

# Chlorine *exact*® **Z**

ADVANCED PHOTOMETER SYSTEM

**DIGITAL ACCURACY FOR RELIABLE WATER CARE**



**DIGITAL  
WATER TESTING**  
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## WELCOME TO YOUR NEW CHLORINE EXACT® EZ PHOTOMETER.

Thank you for your Chlorine eXact® EZ purchase! This guide will quickly walk you through the technical details of your new photometer. After initial set-up, test procedures, and tips, you will be on your way to digital water testing! Each test will require the use of one or more of the testing methods outlined in this manual.

## YOUR CHLORINE EXACT® EZ COMES WITH:

- Cleaning Brush
- Quick Start Guide (this booklet)
- 30 foil packet strips (6 of each): Free Chlorine (DPD-1), Combined Chlorine (DPD-3), Total Chlorine (DPD-4), Total Chlorine High, and pH

## WHAT YOU WILL NEED TO GET STARTED:

- Four (4) AAA batteries
- #4 Phillips head screwdriver

*Note:* This system has been calibrated for use with only our eXact® Micro reagents.

**YOUR NEW CHLORINE EXACT EZ PHOTOMETER IS IDEAL FOR TESTING AND MAINTAINING YOUR DRINKING WATER AND FOOD PROCESS WATER.**

**SAMPLE CELL - 4 ML**

Built-in plastic 4mL cell for collecting your water sample

**LIGHT SOURCE**

Uses 525nm wavelength and 11mm path-length for testing

**LCD DISPLAY**

**LOW BATTERY**  
**RESULT UNITS**

**LCD DISPLAY**

Displays results and test name

**READ****READ BUTTON**

Starts test timer

**MENU****MENU BUTTON**

Cycles through available tests

**ZERO/ON****ZERO/ON BUTTON**

Turns the meter on and creates a baseline for your water testing

**BASE**

Install/replace batteries here (IP67 rated waterproof)

**CELL COVER**

Covers the cell for mixing and bright light situations

**waterproof IP67**

Protected against the effects of immersion in water to depth between 15cm and 1m

Part no. **486204**

**INSTALL "AAA" BATTERIES (NOT INCLUDED)**

1. Use a #4 Phillips head screwdriver to remove the screw from the base of your Chlorine eXact® EZ.
2. Remove the base.
3. Install Four (4) new AAA batteries as illustrated inside your photometer's battery compartment. We recommend using high quality batteries.
4. Replace the base firmly with pressure while tightening the screw. The meter will turn on automatically.
5. Tighten the screw with #4 Phillips head screwdriver. Be sure not to over tighten.

**SCREW**

Unscrew to remove base

## FILL, DIP, READ FREE CHLORINE

1

### POWER ON PHOTOMETER

Press the **ZERO/ON** button to power on the Chlorine eXact® EZ.

2

### FILL CELL

Rinse the cell 3 times with the water sample to be tested and **FILL** to the top to begin test.



#### TIP

Use the included cleaning brush to clean the cell after each test to achieve the most accurate result.

3

### SELECT TEST

Press and re-press the **MENU** button until the display shows CL1.



4

### ZERO METER

Press **ZERO/ON** and the LCD Display reads 0.00PPM, indicating the meter is ready for testing.



#### TIP

In bright light situations use cell cover for zeroing and reading.

**5**

## **REMOVE STRIP**

Remove one eXact® Strip Micro CL (DPD-1) Free Chlorine and set in a dry, convenient place. Replace cap on bottle



**6**

## **DIP STRIP AND PRESS READ**

Press **READ** to initiate a 20 second countdown and simultaneously **DIP** the eXact® Strip by submerging all pads in the sample then use a gentle, constant, back and forth motion (2 strokes per second) until the timer displays '1'. Remove and discard the strip.



**7**

## **READ RESULTS**

**READ** result displayed as Free Chlorine. This result is automatically stored in the CL1 menu. After testing is complete, rinse the sample cell immediately.



