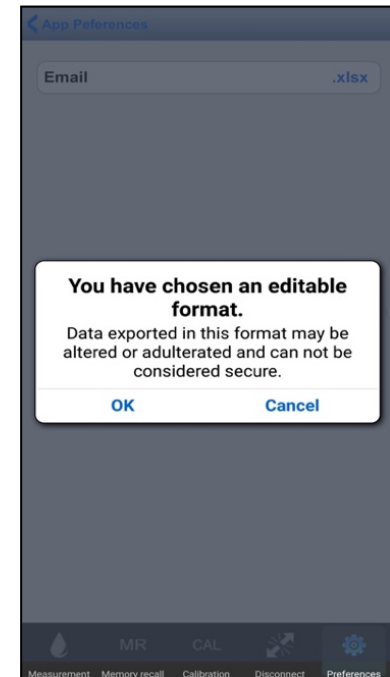
3. The main App Preferences screen will appear.
4. Tap the Email Format line.



5. The Email Format Edit screen will appear showing the current setting. Tap anywhere inside the Email Format field.



6. A Menu will appear with the Email Format options. Make your selection and tap **APPLY**.



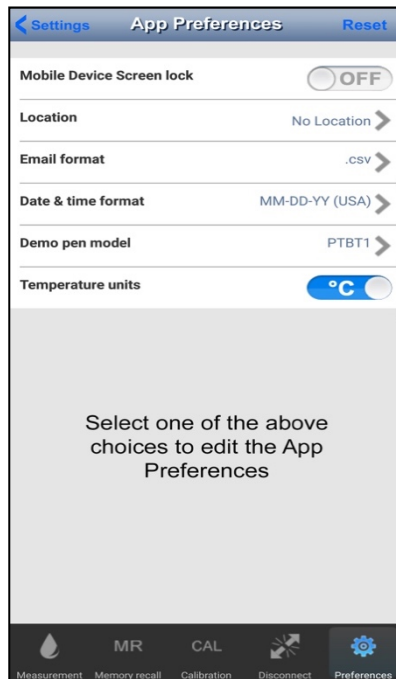
7. A Data Security warning message will appear. Tap **OK** to accept the new Email Format. The message will disappear.

## 34. Changing the Time and Date Formats

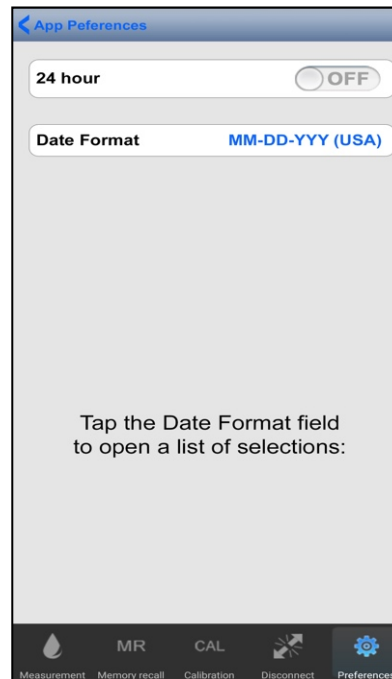
- Time values can be displayed as either:
  - 12-hour format with AM/PM (default).
  - 24-hour format.
- Date values can be displayed as one of the following:
  - DD-MM-YYYY: standard international format.
  - MM-DD-YY: commonly used in the USA (default).
  - YYYY-MM-DD: also, an international date format.

**NOTE:** There does NOT have to be a Connected / Paired ULTRAPENX2 to change the Time and Date formats.

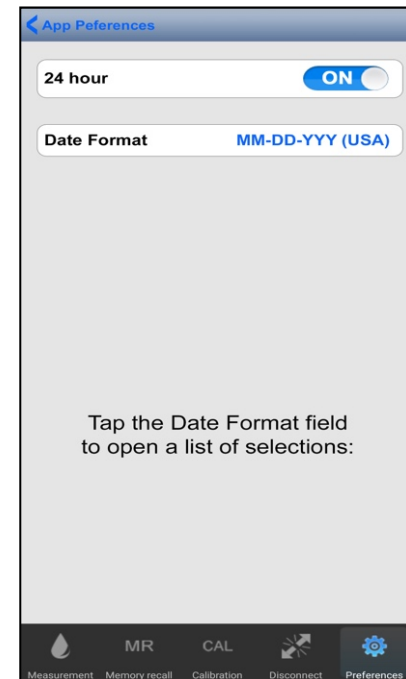
1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select **App Preferences** from the list that appears.



3. The main Application Preferences screen will appear.  
Tap the Date and Time format line.

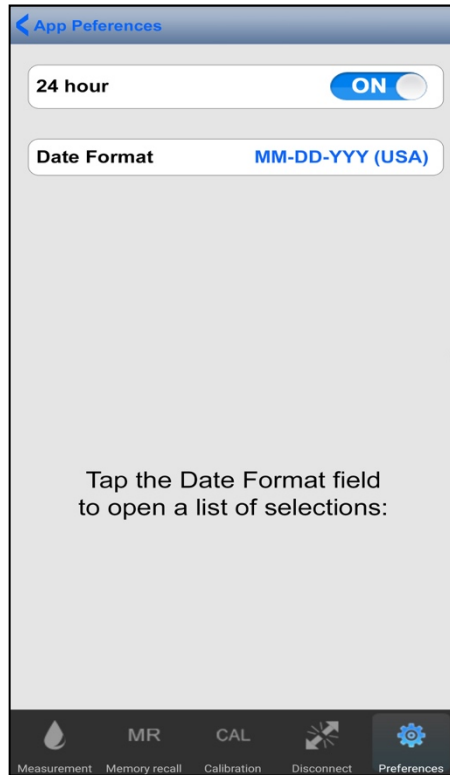


4. The Date / Time Edit screen will appear.  
It will show the current settings for both Date and Time.

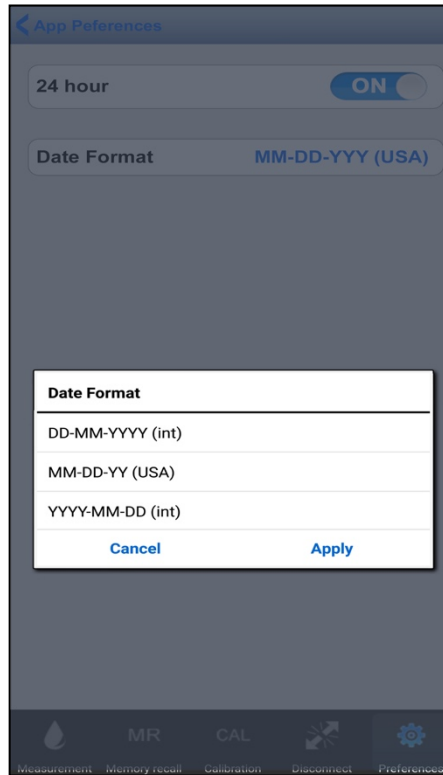


5. To change the Time format, from 12- to 24-hour format, slide the **24 hour** switch to the right.  
The switch color should change to BLUE and the label should change to say **ON**.

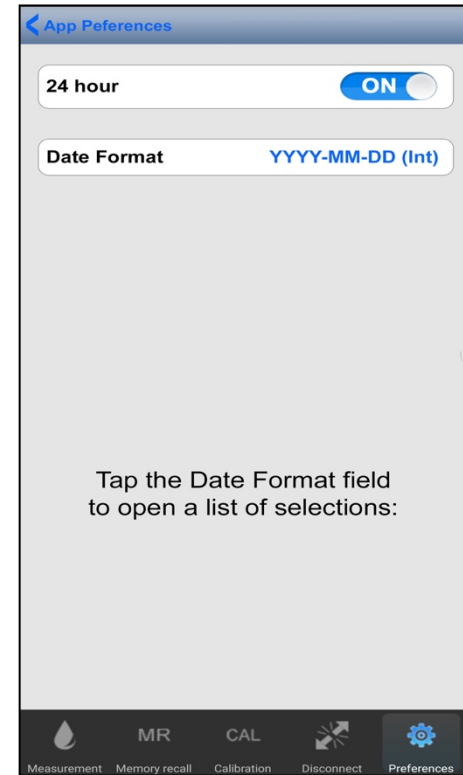
## Operation Manual – PTBTX2 App – App Preferences



6. To change the Date Format, tap the Date Format field.



7. A Menu will appear with the Date Format options.  
Make your selection and tap APPLY.



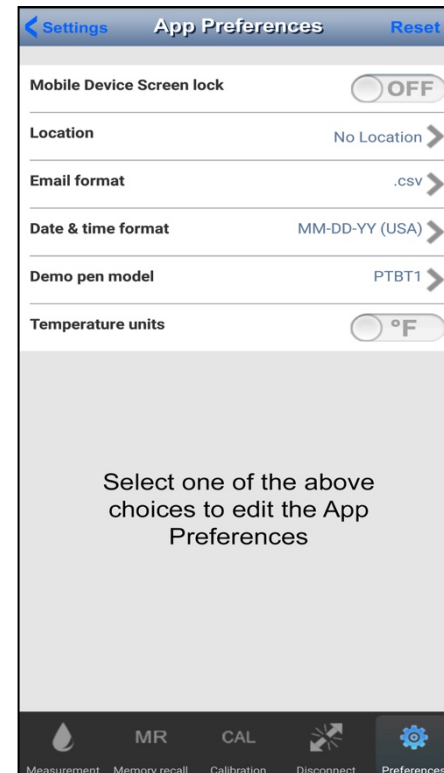
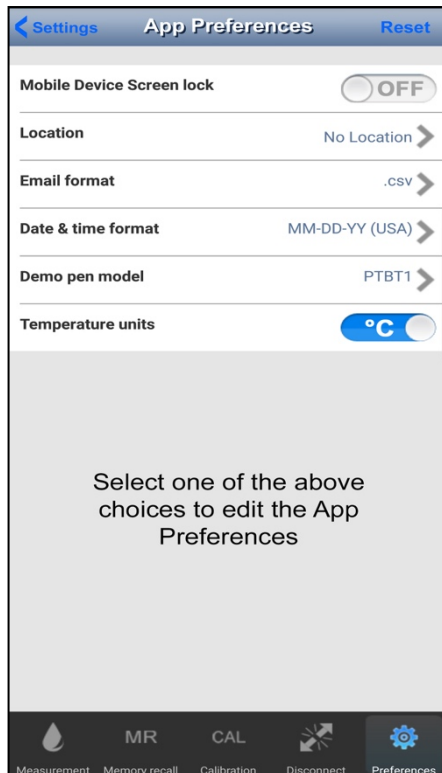
8. The menu will disappear.  
The new Date will appear in the Date field.

### 35. Changing the Temperature Units of Measure

- Temperature units displayed on the Measurement screen and in Data Records can be displayed as either °C or °F.

**NOTE** There does NOT have to be a Connected / Paired ULTRAPENX2 to change the Temperature units of measure.

1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select App Preferences on the list that appears.



3. The main App Preferences screen will appear.  
The default setting is °C.

4. Slide the Temperature units switch to the left to change the setting to °F.

## 36. Creating and Using Locations

The PTBTX2 App allows you to include the location of measurements when storing measurements in data records.

- **GPS Locations:** A location can be associated with a GPS Latitude & Longitude as reported by the phone's GPS Services.
  - When the PTBTX2 App's GPS Services setting is turned **ON**:
    - When new locations are added, the current latitude and longitude coordinates will automatically be included unless the new location is renamed by the user.
    - The App will automatically select the NEAREST programmed GPS Location for all data records.
    - To use the GPS version of this feature, the mobile device's Location Service must be turned **ON**.
      - If your device's OS requires Location Services be set for each app, go to the device's preferences and set PTBTX2 to **ON**.
- **NON-GPS Locations:** These locations are manually created and selected by the user.
  - They are particularly useful in cases where one might have several testing locations that are too close together for the mobile device to reliably differentiate between them (such as two water tanks sitting side-by-side in a testing lab or three aquariums sitting side-by-side on a store shelf).

### Location List Sorting

Once you have loaded several locations into the list they will be sorted as follows:

- GPS Services set to **ON**:
  - All GPS locations will appear at the top of the list, sorted closest to farthest.
  - All Non-GPS locations will appear beneath the farthest GPS location sorted in ascending alphanumerical order.
- GPS Services set to **OFF**:
  - If there is a currently selected Location, it will be at the top of the Location list.
  - All other locations will appear below that, sorted in ascending alphanumerical order.
- Regardless of whether the **GPS** switch is set to **ON** or **OFF**, the acronym GPS will always appear next to locations associated with latitude and longitude coordinates.

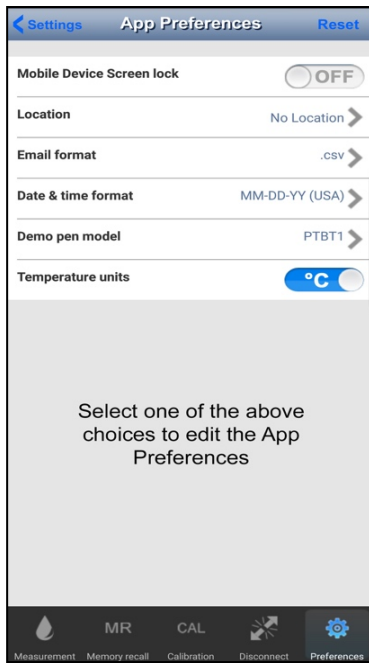
## Adding a GPS Location

**NOTE:** GPS locations must be separated by a certain distance. The exact distance is dependent upon the accuracy and resolution of your device's GPS circuitry.

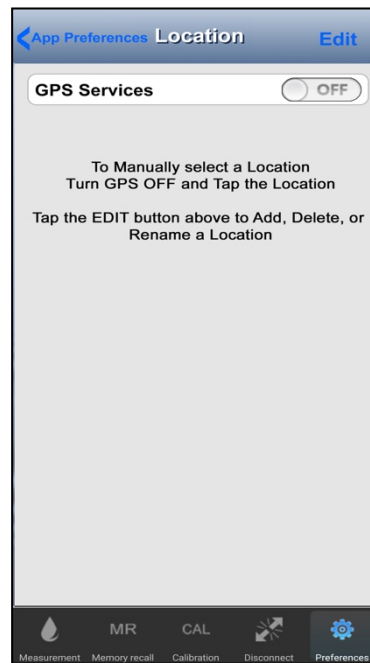
- If you are too close to a previously programmed GPS location, the App will select that location instead of displaying a new set of Longitude and Latitude coordinates.
  - If you're unable to get the App to display a new set of Longitude and Latitude coordinates you may be too close to an already saved GPS location.
  - If so, you can enter the location as a Non-GPS location.

**NOTE** There does NOT have to be a Connected / Paired ULTRAPENX2 to add a new GPS location.

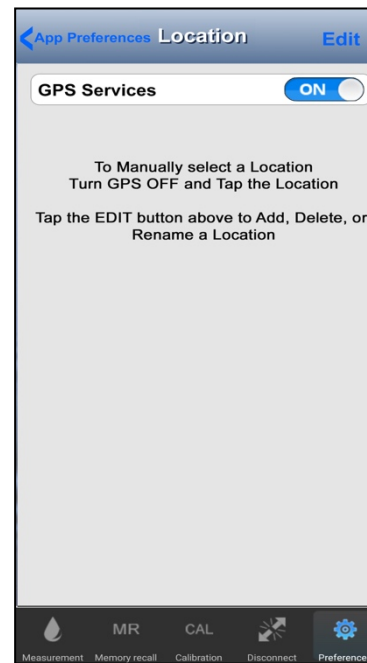
1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select **App Preferences** on the list that appears.



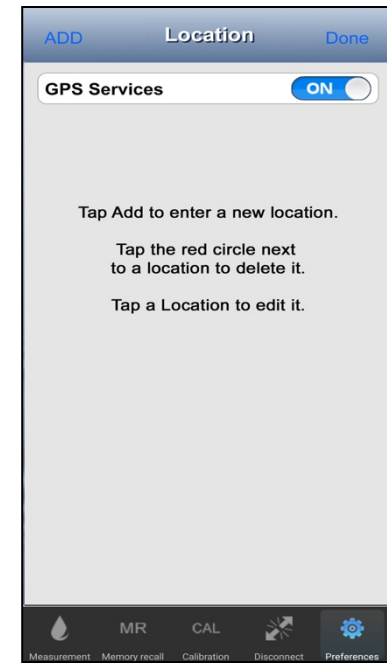
3. The main Application Preferences screen will appear with the current Location setting displayed. The Default setting is "No Location". Tap the Location line.



4. The Location screen will appear. The Default setting for the App GPS Services Is **OFF**.

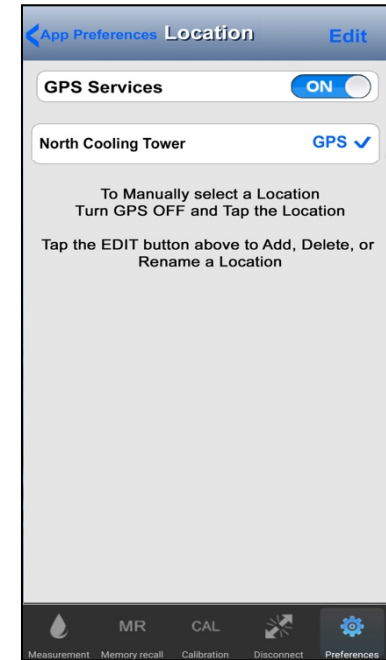
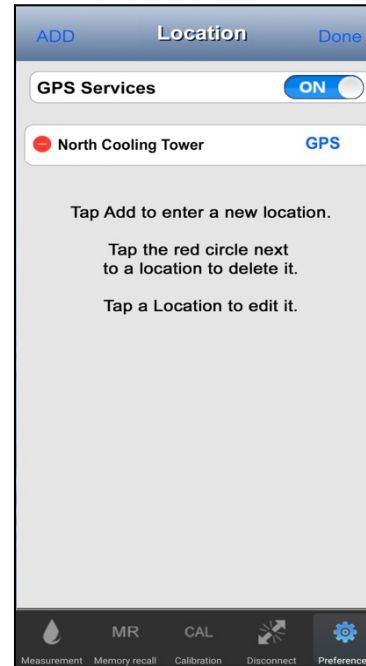
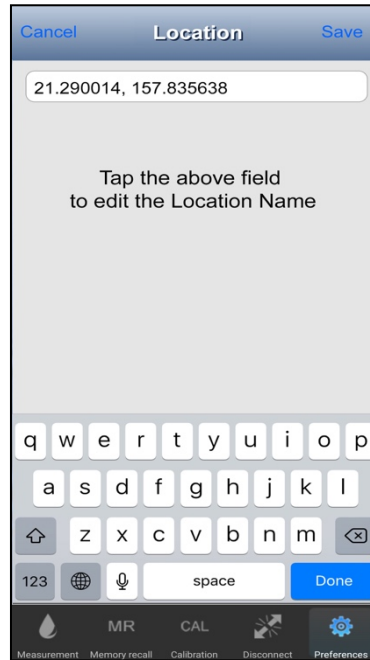
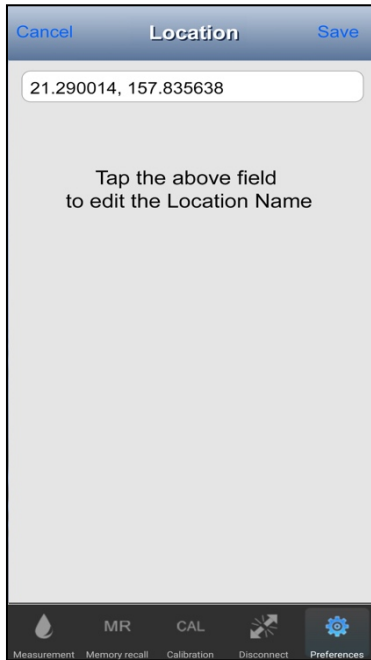


5. Slide the GPS Switch right to turn the App GPS Services **ON**. Tap the **EDIT** button in the upper right to open the Location Edit screen.



6. Tap "Add" in the upper left corner of the screen.

## Operation Manual – PTBTX2 App – App Preferences



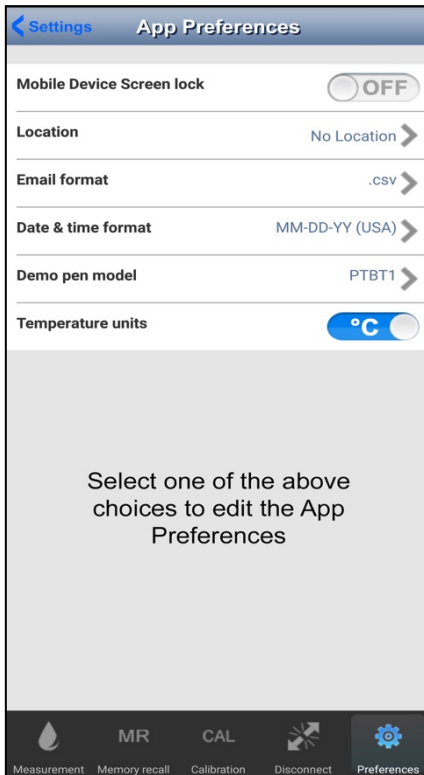
7. The App will open a GPS Field containing the longitude and latitude received from the mobile device's internal GPS. Tap the field containing the coordinates.
8. A standard keypad and text edit cursor will appear for the device's OS. Edit the field contents as you would for any other editable field for your device's OS. Once you are done, tap the **SAVE** button.
9. The App will return to the Location Edit screen.  
**NOTE:** While the GPS switch is set to ON, it will sort the GPS Locations closest to furthest, Tap the **DONE** button to close the Location Edit mode.
10. The App will return to the Main Location screen. When the GPS Switch is set to **ON**, the App will automatically select the location that is physically closest to the mobile device.



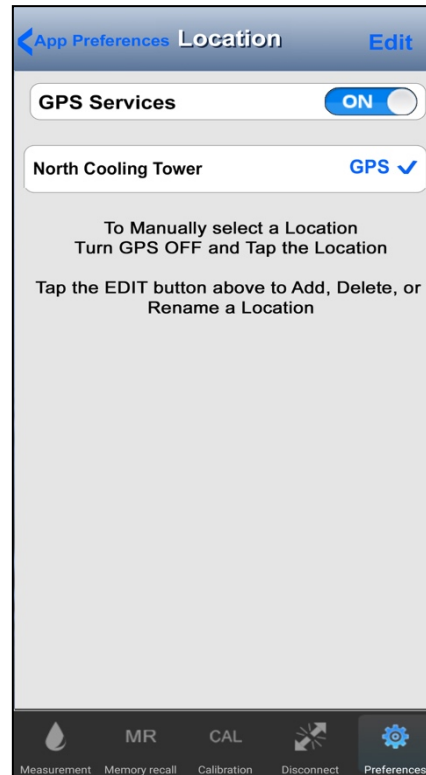
## Adding a NON-GPS Location

**NOTE** There does NOT have to be a Connected / Paired ULTRAPENX2 to add a Non-GPS location.

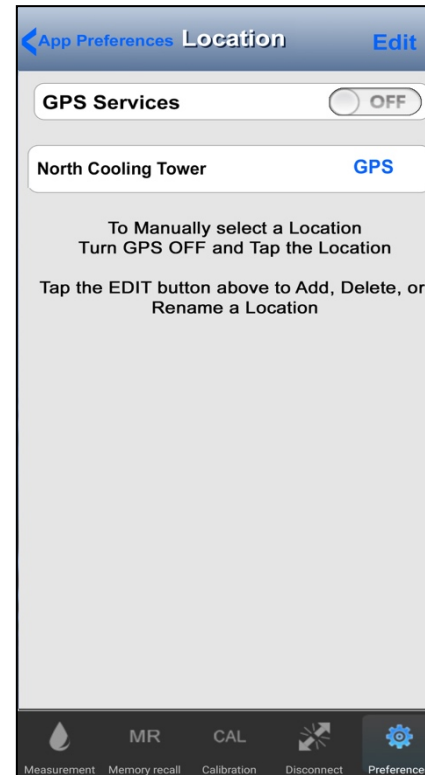
1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select **App Preferences** on the list that appears.



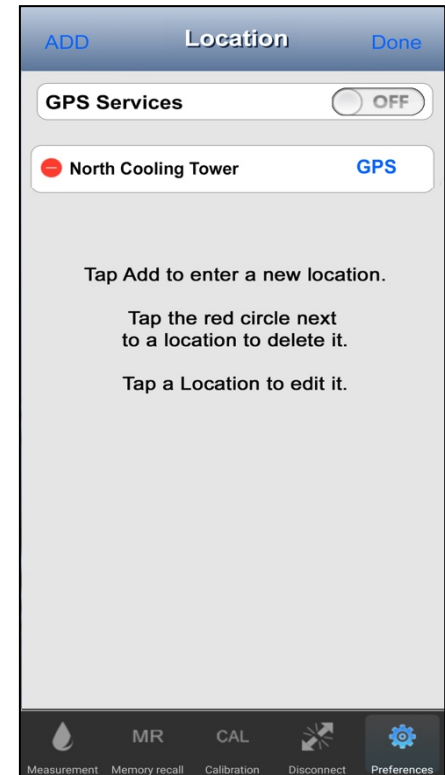
3. The main App Preferences screen will appear with the current Location setting displayed.  
The Default setting is “No Location”.  
Tap the Location line.



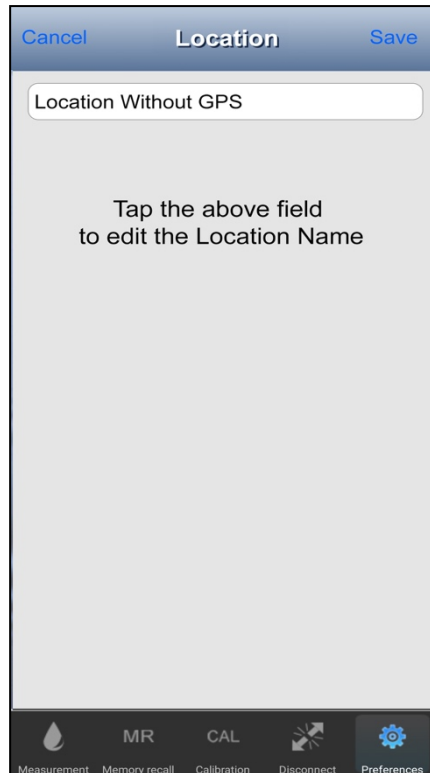
4. The Location screen will appear.  
If the GPS services switch is set to **ON**, slide it to the left and turn it **OFF**.



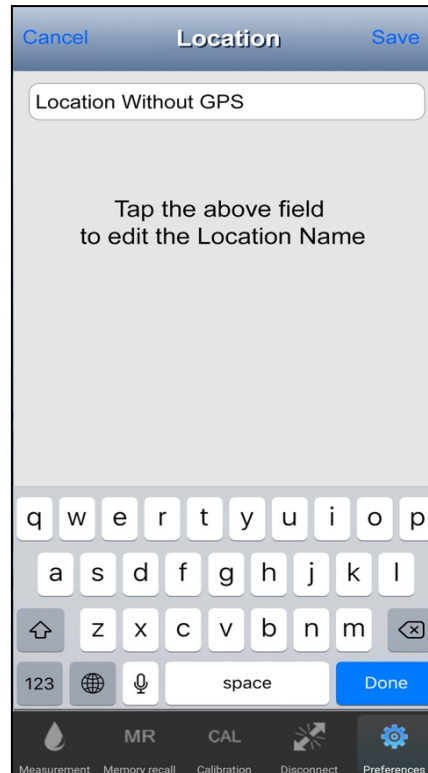
5. The Check mark will disappear from the Currently selected GPS location.  
Tap the **EDIT** button in the upper right to open the Location Edit screen.



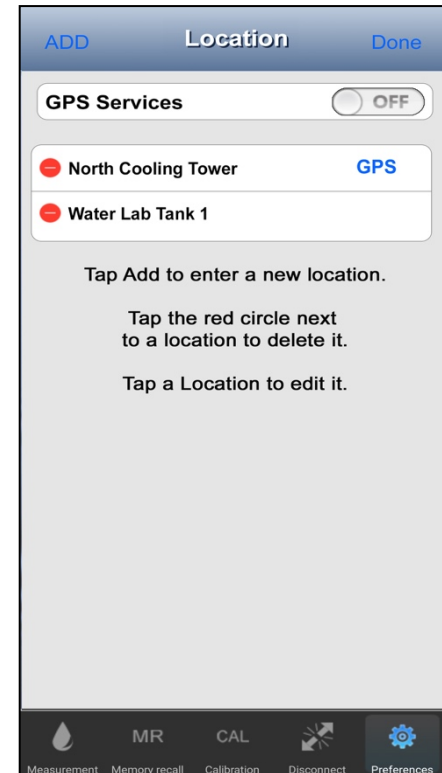
6. Tap the **ADD** button.



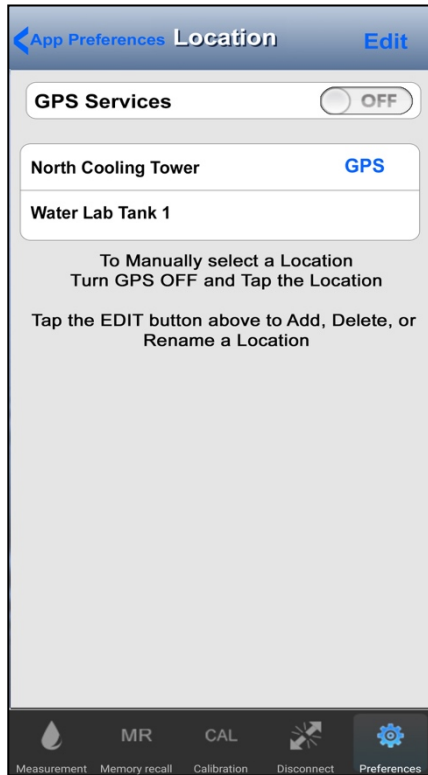
7. The App will open a Location field containing the phrase “Location Without GPS”.  
Tap the field containing “Location Without GPS”.



