

ULTRAPEN™ PT4

Free Chlorine Equivalent (FC^{E}™) & Temperature Pen

CE

- ACCURATE
- RELIABLE
- SIMPLE

Professional Water Analysis

- Accuracy of up to ±0.3 ppm FC^{E}
- Proprietary Sensor Design
- Calibration with pH and ORP Standard Solutions
- Automatic Temperature Compensation
- Temperature Readout
- Waterproof
- Powered by one N Type Battery (Included)

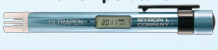
PACKAGE CONTENTS:

- PT4 Pocket Tester Pen - Battery Installed
- Scoop
- Soaker Cap
- Pocket Clip
- Holster
- Lanyard
- ORP Cleaning Paper
- Operating Instructions

Visit our website:
myronl.com/pt4.htm

ALSO AVAILABLE!

ULTRAPEN™ PT1
Conductivity, TDS, Salinity & Temperature



ULTRAPEN™ PT2
pH & Temperature



ULTRAPEN™ PT3
ORP & Temperature



myronl.com

MADE IN USA

MYRON L COMPANY
Water Quality Instrumentation
Accuracy • Reliability • Simplicity
. . . Since 1957

INTRODUCTION



Thank you for purchasing the Myron L ULTRAPEN™ PT4 FC^E Pen. This instrument is designed to be extremely accurate, fast, and simple to use in diverse water quality applications. Advanced features include automatic temperature compensation in calibration mode; highly stable microprocessor-based circuitry; user-intuitive design; and waterproof housing. A true one-handed instrument, the PT4 is easy to calibrate and easy to use. To take a measurement, you simply push a button then dip the PT4 in solution. Results display in seconds.

FEATURES

1. **Push Button** — turns PT4 on; selects mode and unit preferences.
2. **Battery Cap** — provides access to battery for replacement.
3. **Pocket Clip** — holds PT4 to shirt pocket for secure storage.
4. **Battery Indicator** — indicates life remaining in battery.
5. **Display** — displays measurements, menu options, battery indicator, and firmware revision (during power-up).
6. **LED Indicator Light** — indicates when to dip PT4 in solution, when measurement is in progress, and when to remove PT4 from solution.
7. **FC^E Sensor** — measures Free Chlorine Equivalent of a solution.
8. **Soaker Cap** — contains Sensor Storage Solution to maintain sensor hydration. To remove, twist the soaker cap while pulling off using caution not to spill the Storage Solution. To replace, fill the soaker cap half full with Storage Solution. Twist the soaker cap while pushing back on, using caution, as excess Storage Solution may squirt out.

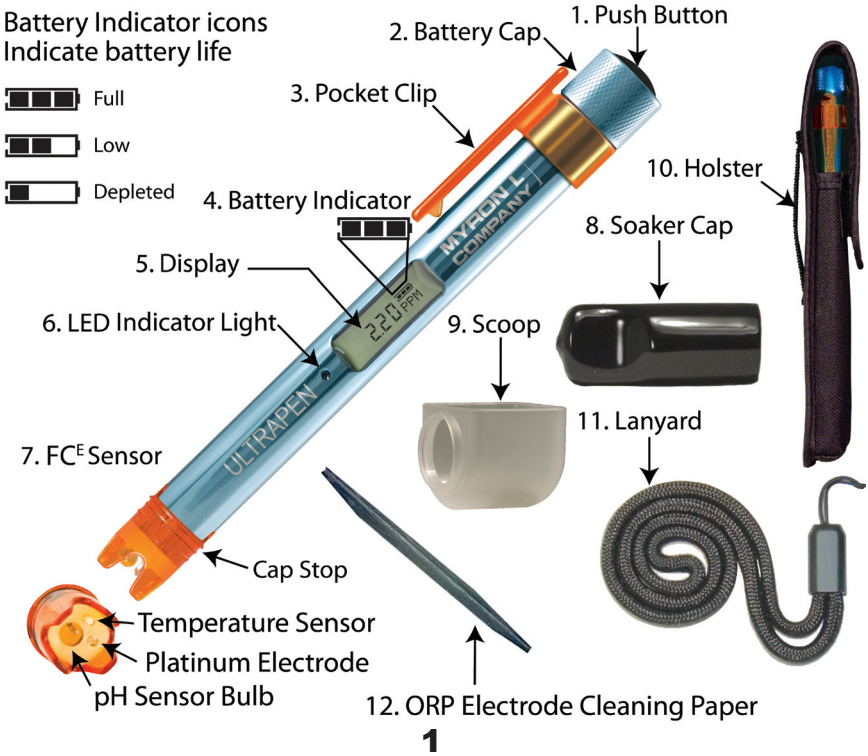
CAUTION: Do **NOT** push the soaker cap beyond the **Cap Stop** as sensor damage **WILL** occur.