### **TIP**

If result is 6.0 or greater, repeat steps 5-7 above using same sample and a fresh strip.

**Important!** Do not empty the CELL if you are also testing for Combined Chlorine. You will need the sample.

## FILL, DIP, READ COMBINED CHLORINE

6

This procedure is a continuation from Free Chlorine Test Method on previous pages. **DO NOT DISCARD SAMPLE FROM FREE CHLORINE TEST.**

8

### ZERO METER

With the Free Chlorine sample still in the CELL, press **ZERO/ON** and the LCD Display reads 0.00PPM, indicating the meter is ready for testing.



#### TIP

In bright light situations use cell cover for zeroing and reading.

9

### REMOVE STRIP

Remove one eXact® Strip Micro CL (DPD-3) Combined Chlorine and set in a dry, convenient place. Replace cap on bottle.



10

### DIP STRIP AND PRESS READ

Press **READ** to initiate a 20 second countdown and simultaneously **DIP** the eXact® Strip by submerging all pads in the sample then use a gentle, constant, back and forth motion (2 strokes per second) until the timer displays '1'. Remove and discard the strip.



# 11

## READ RESULTS

**READ** result displayed as Combined Chlorine. This result is automatically stored in the CL1 menu. After testing is complete, rinse the sample cell immediately.



### eXact® Strip Micro CL (DPD-1, DPD-3, DPD-4) Interferences

Interfering Substance	Interfering Levels & Treatments
Acidity	If sample has acidity above 150mg/L CaCO <sub>3</sub> test may not develop full color. Neutralize to pH 6.0 to 7.0 with 0.5N Sodium hydroxide.
Alkalinity	If sample has alkalinity above 200mg/L CaCO <sub>3</sub> test may not develop full color. Neutralize to pH 6.0 to 7.0 with 0.5N Sulfuric acid.
Bromine & Bromamines, Br <sub>2</sub>	Color similar to free chlorine reaction at all levels.
Chlorine Dioxide, ClO <sub>2</sub>	Color similar to free chlorine reaction at all levels.
Copper, Cu <sup>+2</sup>	Color development is reduced above 10 ppm (mg/L).
Iodine, I <sub>2</sub>	Color similar to free chlorine reaction at all levels.
Manganese, Oxidized (Mn <sup>+4</sup> , Mn <sup>+6</sup> ) or Chromium, Oxidized (Cr <sup>+6</sup> )	See AWWA procedure 4500-CL F, 1(d) for removal of interferences.
Monochloramines (NH <sub>2</sub> Cl) (applies to DPD-1 only)	Monochloramine interferences are known to occur in free chlorine DPD methods. This interference is dependent on temperature and monochloramine concentration.
Ozone, O <sub>3</sub>	Color similar to free chlorine reaction at all levels.
Peroxides	Interference is possible.
pH	Typical pH samples of potable water with a pH of 6.0 to 9.0 are OK. If outside this range adjust to pH 6.0 to 7.0 using acid (0.5N Sulfuric acid) or base (0.5N Sodium hydroxide).

## FILL, DIP, READ TOTAL CHLORINE

1

### POWER ON PHOTOMETER

Press the **ZERO/ON** button to power on the Chlorine eXact® EZ.

2

### FILL CELL

Rinse the cell 3 times with the water sample to be tested and **FILL** to the top to begin test.



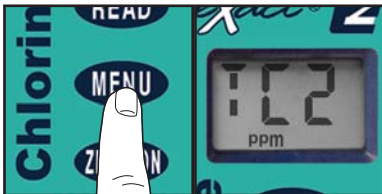
#### TIP

Use the included cleaning brush to clean the cell after each test to achieve the most accurate result.

3

### SELECT TEST

Press and re-press the **MENU** button until the display shows TC2.



4

### ZERO METER

Press **ZERO/ON** and the LCD Display reads 0.00PPM, indicating the meter is ready for testing.