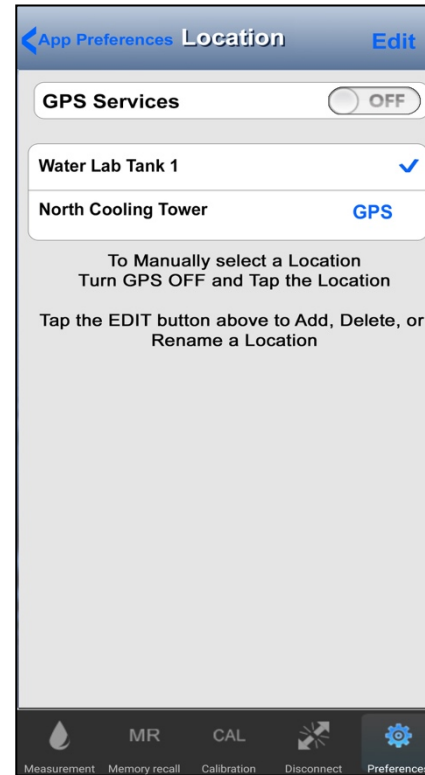
8. A standard keypad and text edit cursor will appear for the device’s OS.  
Edit the field contents as you would for any other editable field for your device’s OS.  
Once you are done, tap the **SAVE** button.



9. The App will return to the Location Edit screen.  
The newly added location will appear.  
The locations will be sorted alphanumerically.  
Tap the **DONE** button to close the Location Edit mode.



10. The App will return to the Main Location screen.  
When the GPS Switch is set to **OFF**, the App will automatically Sort the Location List alphanumerically.



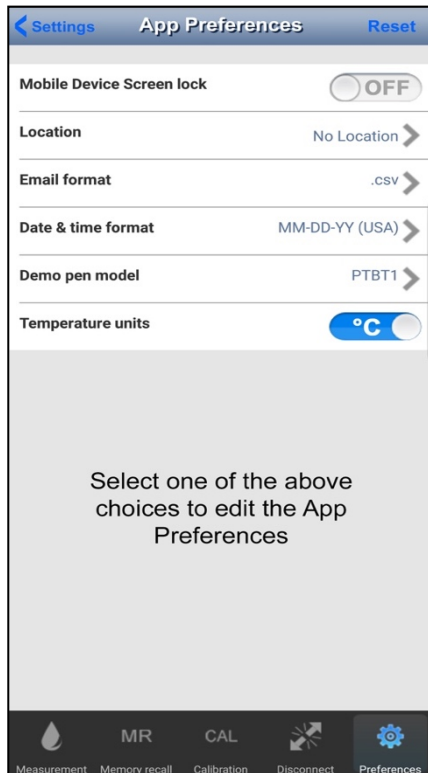
11. Tap the location you wish to select.  
The selected location will always go to the top of the Location List.  
A check mark will appear next to it.

**NOTE:** If no location is selected, the default Location, “No Location” will be used for new data records.

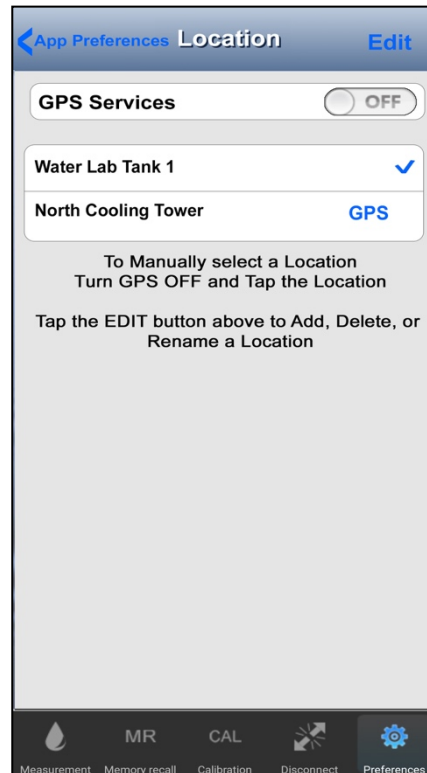
## Editing the Name of a Location on the List

**NOTE** There does NOT have to be a Connected / Paired ULTRAPENX2 to edit the name of a Location.

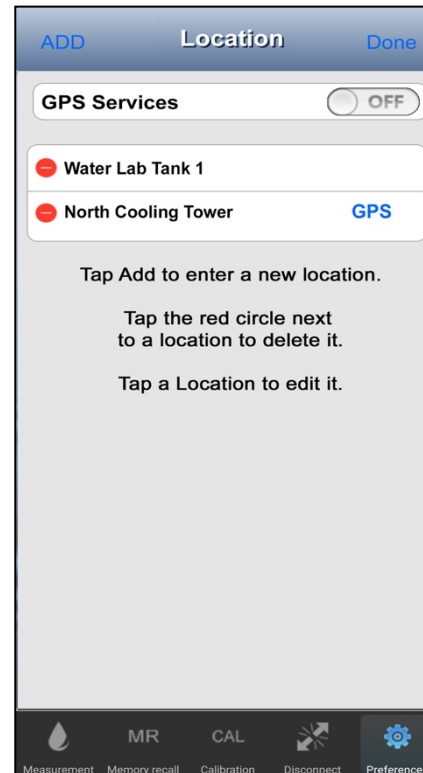
1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select **App Preferences** on the list that appears.



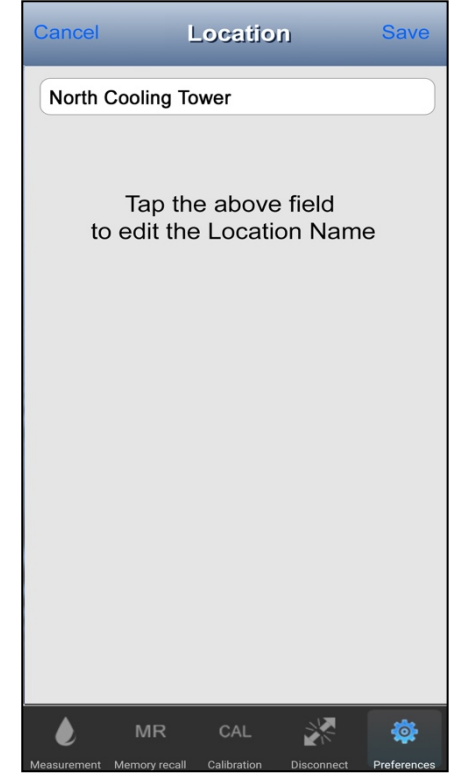
3. Tap the Location line.



4. The Location screen will open.
5. Tap the **EDIT** button in the upper right to open the Location Edit screen.

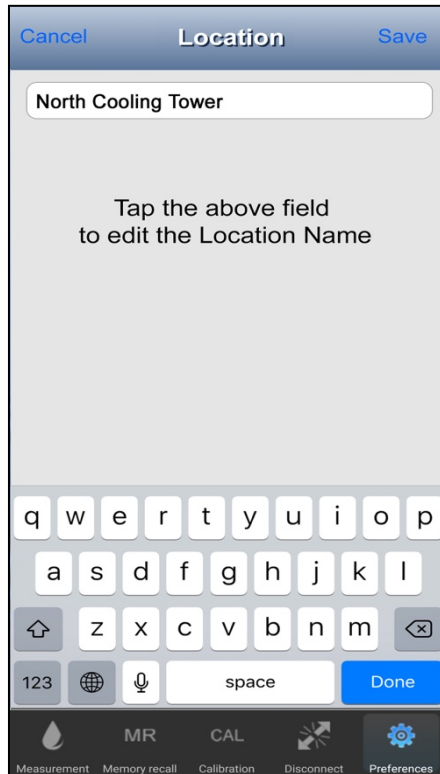


6. Tap the Location you wish to edit.

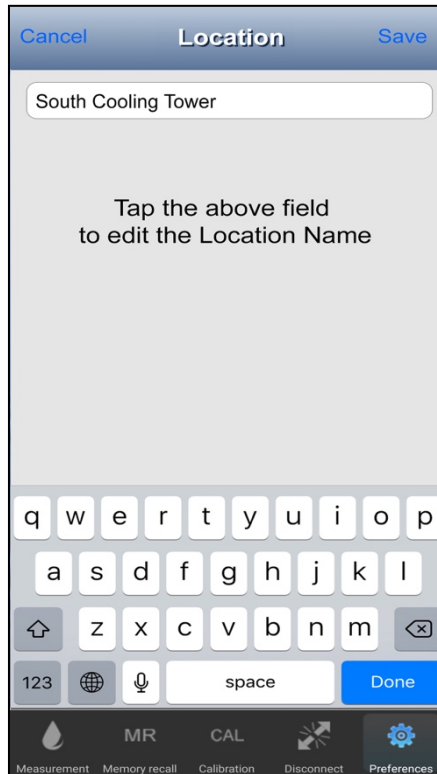


7. Tap the field in which the name appears.

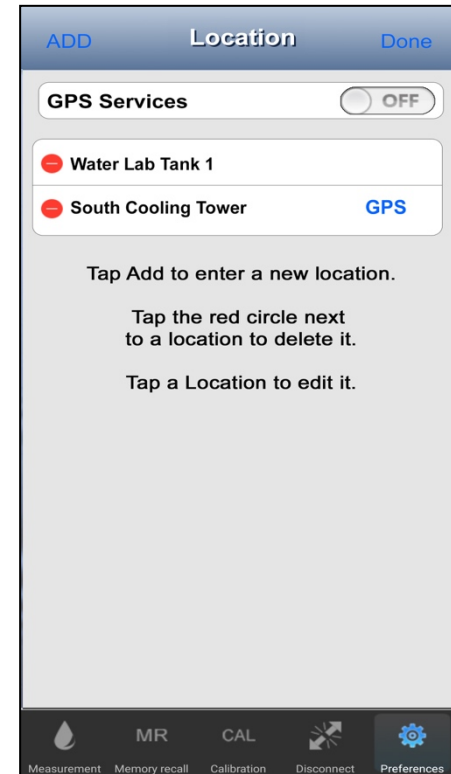
## Operation Manual – PTBTX2 App – App Preferences



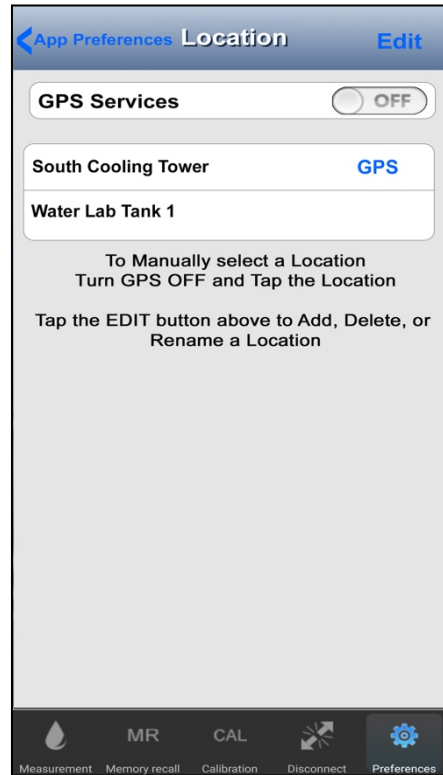
8. A standard keypad and text edit cursor will appear for the device's OS.  
Edit the field contents as you would for any other editable field for your device's OS.



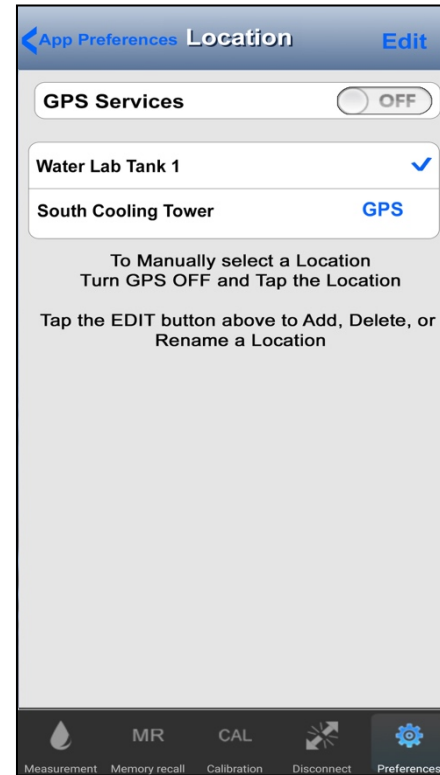
9. Tap the **SAVE** button.



10. The EDIT Location screen will reappear showing the new name for the location.  
Tap the **DONE** button.



11. The App will return to the Main Location screen.  
When the GPS Switch is set to **OFF**, the App will automatically Sort the Location List alphanumerically



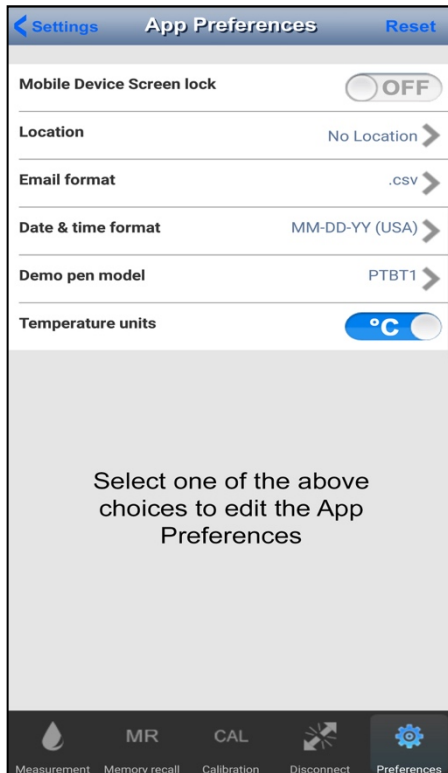
12. Tap the location you wish to select.  
The selected location will always go to the top of the Location List.  
A check mark will appear next to it.

**NOTE:** If no location is selected, the default Location, “No Location” will be used for new data records.

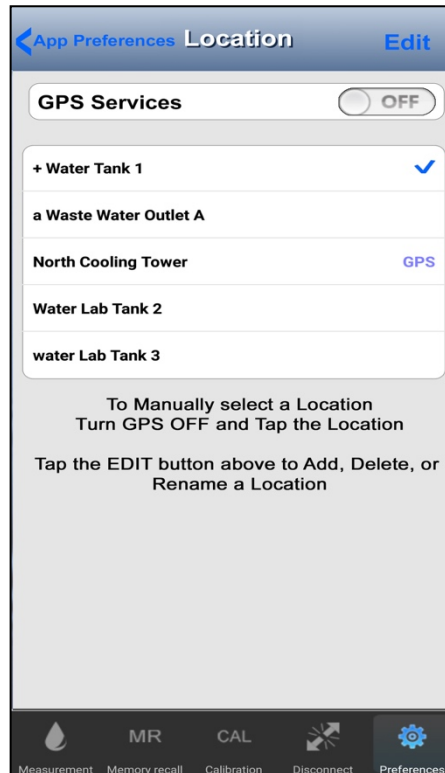
## Deleting a Location from the List.

**NOTE** There does NOT have to be a Connected / Paired ULTRAPENX2 to Delete a Location.

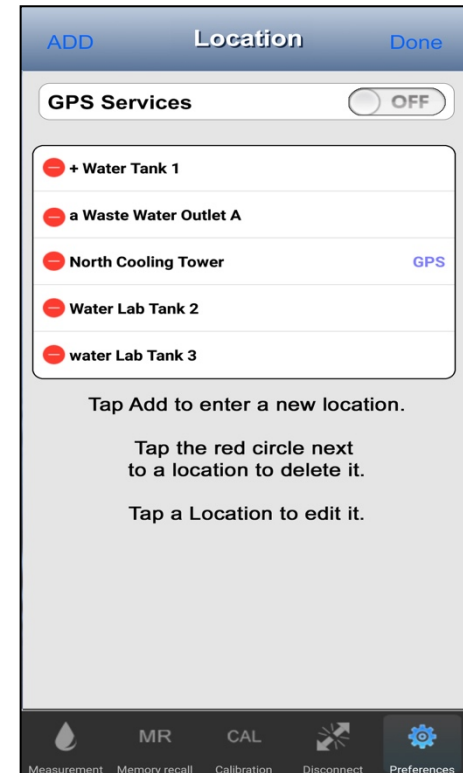
1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select **App Preferences** on the list that appears.



3. Tap the Location line.

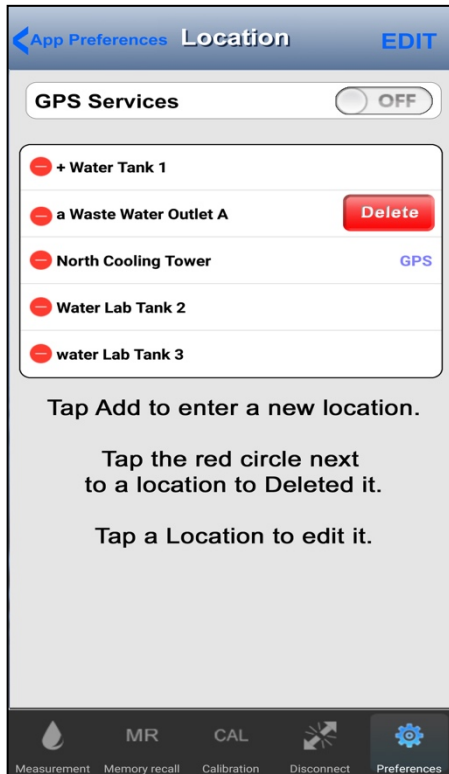


4. Tap the **EDIT** button in the upper right to open the Location Edit screen.

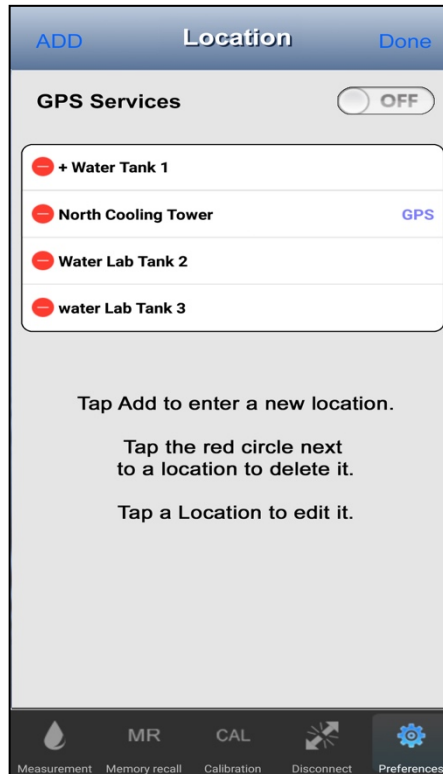


5. Tap the RED circle next to the Location you wish to delete.

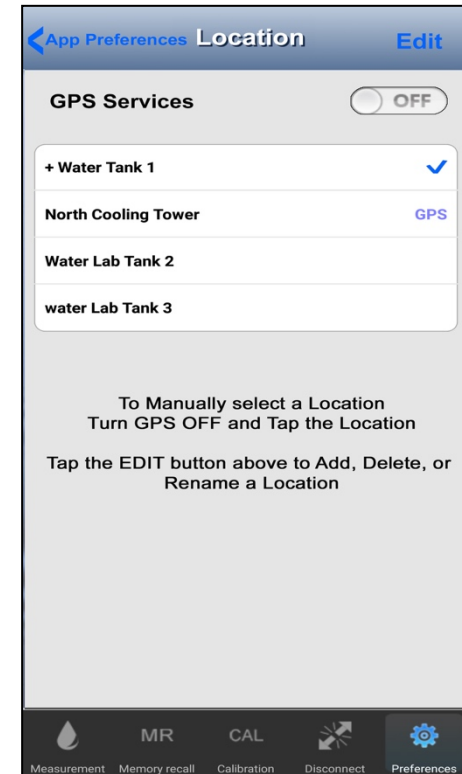
## Operation Manual – PTBTX2 App – App Preferences



6. A red **DELETE** button will appear to the right of the location name. Tap the red **DELETE** button.



7. The selected location will be removed from the list.
8. Tap the **DONE** button.



9. Unless you deleted it, the previously selected location will still be selected. A check mark will appear next to it and it will move to the top of the list.
10. Otherwise tap a location to select it.

**NOTE:** If no location is selected, the default Location, “No Location” will be used for new data records.



## 37. The Demo Ultrapen

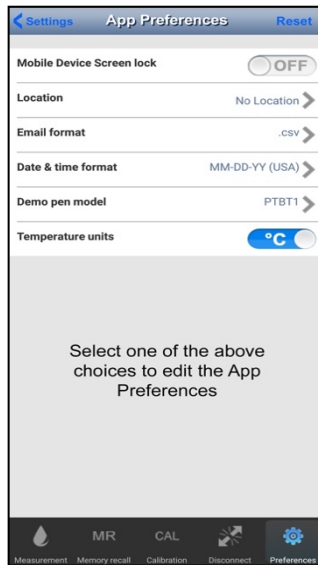
The PTBTX2 App includes a simulated ULTRAPENx2 that can be used to explore the features and functions of the App without having an actual ULTRAPENx2 available and awake.

### Selecting the Demo ULTRAPENx2 Model

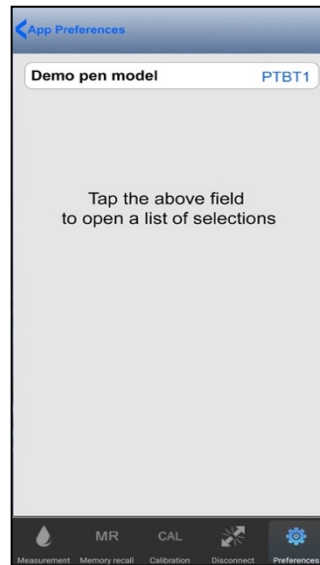
- The Demo Pen feature can emulate any one of the following Myron L<sup>®</sup> Company ULTRAPENx2 instruments.
  - PTBT1 – Conductivity, Total Dissolved Solids and Salinity pocket tester.
  - PTBT2 – pH pocket tester.
  - PTBT3 – Oxidation-Reduction Potential (ORP) pocket tester.
  - PTBT4 – Free Chlorine Equivalent (FC<sup>E</sup>) pocket tester.
    - Measures the equivalent bacterial killing power of the chlorine species present in the sample.
  - PTBT5 – Dissolved Oxygen pocket tester.
  - PTBT6 – Nitrate pocket tester.

**NOTE** There does NOT have to be a Connected / Paired ULTRAPENx2 to select a Demo Pen model.

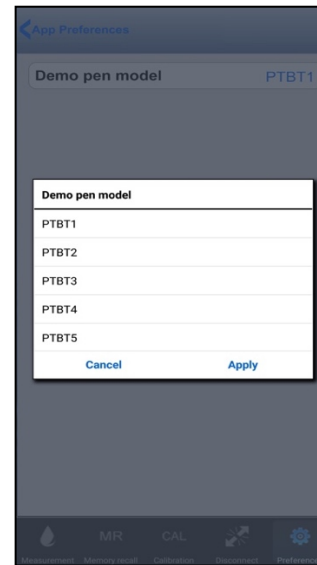
1. Tap on the **PREFERENCES** button on the Feature Navigation Bar.
2. Select **App Preferences** on the list that appears.



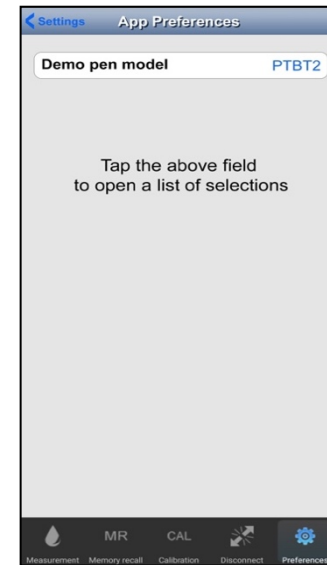
3. Tap the Demo Pen model line.



4. Tap the Demo Pen model field.



5. When the Demo Pen Menu appears, select the model you wish to emulate.
6. Tap "Apply".

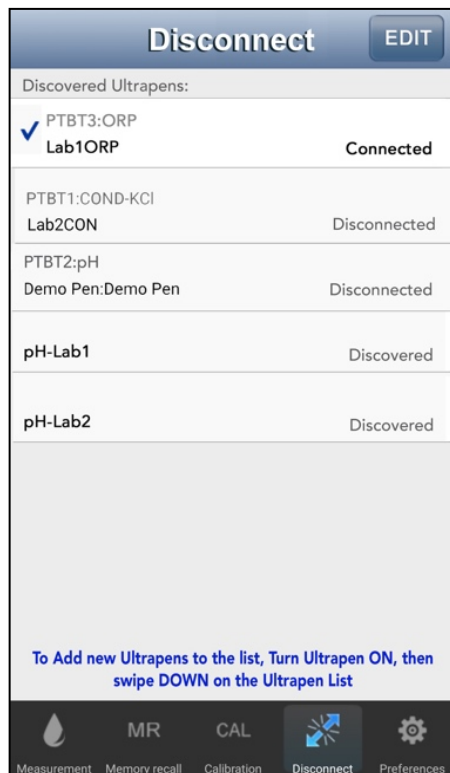


7. The new model will appear in the Pen model field.

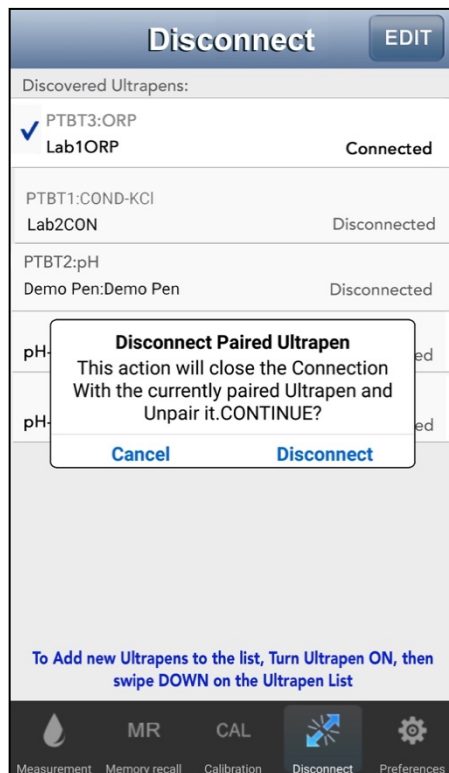
## Connecting to the Demo Pen

**NOTE:** There does NOT have to be a Connected / Paired ULTRAPENX2 to connect to the Demo Pen.

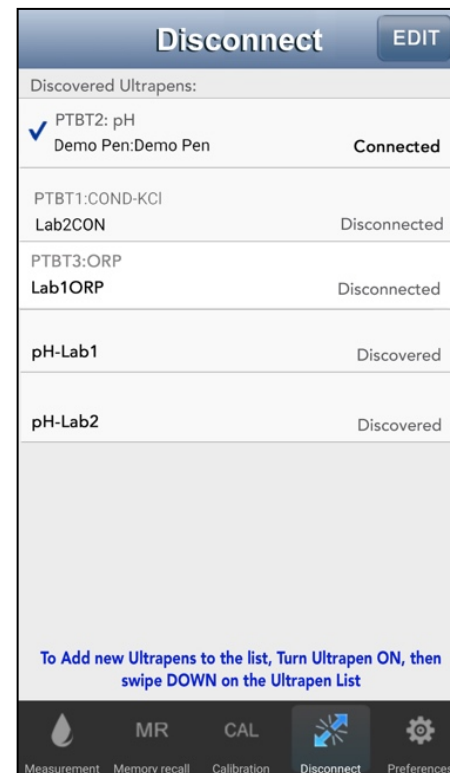
1. Tap the **CONNECT / DISCONNECT** button in the Feature Navigation Bar.



2. Tap the Demo Pen line.



3. If another ULTRAPENX2 is already connected to the App, the Disconnect dialogue box will appear. Tap “Disconnect”.



4. The App will connect to the Demo Pen. The Demo Pen will move to the top of the list. A check mark will appear next to the Demo Pen. The status will change to “Connected”.

**NOTE:** Tap the **MEASUREMENT** button in the Feature Navigation Bar, to switch to the Measurement screen and begin taking measurements.

## REFERENCE INFORMATION

### 38. The Help Link

- This selection will open the mobile device's browser and take you to the Myron L<sup>®</sup> Company web page for PTBTx.
  - ([http://www.myronl.com/main/PTBTX\\_Application\\_DL.htm](http://www.myronl.com/main/PTBTX_Application_DL.htm)).
- Once there, you can find various manuals and downloadable application notes.

#### To Access Help

1. Tap the **PREFERENCES button** in the Feature Navigation Bar.
2. Tap on the **Help** line on the base Settings screen.
3. The App will open the default browser for your mobile device and automatically link you to the Myron L<sup>®</sup> Company PTBTX2 download page.
  - On this page you will find:
    - Quick Start instructions for various models of the ULTRAPENx2 Pocket Testers.
    - Operation Manuals for the ULTRAPENx2 Pocket Testers.
    - The Operation Manual for PTBTX2 App.

### 39. The About Screen

- Allows user to view Application's software revision with warning message about file formats.