NOTE: The formation of KCl crystals around the soaker cap is normal. These crystals do not affect the sensor life, performance, or accuracy provided they are rinsed off with water prior to a test.

9. **Scoop** — used to hold sample solution when dipping is not possible. To install, push the scoop onto the sensor while shifting side-to-side. To remove, pull the scoop off while shifting side-to-side. Verify the FC^E sensor remained fully inserted into the PT4. If not, reinstall per FC^E Sensor Replacement section on page 5. To use, hold the scoop directly under a vertical stream during measurement, avoiding bubbles.



10. **Holster** — run your belt through the strap in the back of the holster for hands-free portability.
11. **Lanyard** — attach through hole in top of pocket clip.
12. **ORP Electrode Cleaning Paper** — for deep cleaning the platinum electrode.



OPERATING INSTRUCTIONS

NOTE: Selecting "ESC" from any menu immediately powers the PT4 off without saving changes.

I. Temperature Unit Selection

The PT4 allows you to select the type of units used for displaying temperature: ˚C (Degrees Celsius) or ˚F (Degrees Fahrenheit).

To set the preference:

1. Push and release the push button to turn the PT4 on.
2. Push and hold the button. The display will alternate between "CAL", "FAC CAL", "ºCºF TEMP", "ModE SEL", "PAr SEL", "SOL ck", and "ESC".
3. Release the button while "ºCºF TEMP" is displayed. The display will alternate between "PUSHnHLD" and "ºCºF TEMP".
4. Push and hold the button. The display will alternate between "˚C", "˚F" and "ESC". Release the button when desired unit preference displays.
5. "SAVEd ºC" or "SAVEd ºF" will display; then the unit will power off.

II. FC^{E} Mode Selection

The PT4 allows you to select the FC^{E} measurement mode you prefer:

Hold Mode (default) — will display real-time readings until stable or 2 minutes, which ever comes first, then display final readings.

LIVE Mode — real-time readings are displayed continuously for up to 5 minutes, a push and release of the button will turn your PT4 off immediately.

To set the FC^{E} measurement mode preference:

1. Push and release the push button to turn the PT4 on.
2. Push and hold the button. The display will alternate between "CAL", "FAC CAL", "ºCºF TEMP", "ModE SEL", "PAr SEL", "SOL ck", and "ESC".
3. Release the button when "ModE SEL" is displayed. The display will alternate between "PUSHnHLD" and "ModE SEL".
4. Push and hold the push button. The display will alternate between "Hold", "LIVE" and "ESC".
5. Release the button when desired mode displays.
6. "SAVEd" will display, then the PT4 will power off.

III. FC^{E} Measurement

The following table explains what the LED Indicator Light signals indicate and gives the duration of each signal:

LED Signal	***Action***	***Duration***
Rapid Flashing	*Dip pen in solution and swirl.*	*6 sec*
Slow Flashing	*Measurement in process; continue to swirl.* ***In Hold mode*** *real-time readings are displayed until the LED is on solid.* ***In LIVE mode*** *real-time readings are displayed until the PT4 turns off..*	*20 -120 sec in* ***Hold mode*** *5 min in* ***LIVE mode***
Solid Light (Hold mode only)	*Measurement is complete. Values are displayed until the PT4 turns off.*	*6 sec*

CAUTION: To measure solution at the extremes of the specified temperature or FC^{E} range, allow the PT4 to equilibrate by submerging the sensor in the sample solution for 1 minute prior to taking a measurement.

NOTE: If you cannot dip the PT4 in the sample solution, pour the sample into a clean container. If you don't have a container or need to test a vertical stream of solution, use the scoop to hold sample solution.