#### TIP

In bright light situations use cell cover for zeroing and reading.



**5**

**REMOVE STRIP**

Remove one eXact® Strip Micro CL (DPD-4) Total Chlorine and set in a dry, convenient place. Replace cap on bottle.



**6**

**DIP STRIP AND PRESS READ**

Press **READ** to initiate a 20 second countdown and simultaneously **DIP** the eXact® Strip by submerging all pads in the sample then use a gentle, constant, back and forth motion (2 strokes per second) until the timer displays '1'. Remove and discard the strip. The display will automatically start to count up for 120 seconds.

\*NOTE: Standard Method (4500-Cl G, procedure for total chlorine) requires the reading to be made after 2 minutes from the time the KI is added. For compliance testing, you must time the two minutes and then make your measurement. NOTE: From testing in our lab, water samples above 70°F (20°C), generally, reach a stabilized reading quicker than 2 minutes.



**7**

**READ RESULTS**

**READ** result displayed as Total Chlorine. This result is automatically stored in the TC2 menu. After testing is complete, rinse the sample cell immediately and clean with brush.



**TIP**

If result is 6.0 or greater, repeat steps 5-7 above using same sample and a fresh strip.

## FILL, DIP, READ

### TOTAL CHLORINE HIGH

10

1

#### POWER ON PHOTOMETER

Press the **ZERO/ON** button to power on the Chlorine eXact® EZ.

2

#### FILL CELL

Rinse the cell 3 times with the water sample to be tested and **FILL** to the top to begin test.



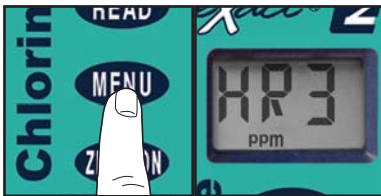
#### TIP

Use the included cleaning brush to clean the cell after each test to achieve the most accurate result.

3

#### SELECT TEST

Press and re-press the **MENU** button until the display shows HR3.



4

#### ZERO METER

Press **ZERO/ON** and the LCD Display reads 0.00PPM, indicating the meter is ready for testing.



#### TIP

In bright light situations use cell cover for zeroing and reading.

5

## REMOVE STRIP

Remove one eXact® Strip Micro CLH High Range Chlorine and set in a dry, convenient place. Replace cap on bottle.



6

## DIP STRIP AND PRESS READ

Press **READ** to initiate a 20 second countdown and simultaneously **DIP** the eXact® Strip by submerging all pads in the sample then use a gentle, constant, back and forth motion (2 strokes per second) until the timer displays '1'. Remove and discard the strip. The display will automatically start to count up for 120 seconds.



7

## READ RESULTS

**READ** result displayed as Total Chlorine. This result is automatically stored in the HR3 menu. After testing is complete, rinse the sample cell immediately.



## FILL, DIP, READ PH

12

1

### POWER ON PHOTOMETER

Press the **ZERO/ON** button to power on the Chlorine eXact® EZ.

2

### FILL CELL

Rinse the cell 3 times with the water sample to be tested and **FILL** to the top to begin test.



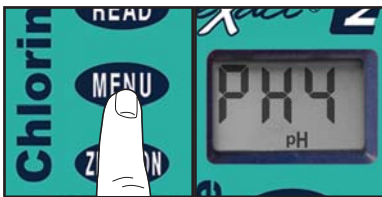
#### TIP

Use the included cleaning brush to clean the cell after each test to achieve the most accurate result.

3

### SELECT TEST

Press and re-press the **MENU** button until the display shows PH4.



4

### ZERO METER

Press **ZERO/ON** and the LCD Display reads 0.0<sub>pH</sub>, indicating the meter is ready for testing.



#### TIP

In bright light situations use cell cover for zeroing and reading.

5

## REMOVE STRIP

Remove one eXact® Strip Micro PH and set in a dry, convenient place. Replace cap on bottle.