**NOTE:** Most of the Settings and Preferences screens have a context sensitive button in the upper left corner that will return you to the previous screen.

#### To Access the ABOUT page

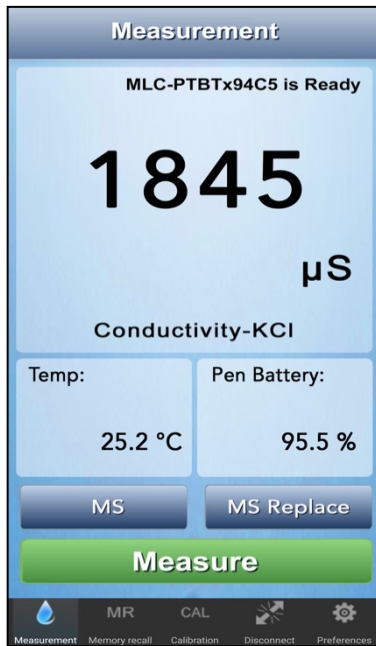
1. Tap the **PREFERENCES button** in the Feature Navigation Bar.
2. Tap on the **About** line on the base Settings screen.
  - On this page you will find:
    - The name of the App.
    - The version of the App.
    - The date the current version App was created and uploaded to the App Store / Google Play Store.

# DATA RECORDS

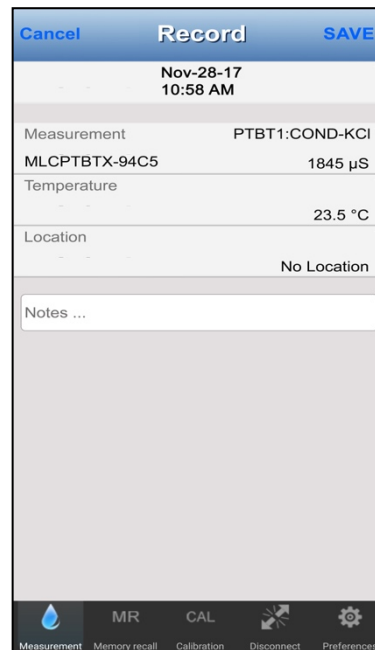
## 40. Creating and Displaying Data Records

### Creating Records (Memory Store):

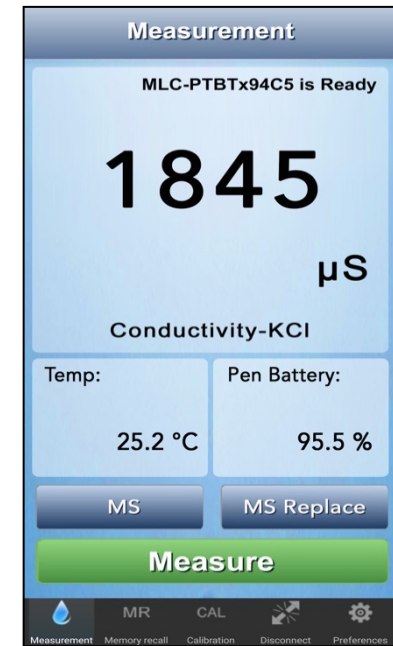
1. Take a measurement as you normally would.



2. Tap the MS button just beneath the temperature value fields.



3. The App will display the data to be saved in the Record.  
Tapping **CANCEL** closes this screen without creating a record.  
Tapping **SAVE** creates a record with the displayed information.

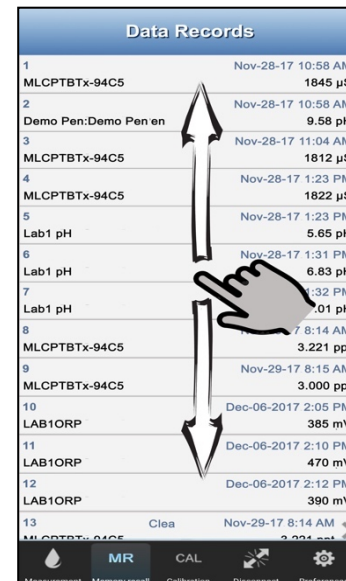
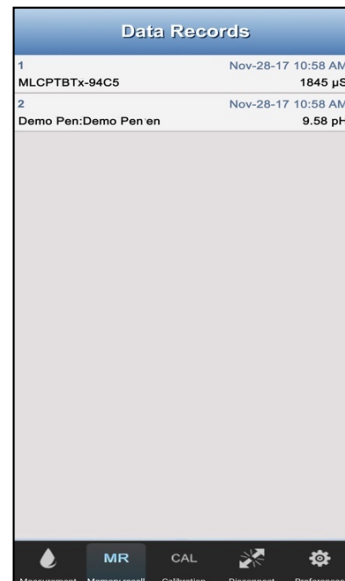
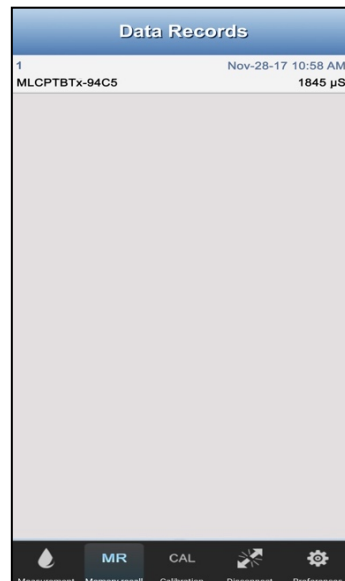
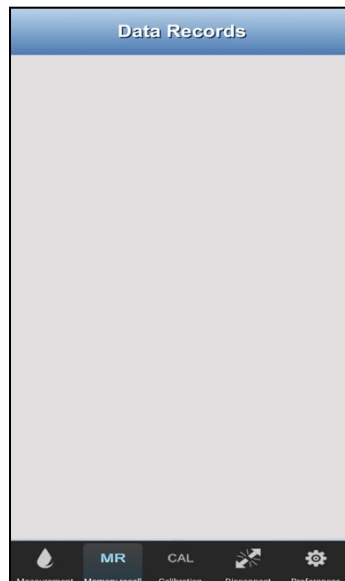


4. The App will return to the previous Measurement screen.  
The values from the previous measurement will still be displayed.

- Only one record may be made for each Measurement.
  - The App will ignore attempts to store a second record for the same measurement.
- In LIVE mode a new record can be made each time the App updates the screen.
  - The App will continue to receive measurements from the pen while the record is being saved.

## Viewing Record List

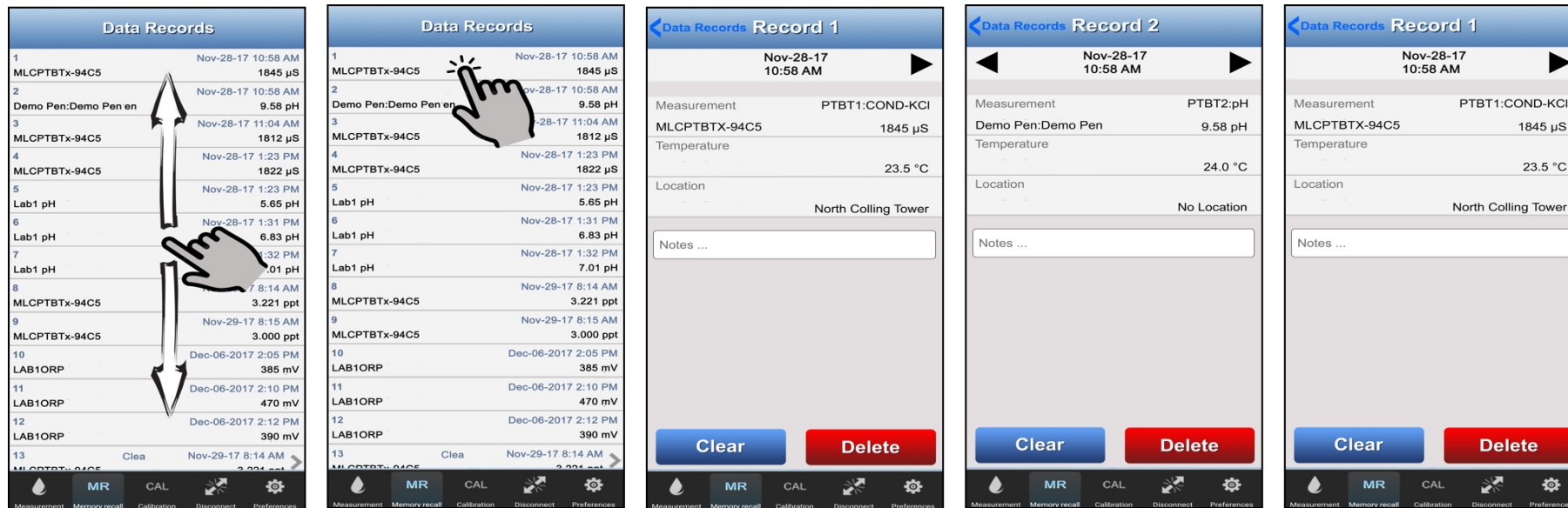
1. Tap the **MR** (Memory Recall) button on the Feature Navigation Bar.



2. If you have not stored any Measurements the Data Records list will be blank.
3. After you have stored a record it will appear on in the list.
4. The App assigns Record Numbers sequentially, starting at "1".
5. As each record is stored, it is added to the list.
6. The Record number will increment by 1 for each record.
7. Once enough records are stored that the list is longer than the available screen space, swipe UP or DOWN to view other records in the list.

## View the Contents of a Record

1. Tap the **MR** (Memory Recall) button on the Feature Navigation Bar.



2. Swipe UP or DOWN to find the record you wish to view.

3. Tap that record once.

4. The Record contents will appear.

5. Tap the ► to display the next record in the list.

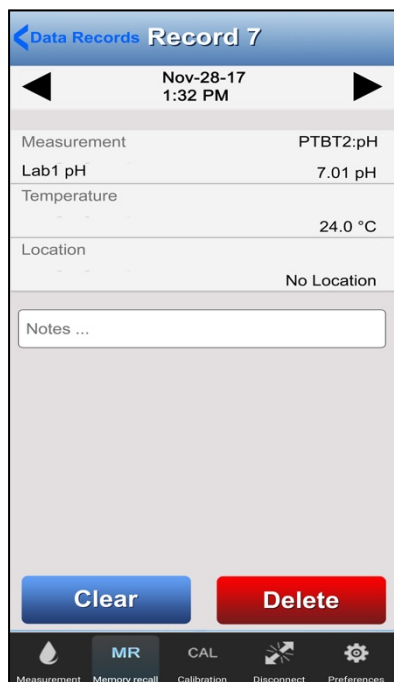
6. Tap the ◀ to display the previous record in the list.

- Tap “Data Records” at the top left of the screen to return to the full Records List.

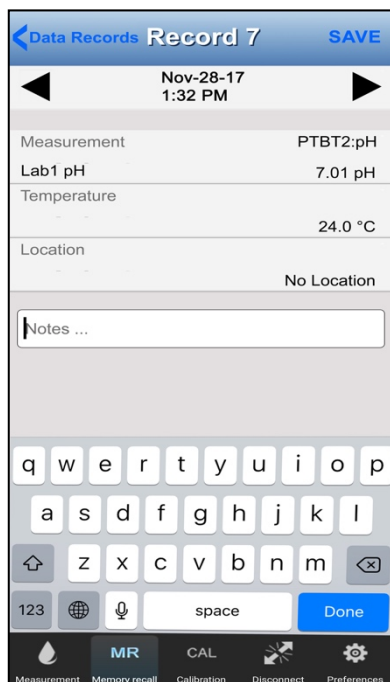
## 41. Adding a Note to a Data Record

You can add notes, remarks, or any kind of additional data to a record. This can be done:

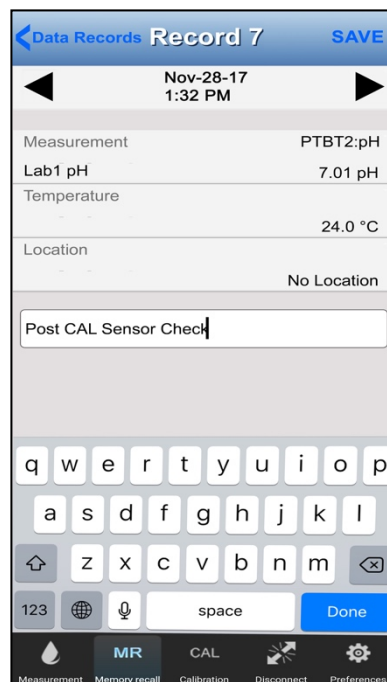
- During the original Memory Save process, or:
- After the record is saved and stored in memory.



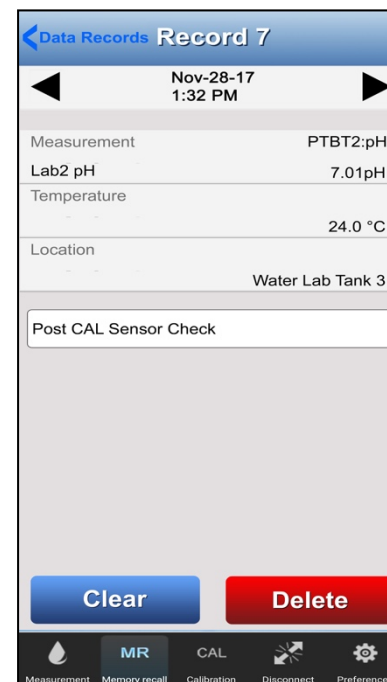
1. Open the record as shown in the previous section.



2. Tap the Notes field. A keypad will appear along with a cursor.



3. Type the note into the field. Tap the **SAVE** button.



4. The note will be saved. The Keypad will disappear.

- Tap **"Data Records"** in the upper left corner to return to the main record list or any button in the Feature Navigation Bar.
  - **NOTE:** Existing notes can be edited using this same procedure.

## 42. Replacing the Data in a Record

You can replace the data in a specific Record Location with data from a new reading.

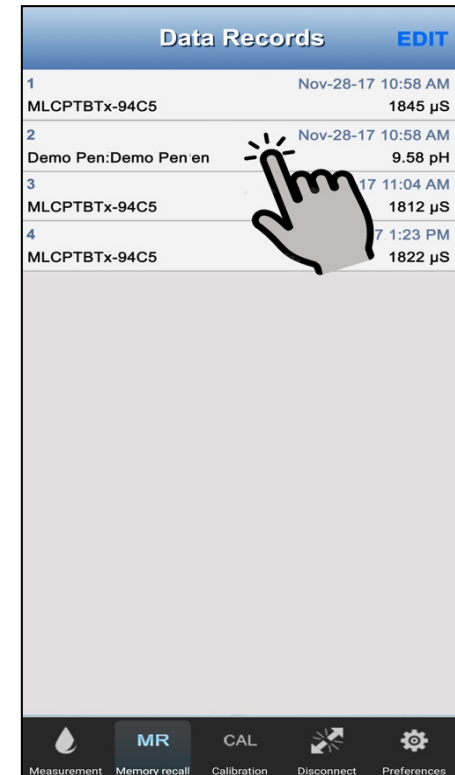
- **This operation will completely erase the original data in that record location but keep the Record Number the same.**



1. Take a measurement as you normally would.  
Tap the **MS REPLACE** button.



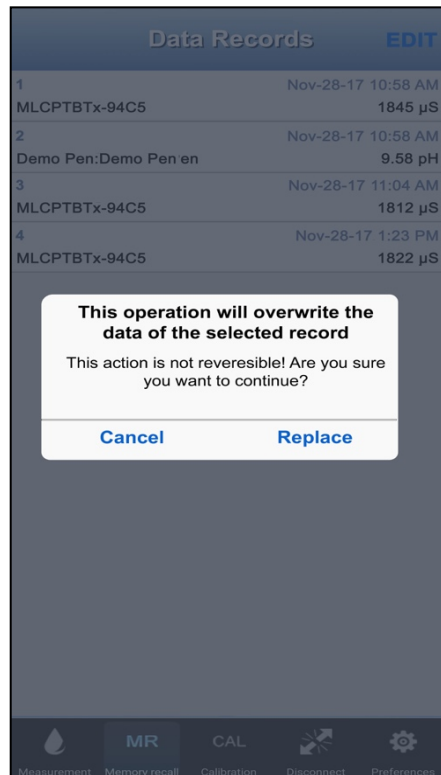
2. The Record List will appear.



3. Tap the record on the list into which you wish to replace data.



# Operation Manual – PTBTX2 App – Reference Information

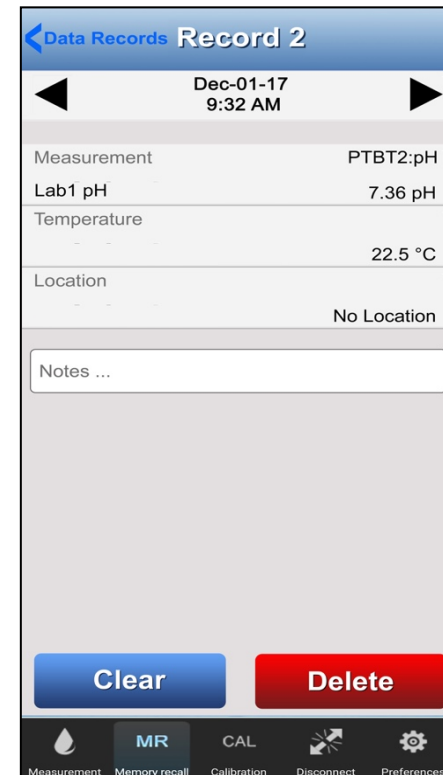


4. A warning dialogue box will appear. Tap the **CANCEL** button to leave the record contents unchanged. Tap the **REPLACE** button to overwrite the existing data with the new data.

NOTE: At this point the App will return to the Measurement screen.



If you tap the **MR** button, you will notice that the data from the new measurement appears in the data record fields of the target record.



If you open the actual record, you will see that the data from the new measurement appears in all of the fields, including the Date and time of the new measurement.

## EDITING THE DATA RECORDS AND THE RECORDS LIST

You can use the Data Records list to perform the following actions on individual or groups of records: select groups of records to; Export, Clear, Sort, or Delete. You can also set Filter criteria so that the App displays a subgroup of the entire list (see Section 45).

### 43. Manually Selecting Multiple Records

1. Tap the **MR** button on the Feature Navigation Bar.

Data Records		EDIT
1	MLCPTBTx-94C5 Nov-28-17 10:58 AM	1845 μS
2	Demo Pen:Demo Pen Nov-28-17 10:58 AM	9.58 pH
3	MLCPTBTx-94C5 Nov-28-17 11:04 AM	1812 μS
4	MLCPTBTx-94C5 Nov-28-17 1:23 PM	1822 μS
5	Lab1 pH Nov-28-17 1:23 PM	5.65 pH
6	Lab1 pH Nov-28-17 1:31 PM	6.83 pH
7	Lab1 pH Nov-28-17 1:32 PM	7.01 pH
8	MLCPTBTx-94C5 Nov-29-17 8:14 AM	3.221 ppt
9	MLCPTBTx-94C5 Nov-29-17 8:15 AM	3.000 ppt
10	LAB1ORP Dec-06-2017 2:05 PM	385 mV
11	LAB1ORP Dec-06-2017 2:10 PM	470 mV
12	LAB1ORP Dec-06-2017 2:12 PM	390 mV
13	MLCPTBTx-94C5 Nov-29-17 8:14 AM	3.221 ppt

2. When the Data Records list appears, tap the **Edit** button in the upper right corner.

Send	Data Records	Done
1	MLCPTBTx-94C5 Nov-28-17 10:58 AM	1845 μS
2	Demo Pen:Demo Pen en Nov-28-17 10:58 AM	9.58 pH
3	MLCPTBTx-94C5 Nov-28-17 11:04 AM	1812 μS
4	MLCPTBTx-94C5 Nov-28-17 1:23 PM	1822 μS
5	Lab1 pH Nov-28-17 1:23 PM	5.65 pH
6	Lab1 pH Nov-28-17 1:31 PM	6.83 pH
7	Lab1 pH Nov-28-17 1:32 PM	7.01 pH
8	MLCPTBTx-94C5 Nov-29-17 8:14 AM	3.221 ppt
9	MLCPTBTx-94C5 Nov-29-17 8:15 AM	3.000 ppt
10	LAB1ORP Dec-06-2017 2:05 PM	385 mV
11	LAB1ORP Dec-06-2017 2:10 PM	470 mV
12	LAB1ORP Dec-06-2017 2:12 PM	390 mV

Select All Delete (4) Sort / Filter Clear (4)

3. The Record List EDIT screen will appear.  
A new Menu Bar will appear at the bottom of the screen that includes:
  - a. Select All.
  - b. Delete.
  - c. Sort/Filter.
  - d. Clear.

Data Records	
1	MLCPTBTx-94C5 Nov-28-17 10:58 AM
2	Demo Pen:Demo Pen en Nov-28-17 10:58 AM
3	MLCPTBTx-94C5 Nov-28-17 11:04 AM
4	MLCPTBTx-94C5 Nov-28-17 1:23 PM
5	Lab1 pH Nov-28-17 1:23 PM
6	Lab1 pH Nov-28-17 1:31 PM
7	Lab1 pH Nov-28-17 1:32 PM
8	MLCPTBTx-94C5 Nov-29-17 8:14 AM
9	MLCPTBTx-94C5 Nov-29-17 8:15 AM
10	LAB1ORP Dec-06-2017 2:05 PM
11	LAB1ORP Dec-06-2017 2:10 PM
12	LAB1ORP Dec-06-2017 2:12 PM
13	MLCPTBTx-94C5 Nov-29-17 8:14 AM

4. Tap those records you wish to select.  
You can select as many records as you want.  
If the records you want to select do not appear on the screen, swipe **UP** or **DOWN** until you find them.  
Tap the **SELECT ALL** button to choose every record on the list.  
Notice that the **DELETE** and **CLEAR** buttons change to show the number of records selected.

**NOTE:** Once a group of records have been selected, that group can be deleted, cleared or exported without affecting any other records in the list.

## 44. Using the Sort Feature to Arrange Data Records on the List

You can use the Data Record List >Edit mode to Sort Records.

- Sorting can be performed with up to four levels of nested keys.
  - All Sorting is in ascending order.
- Sorting and filtering can be done according to the following criteria:
- **DEFAULT:** The Data Records list is sorted by Record Number.
  - **MEASUREMENT TYPE:**
    - Records are sorted according to the Measurement Type (see Table 7):
  - **DATE**
    - Records are sorted in ascending order according to the date and time the records were made.
  - **ULTRAPEN NAME**
    - Records are sorted in ascending, alphanumeric order according the name of the ULTRAPENX2 used to make the measurements.
  - **LOCATION**
    - Records are sorted in ascending, alphanumeric order according the location assigned to the measurements.

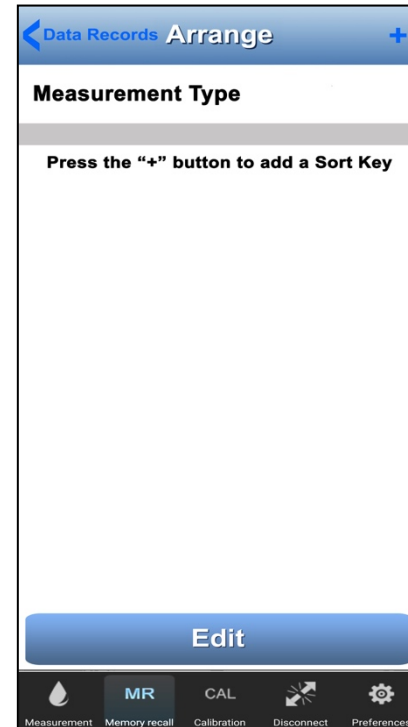
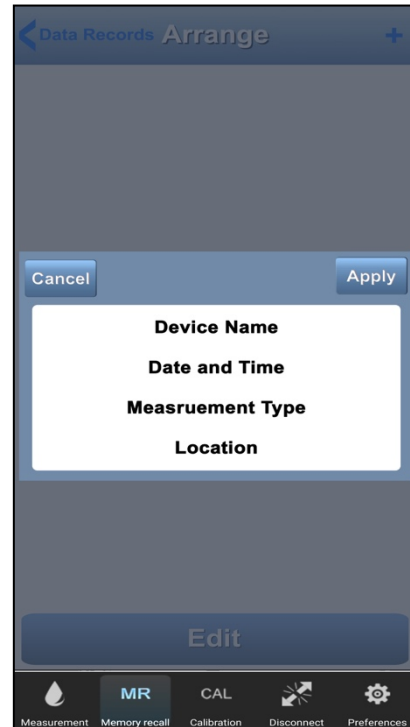
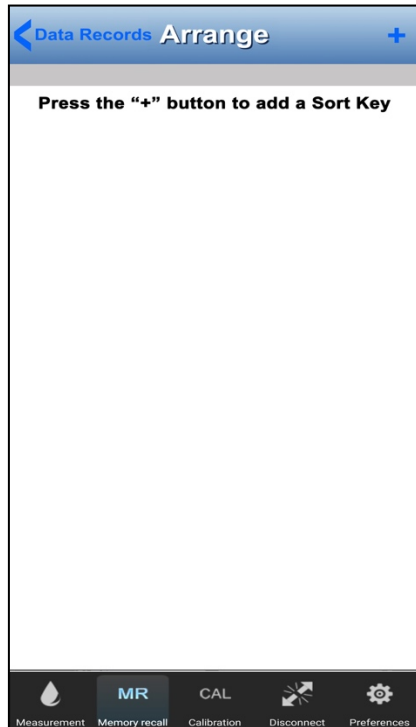
Table 7 – Measurement Sort Order

Measurement Types in Ascending Order <sup>1</sup>	Units of measure displayed on the Record List.	Pen Model <sup>1</sup>
COND-KCL	µS	PTBT1
DO Concentration	ppm	PTBT5
DO Default	ppm	PTBT5
DO Saturation	%	PTBT5
FC <sup>E</sup>	ppm	PTBT4
mV	mV	PTBT6
NO <sub>3</sub> <sup>-</sup>	ppm NO <sub>3</sub>	PTBT6
NO <sub>3</sub> <sup>-</sup> -N	ppm NO <sub>3</sub> <sup>-</sup> -N	PTBT6
ORP	mV	PTBT3
ORPpr	mV	PTBT4
pH	pH	PTBT2
Salinity-442	ppt	PTBT1
Salinity-NaCl	ppt	PTBT1
TDS-442	ppm	PTBT1
TDS-NaCl	ppm	PTBT1

<sup>1</sup> The Measurement Type and Pen Type are included in the actual Data Record they do not appear in the Data Records List.

## Adding Sort Keys

1. Tap the **MR** button on the Feature Navigation Bar.
2. Tap the **EDIT** button in the top right corner.
3. Tap the **SORT/FILTER** button that appears in the Record Edit bar at the bottom of the screen.



Data Records		EDIT
1	MLCPTBTx-94C5	Nov-28-17 10:58 AM 1845 µS
2	Demo Pen:Demo Pen	Nov-28-17 10:58 AM 9.58 pH
3	MLCPTBTx-94C5	Nov-28-17 11:04 AM 1812 µS
4	MLCPTBTx-94C5	Nov-28-17 1:23 PM 1822 µS
5	Lab1 pH	Nov-28-17 1:23 PM 5.65 pH
6	Lab1 pH	Nov-28-17 1:31 PM 6.83 pH
7	Lab1 pH	Nov-28-17 1:32 PM 7.01 pH
8	MLCPTBTx-94C5	Nov-29-17 8:14 AM 3.221 ppt
9	MLCPTBTx-94C5	Nov-29-17 8:15 AM 3.000 ppt
10	LAB1ORP	Dec-06-2017 2:05 PM 385 mV
11	LAB1ORP	Dec-06-2017 2:10 PM 470 mV
12	LAB1ORP	Dec-06-2017 2:12 PM 390 mV
13	MLCPTBTx-94C5	Nov-29-17 8:14 AM 3.221 ppt

4. The Arrange screen will appear.  
Tap the "+" button at the top right of the screen.
5. A menu will appear.  
Select the key by which you wish to sort the list.
6. Tap Apply.
7. The Sort Key will appear on the Arrange screen.
8. Repeat steps 4, 5 & 6 to add additional Sort Key.
9. Tap the **DATA RECORDS** button or the **MR** button to return to the Record List.  
The records will appear in ascending order based on the Sort Keys selected.

- You can add up to four, nested Sort Keys.