1. Rinse the pen 3 times in a sample of the solution.
2. Push and release the push button.
3. While the LED flashes rapidly, dip the PT4 in FRESH sample solution so that the sensor is completely submerged. If you do not submerge the sensor in solution before the flashing slows, allow the PT4 to power off and retake the reading.
4. While the LED flashes slowly, swirl the PT4 around to remove any air bubbles, keeping the sensor submerged.
   a. **In Hold mode** when the LED turns on solid, remove the PT4 from solution. The display will alternate between the final FC^{E} and temperature readings. Note the readings for your records.
   b. **In LIVE mode** allow the PT4 to remain in solution while the LED flashes slowly. The display will alternate between live FC^{E} and temperature readings. Note the readings for your records. LIVE measurement will time out after 5 minutes OR push and release the push button to turn the PT4 off at any time during LIVE measurement.

IV. Calibration

The Myron L Company recommends calibrating twice a month, depending on usage.

However, you should check the calibration whenever measurements are not as expected. For greatest accuracy, you should perform a 3-point wet pH calibration, and wet ORP calibration with the ORP Standard Solution closest in value to the solution you will be testing.

NOTE: If the measurement is NOT within calibration limits for any reason, "Error" will display. Check to make sure you are using a proper Myron L Company pH Buffer or ORP Standard Solution. If the solution is correct, clean the sensor as described in Sensor Cleaning section on page 4. Restart calibration.

NOTE: Small bubbles trapped in the sensor may give a false calibration. After calibration is completed, measure the pH Buffer or ORP Standard Solutions again in solution check mode "SOL ck" (see pages 3 and 4) to verify correct calibration.

NOTE: If at any point during calibration, you do not submerge the sensor in solution before the flashing slows, allow the PT4 to power off and start over.

NOTE: You should always calibrate with pH 7 first.

A. Calibration Preparation

For maximum accuracy, fill 2 clean containers with each pH Buffer and/or ORP Standard Solution. Arrange them in such a way that you can clearly remember which is the rinse solution and which is the calibration standard/buffer. If you don't have enough standard/buffer, you can use 1 container of each standard/buffer for calibration and 1 container of clean water for all rinsing. Always rinse the FC^E sensor between standard/buffer solutions. Ensure the FC^E sensor is clean and free of debris.

B. pH Calibration using Myron L Company pH 7, 4, and 10 Buffer Solutions.

NOTE: You should always calibrate with pH 7 first.

1. Thoroughly rinse the PT4 by submerging the sensor in pH 7 Buffer rinse solution and swirling it around.
2. Push and release the push button to turn the PT4 on.
3. Push and hold the push button. The display will alternate between "CAL", "FAC CAL", "ºCºF TEMP", "ModE SEL", "PAr SEL", "SOL ck", and "ESC".
4. Release the button when "CAL" displays.
5. The display will alternate between "PUSHnHLD" and "CAL.
6. Push and hold the button, The display will alternate between "PH" and "ORP".
7. Release the button when "PH" is displayed.
8. The display will indicate "CAL" and the LED will flash rapidly.
9. While the LED flashes rapidly, dip the PT4 in pH 7 Buffer Calibration Solution so that the sensor is completely submerged.
10. While the LED flashes slowly, the pH calibration point will display along with "CAL". Swirl the PT4 around to remove bubbles, keeping the sensor submerged.
11. If the pH 7 calibration is successful, the display will indicate "SAVEd", then "PUSHCONT" will be displayed ("PUSHCONT" will NOT be displayed if only calibrated with pH 4 or 10).
12. Push and release to continue or let the unit time out to exit after a 1-point or 2-point calibration.
13. Repeat steps 9 through 12 with pH 4 and 10 Buffer Solutions. After the 3rd calibration point is successfully saved, the display will indicate "SAVEd" and power off.
14. Verify calibration by retesting the calibration solution in solution check mode "SOL ck", see section V below.

C. ORP Calibration using Myron L Company 80mV Quinhydrone, 260mV Quinhydrone, or 470mV MLC Light's ORP Standard Solution.

NOTE: The PT4 has automatic temperature compensation in ORP calibration mode (from 15ºC to 30ºC).