6

## DIP STRIP AND PRESS READ

Press **READ** to initiate a 20 second countdown and simultaneously **DIP** the eXact® Strip by submerging all pads in the sample then use a gentle, constant, back and forth motion (2 strokes per second) until the timer displays '1'. Remove and discard the strip.



7

## READ RESULTS

**READ** result displayed as pH. This result is automatically stored in the PH4 menu. After testing is complete, rinse the sample cell immediately.



The Chlorine eXact® EZ photometer has a 5 minute auto-shutoff timer.

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Each test menu can store 20 results. To retrieve the stored results, go to the desired test using the MENU key. When the desired test is displayed, press and hold down the MENU key. Continue holding down the MENU key to scroll the stored results for that test, starting with the most recent result. The meter will display, from memory, the last 20 readings in sequence beginning with -20, which is the latest result, followed by -19, which is the 2nd latest result, etc; and finally -01, which is the oldest result retained. Only the last 20 readings are stored in each menu. This meter is able to store 100 results in memory (20 in each menu).

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Before testing, rinse the meter sample cell with the sample water 3 times.

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Always fill the cell to capacity (4mL); be careful not to splash liquid over the side.

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Test immediately after filling the cell with the water sample.

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To obtain optimal accuracy when testing outdoors (sunlight), use the cell cover when zeroing and reading the sample.

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Due to the strip slitting process, you may find one or two strips that are noticeably smaller or larger in width than the normal strips in the bottle. These should be discarded. Using these strips may give unreliable results.

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Meter is not compatible for use with powder pillows, tablets, or liquids from other manufacturers.

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Dip strip for entire countdown.

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Each eXact® Strip Micro is valid for ONLY one test. Discard strip after use.

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Dry the outside of the meter before storage.

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Remove batteries before storing for prolonged periods.

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Store the meter and test materials out of direct sunlight and away from chemical storage areas.

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Minimize exposure of meter and test reagents to heat above 90°F (32°C).

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When installing batteries, verify the O-ring is still attached to the screw before tightening.

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Cleaning the cell with water and brush after each test is recommended for best accuracy and prior to storage of unit.

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Listed below are possible situations that may arise while testing. Please contact one of our knowledgeable customer service representatives if you require further assistance.

Subject	Cause	Solution
Dim screen or no response from meter	Low battery	Replace batteries
"LO" on LCD while zeroing	Low battery	Replace batteries
	Dirty cell	Clean cell
	Cloudy sample	Dilute sample or use filter
	Bad LED	Contact ITS
"HI" on LCD while reading	Result above detection level	Re-run test to verify result
"LO" on LCD while reading	Result below detection level	Re-run test to verify result
"LO" flashes on LCD, then "Err"	Improper test procedure for Combined Chlorine	Re-read test procedure and follow directions carefully
"HI" flashes on LCD, then "Err"	Combined Chlorine result above detection limit	Re-run test to verify result
		Dilute and re-run test

## CHLORINE EXACT® EZ ACCURACY

All tests have been calibrated using certified reference standards and analytical spectrophotometric methods. The Chlorine eXact® EZ has been factory calibrated and will stay valid because of its exceptional quality. We are so confident in the Chlorine eXact® EZ, we offer an industry leading 2-year warranty.

We built the Chlorine eXact® EZ to be easy, accurate and environmentally friendly. We have achieved this by utilizing our patented eXact® Strip Micro Technology, which uses 60% less water and chemistry than alternative methods. Instead of using a 10mL water sample, eXact® Strip Micro uses a 4mL water sample. The accuracy of the meter is maintained by designing the sample cell with an 11mm path-length.

## TECHNICAL SUPPORT

Please visit [sensafe.com/photometers/chlorine-exact-ez/](http://sensafe.com/photometers/chlorine-exact-ez/) for the latest technical information and how-to-videos. For additional technical support, call (803) 329-9712.