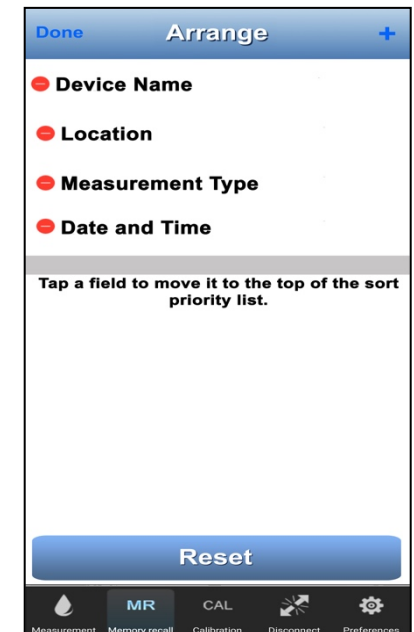
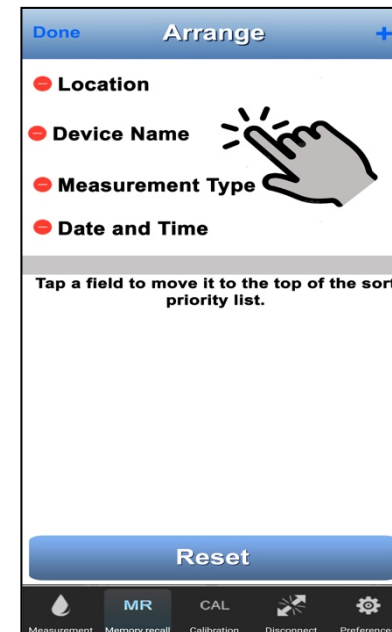
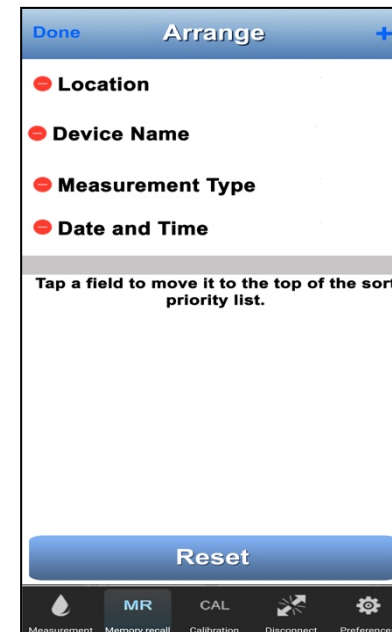
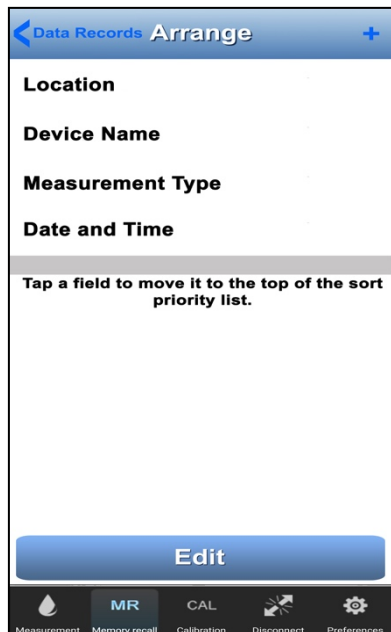
## Arranging Sort Keys

If you have selected multiple Sort Keys they will act as a nested sort:

- The key appearing at the top of the Arrange screen list is the primary Sort Key.
- The 2nd key from the top is the secondary Sort Key.
- The 3rd key from the top is the tertiary Sort Key.
- The 4th key from the top is the quaternary Sort Key.

To change the order of the Sort Keys without deleting and re-adding them:

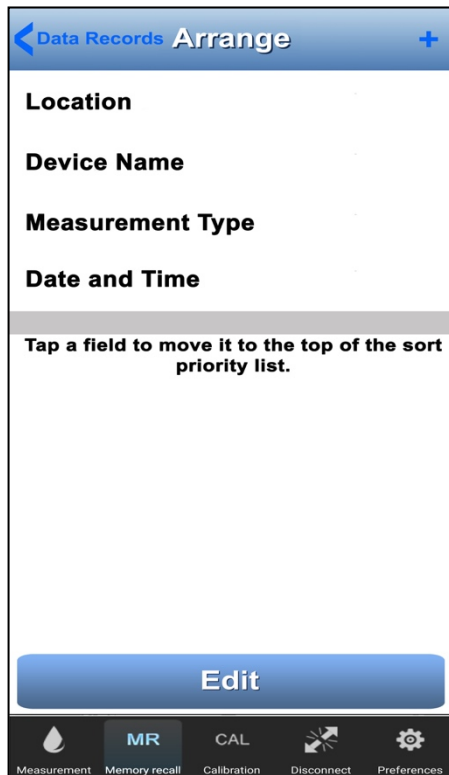
1. Tap the **MR** button on the Feature Navigation Bar.
2. Tap the **EDIT** button in the top right corner.
3. Tap the **Sort/Filter** button that appears in the Record Edit bar at the bottom of the screen.



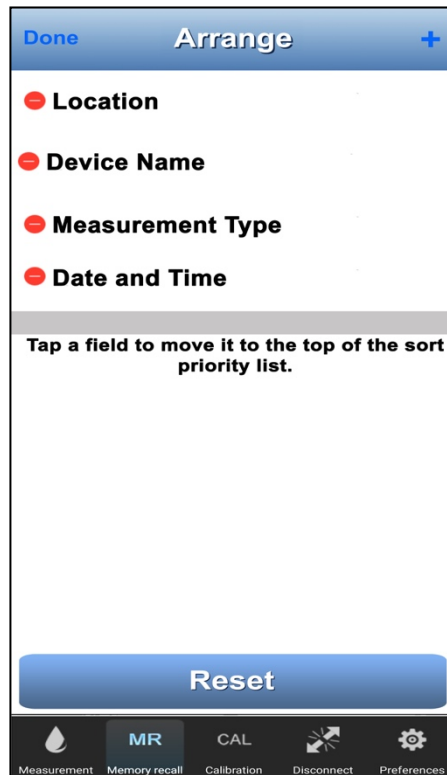
4. The Arrange screen will appear.  
Tap the **BLUE EDIT** button at the **BOTTOM** of the screen.  
The button will change to a Reset button.
5. The Arrange Edit screen will appear.  
A **DONE** button will appear in the upper left corner.  
A **RED** circle will appear to the left of each key.
6. Tap any key on the list besides the TOP key.  
DO NOT tap the red circle.
7. That key will move to the top of the key list and become the new primary Sort Key.
8. Tap the **DONE** button to return to the Record List.

## Removing Sort Keys

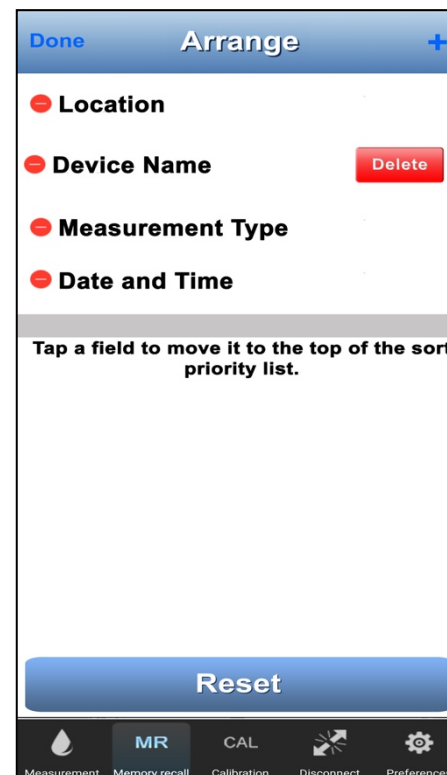
1. Tap the **MR** button on the Feature Navigation Bar.
2. Tap the **EDIT** button in the top right corner.
3. Tap the **SORT/FILTER** button that appears in the Record Edit bar at the bottom of the screen.



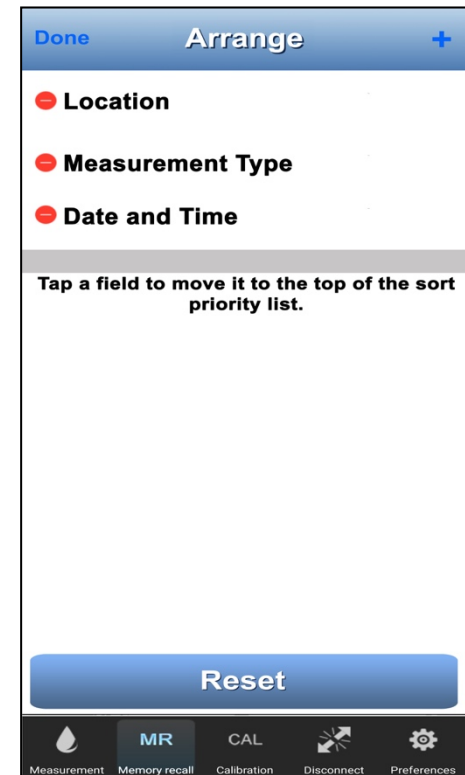
4. The Arrange screen will appear.  
Tap the BLUE **EDIT** button at the **BOTTOM** of the screen.  
The button will change to a Reset button.



5. The Arrange Edit screen will appear.  
A **DONE** button will appear in the upper left corner.  
A **RED** circle will appear to the left of each key.



6. Tap the RED circle next to a Sort Key.  
A RED **DELETE** button will appear to the right of the key.



7. Tap the **DELETE** button.  
The Sort Key will disappear from the list.
8. Tap the **DONE** button to return to the All Record list.

### NOTES:

- Tapping the **RESET** button clears ALL Sort Keys and returns the Data Records List to its default state (sorted by Record Number).
- Shutting the PTBTX2 App **OFF**, will not remove Sort Keys.

## 45. Filtering the Data Records List

The filter feature allows you to modify the **SORTED** record list so that it ONLY shows certain records.

- Filtering the List allows you to export, clear or delete a subset of records without affecting other records.
- One Filter can be added for each Sort Key that has been set.
  - The App will build a list of Filter Criteria for each Sort Key based on the contents of the records currently stored in the App's data base.

### Combining Filter Criteria;

Filter Criteria can be combined to display more focused records lists by selecting a Filter Criterion for each selected Sort Key.

- The order in which Filter Criteria are applied is the same as the nesting order of the Sort Keys to which they belong.

#### EXAMPLE 1:

- Primary Sort Key: Measurement Type:
  - Filter Criterion: pH:
    - Only records for which the Measurement Type = pH will appear on the Record List.

#### EXAMPLE 2:

- Primary Sort Key: Measurement Type:
  - Filter Criterion: pH.
- Secondary Sort Key: Location:
  - Filter Criterion: North Cooling Tower:
    - Only records for which the Measurement Type = pH **AND** Location = North Cooling Tower will appear on the Records List.

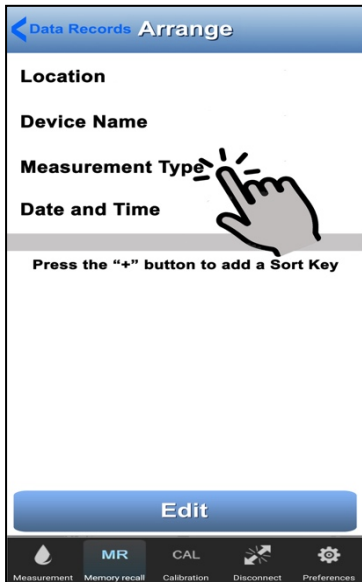
Records that are excluded by the Filter Criteria **ARE NOT GONE** from the App's memory and will appear when the Filter Criteria are removed.

When Exporting, Deleting or when Clearing records, the **SELECT All** button **WILL ONLY AFFECT** those records included in the filtered list.

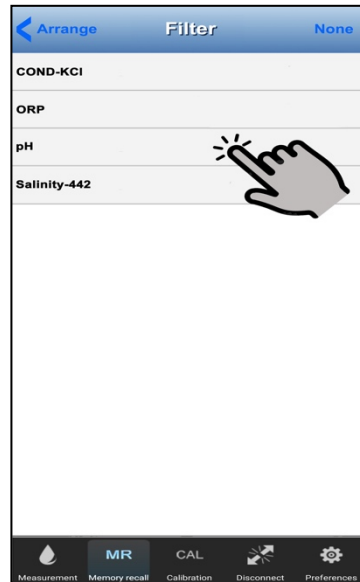
- Records that are hidden by the current Filter Criteria **WILL NOT** be exported, cleared or deleted.

## Adding Filtering Criteria

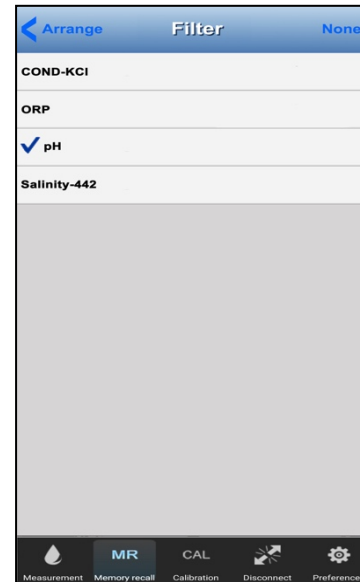
1. Tap the **MR** button on the Feature Navigation Bar.
2. Tap the **EDIT** button in the top right of the screen.
3. Tap the **SORT/FILTER** button that appears in the Record Edit bar at the bottom of the screen.



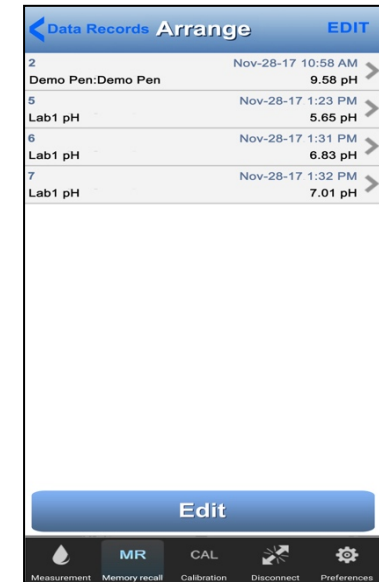
4. The Arrange screen will appear.  
Tap the Sort Key for which you wish to create a filter.  
If the Sort Key relevant to the filter you want to set is not on the list, add it.



5. A list of the available Criteria for that Sort Key will appear.  
An **ARRANGE** back button will appear in the upper left corner.  
A **NONE** button will appear in the upper right corner.



6. Tap the Criterion you wish to use.  
A check mark will appear next to the selected filter criterion.
7. Tap the **ARRANGE** button.



8. Tap the **DATA RECORDS** button to return to the Record List.  
Only those records that meet the chosen Filter Criterion will appear.

## Removing a Filter Criterion

There are several ways to remove Filter Criteria:

1. Tapping the **NONE** button on the Filter List will clear the current Filter Criterion for that Sort Key.
2. Deleting the parent Sort Key will delete any Filter Criterion set for it.
3. Taping the **RESET** button will delete **ALL** Sort Keys and therefore **ALL** Filter Criterion,
  - The record list will return to its default state.

**NOTE:** Shutting the PTBTX2 App **OFF**, will not remove Sort Keys or Filter Criteria.

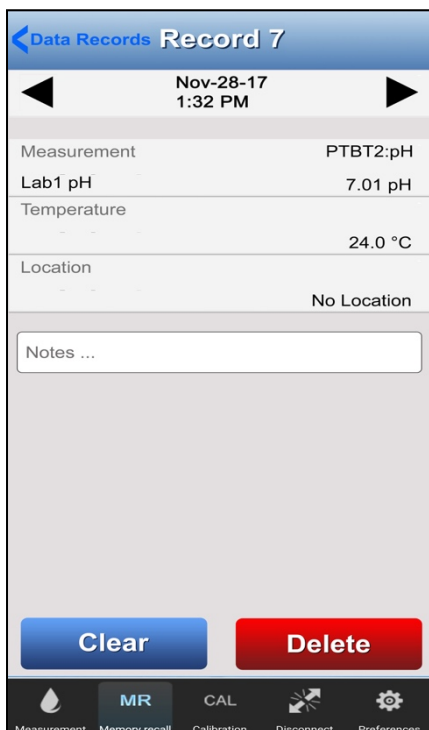


## 46. Clearing a Single Record on the List

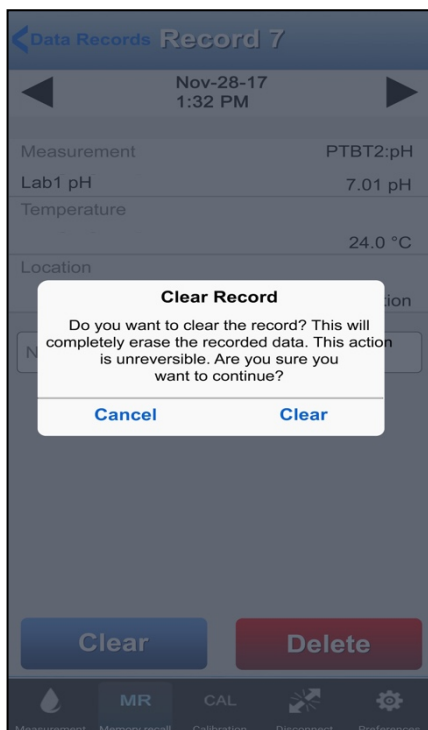
Clearing a record removes all the data from the fields in a record, but does not remove the record number from the record list.

- Example: if you clear record 7, it will continue to exist, but the data in its fields will be erased and replaced with dashes.

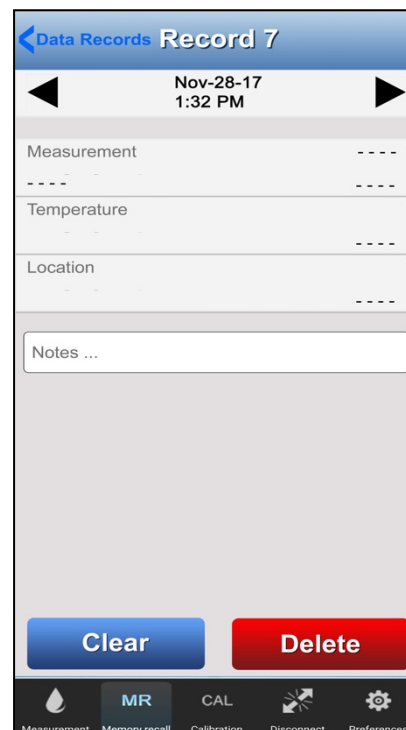
1. Tap the **MR** button on the Feature Navigation Bar.
2. Tap the record you wish to clear.
  - If it does not appear on the list, swipe UP or DOWN until you find it.
3. The Single Record Display screen will appear.



4. Tap the blue **CLEAR** button at the bottom left of the record display.



5. A dialogue box will appear warning you that this action is irreversible.
6. Tap the **CLEAR** button to erase the record's data.  
Tap the **CANCEL** button to leave the record unaffected.



7. All the data in the record will be erased and replaced by dashes.



8. Tap the **DATA RECORDS** button or the **MR** button to return to the record list.

- You can use the REPLACE feature (see Section 42) to load new data into the cleared record.

## 47. Clearing Multiple Records on the List

1. Tap the **MR** button on the Feature Navigation Bar.

Data Records		EDIT
1	MLCPTBTx-94C5 Nov-28-17 10:58 AM	1845 µS >
2	Demo Pen:Demo Pen Nov-28-17 10:58 AM	9.58 pH >
3	MLCPTBTx-94C5 Nov-28-17 11:04 AM	1812 µS >
4	MLCPTBTx-94C5 Nov-28-17 1:23 PM	1822 µS >
5	Lab1 pH Nov-28-17 1:23 PM	5.65 pH >
6	Lab1 pH Nov-28-17 1:31 PM	6.83 pH >
7	Lab1 pH Nov-28-17 1:32 PM	7.01 pH >
8	MLCPTBTx-94C5 Nov-29-17 8:14 AM	3.221 ppt >
9	MLCPTBTx-94C5 Nov-29-17 8:15 AM	3.000 ppt >
10	LAB1ORP Dec-06-2017 2:05 PM	385 mV >
11	LAB1ORP Dec-06-2017 2:10 PM	470 mV >
12	LAB1ORP Dec-06-2017 2:12 PM	390 mV >
13	LAB1ORP Nov-29-17 8:14 AM	390 mV >

Send	Data Records	Done
1	MLCPTBTx-94C5 Nov-28-17 10:58 AM	1845 µS
2	Demo Pen:Demo Pen Nov-28-17 10:58 AM	9.58 pH
3	MLCPTBTx-94C5 Nov-28-17 11:04 AM	1812 µS ✓
4	MLCPTBTx-94C5 Nov-28-17 1:23 PM	1822 µS
5	Lab1 pH Nov-28-17 1:23 PM	5.65 pH ✓
6	Lab1 pH Nov-28-17 1:31 PM	6.83 pH ✓
7	Lab1 pH Nov-28-17 1:32 PM	7.01 pH
8	MLCPTBTx-94C5 Nov-29-17 8:14 AM	3.221 ppt
9	MLCPTBTx-94C5 Nov-29-17 8:15 AM	3.000 ppt ✓
10	LAB1ORP Dec-06-2017 2:05 PM	385 mV
11	LAB1ORP Dec-06-2017 2:10 PM	470 mV
12	LAB1ORP Dec-06-2017 2:12 PM	390 mV

Send	Data Records	Done
1	MLCPTBTx-94C5 Nov-28-17 10:58 AM	1845 µS
2	Demo Pen:Demo Pen Nov-28-17 10:58 AM	9.58 pH
3	MLCPTBTx-94C5 Nov-28-17 11:04 AM	1812 µS ✓
4	MLCPTBTx-94C5 Nov-28-17 1:23 PM	1822 µS
5	Lab1 pH Nov-28-17 1:23 PM	5.65 pH ✓
6	Lab1 pH Nov-28-17 1:31 PM	6.83 pH ✓
7	Lab1 pH Nov-28-17 1:32 PM	7.01 pH
8	MLCPTBTx-94C5 Nov-29-17 8:14 AM	3.221 ppt
9	MLCPTBTx-94C5 Nov-29-17 8:15 AM	3.000 ppt ✓
10	LAB1ORP Dec-06-2017 2:05 PM	385 mV
11	LAB1ORP Dec-06-2017 2:10 PM	470 mV
12	LAB1ORP Dec-06-2017 2:12 PM	390 mV

Send	Data Records	Done
1	MLCPTBTx-94C5 Nov-28-17 10:58 AM	1845 µS
2	Demo Pen:Demo Pen Nov-28-17 10:58 AM	9.58 pH
3	----	----
4	MLCPTBTx-94C5 Nov-28-17 1:23 PM	1822 µS
5	----	----
6	----	----
7	Lab1 pH Nov-28-17 1:32 PM	7.01 pH
8	MLCPTBTx-94C5 Nov-29-17 8:14 AM	3.221 ppt
9	----	----
10	LAB1ORP Dec-06-2017 2:05 PM	385 mV
11	LAB1ORP Dec-06-2017 2:10 PM	470 mV
12	LAB1ORP Dec-06-2017 2:12 PM	390 mV

2. When the Record list appears, tap the **EDIT** button in the upper right corner.  
Record Edit screen will appear.

3. Tap the records you wish to clear.  
If they do not appear on the list, swipe **UP** or **DOWN** until you find them.  
Tap as many records as you want.  
The **DELETE** and **CLEAR** buttons change to show the number of records selected.

4. Tap the **CLEAR** button.  
A dialogue box will appear warning you that this action is irreversible.  
Tap the **CLEAR** button in the dialogue box.  
Tap the **CANCEL** button to leave the record unaffected.

5. All the data in the selected records will be erased and replaced by dashes.
6. Tap the **DONE** button to exit EDIT mode.

**NOTE:** You can also use the Filter Record List feature (see Section 45) to highlight a subgroup of records and clear them.

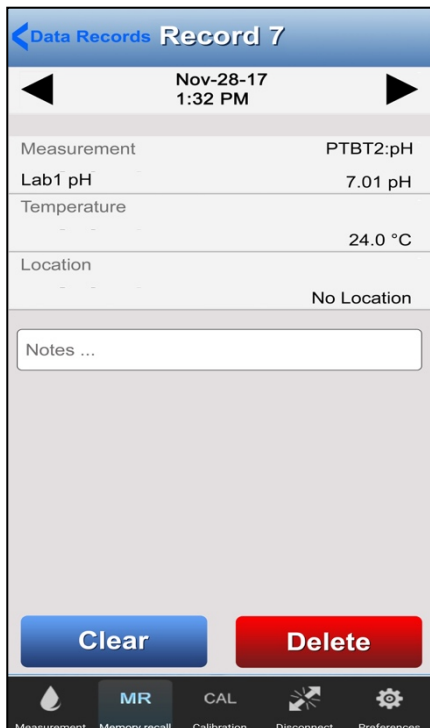
- Once you've filtered the list to show the subgroup of records you wish to clear, tap Select All, then proceed with clearing the records.
  - Once you have cleared the filtered list, the records will disappear because they no longer meet the filter criteria.
  - Reset / remove the current Filter criteria to see the entire record list.

## 48. Deleting a Single Record from the List

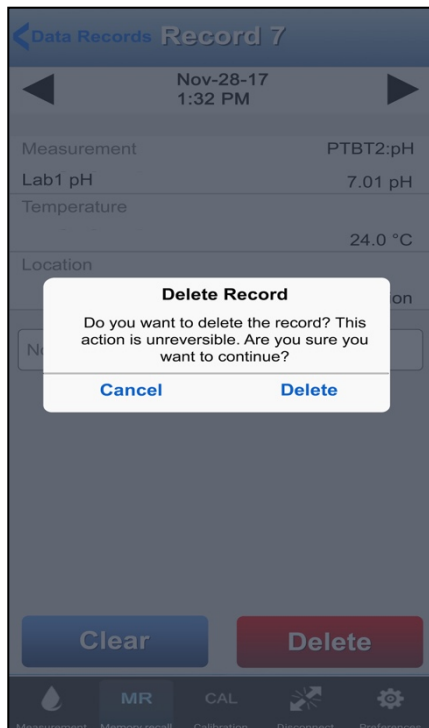
The chosen record will be completely removed from the list and from the App's memory.

Deleting a record removes all the data in a record, and removes the record number from the record list.

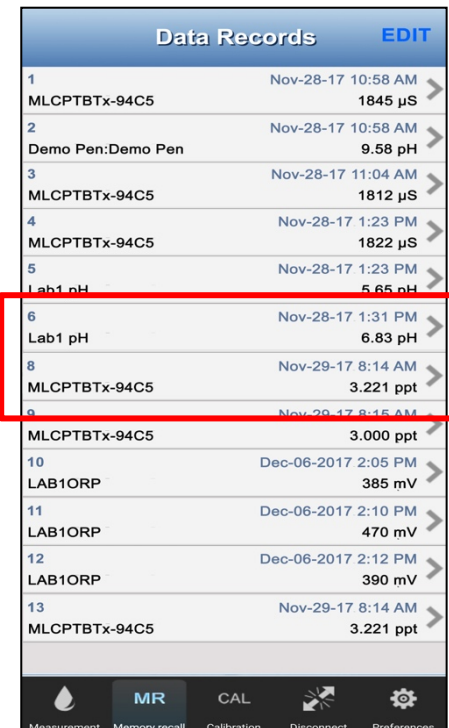
1. Tap the **MR** button on the Feature Navigation Bar.
2. Tap the record you wish to delete.
  - If it does not appear on the list, swipe UP or DOWN until you find it.
3. The Single Record Display screen will appear (NOTE: Record 7 is shown in example).



4. Tap the RED **DELETE** button at the bottom right of the record display.



5. A dialogue box will appear warning you that the action is irreversible.
6. Tap **CANCEL** to leave the record unaffected.
7. Tap the **DELETE** button to remove the record from the App's database completely.
8. If the Record List does not appear, tap **DATA RECORDS**.



9. The deleted record will no longer be on the list.

**NOTE:** There is no longer a Record #7 and the record numbers of the undeleted records have not changed.

## 49. Deleting Multiple Records from the List

1. Tap the **MR** button on the Feature Navigation Bar.

Data Records		EDIT
1	Nov-28-17 10:58 AM	>
MLCPTBTx-94C5	1845 µS	
2	Nov-28-17 10:58 AM	>
Demo Pen:Demo Pen	9.58 pH	
3	Nov-28-17 11:04 AM	>
MLCPTBTx-94C5	1812 µS	
4	Nov-28-17 1:23 PM	>
MLCPTBTx-94C5	1822 µS	
5	Nov-28-17 1:23 PM	>
Lab1 pH	5.65 pH	
6	Nov-28-17 1:31 PM	>
Lab1 pH	6.83 pH	
7	Nov-28-17 1:32 PM	>
Lab1 pH	7.01 pH	
8	Nov-29-17 8:14 AM	>
MLCPTBTx-94C5	3.221 ppt	
9	Nov-29-17 8:15 AM	>
MLCPTBTx-94C5	3.000 ppt	
10	Dec-06-2017 2:05 PM	>
LAB1ORP	385 mV	
11	Dec-06-2017 2:10 PM	>
LAB1ORP	470 mV	
12	Dec-06-2017 2:12 PM	>
LAB1ORP	390 mV	
13	Nov-29-17 8:14 AM	>
MLCPTBTx-94C5	3.221 ppt	

Send	Data Records	Done
1	Nov-28-17 10:58 AM	
MLCPTBTx-94C5	1845 µS	
2	Nov-28-17 10:58 AM	
Demo Pen:Demo Pen en	9.58 pH	
3	Nov-28-17 11:04 AM	✓
MLCPTBTx-94C5	1812 µS	
4	Nov-28-17 1:23 PM	
MLCPTBTx-94C5	1822 µS	
5	Nov-28-17 1:23 PM	✓
Lab1 pH	5.65 pH	
6	Nov-28-17 1:31 PM	✓
Lab1 pH	6.83 pH	
7	Nov-28-17 1:32 PM	
Lab1 pH	7.01 pH	
8	Nov-29-17 8:14 AM	
MLCPTBTx-94C5	3.221 ppt	
9	Nov-29-17 8:15 AM	✓
MLCPTBTx-94C5	3.000 ppt	
10	Dec-06-2017 2:05 PM	
LAB1ORP	385 mV	
11	Dec-06-2017 2:10 PM	
LAB1ORP	470 mV	
12	Dec-06-2017 2:12 PM	
LAB1ORP	390 mV	

Send	Data Records	Done
1	Nov-28-17 10:58 AM	
MLCPTBTx-94C5	1845 µS	
2	Nov-28-17 10:58 AM	
Demo Pen:Demo Pen en	9.58 pH	
3	Nov-28-17 11:04 AM	✓
MLCPTBTx-94C5	1812 µS	
4	Nov-28-17 1:23 PM	
MLCPTBTx-94C5	1822 µS	
5	Nov-28-17 1:23 PM	✓
Lab1 pH	5.65 pH	
6	Nov-28-17 1:31 PM	✓
Lab1 pH	6.83 pH	
7	Nov-28-17 1:32 PM	
Lab1 pH	7.01 pH	
8	Nov-29-17 8:14 AM	
MLCPTBTx-94C5	3.221 ppt	
9	Nov-29-17 8:15 AM	✓
MLCPTBTx-94C5	3.000 ppt	
10	Dec-06-2017 2:05 PM	
LAB1ORP	385 mV	
11	Dec-06-2017 2:10 PM	
LAB1ORP	470 mV	
12	Dec-06-2017 2:12 PM	
LAB1ORP	390 mV	

Data Records		EDIT
1	Nov-28-17 10:58 AM	>
MLCPTBTx-94C5	1845 µS	
2	Nov-28-17 10:58 AM	>
Demo Pen:Demo Pen en	9.58 pH	
4	Nov-28-17 1:23 PM	>
MLCPTBTx-94C5	1822 µS	
7	Nov-28-17 1:32 PM	>
Lab1 pH	7.01 pH	
8	Nov-29-17 8:14 AM	>
MLCPTBTx-94C5	3.221 ppt	
10	Dec-06-2017 2:05 PM	>
LAB1ORP	385 mV	
11	Dec-06-2017 2:10 PM	>
LAB1ORP	470 mV	
12	Dec-06-2017 2:12 PM	>
LAB1ORP	390 mV	
13	Nov-29-17 8:14 AM	>
MLCPTBTx-94C5	3.221 ppt	

2. When the Data Record list appears, tap the **EDIT** button in the upper right corner.  
The Record List EDIT screen will appear.