1. Follow pH calibration steps 1 through 6, using ORP Solutions.
2. Release the button when "ORP" is displayed.
3. The display will indicate "CAL" and the LED will flash rapidly.
4. While the LED flashes rapidly, dip the PT4 in ORP Standard Solution so that the sensor is completely submerged.
5. While the LED flashes slowly, the ORP calibration point will display along with "CAL". Swirl the PT4 around to remove any air bubbles, keeping the sensor submerged.
6. If the ORP calibration is successful, the display will indicate "CAL SAVEd", then time out.
7. Verify calibration by retesting the calibration solution in solution check mode.

V. SOLUTION CHECK

Solution check is provided to verify the proper calibration value was recorded when using Myron L Company pH Buffers and ORP Standard Solutions. To verify proper calibration, simply put the PT4 into solution check mode, select the mode to verify (pH or ORP), then dip the sensor into the pH Buffer or ORP Calibration Solution so that the sensor is completely submerged and swirl around to release any air bubbles, then verify displayed value matches the value on the bottle. ***Solution Check continued on page 4 ...***

... Solution Check continued from page 3

To perform Solution Check:

1. Push and release the push button to turn the PT4 on.
2. Push and hold the push button. The display will alternate between “CAL”, “FAC CAL”, “ºCºF TEMP”, “ModE SEL”, “PAr SEL”, “SOL ck”, and “ESC”.
3. Release the button when “SOL ck” displays.
4. The display will alternate between “PUSHnHLD” and “SOL ck”.
5. Push and hold the button, The display will alternate between “PH” and “ORP”.
6. Release the button when desired mode (pH or ORP) is displayed.
7. While the LED flashes rapidly, dip the PT4 in FRESH buffer/calibration solution so that the sensor is completely submerged and swirl the PT4 around to remove any air bubbles.
8. Verify value displayed is correct.

NOTE: To verify ORP calibration while in solution check mode, you must manually correct for temperature variations from 25ºC. See instructions that come with the ORP Standard Solutions for temperature chart.

VI. Factory Calibration

When pH Buffers are not available, the PT4 can be returned to factory default calibration using the FAC CAL function. This will erase any stored wet calibration.

NOTE: Default factory calibration resets the electronics only and does NOT take the condition of the sensor into consideration.

To return your PT4 to factory calibration:

1. Push and release the push button.
2. Push and hold the button. The display will alternate between “CAL”, “FAC CAL”, “ºCºF TEMP”, “ModE SEL”, “PAr SEL”, “SOL ck”, and “ESC”.
3. Release the button when “FAC CAL” displays. The display will alternate between “PUSHnHLD” and “FAC CAL”.
4. Push and hold the push button. “SAVEd FAC” displays indicating the pen has been reset to its factory calibration.

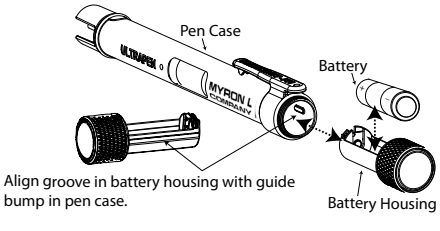
MAINTENANCE

I. Routine Maintenance

1. **ALWAYS** rinse the FC^E sensor with clean water after each use.
2. **ALWAYS** replace the soaker cap half filled with Sensor Storage Solution to prevent the sensor from drying out after each use.
3. Do not drop, throw, or otherwise strike the PT4. This voids the warranty.
4. Do not store the PT4 in a location where the ambient temperatures exceed its specified Operating/Storage Temperature limits.

II. Battery Replacement

The PT4 display has a battery indicator that depicts the life remaining in the battery. When the indicator icon is at 3 bars, the battery is full. When the indicator icon falls to 1 bar, replace the battery with an N type battery.



1. In a clean/dry environment, unscrew the pen cap in a counter-clockwise motion.
2. Slide the cap and battery housing out of the PT4.
3. Remove the depleted battery out of 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 the PT4 case and slide the battery housing back in.
6. Screw the PT4 cap back on in a clockwise direction. Do not over tighten.

III. Sensor Cleaning (additional sensor cleaning methods at www.myronl.com)

Cleaning the sensor: The Myron L Company recommends cleaning your sensor every two weeks, however this depends on application and frequency of use. Indications of a dirty sensor are slower and/or erroneous readings.