### Industrial Test Systems, Inc.

1875 Langston Street, Rock Hill, SC 29730  
800-861-9712 or 803-329-9712  
its@sensafe.com | sensafe.com

### ITS Europe, Ltd.

The UK Centre for Homeland Security  
Building 7, Chilmark, Salisbury,  
Wiltshire SP3 5DU UK +44 1722 717911  
itseurope@sensafe.com | itseurope.co.uk



## BUILT IN SAMPLE CELL

The built-in sample cell is made of transparent plastic; the sturdy cell design will last for over 20,000 readings. Our studies have shown that scratches on the cell will not compromise the accuracy of your results because of the cell's fixed position.

## WARRANTY (2 YEARS)

Registration of your eXact® photometer must be received within 30 days from date of purchase to activate the warranty. Registration is available over the phone (+1-803-329-9712 Ext. 0) or online at [sensafe.com/micro/warranty/](https://sensafe.com/micro/warranty/) (Personal data is kept confidential). The eXact® photometer is warranted to be free from defects in materials and workmanship for a period of two (2) years from the date of purchase by the customer. ITS will repair or replace, at its discretion, product which is deemed to be faulty due to manufacturing defect. Warranty does not cover product damage caused by abuse (such as crushing a tablet in the cell), battery corrosion damage, or improper use. If the meter is faulty or otherwise defective contact ITS by phone (+1-803-329-9712 Ext. 0) or email ([its@sensafe.com](mailto:its@sensafe.com)) to describe the problem and obtain a return authorization form before returning the photometer to ITS. Damage caused by improper packing of the photometer for return shipment to ITS will not be covered by the warranty. Customer is responsible for shipping charges to ITS. ITS pays postage when photometer is returned to customer. A maximum processing fee of \$75 will be charged for repair or replacement of non-registered photometers and damages not covered by this warranty. The repair or replacement of the photometer will not extend or renew the period of guarantee. This warranty does not affect your statutory rights. The warranty is not transferable.

## METHOD VERIFICATION **ReadySnap®**

Ready Snap® 3 is a calibration verification solution with predetermined color to verify the accuracy of your Chlorine eXact® EZ photometer.

The easy 3 step procedure (snap, fill, and test) allows for quick verification of test parameters. Each box contains 10 ampoules of 10mL solution with no dilution necessary.



<b>CHLORINE EXACT® EZ ASSIGNED VALUE FOR READY SNAP® 3</b>		
<b>READY SNAP® 3</b>	<b>FREE CHLORINE DESIRED VALUE</b>	<b>FREE CHLORINE ACCEPTABLE RANGE</b>
Red dye # 505	1.5 ppm	1.46 – 1.59 ppm
Red dye # 22515	0.94 ppm	0.87 – 1.01 ppm

*Note: Values indicated are specific to Chlorine eXact® EZ readings and current concentrations as found at time of manufacture.*



## COMPLIANCE TESTING

This DPD test system for Chlorine and Chlorine Dioxide are accepted for reporting by most health departments because the tests are USEPA (DIN Standard 38 408 G4/G5, ISO 7393/2) accepted for testing requirements for Free Chlorine, Total Chlorine, and Chlorine Dioxide.



The compliance requirement is a photometer wavelength to measure between 490 and 530nm. The Chlorine eXact® EZ smart photometer uses a 525nm wavelength and 11 mm path-length. The eXact® Strip Micro CL/Cd (DPD-1) use the same reagents and proportions, and the resulting solution pH is maintained between 6.2 and 6.5 as specified by AWWA method 4500-Cl G/ClO<sub>2</sub>-D. The USEPA does not “approve” commercial DPD delivery systems. The eXact® Strip Micro CL (DPD-1) for **Free Chlorine**, and the eXact® Strip Micro CL (DPD-3) for **Combined Chlorine**, the eXact® Strip Micro CL (DPD-4) for **Total Chlorine**, and the eXact® Strip Micro Cd (DPD-1) for **Chlorine Dioxide** meet your reportable testing requirements because the eXact® Strip Micro strips deliver the same chemicals in identical proportions. Consult with your local health department for official regulations.