3. Tap the records you wish to delete.  
If they do not appear on the list, swipe UP or DOWN until you find them.  
Tap as many records as you want.

4. Tap the **RED DELETE** button.  
A warning will appear. This action is **IRREVERSIBLE**.
5. Tap the **CANCEL** button to leave the record unaffected.
6. Tap the **DELETE** button in the dialogue box to remove the records from the App's database completely.

7. The deleted records will no longer be on the list.  
**NOTE:** The record numbers of the undeleted records will not change.
8. Tap the **DONE** button to exit edit mode.

**NOTE:** You can also use the Filter Record List feature (see Section 45) to highlight a subgroup of records and delete them.

- Once you've filtered the list to show the subgroup of records you wish to delete, tap Select All, then proceed with deleting the records.
  - Once you have deleted the filtered list, the Records List will be blank because there are no longer any records meeting the filter criteria.
  - Reset / remove the current Filter criteria to see the entire record list.

## 50. Exporting Data Records

You can export one or more data records from the record list by emailing them from the PTBTX2 App.

- The records will be exported in whatever the currently chosen format is: .xls, .xlsx, or .csv.
1. Tap the **MR** button on the Feature Navigation Bar.
  2. Tap the **EDIT** button in the top right of the screen.
  3. Select the records you wish to email by:
    - Manually selected specific records).
    - Tapping the **SELECT ALL** button to send the entire Record list.
    - Using the Filter Records List feature to highlight a subgroup of records, then tapping **SELECT ALL**.
  4. Once you've selected the Records, tap the **SEND** button in the upper left.
  5. A standard email screen for your device will appear.
    - The selected records will be automatically added to the email as an attachment.
    - You can add a cover letter and email addresses as you normally would when sending an email on your device type.
  6. Once the email has been sent, the App will return to the Record List screen.

# ULTRAPENx2 CALIBRATION

## 51. General Calibration Information

The Myron L<sup>®</sup> Company recommends calibrating regularly, however, you should check the calibration whenever measurements are not as expected.

### NOTES:

- Small bubbles trapped in the sensor or measurement cell may give a false calibration.
- Whenever possible, verify the calibration by performing a measurement of the same calibration buffer or standard solution.

## Calibration Errors

If calibration was not successful (e.g. the measured value is too far from the expected calibration value or the Bluetooth connection with the instrument is lost):

- The Message screen changes to read, "**Error: Check Sensor - Check Solution**".
- In the Previous CAL Table, the CAL mode, Reference Solution, and the Last CAL values will all be dashed out.
- No Cal Record will be made.

## Calibration Types

- **Wet Calibration:** A calibration performed using Buffers/standard solutions that results in the ULTRAPENx2 storing calibration constants based on the measurements made that will be applied to future measurements.
  - This is an automatic calibration and does not require manual adjustment.
  - **Single Point Calibration:** Some types of ULTRAPENx2 instruments such as the PTBT1 Conductivity pocket tester, only require calibration at a single point to establish an offset.
  - **Multiple Point Calibration:** Some types of ULTRAPENx2 instruments such as the PTBT2 pH pocket tester, require calibration at several points in order to establish offset as well as a gain factor.
- **FAC CAL:** Resets the ULTRAPENx2's internal calibration constants to the original factory settings and erases all previously stored Wet Calibration data.
  - If you do not have the proper calibration Buffer/standard solution use the FAC CAL function.
  - Once reset to FAC CAL settings, the measurements will not reflect the current state of the sensor or measurement cell.
- **Cal Records:** A record is automatically made for each Calibration.

## Calibration Preparation

- Ensure the sensor / cell is clean and free of debris.
- For maximum accuracy, fill two clean containers with each pH buffer or reference solution you will be using.
  - Arrange them in such a way that you can clearly remember which is the rinse solution and which is the calibration buffer/solution.
  - When performing a Multi-Point pH calibration, always rinse the pH sensor between calibration points.
- **NOTE:** If you don't have enough buffer/reference solution, you can use 1 container of each buffer/reference solution for calibration and 1 container of clean water (preferably de-ionized, reverse osmosis or distilled) for all rinsing.

**Table 8: Calibration Reference Buffers and Standard Solutions**

ULTRAPENX2 Model	Mode	Parameter	Reference Solution Model	Displays As	Calibration Type
PTBT1	Cond KCl	Conductivity	1800 µS KCl	1800 µS	Single Point
	TDS 442	Total Dissolved Solids (TDS)	442-3000 ppm™ Myron L® Company Natural Water Standard	3000 ppm	
	TDS NaCl	Total Dissolved Solids (TDS)		2027 ppm	
	Salinity 442	Salinity		3.000 ppt	
	Salinity NaCl	Salinity		2.027 ppt	
PTBT2		pH		4.0, 7.0 and 10.0 pH	4.00 pH, 7.00 pH and/or 10.00 pH
PTBT3	N/A	ORP	80 mV, 260 mV, and 470 mV	80 mV, 260 mV, or 470 mV	Single Point
PTBT4	N/A	pH	4.0, 7.0 and 10.0 pH	4.00 pH, 7.00 pH and/or 10.00 pH	Multi-Point <sup>1</sup>
		ORP	80 mV, 260 mV, and 470 mV	80 mV, 260 mV, or 470 mV	Single Point
PTBT5	N/A	DO Saturation	Air Cal	104.0% DO Saturation	Single Point
			Water Cal <sup>2</sup>	100.0% DO Saturation	Single Point
			Zero Cal <sup>2</sup>	0.0 % DO Saturation	Single Point
PTBT6	N/A	NO <sub>3</sub> <sup>-</sup> -N	1 ppm, 10 ppm, 100 ppm, or 1000 ppm <sup>3, 4</sup>	NO <sub>3</sub> <sup>-</sup> -N in ppm (matching the standard solution(s) used in the calibration)	Single or 2-Point

<sup>1</sup> These calibrations can be performed with one, two, or three different pH buffers. The ULTRAPENX2 automatically determines which buffer is being used.

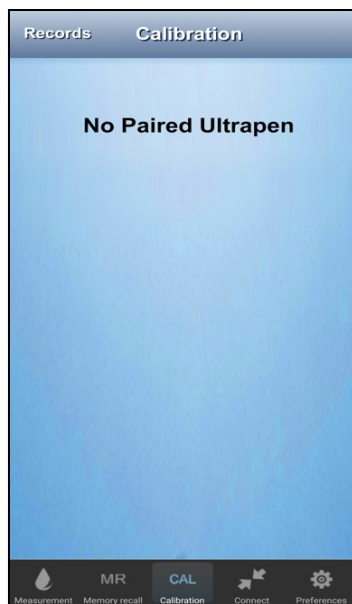
<sup>2</sup> Requires a special setup, equipment and procedure. ZERO Cal requires standard solution and procedure. Download the PTBT5 operation Manual (PTBT5OM-X2) from the Downloads page of the Myron L® Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

<sup>3</sup> The NO<sub>3</sub><sup>-</sup>-N standard solutions must be properly prepared prior to calibrating the PTBT6, Download the PTBT6 operation Manual (PTBT6OM-X2) from the Downloads page of the Myron L® Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

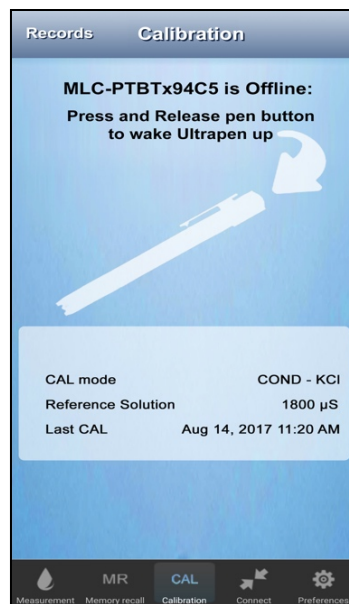


## Main Calibration Start Screen

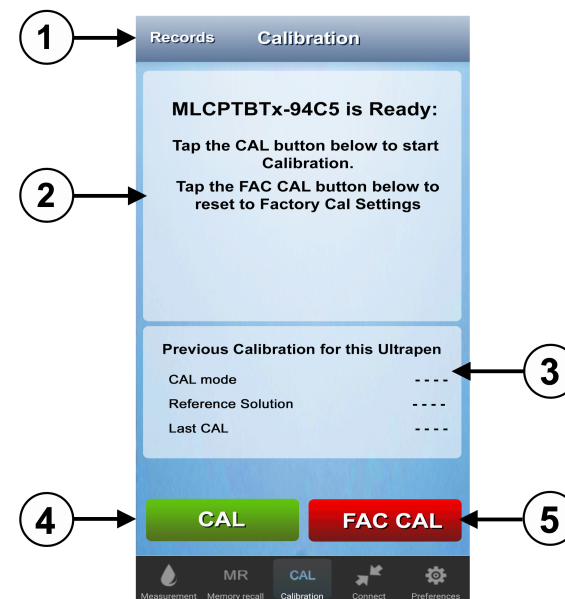
1. To access the Calibration function of the PTBTX2 App, tap the **CAL** button in the Feature Navigation Bar.



2. If there is no Connected / Paired Ultrapen, this screen will appear. See the Section 14 above for instructions on connecting an ULTRAPENX2 to the PTBTX2 App.



3. If this screen appears, the Connected / Paired ULTRAPENX2 is OFF. Press and release the PEN BUTTON on the Connected / Paired Ultrapen.



4. If this screen appears the App is ready to begin calibration.

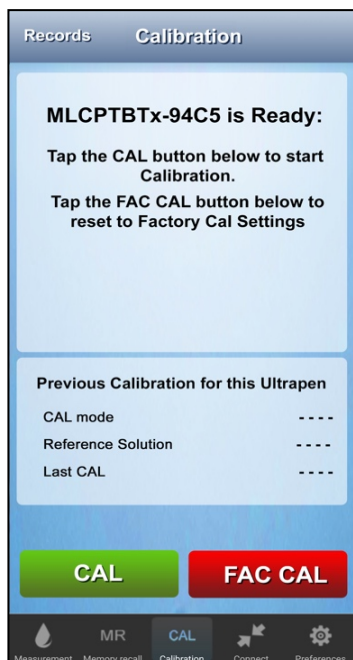
### KEY:

1. **Records button:** Tap this button to display a list of Calibration Records.
2. **Cal Value Field:** This field displays prompts and messages during calibration as well as the before and after calibration values.
3. **Previous Calibration Table:** This table shows the results of the most recent calibration of the Connected / Paired ULTRAPENX2, specifically:
  - **CAL Mode:** The Measurement mode setting(s) for that calibration.
  - **Reference Solution:** Displays the reference solution(s) used for that calibration.
  - **Last Cal:** Displays the Date and Time that the calibration was performed.
  - **NOTE:** If no Calibration Records exist for the Connected / Paired ULTRAPENX2, the field contents will be "----".
4. **CAL button:** Starts a wet calibration.
5. **FAC CAL button:** Starts a FAC CAL reset.

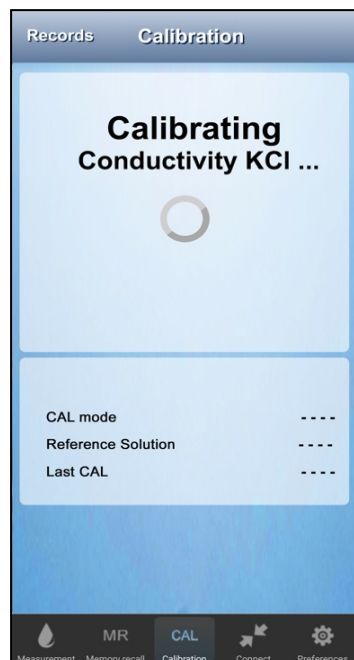


## 52. PTBT1 – Single Point Wet Calibration

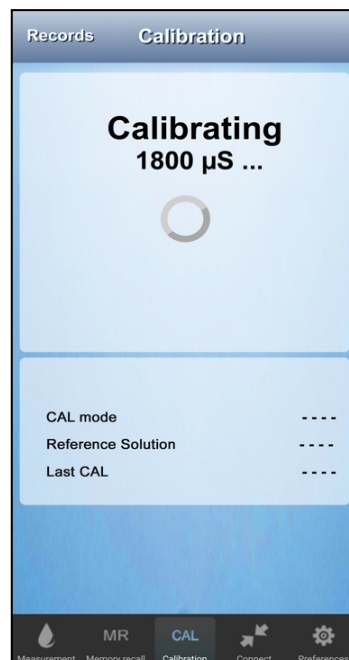
1. Prepare for calibrating the PTBT1 (see Table 8 above).
2. Rinse the measurement cell by swirling it in reference solution of the same type as you will use during the calibration for 20-30 seconds.
3. Tap the **CAL** button in the App's Feature Navigation Bar.
4. Press and release the Connected / Paired PTBT1's PEN BUTTON to turn it **ON** and place it in Standby mode.
5. Grasp the PTBT1 near the battery cap to avoid sample contamination and completely submerge the cell in fresh calibration solution.



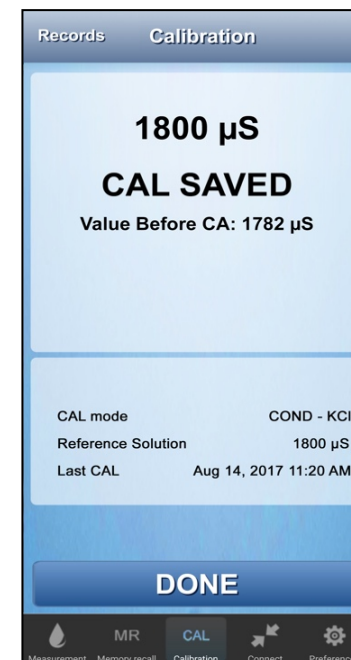
6. Tap the green **CAL** button.  
Swirl the cell head in the calibration solution.  
Keep the cell head at least 1-inch away from the sides or bottom of the vessel containing the calibration solution.



7. The PTBT1's LED will begin flashing rapidly and the App will display a message stating the calibration is ongoing.  
A spinning activity indicator will appear while the calibration is ongoing.



8. The App will verify that the correct calibration solution is being used and display that value.



9. Once the Calibration is completed, the App will automatically make a CAL Record.
10. Tap the **DONE** button to return to the Start CAL screen.

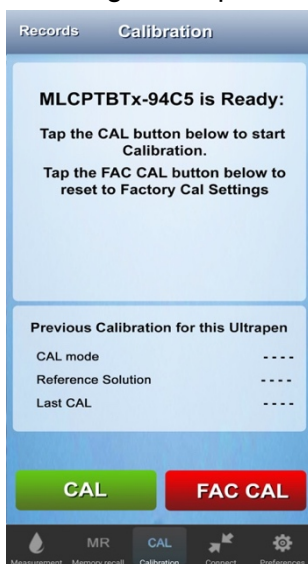
## 53. PTBT2 – Full 3-Point pH Calibration

This Calibration mode allows the user to calibrate the PTBT2 at 7.0 pH and at both 4.0 pH and 10.0 pH.

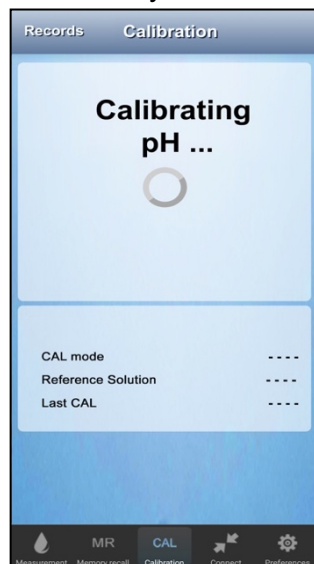
1. Prepare for calibrating the PTBT2 (see Table 8 above).
2. Rinse the sensor by swirling it in 7.0 pH reference buffer for 20-30 seconds.
3. Tap the **CAL** button in the App's Feature Navigation Bar.
4. Press and release the Connected / Paired PTBT2's PEN BUTTON to turn it **ON** and place it in Standby mode.
5. Grasp the PTBT2 near the battery cap to avoid sample contamination and completely submerge the sensor in fresh calibration buffer.

### Initial Point Calibration (Offset)

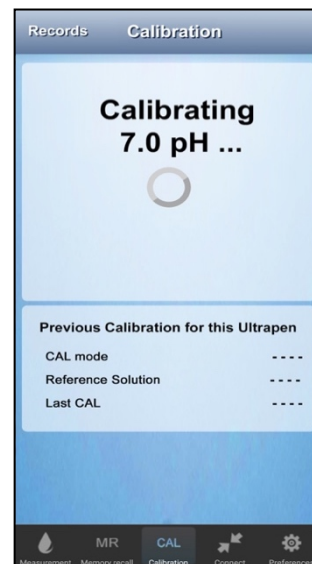
Performing a Multipoint Calibration **REQUIRES** you to start with 7.0 pH buffer.



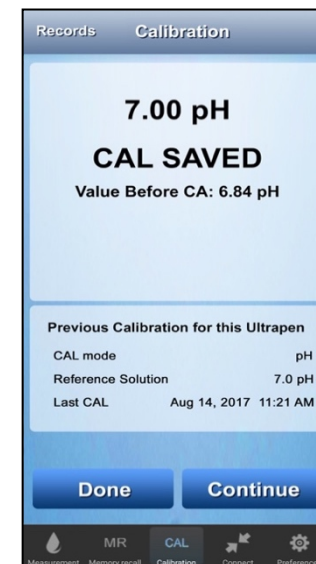
6. Tap the **CAL** button.  
Swirl the sensor in 7.0 pH calibration buffer.  
Keep sensor at least 1-inch away from the sides or bottom of the vessel containing the calibration solution.



7. The PTBT2 LED will begin flashing rapidly and the App will display a message stating the calibration is ongoing.  
A spinning activity indicator will appear while the calibration is ongoing.



8. The App will identify which of the three possible buffer solutions is being used.

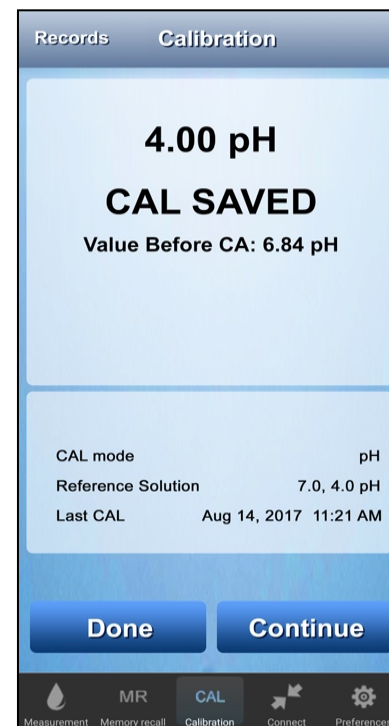
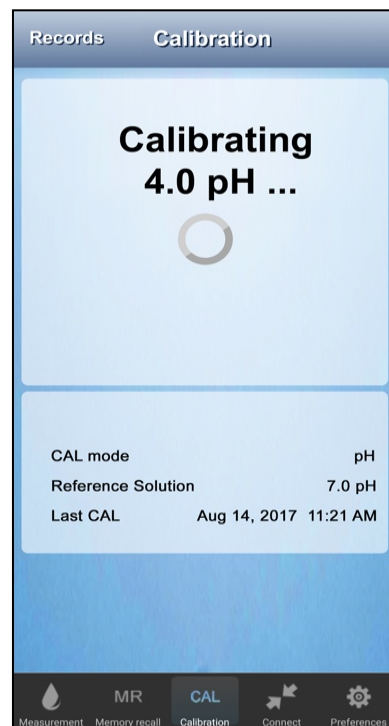
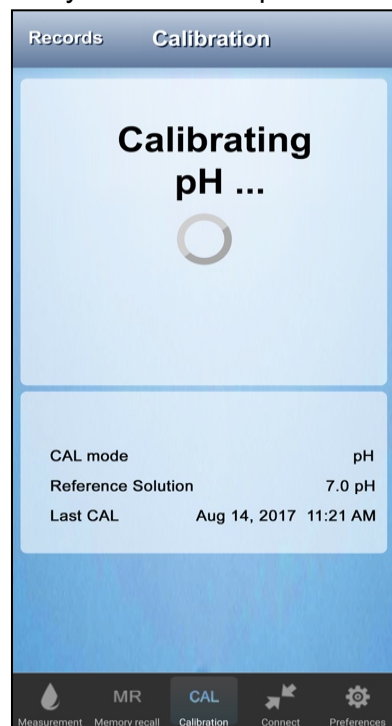
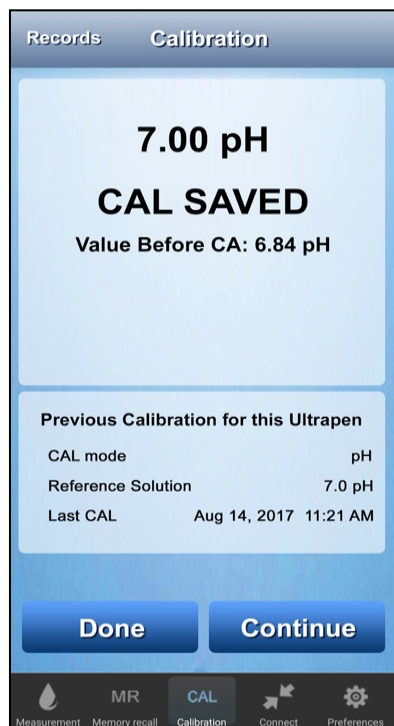


9. Once the 1st CAL point is completed, the App will make a CAL Record & update the previous CAL table.

## Calibrating Additional Points (Gain)

At this point you can use either 4.0 pH buffer or 10.0 pH buffer to complete the second calibration point (4.0 pH will be used in this example).

- Always rinse the sensor in a separate container of the same pH buffer to be used for the second calibration point.
- The PTBT2 will automatically detect which point is being calibrated based on its initial measurement of the solution.



10. Place the PTBT2's sensor in either 4.0 pH or 10.0 pH buffer after rinsing the sensor in a separate container of the same buffer.

11. Tap the **CONTINUE** button.

12. The PTBT2's LED will begin flashing rapidly; the App will display a calibration message.

A spinning activity indicator will appear while the calibration is ongoing.

13. The App will identify which of the three possible calibration solutions is being used.

In this example, 4.0 pH buffer.

14. Once the 2nd CAL point is completed, the App will update the CAL Record & update the previous CAL table.

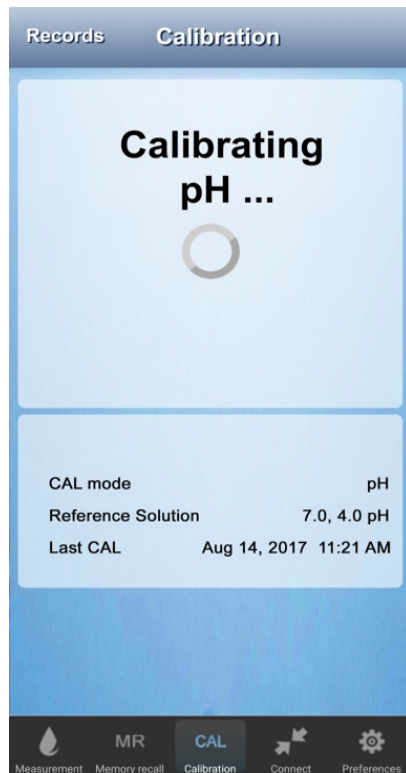
15. To proceed to a 3rd point:

- Rinse the sensor.
- Submerge the sensor in the final buffer (which ever one hasn't been used yet).
- Tap the **CONTINUE** button.

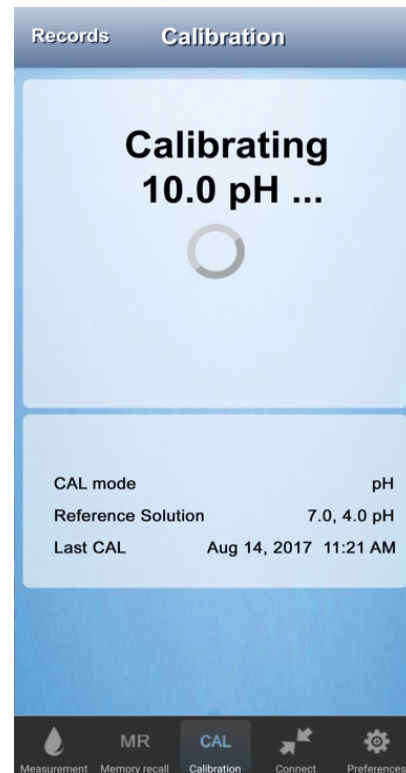
### **IMPORTANT NOTE!**

*The second and third CAL points MUST BE STARTED no more than 45 seconds after the previous CAL point is completed.*

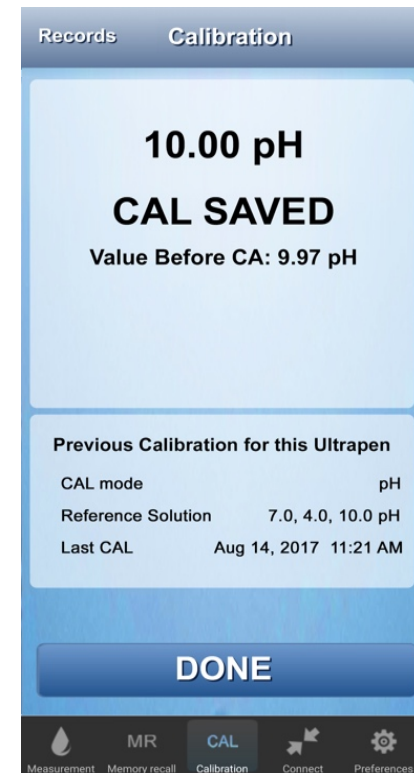
*The PTBTX2 App will save / update the CAL record with the completed Cal points and return to the Initial CAL Screen.*



16. If you tapped the **CONTINUE** button, the PTBT2's LED will begin flashing rapidly; the App will display a calibration message.  
A spinning activity indicator will appear while the calibration is ongoing.



17. The App will identify which of the three possible calibration solutions is being used.  
In this example 10.0 pH buffer.



18. Once the 3rd and final CAL point is completed, the App will update the CAL Record & update the previous CAL table.  
Only the **DONE** button will appear.  
19. Tap **DONE** button to return to the Calibration Start screen.

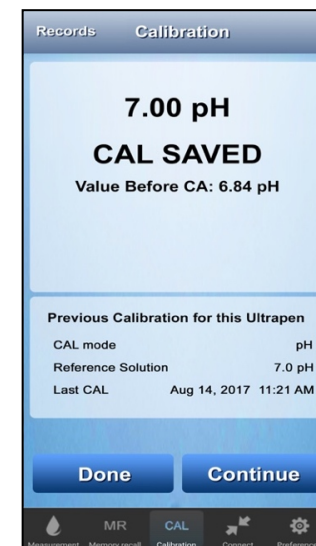
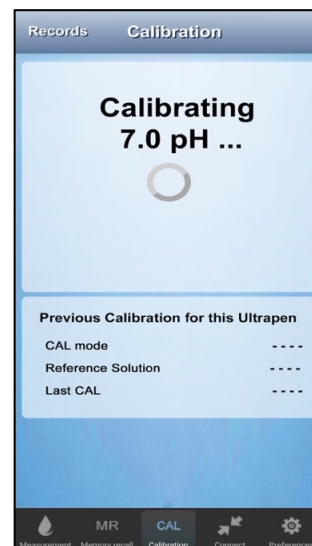
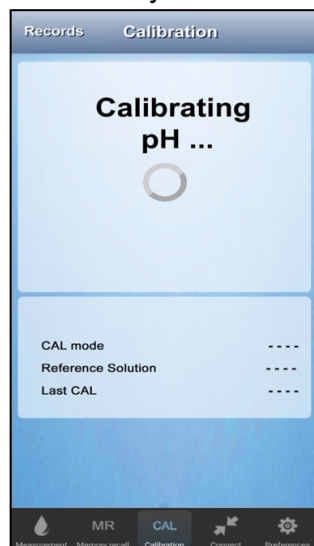
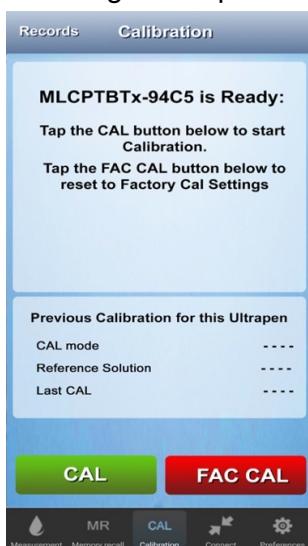
## 54. PTBT2 – 2-Point pH Calibration

Two Point Calibration allows the user to calibrate the PTBT2 at 7.0 pH and a second point at either 4.0 pH or 10.0 pH.