There are three critical components in your PT4 sensor; a very sensitive glass pH sensor bulb, a platinum ORP electrode, and a temperature sensor encapsulated in a small glass noid. Use extreme caution when cleaning your PT4 sensor.

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 body and platinum electrode, rinse thoroughly with clean water, then recondition the sensor.
- Cleaning the pH Sensor Bulb: If the sensor becomes dirty, clean the sensor surface with an isopropyl soaked cotton swab. Then rinse thoroughly with clean water.
- Deep cleaning the platinum ORP electrode: Using the ORP electrode cleaning paper and water, gently clean the platinum electrode, rinse thoroughly then recondition the sensor.

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).

IV. FC^E Sensor Replacement

CAUTION: Only Remove/Replace the FC^E sensor in a CLEAN and DRY environment!

To remove the FC^E sensor: Remove the soaker cap; make sure the PT4 (including the FC^E sensor) is clean and dry.

Loosen the battery tray (to allow pressure equalization).

Then firmly grasp the FC^E sensor body and slowly pull the FC^E sensor out.

To install a new FC^E sensor: Line up the alignment tabs on the FC^E sensor with the alignment slots on the PT4 unit. Gently push the FC^E sensor into position, then close the battery cap.

SPECIFICATIONS

	FC^E	Temperature
Range:	0 – 10.0 ppm	0 - 71°C / 32 - 160°F
Accuracy:	<5.00ppm ±0.3 ppm ≥5.00ppm ±0.5 ppm	± 0.1ºC / ± 0.1ºF
Resolution:	0.01 ppm	0.1ºC / 0.1ºF
Time to Reading Stabilization: 10 - 45 seconds		
Power Consumption: Active Mode 37mA, Sleep Mode 2µA		
Temperature Compensation: Automatic In Calibration Mode From 15ºC to 30ºC		
Physical Dimensions: 17.15cm L x 1.59cm D / 6.75in. L x 0.625in. D		
Weight: 50.4g / 1.78oz. (without soaker cap and lanyard)		
Case Material: Anodized Aircraft Aluminum with Protective Coating		
Battery Type: N type, Alkaline, 1.5V		
Calibration Standard Solutions: pH4, pH7, pH10, ORP80, ORP260, ORP470		
Operating/Storage Temperature: 0 - 55ºC / 32 - 131ºF		
Enclosure Ratings: IP67 and NEMA6		
EN61236-1: 2006 – Annex A: 2008: Electrostatic discharge to the PT4 may cause it to spontaneously turn on. If this occurs, the PT4 will turn off.		

QUICK REFERENCE INSTRUCTIONS

1. Push and release the push button to turn the PT4 on.
2. While the LED flashes rapidly, dip the PT4 in sample solution so that the sensor is completely submerged.
3. While LED flashes slowly, swirl PT4 around to remove bubbles, keeping the sensor submerged. Avoid contact with sides/bottom of container, if applicable.

If in LIVE mode, while the LED is flashing slowly, the display will alternate between the live FC^E and temperature readings. Note readings for your records.

If in Hold mode, when the LED is flashing slowly, the display will alternate between the live FC^E and temperature readings, when the LED turns on solid, remove the PT4 from the solution. The display will alternate between the captured FC^E and temperature readings. Note readings for your records.

ACCESSORIES

STANDARD SOLUTIONS FOR CALIBRATION:

The ULTRAPEN™ PT4 requires pH 4, pH 7, and pH 10 pH Buffer Solutions and 80mV Quinhydrone, 260mV Quinhydrone, or 470mV MLC Light's ORP Standard Solutions for wet calibration, and Sensor Storage Solution for proper storage.

Order Model Numbers: PH4Q, PH7Q, PH10Q, ORP802OZ, ORP2602OZ, ORP4701OZ, ORPCALKIT, SSQ.

RPT4 Replacement FC^E Sensor (with instructions)

OECP-25/-100 ORP Electrode Cleaning Paper, QTY 25 or QTY 100

For additional calibration kits available, contact the Myron L Company.

MYRON L WARRANTY

The PT4, excluding the FC^E sensor, has a one (1) year limited warranty.

The FC^E sensor has a six (6) month limited warranty.

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