COMPONENT (FREE CHLORINE)	AWWA 4500-CL G	CHLORINE EXACT® EZ
Anhydrous DPD sulfate	1.5%	1.5%
Anhydrous Na <sub>2</sub> HPO <sub>4</sub>	33.4%	33.4%
Anhydrous KH <sub>2</sub> PO <sub>4</sub> Na <sub>2</sub>	64.0%	64.0%
EDTA	1.1%	1.1%

### TIP

Store all your necessary reagents together with your Chlorine eXact® EZ in our convenient carrying case!

## CARRYING CASE FOR CHLORINE EXACT® EZ

Made of sturdy material lined with foam, the carrying case offers storage for a Chlorine eXact® EZ photometer and eXact® Micro reagents.



ITEM	INCLUDES	PART NO.
Standard Carrying case	Blue carrying case with foam inserts (holds up to 7 bottles)	486111
XL Carrying case	Black carrying case with foam inserts (holds up to 14 bottles)	486001





# Chlorine *eXact*® **EZ**

**ADVANCED PHOTOMETER SYSTEM**

## **EXACT® MICRO TESTS & REAGENTS**

PARAMETER / TEST	PART #	RANGE ppm	% BEST ACCURACY	# OF TESTS
Chlorine, Free (DPD-1) <sup>1</sup>	486637	0.01 – 12.0	5	100
Chlorine, Combined (DPD-3) <sup>2</sup>	486638	0.01 – 12.0	5	100
Chlorine, Total (DPD-4) <sup>1</sup>	486670	0.01 – 12.0	5	100
Chlorine, Total High	486672	1 – 260	5	50
pH-II	486639-II	6.4 – 8.4 pH	0.2 pH	100

<sup>1</sup> Value provided represents best possible accuracy under laboratory conditions, but may vary throughout the detection range. For a complete list of accuracies throughout all ranges, please visit [sensesafe.com/photometers/chlorine-exact-ez/](http://sensesafe.com/photometers/chlorine-exact-ez/).

<sup>1</sup> Requires the use of 2 strips if reading is above 6 ppm.

<sup>2</sup> Combined Chlorine DPD-3 Test requires Free Chlorine DPD-1 (486637) to be run first.

For resellers and distributors - products sold in case quantities (12 units per case).

## **PATENT INFORMATION**

US Patent #7,333,194; Euro Pat No. 1 725 864 DE FR UK; South Africa Pat No 2007/0628 by Industrial Test Systems, Inc., 1875 Langston Street, Rock Hill, SC USA.

EXACT® is a registered trademark of Industrial Test Systems, Inc. Rock Hill, SC USA.

Visit us online:

[sensesafe.com/photometers/chlorine-exact-ez/](http://sensesafe.com/photometers/chlorine-exact-ez/)

for up-to-date product information.



## **MANUFACTURED BY**

Industrial Test Systems, Inc.  
1875 Langston Street, Rock Hill, SC 29730  
1-800-861-9712—Inside the U.S.A.  
1-803-329-9712—Outside the U.S.A.  
Fax: 1-803-329-9743  
Email: [ITS@SENSESAFE.COM](mailto:ITS@SENSESAFE.COM)  
[WWW.SENSESAFE.COM](http://WWW.SENSESAFE.COM)

ITS EUROPE, LTD  
The UK Centre for Homeland Security  
Building 7, Chilmark  
Salisbury, Wiltshire, SP3 5DU, UK  
Phone: +44 (0)1722 717911  
Fax: +44 (0) 1722 717941  
Email: [ITSEUROPE@SENSESAFE.COM](mailto:ITSEUROPE@SENSESAFE.COM)  
[WWW.ITSEUROPE.CO.UK](http://WWW.ITSEUROPE.CO.UK)



**Industrial Test Systems, Inc.**

Innovators of Water Quality Testing