1. Prepare for calibrating the PTBT2 (see Table 8 above).
2. Rinse the sensor by swirling it in 7.0 pH reference buffer for 20-30 seconds.
3. Tap the **CAL** button in the App's Feature Navigation Bar.
4. Press and release the Connected / Paired PTBT2's PEN BUTTON to turn it **ON** and place it in Standby mode.
5. Grasp the PTBT2 near the battery cap to avoid sample contamination and completely submerge the sensor in fresh calibration buffer.

### Initial Point Calibration (Offset)

Performing a Multipoint Calibration **REQUIRES** you to start with 7.0 pH buffer.



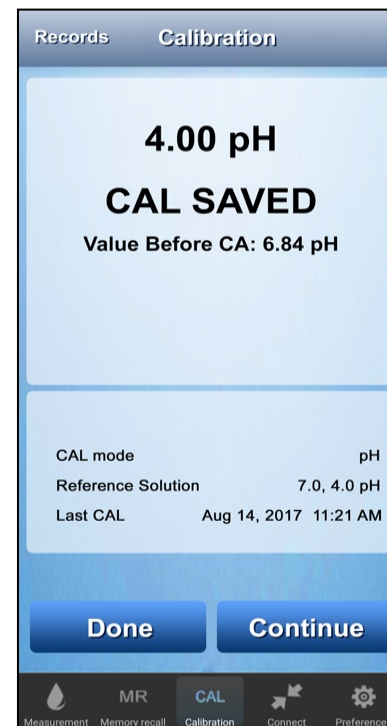
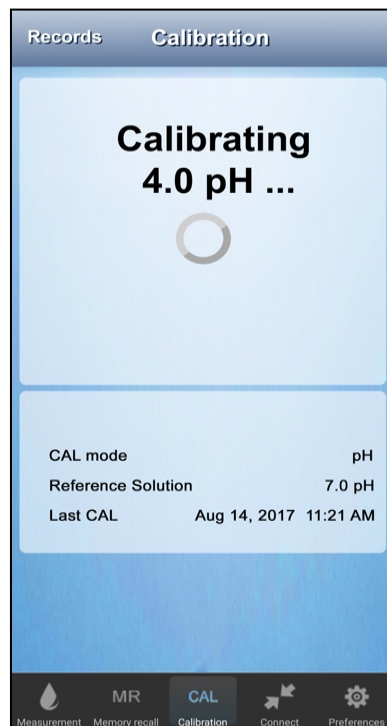
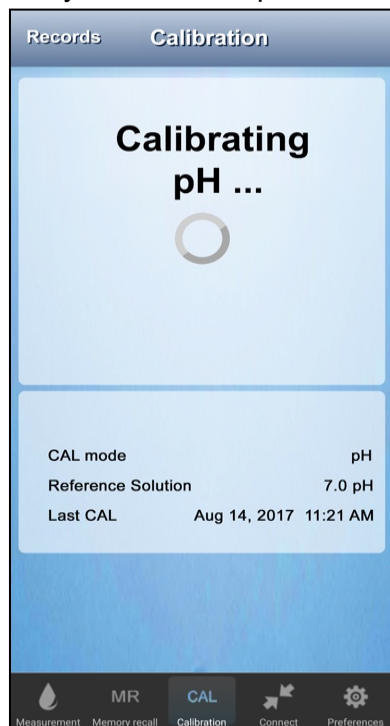
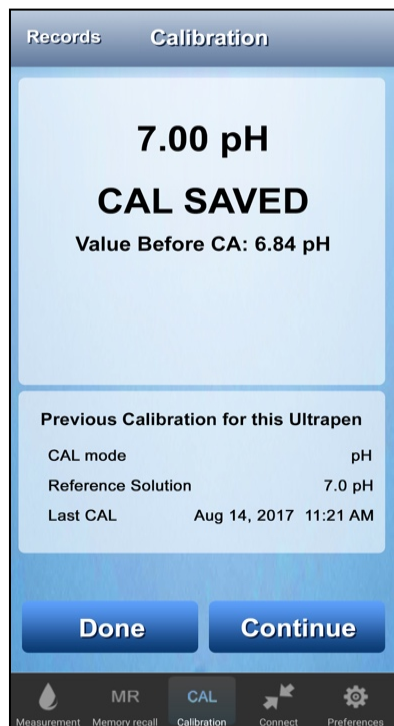
6. Tap the **CAL** button.  
Swirl the sensor in the 7.0 pH calibration buffer. Keep the sensor at least 1-inch away from the sides or bottom of the vessel containing the calibration solution.
7. The PTBT2's LED will begin flashing rapidly and the App will display a message stating the calibration is ongoing.  
A spinning activity indicator will appear while the calibration is ongoing.
8. The App will identify which of the three possible buffer solutions is being used.
9. Once the CAL point is completed, the App will make a CAL Record & update the previous CAL table.



## Calibrating the Second Point

At this point you can use either 4.0 pH buffer or 10.0 pH buffer to complete the 2-point calibration (4.0 pH will be used in this example).

- Always rinse the sensor in a separate container of the same pH buffer to be used for the second calibration point.
- The PTBT2 will automatically detect which point is being calibrated based on its initial measurement of the solution.



- Place the PTBT2's sensor in either 4.0 pH or 10.0 pH buffer after rinsing the sensor in a separate container of the same buffer.
- Tap the **CONTINUE** button.

- The PTBT2's LED will begin flashing rapidly; the App will display a calibration message.  
A spinning activity indicator will appear while the calibration is ongoing.

- The App will identify which of the three possible calibration solutions is being used.

- Once the 2nd CAL point is completed, the App will update the CAL Record & update the previous CAL table.
- Tap the **DONE** button to END the calibration after 2 points.

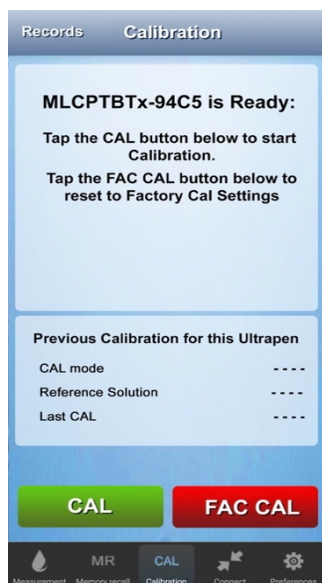
### IMPORTANT NOTE!

The second and third CAL points MUST BE STARTED no more than 45 seconds after the previous CAL point is completed, or the PTBTX2 App will save / update the CAL record with the completed Cal points and return to the Initial CAL Screen.

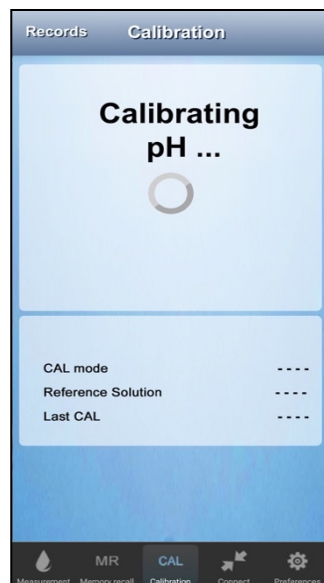
## 55. PTBT2 – Single Point (Offset), pH Calibration

If you wish to ONLY calibrate the PTBT2's Offset (Zero Point) follow these steps.

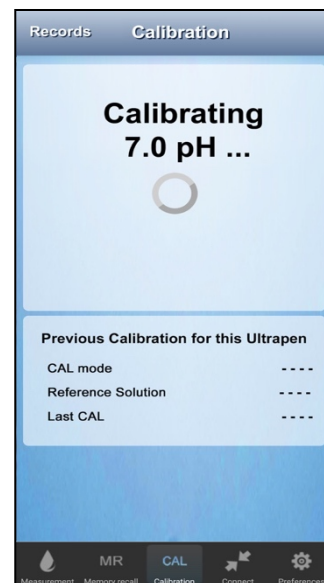
1. Prepare for calibrating the PTBT2 (see Table 8 above).
2. Rinse the sensor by swirling it in 7.0 pH reference buffer for 20-30 seconds.
3. Tap the **CAL** button in the App's Feature Navigation Bar.
4. Press and release the Connected / Paired PTBT2's PEN BUTTON to turn it **ON** and place it in Standby mode.
5. Grasp the PTBT2 near the battery cap to avoid sample contamination and completely submerge the sensor in fresh calibration buffer.



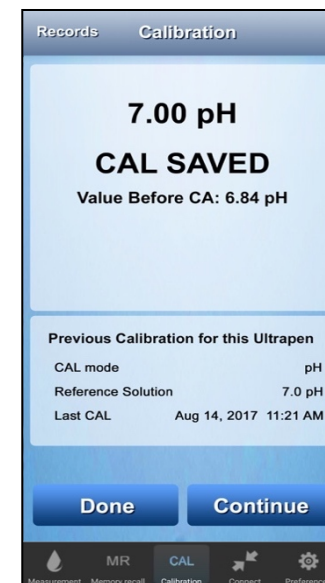
6. Tap the **CAL** button.  
Swirl the sensor in the 7.0 pH calibration buffer.  
Keep the sensor at least 1-inch away from the sides or bottom of the vessel containing the 7.0 pH buffer.



7. The PTBT2's LED will begin flashing rapidly and the App will display a message stating the calibration is ongoing.  
A spinning activity indicator will appear while the calibration is ongoing.



8. The App will identify that 7.0 pH Calibration buffer is being used.

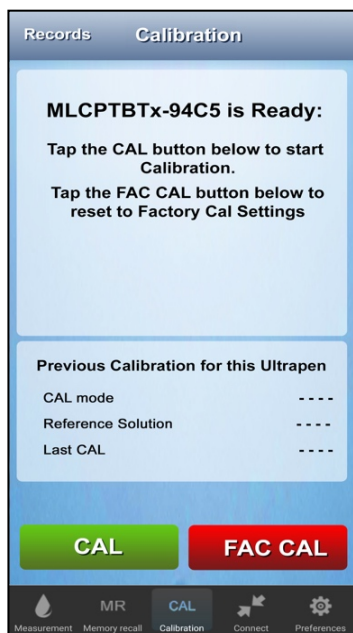


9. Once the CAL point is completed, the App will make a CAL Record & update the previous CAL table.
10. Tap the **DONE** button.

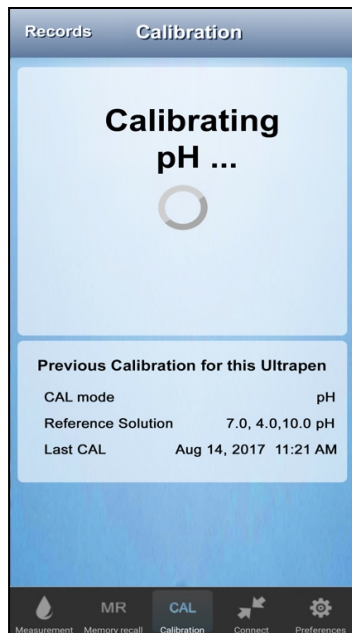
## 56. PTBT2 – Single Point (Gain), pH Calibration

A single point Calibration may be performed on the PTBT2 by using either 4.0 pH buffer or 10.0 pH (10.0 pH will be used in this example).

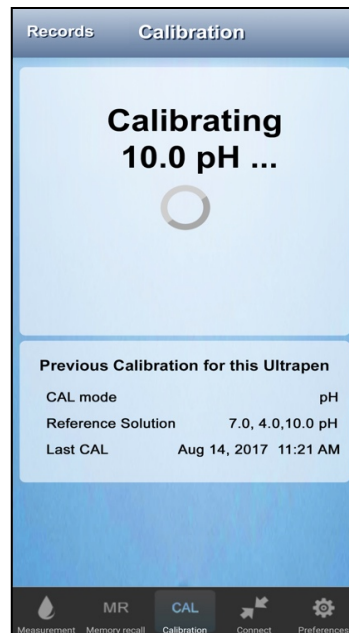
1. Prepare for calibrating the PTBT2 (see Table 8 above).
2. Rinse the sensor by swirling it in fresh reference buffer of the same type as you will use during the calibration for 20-30 seconds.
3. Tap the **CAL** button in the App's Feature Navigation Bar.
4. Press and release the Connected / Paired PTBT2's PEN BUTTON to turn it **ON** and place it in Standby mode.
5. Grasp the PTBT2 near the battery cap to avoid sample contamination and completely submerge the sensor in the sample solution.



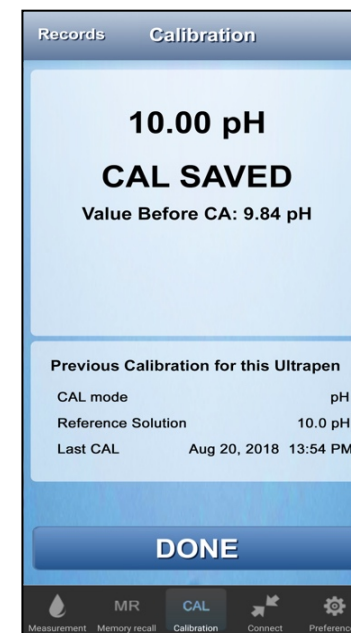
6. Tap the **CAL** button.  
Swirl the sensor in either 4.0 pH or 10.0 pH calibration buffer.  
Keep the sensor at least 1-inch away from the sides or bottom of the vessel containing the calibration solution.



7. The PTBT2's LED will begin flashing rapidly and the App will display a message stating the calibration is ongoing.  
A spinning activity indicator will appear while the calibration is ongoing.



8. The App will identify which calibration buffer is being used.

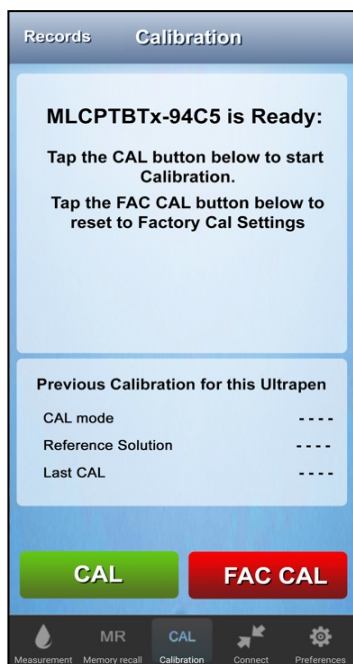


9. Once the gain calibration is completed, the App will automatically make a CAL Record and update the Previous CAL table.  
Only the **DONE** button will appear.
10. Tap the **DONE** button to return to the Start CAL screen.

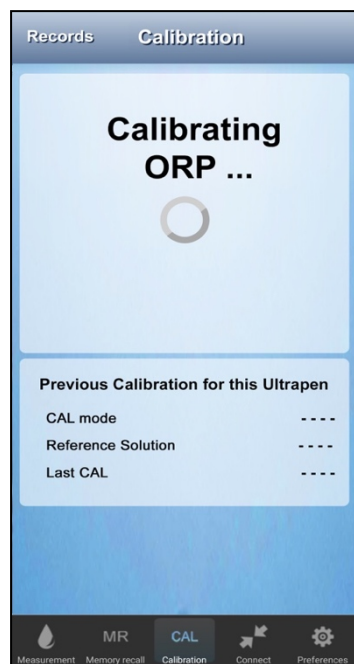


## 57. PTBT3 – Single Point ORP Calibration

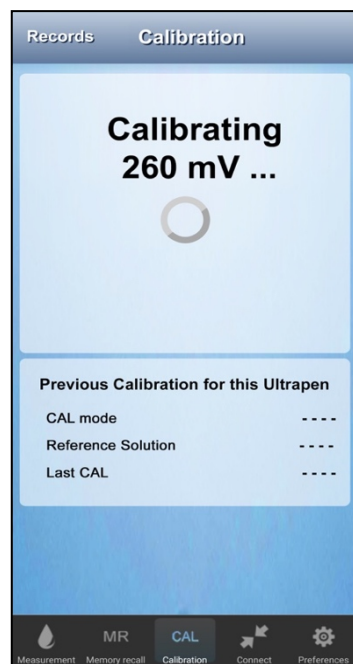
1. Prepare for calibrating the PTBT3 (see Table 8 above).
2. Rinse the sensor by swirling it in fresh reference solution of the same type as you will use during the calibration for 20-30 seconds.
3. Tap the **CAL** button in the App's Feature Navigation Bar.
4. Press and release the Connected / Paired PTBT3's PEN BUTTON to turn it **ON** and place it in Standby mode.
5. Grasp the PTBT3 near the battery cap to avoid sample contamination and completely submerge the sensor in the calibration solution.



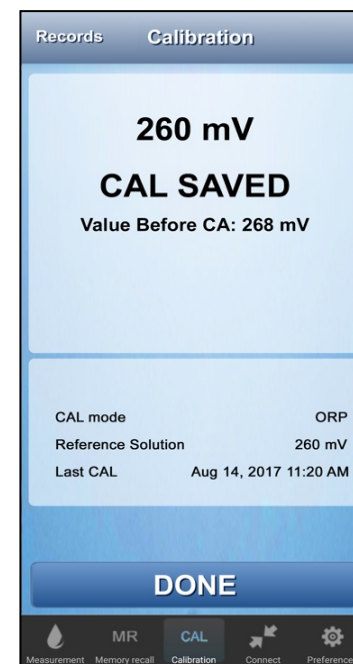
6. Tap the **CAL** button.  
Swirl the sensor head in the calibration solution.  
Keep the sensor at least 1-inch away from the sides or bottom of the vessel containing the calibration solution.



7. The PTBT3's LED will begin flashing rapidly and the App will display a message stating the calibration is ongoing.  
A spinning activity indicator will appear while the calibration is ongoing.



8. The App will identify which one of the three possible calibration solutions is being used.

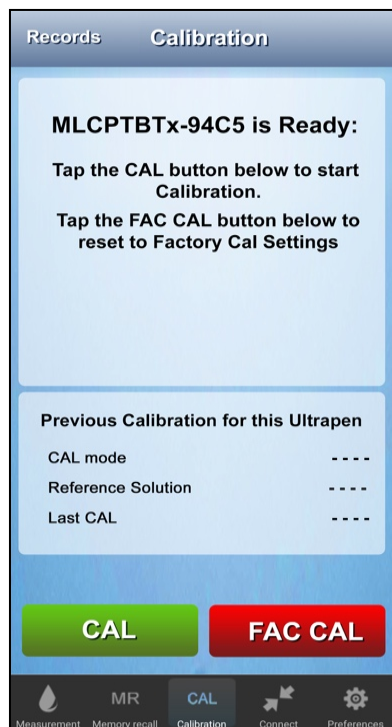


9. Once the Calibration is completed, the App will automatically make a CAL Record.
10. Tap the **DONE** button to return to the Start CAL screen.

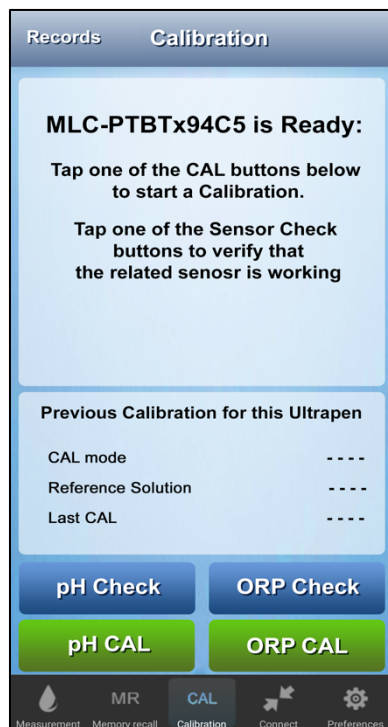
## 58. PTBT4 – pH Calibration and Sensor Check

### pH Sensor Check

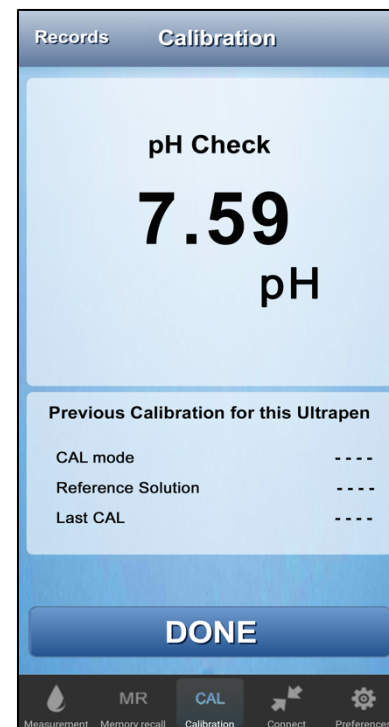
1. Press and release the Connected / Paired PTBT4's PEN BUTTON to turn it ON and place it in Standby mode.
2. Tap the CAL button in the Feature Navigation Bar. The Primary CAL screen will appear.



3. Tap the **CAL** button.



4. The Secondary PTBT4 Calibration screen will appear.
5. Submerge the PTBT4 sensor in either 4, 7 or 10 pH buffer.
6. Swirl the PTBT4 sensor in the buffer.
7. Tap the **pH CHECK** button.



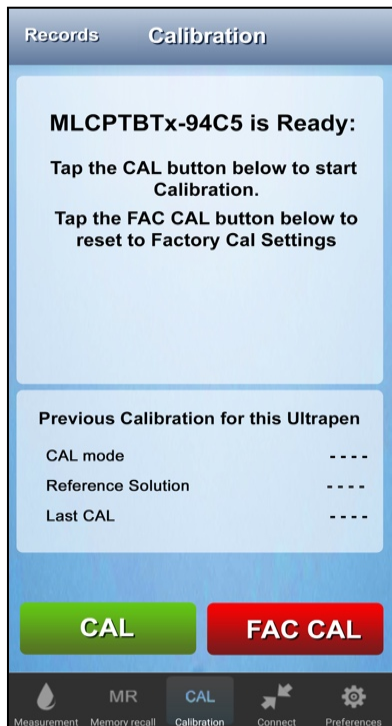
8. The App will display current pH value measured by the PTBT4 sensor.
9. Tap the **DONE** button to stop the pH Sensor Check and return to the Primary CAL screen.

**NOTE:** If the value reported during the Sensor Check is  $> \pm 1.0$  pH from the value of the buffer used, the sensor should be replaced (see Section 75 below).

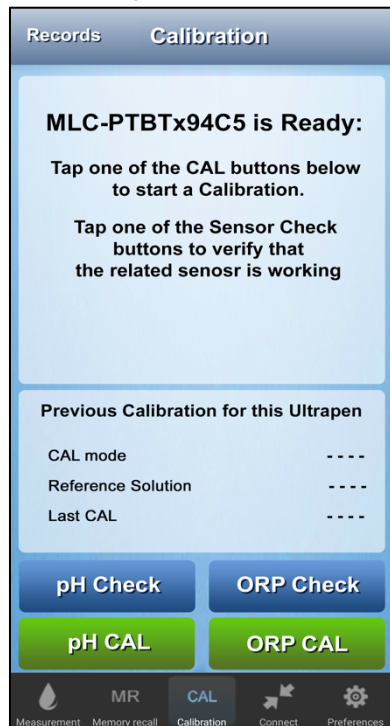
## pH Sensor Cal

- Calibrating the pH section of the PTBT4 sensor uses the same method as described in Sections 53 through Section 56 above.

1. Press and release the Connected / Paired PTBT4's PEN BUTTON to turn it ON and place it in Standby mode.
2. Tap the **CAL** button in the Feature Navigation Bar. The Primary CAL screen will appear.

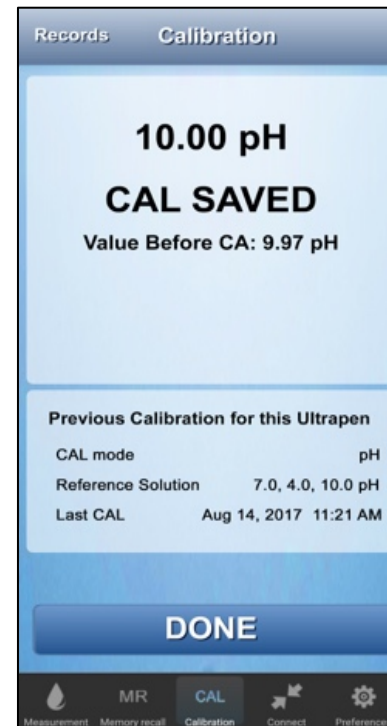


3. Tap the **CAL** button.



4. The Secondary PTBT4 Calibration screen will appear.

5. To Start a 3-point, calibration use 7.0 pH buffer.
  - a. Follow the instructions in Section 53 above.
6. To Start a 2-point calibration use 7.0 pH buffer.
  - a. Follow the instructions in Sections 54 above.
7. To Start a Single-Point Offset calibration use 7.0 pH buffer.
  - a. Follow the instructions in Sections 55 above.
8. To Start 1-point Gain calibration use either 4.0 or 10.0 pH buffer.
  - a. Follow the instructions in Sections 56 above.



9. When the last Cal Point has been completed, tap the **DONE** button to return to the Primary CAL screen.

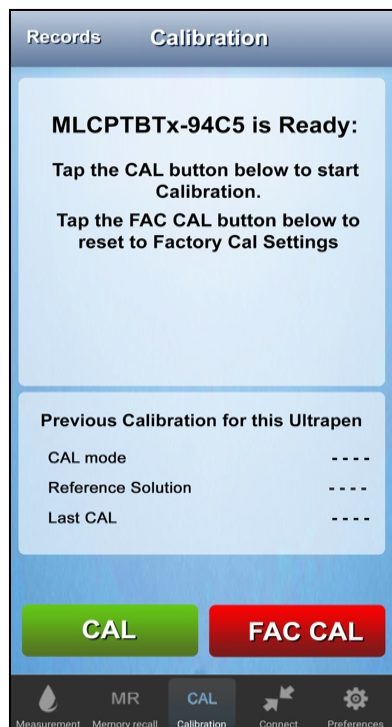
### IMPORTANT NOTE!

The second and third CAL points **MUST BE STARTED** no more than 45 seconds after the previous CAL point is completed, or the PTBTX2 App will save / update the CAL record with the completed Cal points and return to the Initial CAL Screen.

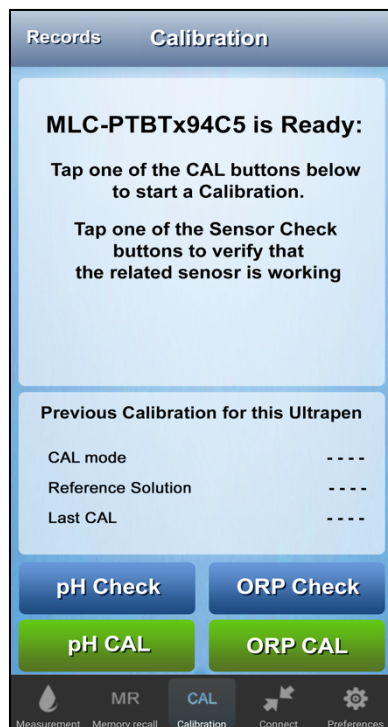
## 59. PTBT4 – ORP Calibration and Sensor Check

### ORP Sensor Check

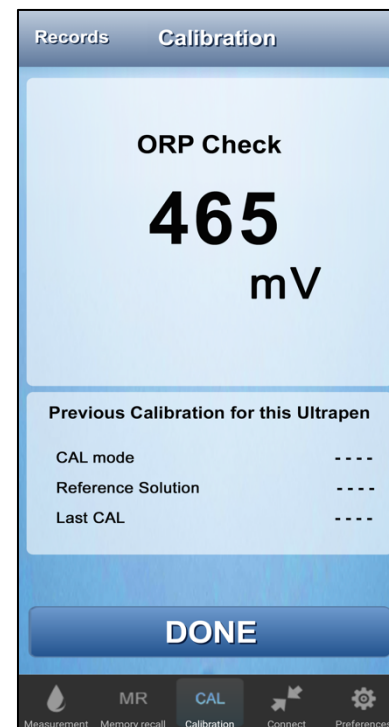
1. Press and release the Connected / Paired PTBT4's PEN BUTTON to turn it ON and place it in Standby mode.
2. Tap the **CAL** button in the Feature Navigation Bar. The Primary CAL screen will appear.



3. Tap the **CAL** button.



4. Submerge the PTBT4 sensor in Myron L<sup>®</sup> Company ORP reference solution (see Table 8 above).
5. Swirl the PTBT4 sensor in the solution.
6. Tap the **ORP CHECK** button.



7. The App will display current ORP value measured by the PTBT4 sensor.
8. Tap the Done button to stop the ORP Sensor Check and return to the Primary CAL screen.

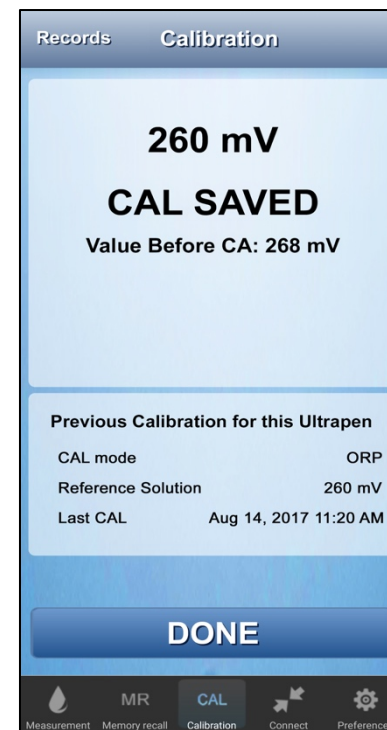
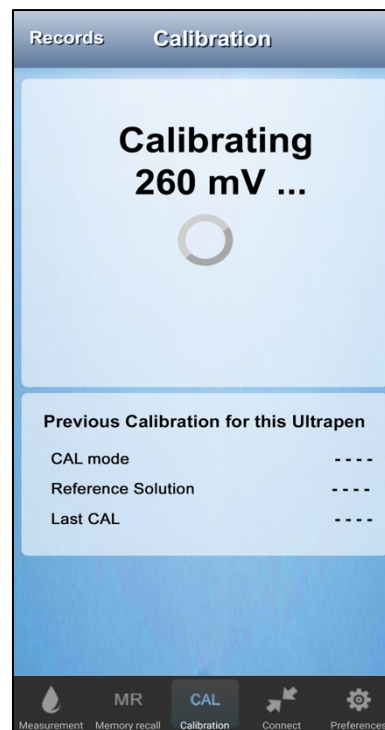
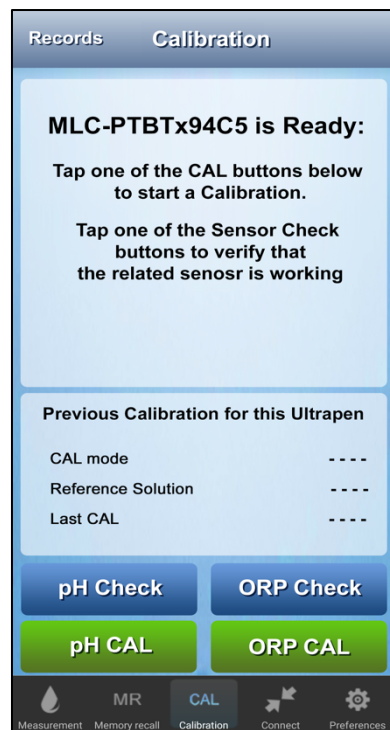
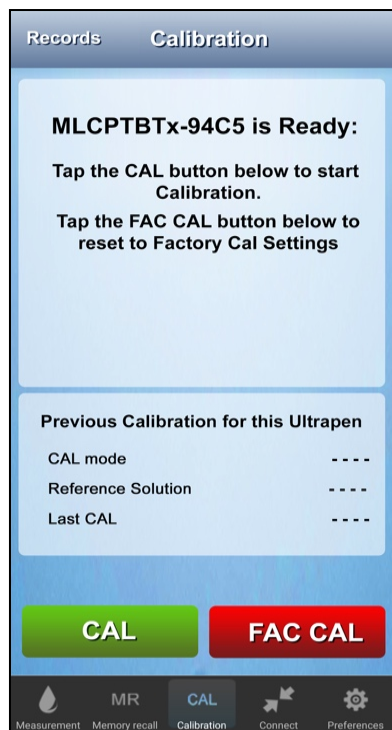
**NOTE:** If the value reported during the Sensor Check is  $> \pm 50$  mV from the value of the reference solution used, the sensor should be cleaned (see Section 72 below) or replaced (see Section 75 below).



## ORP Sensor Cal

- Calibrating the ORP section of the PTBT4 sensor uses the same method as described in Section 57 above.


1. Press and release the Connected / Paired PTBT4's PEN BUTTON to turn it ON and place it in Standby mode.
2. Tap the **CAL** button in the Feature Navigation Bar. The Primary CAL screen will appear.

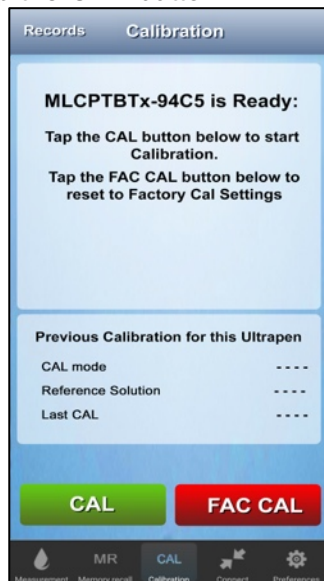


3. Tap the **CAL** button.
4. The Secondary PTBT4 Calibration screen will appear.
5. Submerge the PTBT4 sensor in ORP standard solution (see Table 8 above).
6. Tap the **ORP CAL** button.
7. Swirl the PTBT4 sensor in the standard solution while the Calibration is ongoing.
8. When Calibration has been completed, tap the **DONE** button to return to the Primary CAL screen.

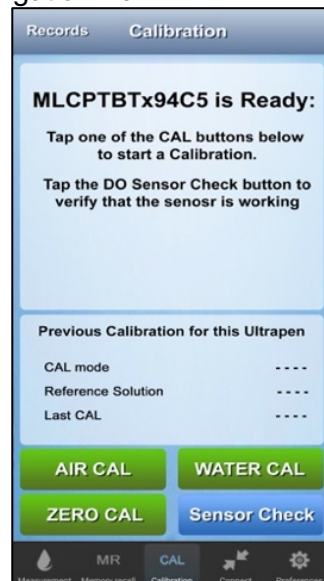
## 60. PTBT5 – Single Point DO Calibration and Sensor Check

### PTBT5 Sensor Check

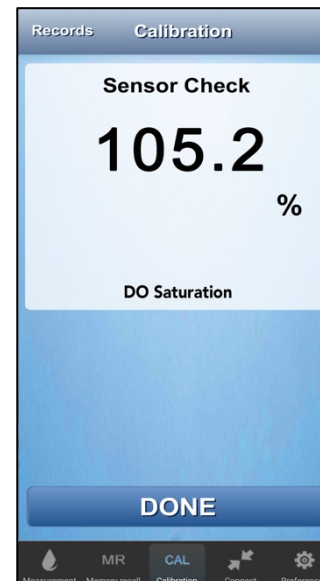
1. Remove the protective / hydration cap from the DO sensor.
2. Dip the sensor in clean DI, RO, or purified water.
3. Carefully blot the sensor membrane with a soft, clean, lint-free cloth or tissue to remove any water drops.
4. Fill the Protective / Hydration cap with enough DI, RO, or distilled water to soak the sponge inside.
5. Hold the PTBT5 upright with the DO sensor down and insert the sensor into the hydration cap.
  - Make sure there is a good seal between the sensor and the cap.
  - DO NOT insert the sensor so far that the vent hole is covered
6. Press and release the PEN BUTTON to turn the PTBT5 ON.
7. Tap the **CAL** button  in the Feature Navigation Bar.



8. Tap the **CAL** button.



9. On the Secondary CAL screen, tap the **Sensor Check** button.



10. The App will display current DO Saturation value measured by the PTBT5 sensor.
11. Tap the **DONE** button to stop the PTBT5 Sensor Check to return to the Primary CAL screen.

The value displayed will include temperature compensation, but no calibration constant will have been applied.

- The sensor is GOOD, if the value displayed is  $\geq 57.5\%$ .
- If the value reported is  $< 57.5\%$ , the App will display an ERROR message.

## PTBT5 DO Calibration

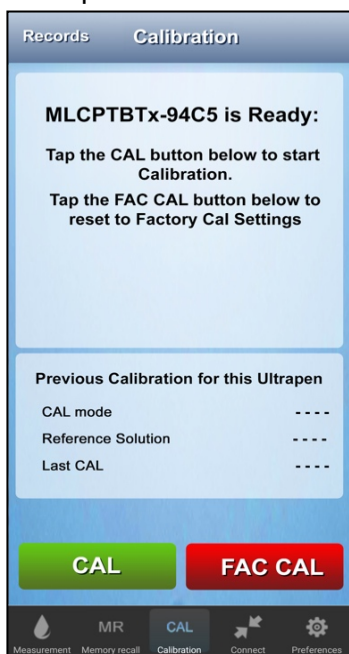
The PTBT5 sensor can be calibrated in several different ways:

- Air Calibration: Uses air saturated with water.
- Water Calibration<sup>1, 3</sup>: Uses water saturated with air.
- Zero Calibration<sup>2, 3</sup>:

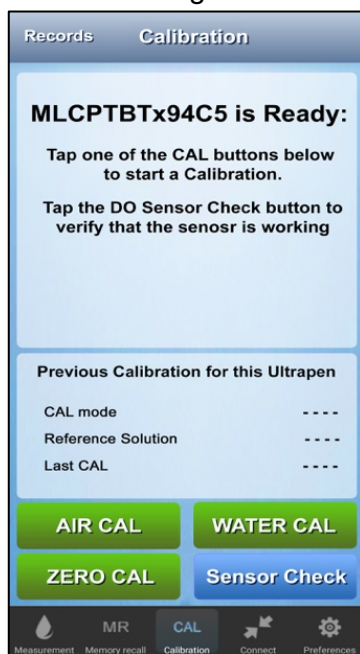
**NOTE:** All PTBT5 Calibrations are performed as DO Saturation (%).

To perform a basic Air Calibration of the PTBT5:

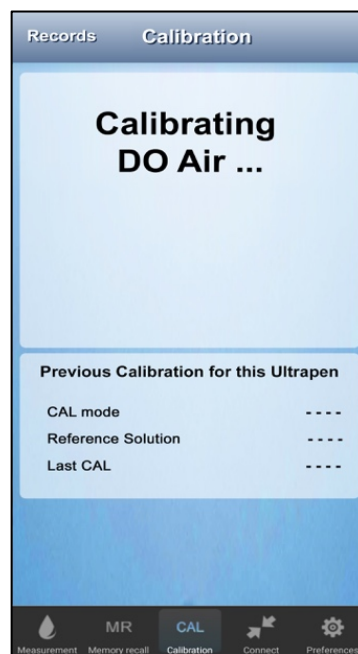
1. Follow the Air Calibration steps 1 through 6 above.
2. Tap the **CAL** button  in the Feature Navigation Bar.



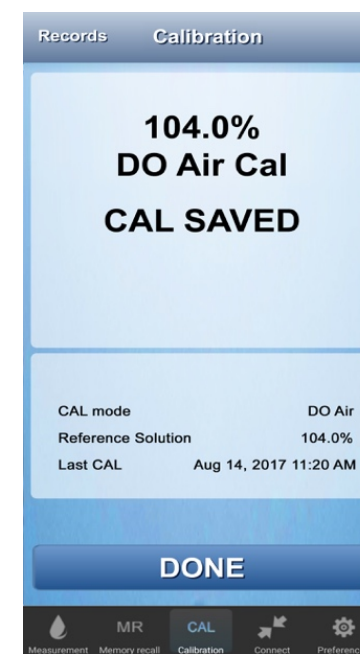
3. Tap the **CAL** button.



4. On the Secondary CAL screen, tap the AIR CAL button.



5. The PTBT5 will perform the Air calibration.



6. The App will display calibrated DO Saturation value.
7. Tap the **DONE** button to return to the Primary CAL screen.

<sup>1</sup> Requires a special setup equipment and procedure.

<sup>2</sup> Requires a special standard solution and procedure.

<sup>3</sup> For instructions on performing a Water Cal or Zero Cal, download the PTBT5 operation Manual (PTBT5OM-X2) from the Downloads page of the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

## 61. PTBT6 – NO<sub>3</sub><sup>-</sup>-N 2-Point Calibration and Sensor Diagnostic

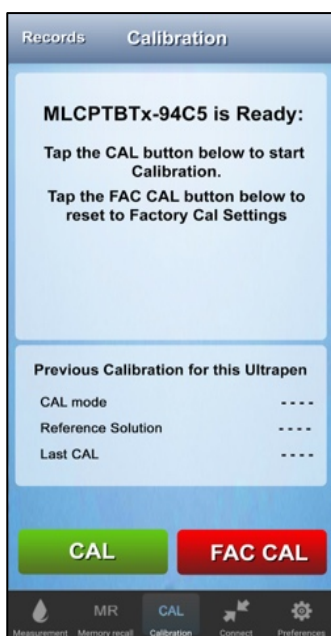
### IMPORTANT NOTES:

- The nitrate sensor must be conditioned prior to performing a calibration<sup>1</sup>.
- PTBT6 requires two properly prepared<sup>1</sup> NO<sub>3</sub><sup>-</sup>-N standard solution of either 1 ppm, 10 ppm, 100 ppm or 1000 ppm.
- **ALWAYS**, keep the temperature of the prepared calibration solution(s) the same as the sample solution you will be testing.

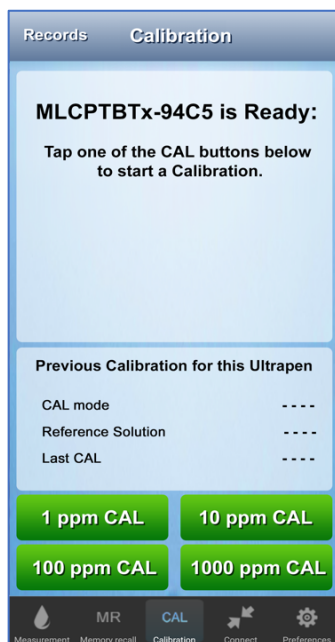
To perform a 2-point calibration.

1. Remove the protective cap from the nitrate sensor and rinse it for about 5 seconds with DI, RO, or distilled water.
2. Carefully blot the sensor membrane with a soft, clean, lint-free cloth or tissue to remove any water drops.
3. Completely Submerge the sensor in the prepared standard solution and swirl to remove any bubbles.
  - When performing a 2-point calibration, ALWAYS start with the lower CAL point.

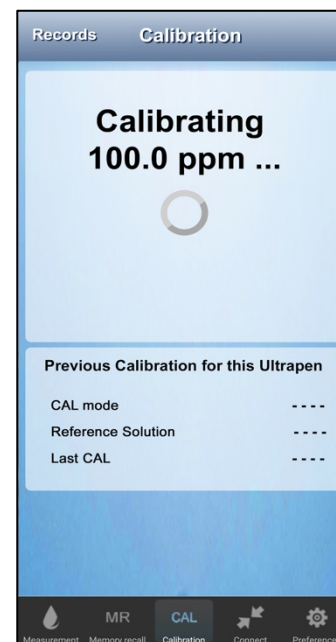
4. Tap the **CAL** button  in the Feature Navigation Bar.



5. The Initial CAL screen will appear.
6. Tap the **CAL** button.



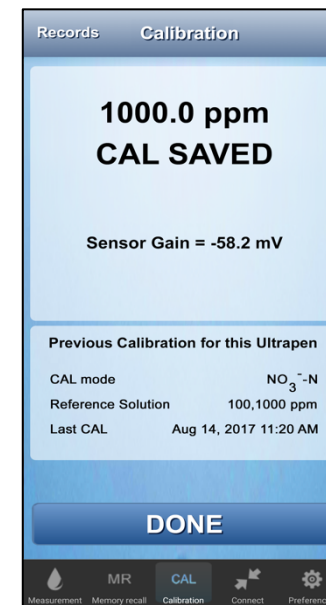
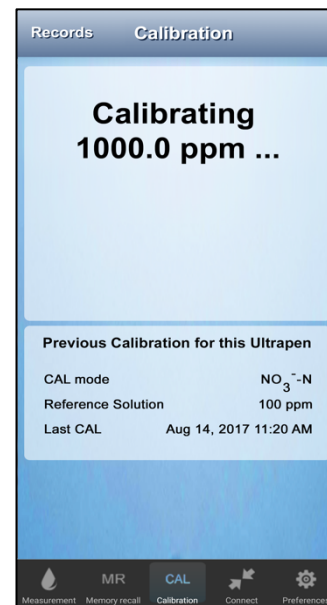
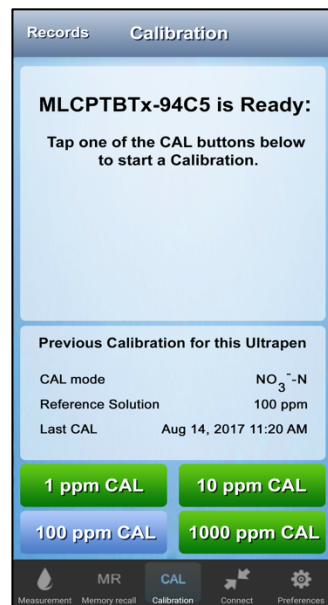
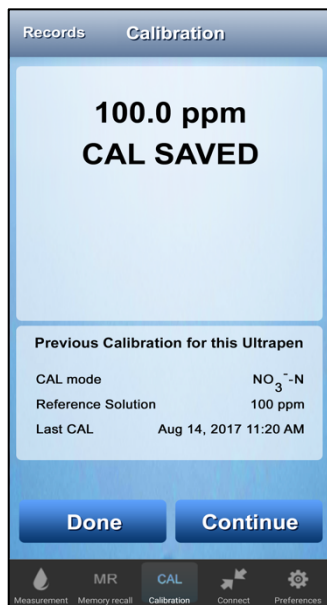
7. The PTBT6 Secondary CAL screen will appear.
8. Tap the appropriate **CAL** button for the standard solution being used (in this example, 100 ppm).



9. The PTBT6 will begin calibrating the initial CAL point.
10. Hold the sensor steady while the calibration is being performed.

<sup>1</sup> For instructions on conditioning the PTBT6 sensor and preparing the NO<sub>3</sub><sup>-</sup>-N standard solutions, download the PTBT6 Operation Manual (PTBT6OM-X2) from the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.





11. The App will display the calibrated value and saves a CAL record.
  - A **CONTINUE** and a **DONE** button will appear.
12. Rinse the Sensor in Clean Water.
13. Submerge it in the reference solution for the second Cal point.
14. Tap the **CONTINUE** button.
15. The PTBT6 Secondary CAL screen will appear.
  - Note that the button for the previously performed CAL point is inactive.
16. Tap the appropriate button for the second Cal point (in this example, 1000 ppm).
17. The PTBT6 will begin calibrating the final CAL point.
18. Hold the sensor steady while the calibration is being performed.
19. When the final CAL point is completed, the App will display a Sensor Gain value, the CAL values and update the CAL record.
  - **ONLY** the **DONE** button will appear.
20. Tap the **DONE** button to return to the Primary Cal Screen.

## IMPORTANT NOTE!

*The second CAL points MUST BE STARTED no more than 45 seconds after the previous CAL point is completed, or the PTBTX2 App will save / update the CAL record with the completed Cal points and return to the Initial CAL Screen.*

**NOTE:** To properly interpret the Sensor Gain value, read Section 62 below.

## 62. PTBT6 – Sensor Diagnostic

To perform a diagnostic test on the PTBT6 nitrate sensor:

1. Perform a 2-Point calibration using 100 ppm as the initial CAL point and 1000 ppm final CAL point.
2. Both standard solutions **MUST** be at 25°C ± 2°C.
3. The expected sensor gain should be between -50.0 mV and -62.0 mV.

If the sensor gain is outside of these limits:

1. Recondition the sensor as described in the PTBT6 operation Manual (PTBT6OM-X2).
2. Redo a 2-Point calibration using 100 ppm as the initial CAL point and 1000 ppm final CAL point @ 25°C ± 2°C.


**If the problem persists, the sensor should be replaced.**

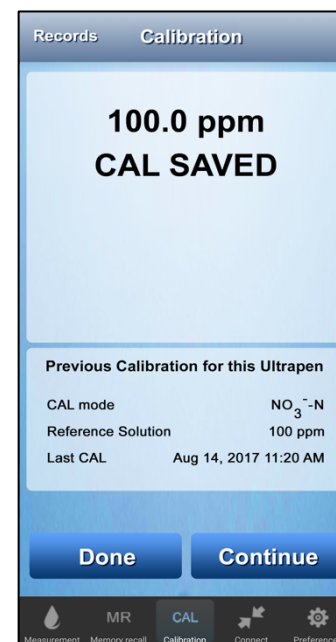
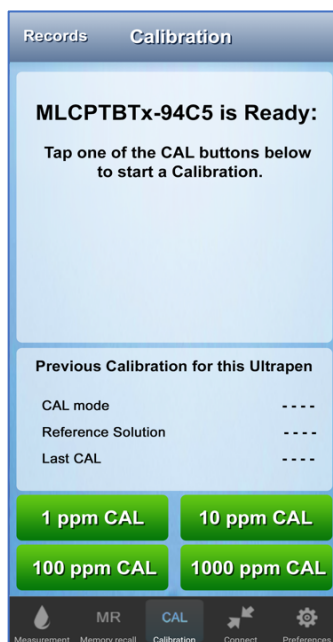
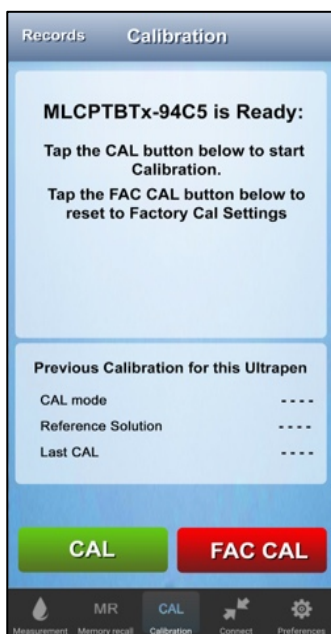
## 63. PTBT6 – NO<sub>3</sub><sup>-</sup>-N Single-Point Calibration

### IMPORTANT NOTES:

- The nitrate sensor must be conditioned prior to performing a calibration<sup>1</sup>.
- PTBT6 requires a properly prepared<sup>1</sup> NO<sub>3</sub><sup>-</sup>-N standard solution of either 1 ppm, 10 ppm, 100 ppm or 1000 ppm.
- **ALWAYS**, keep the temperature of the prepared calibration solution(s) the same as the sample solution you will be testing.

To perform a single-point calibration:

1. Remove the protective cap from the nitrate sensor and rinse it for about 5 seconds with DI, RO, or distilled water.
2. Carefully blot the sensor membrane with a soft, clean, lint-free cloth or tissue to remove any water drops.
3. Completely Submerge the sensor in the prepared standard solution and swirl to remove any bubbles.
4. Tap the **CAL** button  in the Feature Navigation Bar.



5. The Initial CAL screen will appear.
6. Tap the **CAL** button.
7. The PTBT6 Secondary CAL screen will appear.
8. Tap the appropriate **CAL** button for the standard solution being used.
9. The PTBT6 will begin calibrating.
  - Hold the sensor steady while the calibration is being performed.
10. The App will display the calibrated value and saves a CAL record.
 

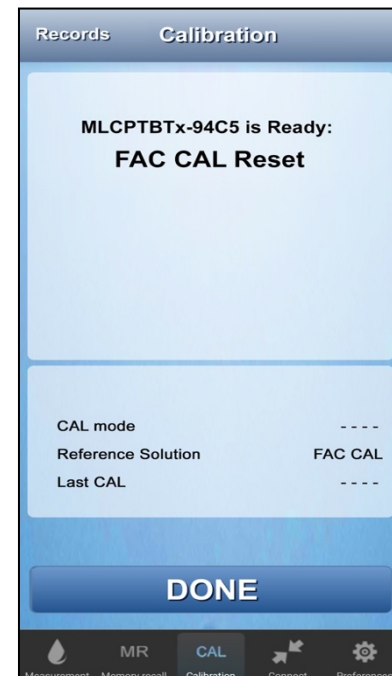
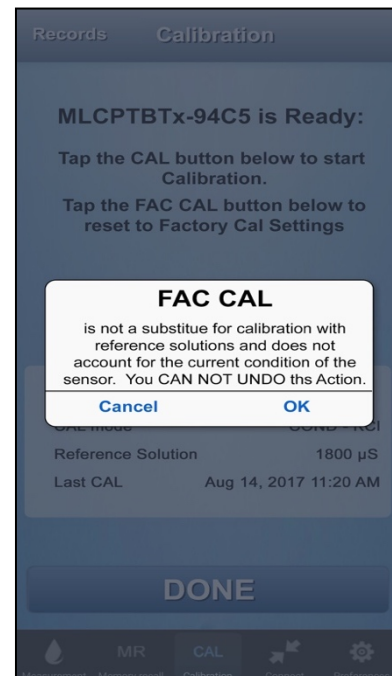
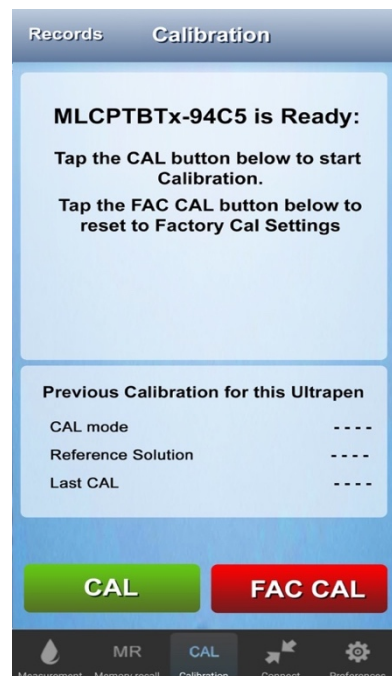
**NOTE:** A Sensor Gain value will **NOT** appear.

A **CONTINUE** and a **DONE** button will appear.
11. Tap the **DONE** button to return to the Primary Cal Screen.

<sup>1</sup> For instructions on conditioning the PTBT6 sensor and preparing the NO<sub>3</sub><sup>-</sup>-N standard solutions, download the PTBT6 Operation Manual (PTBT6OM-X2) from the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

## 64. Factory CAL

**CAUTION:** FAC CAL resets the ULTRAPENx2's internal calibration constants and erases all previously stored Wet Calibration data. Future measurements will not reflect the current state of the sensor and measurement cell.



1. Turn on the Connected / Paired ULTRAPENx2  
Tap the **CAL** button in the Feature Navigation Bar.
2. When the Calibration Start screen appears, tap the red **FAC CAL** button.
3. A dialogue box will appear warning that the FAC CAL will affect the Ultrapen's performance.  
Tap **OK** to start the FAC CAL Reset.  
Tap **CANCEL** to leave the Ultrapen's calibration data unchanged.
5. The App will inform the user when the FAC CAL reset is completed.  
The Previous Calibration Table will be updated to show the FAC CAL and a CAL Record will be saved.  
Only the **DONE** button will appear.
6. Tap the **DONE** button to return to the Calibration Start screen.

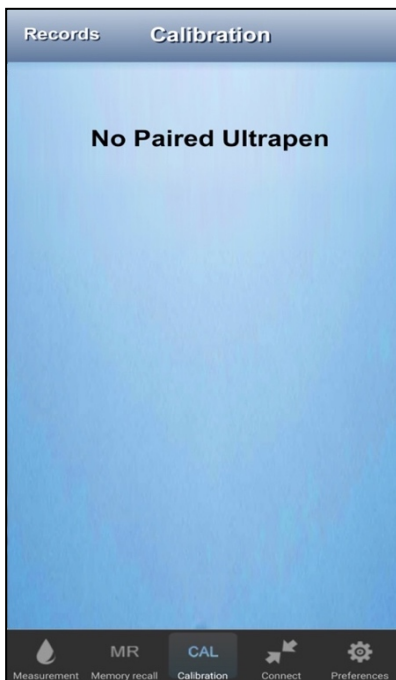
# CALIBRATION RECORDS

A record of each wet calibration performed is automatically stored in the mobile devices memory.

## 65. Accessing Calibration Records

**NOTE:** There does NOT have to be a Connected / Paired ULTRAPENX2 to access Calibration Records.

1. Tap the **CAL** button in the Feature Navigation Bar.



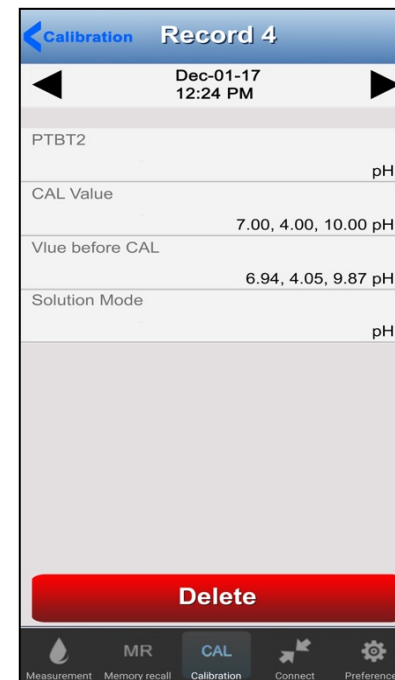
2. When the Initial Cal screen appears, tap the **RECORDS** button in the upper left corner of the main CAL screen.



3. The CAL Records list will appear.  
If there are more CAL Records on the list than can be viewed at one time, **SWIPE UP** or **DOWN** to view other records in the list.



4. Tap an individual record to open the file.  
The Cal record will open and be displayed.



5. Tap the ► to display the next record in the list.  
Tap the ◀ to display the previous record in the list.
6. A RED **Delete** button at the bottom of the screen can be used to delete this record.

**NOTE:** Tap “<Calibration” in the upper left to return to the Calibration Start screen

## Clearing CAL Records

While a Calibration Record can be deleted completely from the App's database, the data in a Calibration Record cannot be cleared or replaced.

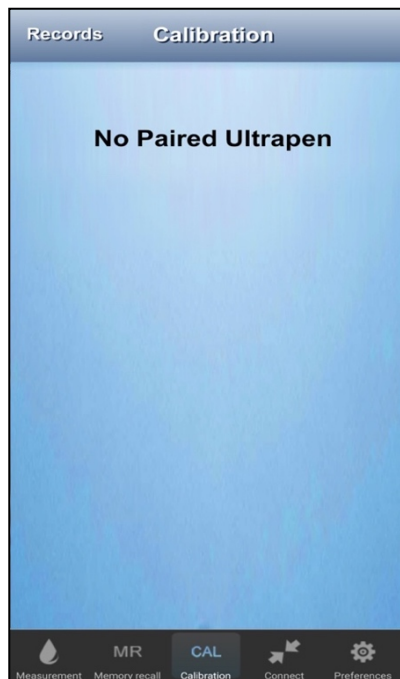
## Exporting (Emailing) CAL Records

Calibrations may not be exported.

## 66. Sorting, Filtering and Deleting Calibration Records

To open the Edit CAL Records List:

1. Tap the **CAL** button on the Feature Navigation Bar.



2. When the Initial Cal screen appears, tap the **RECORDS** button in the upper left corner of the main CAL screen.

3. Tap the **EDIT** button in the upper right corner of the screen.

4. The Cal Record List Edit screen will appear.

Once the Cal Record List Edit mode is open:

- The CAL Record List may be sorted and filtered in the same way as Data Records.
- Single or multiple CAL Records may be selected and deleted in the same way as Data Records.

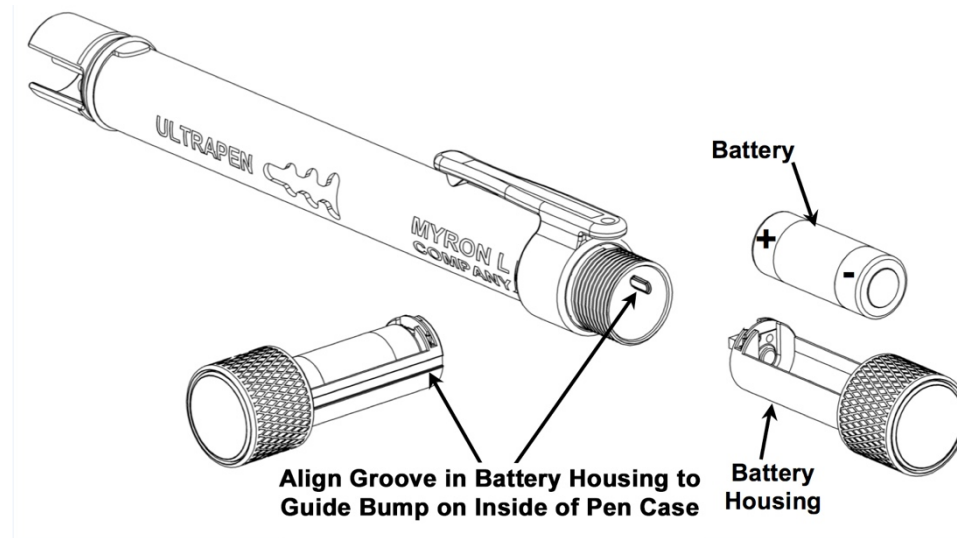


## MAINTENANCE AND CLEANING

### 67. Battery Replacement

The PTBTX2 App display has an indicator that depicts the ULTRAPENX2 battery's charge level.

- When the charge level falls below 25%, the indicator will flash RED. Replace the battery with an N-type battery.



1. In a CLEAN, DRY place unscrew the ULTRAPENX2 battery cap in a counter-clockwise motion.
2. Slide the cap and battery housing out of the ULTRAPENX2.
3. Remove the depleted battery from its housing.
4. Insert a new battery into the battery housing oriented with the negative end touching the spring.
5. Align the groove along the battery housing with the guide bump inside of the ULTRAPENX2 case and slide the battery housing back in.
6. Screw the ULTRAPENX2 cap back on in a clockwise direction. Do not over tighten.

### 68. Routine Maintenance – General

- Always rinse the cell / sensor and electrodes with clean water after each use.
- Do not drop, throw or otherwise strike the ULTRAPENX2. **This may void the warranty.**
- Do not store the ULTRAPENX2 in a location where the ambient temperatures exceed its specified Operating/Storage Temperature limits.

## 69. Routine Maintenance – PTBT1

- If the electrodes develop scaling or become dirty, clean the cell by submerging the probe end in a 1: 1 solution of Lime-A-Way® and water for 5 minutes. Then rinse **thoroughly** with clean water.

## 70. Routine Maintenance – PTBT2

- ALWAYS replace the Protective/Hydration cap half filled with Sensor Storage Solution after each use to prevent it from drying out and to preserve the sensor's accuracy.

### Cleaning the PTBT2 Sensor:

- If the pH sensor becomes dirty, carefully clean the sensor surface with a cotton swab soaked in isopropyl alcohol. Then rinse thoroughly with clean water.

## 71. Routine Maintenance – PTBT3

- **ALWAYS** replace the Protective/Hydration cap half filled with Sensor Storage Solution after each use to prevent it from drying out and to preserve the sensor's accuracy.

### Cleaning the PTBT3 ORP Sensor:

- The Myron L® Company recommends cleaning your sensor regularly, however this depends on application and frequency of use.
- Indications of a dirty sensor are slower and/or erroneous readings.
- Always recondition your sensor after cleaning.
- To clean your sensor, select one of the following methods:
- Basic Cleaning:
  - Using a solution made of dish soap mixed with water and a cotton swab, gently clean the inside of the sensor head and platinum electrode, rinse thoroughly with clean water, then recondition the sensor.
- Moderate Cleaning:
  - Using a paste made of Comet® cleanser mixed with water and a cotton swab, gently clean the inside of the sensor head and platinum electrode, rinse thoroughly with clean water, then recondition the sensor.
    - If Comet® Cleanser is not available, use another mildly abrasive household cleanser.
- Deep Cleaning:
  - Using ORP electrode cleaning paper (included with PTBT3) and water, gently clean the platinum electrode, rinse thoroughly with clean water, then recondition the sensor.
- Reconditioning the sensor: For greatest accuracy and speed of response, the Myron L® Company recommends reconditioning the sensor after cleaning. To recondition the sensor:
  - Rinse the sensor thoroughly with clean water, then allow it to soak in Storage Solution for a minimum of 1 hour.
  - For best results allow the sensor to soak in Storage Solution overnight.

## 72. Routine Maintenance – PTBT4

- ALWAYS replace the Protective/Hydration cap half filled with sensor Storage Solution after each use to prevent it from drying out and to preserve the sensor's accuracy.

### **Cleaning the PTBT4 pH Sensor:**

- If the pH sensor becomes dirty, carefully clean the sensor surface with a cotton swab soaked in isopropyl alcohol. Then rinse thoroughly with clean water.

### **Cleaning the PTBT4 ORP Sensor:**

- The Myron L<sup>®</sup> Company recommends cleaning your sensor regularly. More often if your frequency of use is high.
- Indications of a dirty sensor are slower and/or erroneous readings.
- Always recondition your sensor after cleaning.
- Follow the procedure described in Section 71 above for cleaning the PTBT3 sensor.

## 73. Routine Maintenance – PTBT5

- After each use ALWAYS rinse the DO sensor with DI, RO, or distilled water and then carefully blot the sensor membrane with a soft, clean cloth or tissue to remove any water drops.
- ALWAYS replace the hydration cap on the DO sensor after each use.
- DO NOT remove the DO sensor membrane except to replace it with a new membrane or to replace / refill the electrolyte.
- Unnecessarily removing and replacing the same membrane can degrade the quality of the DO measurements.

### **Refilling or Replacing the DO Electrolyte**

You should empty and refill the DO Sensor with fresh electrolyte if:

- Excess bubbles have formed inside the electrolyte well.. Minimizing air bubbles inside the electrolyte well will improve accuracy.
- When too many white zinc oxide particles have formed inside the electrolyte solution.
- If you get erroneous readings after changing the membrane cap and performing the proper calibration.
- For specific instructions on replacing the DO sensor's electrolyte properly, download the PTBT5 Operation Manual (PTBT5OM-X2) from the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

### **Cleaning the PTBT5 DO Sensor**

- Cleaning the DO sensor involves removing the DO membrane cap, emptying the sensor of electrolyte, washing the sensor electrode in vinegar, then refilling it with new electrolyte and replacing the membrane cap.
  - For specific instructions on performing these actions properly, download the PTBT5 Operation Manual (PTBT5OM-X2) from the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.



### Storage

- The PTBT5 sensor is continuously oxidizing and reducing even while unused, causing white zinc oxide particles to build up inside the sensor. If you need to store the PTBT5, follow the instructions below.

#### *SHORT-TERM STORAGE (LESS THAN A MONTH):*

- The sensor should be kept moist at all times. Always replace the hydration cap containing a sponge moistened with DI, RO or distilled water.

#### *LONG-TERM STORAGE (A MONTH OR LONGER):*

- If you are planning on not using your PTBT5 for longer than 1 month, you must properly prepare it for storage.
  - For full instructions on how to prepare the PTBT5 sensor for long term storage download the PTBT5 Operation Manual (PTBT5OM-X2) from the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

## 74. Routine Maintenance – PTBT6

- After each use ALWAYS rinse the nitrate sensor with DI, RO, or distilled water and then carefully blot the sensor membrane with a soft, clean cloth or tissue to remove any water drops.
- ALWAYS replace the protective cap on the nitrate sensor after each use.
- Do not touch the ISE membrane as oil from your finger may contaminate the sensor.

### Storage

- After each use ALWAYS rinse the nitrate sensor with clean water (preferably DI, RO, or distilled) and then carefully pat the sensor with a clean soft lint-free cloth to remove any water drops.

#### *SHORT TERM STORAGE (≤ 3 DAYS):*

- Keep the sensor in the protective cap filled half-full with prepared 100 ppm standard solution.
- **DO NOT** store the PTBT6 with the cap filled with reference solution mixed with Nitrate Interference Suppression Buffer (NISBSOL).
- Store the PTBT6 in a cool place.

#### *LONG TERM STORAGE (>3 DAYS):*

- Rinse the nitrate sensor with clean water (preferably DI, RO, or distilled) and then carefully pat the sensor with a clean soft lint-free cloth to remove any water drops.
- Thoroughly rinse the protective cap with clean water (preferably DI, RO, or distilled)
- Pat with a clean soft lint-free cloth to remove any water drops.
- Put the protective cap on the sensor and store the PTBT6 in a cool place.

## 75. ULTRAPENX2 Sensor Replacement

### PTBT1 Sensor Replacement

The PTBT1 conductivity cell is not replaceable.

### PTBT2, PTBT3 and PTBT4 Sensor Replacement

#### **CAUTIONS and NOTES:**

- Only remove/replace the pH / ORP sensor in a CLEAN and DRY environment!
- The Protective / Hydration Cap contains saline, storage solution that will cause damage to the pocket tester's internal electronics and / or the sensor connector and circuitry.
- The O-rings of the sensor are pre-greased for ease of insertion.
  - DO NOT clean the grease from the O-Rings.
  - Carefully remove any bits of packaging material from the sensor shaft or O-rings before installation.
  - Handle the sensor by the Protective / Hydration Cap end to avoid migration of the grease.

#### **Removing the old Sensor**

1. Remove Protective / Hydration by wiggling the cap side-to-side while gently pulling it off the ULTRAPENX2 Pocket Tester.
2. Carefully clean off any residual salt or liquid around sensor by:
  - a. Rinsing it with clean DI, DO or distilled water.
  - b. Drying it thoroughly with a clean towel.
3. Make sure that your hands are clean and dry to prevent contaminating the pocket tester's internal electronics.
4. Unscrew the battery cap and remove the battery tray.
  - This allows the air pressure inside the pocket testers to equalize while you are removing or installing a sensor..
5. Grasp the pH sensor body and gently pull the sensor out of the pocket testers.

#### **Preparing the New Sensor**

***To prevent contaminating the ULTRAPENX2's electronics, perform the following steps away from the pocket tester.***

1. Remove the warning label from around the Protective / Hydration cap.
2. Remove the clear tape from around the top of the Protective / Hydration Cap.
3. DO NOT remove either the:
  - a. Black plastic Protective / Hydration the on front of the sensor .
  - b. Brown plastic cap covering the connector of the sensor.
4. If there are salt crystals around the cap of the sensor remove them by:
  - a. Carefully rinsing the sensor with clean water.
  - b. Shake off excess water.
  - c. Dry the outside of the sensor body.

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5. Once the sensor is COMPLETELY dry:
  - a. Remove the brown plastic cap over the connector end of the sensor.
  - b. Inspect to ensure the three O-rings are on sensor body.
6. If any of the O-rings appear damaged or there is any other damage to the sensor, DO NOT use the sensor.

### Installing the New Sensor

1. Align the large and small alignment tabs on the sensor with the corresponding notches in the body of the ULTRAPENx2.
  - It will only go in one way.
  - **WARNING:** Damage WILL occur to the connectors inside your ULTRAPENx2 if you attempt to install the sensor incorrectly.
2. Gently apply pressure to insert the sensor into the ULTRAPENx2.
  - a. You may need to apply a slight twisting motion to start each O-ring, ensuring all 3 O-rings on sensor slide evenly into ULTRAPENx2.
    - **CAUTION:** if you damaged an O-ring DO NOT use the sensor. This will allow solution to leak into the instrument.
3. Press sensor STRAIGHT into the ULTRAPENx2 until it is securely in place.
4. Replace the battery tray:
  - a. Aligning the groove in the side of the ULTRAPENx2 enclosure with the groove in the battery tray.
  - b. Slide the tray into the case until it is fully seated.
  - c. Screw the battery cap back on.

**Make sure to recalibrate the ULTRAPENx2 before making measurements!**

## PTBT5 Dissolved Oxygen Sensor Replacement

### Replacing the DO Sensor Membrane Cap

- Replacing the DO sensor membrane cap involves removing the DO membrane cap, emptying the sensor of electrolyte, then refilling it with new electrolyte and attaching a new membrane cap.
  - For specific instructions on performing these actions properly, download the PTBT5 Operation Manual (PTBT5OM-X2 from the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

### Replacing the DO Sensor Entirely

- Follow the same procedure as described for the PTBT2, PTBT3 and PTBT4 above.
- The new sensor will require a new membrane cap and will need to be filled with fresh electrolyte.
  - For specific instructions on performing these actions properly, download the PTBT5 Operation Manual (PTBT5OM-X2) from the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

## **PTBT6 Nitrate Sensor Replacement**

- Follow the instructions that come with your replacement sensor.
- Only remove/replace the nitrate sensor in a CLEAN and DRY environment.

### **To Remove the Nitrate Sensor:**

1. Remove the protective cap by wiggling it side to side while you pull it off the PTBT6.
2. Make sure the PTBT6 (including the sensor) is clean and dry.
3. Loosen the battery tray (to allow pressure equalization).
4. Firmly grasp the sensor body and slowly pull the sensor out. DO NOT allow any dust or moisture into the body of the PTBT6.

### **To install a new Nitrate sensor:**

1. Line up the alignment tabs on the sensor with the alignment slots on the PTBT6 unit.
2. Gently push the sensor into position.
3. Tighten the battery cap.
4. Condition the new sensor according to the instructions found in the PTBT6 Operation Manual (PTBT6OM-X2). Downloadable from the Myron L<sup>®</sup> Company website ([www.myronl.com](http://www.myronl.com)) Downloads tab.

# ACCESSORIES

## Calibration Standards / Buffers

- The ULTRAPENx2™ PTBT1 uses the following solutions for wet calibration.
  - Order Part Numbers:
    - **KCL-1800**, 1800 µS KCl standard solution.
    - **442-3000**, Myron L® Company 442™ Natural Water standard solution: **Displays as:**
      - 3000 ppm when PTBT1 is set for TDS-442 Solutions mode.
      - 2027 ppm when PTBT1 is set for TDS-NaCl Solutions mode.
      - 3.000 ppm when PTBT1 is set for Salinity-442 Solutions mode.
      - 2.027ppm when PTBT1 is set for Salinity-NaCl Solutions mode.
- The ULTRAPENx2™ PTBT2 and PTBT4 require pH 4.0, pH 7.0, and pH 10.0 buffer solutions for wet calibration and pH Sensor Storage Solution for proper storage.
  - Order Part Numbers:
    - **PH4**, Myron L® Company 4.0 pH Calibration buffer.
    - **PH7**, Myron L® Company 7.0 pH Calibration buffer.
    - **PH10** Myron L® Company 10.0 pH Calibration buffer.
- The ULTRAPENx2™ PTBT3 and PTBT4 require Myron L® Company 80mV Quinhydrone, 260mV Quinhydrone, or 470mV MLC Light's ORP standard solutions for wet calibration and Sensor Storage Solution for proper storage.
  - Order Part Numbers:
    - **ORP802OZ** 80 mV, Kit, Quinhydrone/pH7 2oz.
    - **ORP2602OZ** 260 mV, Kit, Quinhydrone/pH4 2oz.
    - **ORP4701OZ** 470 mV, MLC Light's Solution 1oz.
    - **ORPCALKIT** Calibration Kit, ORP, 80mV, 260mV, 470mV.
- The ULTRAPENx2™ PTBT5 requires a 0 ppm Dissolved Oxygen standard solution in order to perform a ZERO DO Calibration.
  - Order Part Number:
    - **DOSOL**, 0 ppm Dissolved Oxygen Calibration Solution.
- The ULTRAPENx2™ PTBT6 can be calibrated with 1, 10, 100, or 1000 ppm NO<sub>3</sub><sup>-</sup>-N standard solution.
  - Order Part Numbers:
    - **N1SOL**, 1 ppm NO<sub>3</sub><sup>-</sup>-N (nitrate as nitrogen) standard solution.
    - **N10SOL**, 10 ppm NO<sub>3</sub><sup>-</sup>-N (nitrate as nitrogen) standard solution.
    - **N100SOL**, 100 ppm NO<sub>3</sub><sup>-</sup>-N (nitrate as nitrogen) standard solution.
    - **N1000SOL**, 1000 ppm NO<sub>3</sub><sup>-</sup>-N (nitrate as nitrogen) standard solution.

## Replacement Sensors

- PTBT1: The PTBT1 Conductivity cell is not replaceable.
- PTBT2
  - Order Part Number: **RPT2** – Replacement PTBT2 pH sensor (with instructions).
- PTBT3
  - Order Part Number: **RPT3** – Replacement PTBT3 ORP sensor (with instructions).
- PTBT4
  - Order Part Number: **RPT4** – Replacement PTBT4 FC<sup>E</sup> sensor (with instructions).
- PTBT5
  - Order Part Numbers:
    - **DOM5** – DO Membrane Caps 5pk.
    - **DOSRE** – DO Sensor Replenishment Electrolyte 2 oz.
    - **DOM5K** – DO Membrane Caps 5pk, Replenishment Electrolyte 2 oz., Syringe w/Tip Kit, and instruction sheet.
    - **RPT5** – Full PTBT5 DO Sensor Assembly with 3 DO Membrane Caps (does not include electrolyte solution).
- PTBT6
  - Order Part Number: **RPT6** – PTBT6 Nitrate ISE Sensor (with instructions)

## Misc. Items

- PTBT2, PTBT3 and PTBT4, pH / ORP Sensor Storage Solution: Order Part Number: PHSS.
- PTBT3 and PTBT4 ORP Electrode Cleaning Paper: Order Part Numbers:
  - **OECP-25**, QTY 25.
  - **OECP-100**, QTY 100.
- PTBT5 DO Electrolyte replenishment Syringe w/Tip:
  - Order Part Number. **DORS**.
- PTBT6 Ionic Strength Adjuster:
  - Order Model, **NISASOL**
- PTBT6 Nitrate Interference Suppression Buffer:
  - Order Model, **NISBSOL**.

# TROUBLESHOOTING HINTS

## General Notes

- The most common issues that occur when using the PTBTX2 App are communication errors that occur between the App and the ULTRAPENX2 due to low battery charge levels for either the mobile device or the Ultrapen.

## Prevention:

- Make sure that your mobile device is **FULLY CHARGED**.
  - On some mobile devices this can affect the Bluetooth signal, causing it to weaken, resulting in connectivity problems and communication errors between the ULTRAPENX2 and the App.
- Keeping a fresh battery in the ULTRAPENX2 guarantees its broadcast is as strong as possible.
  - The battery level field will flash RED when the level gets below 25%. Replace the battery **IMMEDIATELY!**

**Table 9: Troubleshooting Hints**

SYMPTOM	POSSIBLE CAUSE	REMEDY
<b>PTBTX2 App Issue</b>		
Ultrapen stays in Standby mode (LED Flashes once every 5 seconds) and does not react when an App button is tapped, such as the <b>CAL</b> or <b>MEASURE</b> button.	Timing error between the App command string and the PTBTX2 Ultrapen.	<ol style="list-style-type: none"> <li>1. Close the PTBTX2 App.</li> <li>2. Make sure the Ultrapen is ON and in Standby mode.</li> <li>3. Reopen the PTBTX2 App</li> <li>6. The App will open to the Measurement screen and automatically refresh the connection to the Connected / Paired Ultrapen.</li> <li>7. Once the Connection is refreshed, a message will appear on the display stating the Ultrapen is ready.</li> <li>8. Restart the original operation.</li> </ol>
Ultrapen goes into Standby mode before completing an operation, such as a measurement of Calibration point.	Timing error between the App command string and the PTBTX2 Ultrapen.	<ol style="list-style-type: none"> <li>7. Once the Connection is refreshed, a message will appear on the display stating the Ultrapen is ready.</li> <li>8. Restart the original operation.</li> </ol>
The Ultrapen cannot be paired to the App because it will not appear on the Connect / Disconnect Screen.	The Bluetooth feature of your mobile device is turned OFF.	<ol style="list-style-type: none"> <li>1. Close the PTBTX2 App.</li> <li>2. Make sure the Ultrapen is ON and in Standby mode.</li> <li>3. Check the status of the mobile device's Bluetooth feature.                             <ul style="list-style-type: none"> <li>○ If it is <b>OFF</b>, turn it ON.</li> <li>○ If it is <b>ON</b>, turn it OFF, then back ON.</li> </ul> </li> <li>4. Wait for 10 seconds while the mobile device rescans for nearby Bluetooth devices.</li> <li>5. Reopen the PTBTX2 App.</li> <li>6. Tap the <b>CONNECT / DISCONNECT</b> button.</li> <li>7. Swipe down on the Ultrapen list to start a search for available Ultrapens.</li> <li>8. The Ultrapen should appear on the list.</li> </ol>
I'm trying to add a GPS location but the App keeps showing me the name of an already existing location.	You are too close to another, already programmed location.	<ol style="list-style-type: none"> <li>1. Move the GPS Services switch on the LOCATION settings screen to OFF.</li> <li>2. Add the new location as a Non-GPS location.</li> </ol>



## Operation Manual – PTBTX2 App – Trouble Shooting Hints

SYMPTOM	POSSIBLE CAUSE	REMEDY
I'm trying to select a Non-GPS Location but it won't work.	The App's GPS Services switch on the LOCATION settings screen is set to ON.	Move the GPS Services switch on the LOCATION settings screen to OFF.
App thinks the Ultrapen is "offline" but the Ultrapen is awake and operating (LED is flashing ON / OFF once per second.)	Communication error between the App and the Ultrapen.	<ol style="list-style-type: none"> <li>1. Close the PTBTX2 App.</li> <li>2. Wait for the Ultrapen to complete its operation and go into Standby mode (LED Flashes once every 5 seconds).               <ul style="list-style-type: none"> <li>o This can take several minutes depending on which operation it was performing.</li> </ul> </li> <li>3. Wait an additional 2 minutes for the Ultrapen's standby mode to expire and for it to turn OFF.</li> <li>4. Turn the Ultrapen ON.</li> <li>5. Reopen the App.</li> <li>6. The App will open to the Measurement screen and automatically refresh the connection to the Connected / Paired Ultrapen.</li> <li>7. Once the Connection is refreshed, a message will appear on the display stating the Ultrapen is ready.</li> <li>8. Restart the original operation.</li> </ol>
Odd Characters appear when I change the Name of an Ultrapen.	Sometimes, after changing the name of an ULTRAPENX2, extra symbols or characters may appear at the end of the new name. Example: <ul style="list-style-type: none"> <li>• New Pen name as entered: MLC pH-Lab1</li> <li>• New Pen name as displayed: MLC pH-Lab1¿ Å</li> </ul>	<ol style="list-style-type: none"> <li>1. To clear the extra character(s):</li> <li>2. Disconnect the ULTRAPENx2 from the App.</li> <li>3. Delete the ULTRAPENx2 from the Connect / Disconnect screen list.</li> <li>4. Re-add the ULTRAPENx2 to the list by pairing it.</li> <li>5. When the ULTRAPENx2 is re-paired and reconnected, the extra characters will be gone.</li> </ol>
<b>General Ultrapen Issues</b>		
Error message during calibration.	Sensor was not properly submerged in solution during calibration.	Repeat calibration and ensure sensor is submerged in solution prior to LED flashing slowly.
	Improper calibration solution.	Verify you are using the proper calibration solution.
	Temperature out of range.	Verify temperature is within range.
	Sensor needs cleaning.	Clean sensor (see Routine Maintenance Sections 68 through 74 above).
	Sensor is damaged.	If cleaning sensor does not correct error, replace sensor (see Section 75 above).
Measurement readings are not as expected.	Sensor was not properly submerged in solution during measurement.	Repeat measurement and ensure sensor is submerged in solution prior to LED flashing slowly.
	Sensor needs cleaning.	Clean sensor (see Routine Maintenance Sections 68 through 74 above).
	Sensor is damaged.	If cleaning sensor does not correct error, replace sensor (see Routine Maintenance Sections 68 through 74 above).
Measurement Screen Displays "Out of Range".	Measured value or Temperature is out of specified range.	If the solution value and temperature are within the specified ranges, the sensor may be damaged, replace sensor (see Routine Maintenance Section above).
<b>PTBT1 Issues</b>		

## Operation Manual – PTBTX2 App – Trouble Shooting Hints

SYMPTOM	POSSIBLE CAUSE	REMEDY
Erratic or unusual measurements.	Conductivity cell is dirty.	<ol style="list-style-type: none"> <li>1. Clean the cell by: submerging the probe end in a 1: 1 solution of Lime-A-Way®.</li> <li>2. Then submerge and soak the sensor in clean water for 5 minutes.</li> <li>2. Rinse <b>thoroughly</b> with a fresh batch of clean water.</li> </ol>
<b>PTBT2 and PTBT4 pH Sensor Issues</b>		
Erratic or unusual measurements.	pH Sensor is dirty.	<ol style="list-style-type: none"> <li>1. Carefully clean the sensor surface with a cotton swab soaked in isopropyl alcohol.</li> <li>2. Rinse <b>thoroughly</b> with clean water.</li> </ol>
PTBT2 returns the same or very similar values for ALL of the buffers, even if the value appears to be correct for one of the buffers.	pH Sensor's glass bulb is cracked or is broken.	<ol style="list-style-type: none"> <li>1. Replace Sensor.</li> </ol>
Sensor Check measurements are not within $\pm 1.0$ pH of the pH value printed on the buffer bottle.	pH Sensor's reference junction has been depleted.	<ol style="list-style-type: none"> <li>1. Replace Sensor.</li> </ol>
<b>PTBT3 and PTBT4 ORP Sensor Issues</b>		
Erratic or unusual measurements.	ORP Sensor is dirty.	<ol style="list-style-type: none"> <li>1. Clean the ORP sensor (see Routine Maintenance Section 75 above).</li> </ol>
Sensor Check measurements are not within $\pm 50$ mV of the mV value printed on the reference solution bottle.	ORP Sensor's reference junction has been depleted. ORP sensor is damaged (e.g. Platinum wire broken or severely bent).	<ol style="list-style-type: none"> <li>1. Replace Sensor.</li> </ol>
<b>PTBT5 Issues</b>		
Erratic or unusual measurements.	DO sensor is low on Electrolyte.	<ol style="list-style-type: none"> <li>1. Refill the DO sensor with fresh electrolyte (see the PTBTX5OM-X2 manual).</li> </ol>
	DO Sensor electrode is oxidized.	<ol style="list-style-type: none"> <li>1. Clean the electrode (see Routine Maintenance Section 75 above).</li> </ol>
	DO membrane is damaged.	<ol style="list-style-type: none"> <li>1. Replace the DO membrane cap (see the PTBTX5OM-X2 manual).</li> </ol>
<b>PTBT6 Issues</b>		
Erratic or unusual measurements.	Sensor electrode may be reaching the end of its useful life.	<ol style="list-style-type: none"> <li>1. Perform a 2 point Calibration at <math>25^{\circ}\text{C} \pm 2^{\circ}\text{C}</math>.               <ul style="list-style-type: none"> <li>o Calibrate the initial point at 100 ppm.</li> <li>o Calibrate the final point 1000 ppm.</li> </ul> </li> <li>2. When the 2nd calibration point is completed the App will display a Sensor Gain in mV:               <ul style="list-style-type: none"> <li>o The expected sensor gain should be between: <b>-50.0 mV and -62.0 mV.</b></li> </ul> </li> <li>3. Recondition the sensor as described in the PTBT6 operation Manual (PTBT6OM-X2).</li> <li>4. Redo a 2-Point calibration using 100 ppm as the initial CAL point and 1000 ppm final CAL point @ <math>25^{\circ}\text{C} \pm 2^{\circ}\text{C}</math>.</li> <li>5. <b><i>If the problem persists, the sensor should be replaced.</i></b></li> </ol>
	Nitrate electrode may be dirty or damaged.	

NOTES:

NOTES:

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