Elite CTS Tester Operating Instructions

68X001308 Rev.0   June, 2017

This instruction manual is applicable for Elite CTS Tester.

Replacing the Batteries

The Elite CTS tester uses four AAA 1.5 V batteries.

1. To remove the battery cover, See Figure 1. Clear the front catch and then the back catch, before sliding the cover off.

2. To remove the battery plate, push the center tab towards the front of the tester as show in Figure 2. Once unlocked, remove the plate to access the batteries.

3. Invert the tester upside down to remove the batteries. Each side uses two AAA batteries. Orient each battery with positive terminal facing downward.

4. To lock the battery plate, align the small taps into the guide ribs on the housing and then press down. See Figure 4.
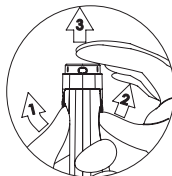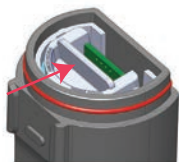

Figure 1: Removing battery cover
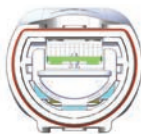

Figure 2: Push to unlock

Figure 3: Align tabs

Figure 4: Push down to unlock

Figure 5: Battery plate unlock position

Figure 6: Battery plate lock position

Getting Started

The Elite CTS tester has been factory calibrated and usually works well out of the box. However, after extended periods of non-use, it is best to remove the sensor cap and soak the sensor in warm tap water for 10 minutes or so. Prior to taking the measurements, periodic callibration with certified standards is recommended for best accuracy.

Measurement Parameter Setting

1. Press ⏻ to power on the tester.

2. Press ☰ to enter setup window. Press ✓ to select Measure. The display shows Cond, TDS and Salinity.

3. Scroll down by pressing ☰ to toggle between Cond, TDS and Salinity. Press ✓ to select Cond.

4. The display shows the selected measure with a ✔.
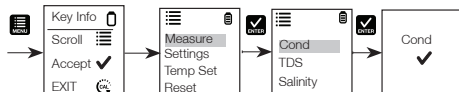
TDS Factor Setting

1. Press 🔲 to enter setup window. Scroll down by pressing 🔲 to select Settings.

2. Press ✅ to select settings. The display shows TDS factor and Backlight.
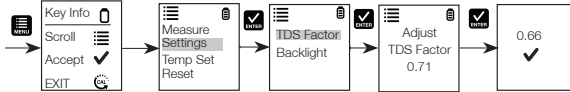
3. Press ✅ to select the default TDS factory setting or 🔲 to adjust the setting.

4. Press ✅ to confirm the selection of the setting. The display shows the set TDS factor with a ✔.


Backlight Settings

1. Press 🔲 to enter setup window. Scroll down by pressing 🔲 to select Settings.

2. Press ✅ to select Settings. The display shows TDS Factor and Backlight.

3. Scroll down by pressing 🔲 to toggle between TDS Factor and Backlight. Press ✅ to select Backlight.

4. The display shows ON and OFF. Scroll down by pressing 🔲 to toggle between ON and OFF. Backlight ON increases readability in low light conditions.

5. Press ✅ to select the desired backlight option. The display shows the selected backlight option with a ✔.
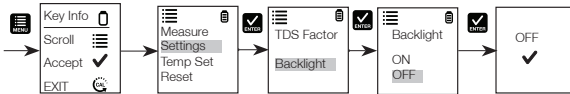
Temperature Settings

1. Press 🔲 to enter setup window. Scroll down by pressing 🔲 to select Temp Set. Press ✅ to select Temp set. The display shows Set °C/°F, Temp Cal and Temp Coeff.

2. Press ✅ to select Set °C/°F. Scroll down by pressing 🔲 to toggle between °C and °F.

3. Press ✅ to select tempareture unit. The display shows the selected temperature setting with a ✔.
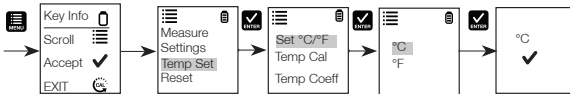
Temperature Calibration

1. Press 🔲 to enter setup window. Scroll down by pressing 🔲 to select Temp Set.

2. Press ✅ to select Temp Set. The display shows Set °C/°F, Temp Cal and Temp Coeff.

3. Scroll down by pressing 🔲 to toggle between Set °C/°F, Temp Cal and Temp Coeff. Press ✅ to select Temp Cal.

4. The lower display shows the current measured temperature reading based on the last set offset and the upper display shows the current measured temperature reading based on factory default calibration.

5. Dip the tester into a solution of known temperature and allow time for the in built temperature sensor to stabilize.

6. Press ☰ to adjust the temperature value or press the ✓ to confirm the calibrated value as the new temperature value of the solution.

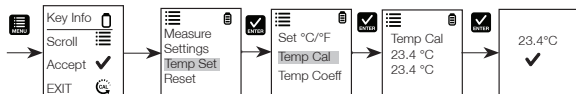**Note:** To exit this program without confirming the calibration, press ☺.

Temp Coefficient

1. Press ☰ to enter setup window. Scroll down by pressing ☰ to select Temp Set.

2. Press ✓ to select Temp Set. The display shows Set °C/°F, Temp Cal and Temp Coeff.

3. Scroll down by pressing ☰ to toggle between Set °C/°F, Temp Cal and Temp Coeff.

4. Press ✓ to select Temp Coeff or ☰ to adjust the Temp Coeff.

5. Press ✓ to confirm the Temp Coeff value. the new value is automatically confirmed with a ✓ .
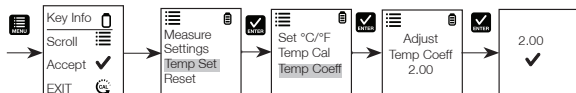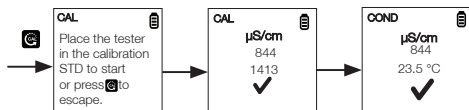

Calibration for Conductivity, TDS, or Salinity

For best results, periodic calibration with an accurate standard is recommended prior to measurement. Use the calibration standard value that is close to your intended sample value.The tester will retain one calibration value in each mode (conductivity, TDS, salinity) when the instrument is powered off. The conductivity value can be calibrated automatically or manually, while the TDS & salinity values require manual calibration. The tester will begin in the measurement mode that was used when it was powered off. See "Elite CTS Measurement Parameter Setting" to change the desired parameter.

Automatic Calibration for Conductivity

1. Remove the cap and press the ⏻ to power on.

2. Dip the sensor in at least 30 mm of calibration standard.

3. Stir gently and press ☺ to begin the calibration.

4. The display will show CAL followed by the default value. CAL is indicated on the display during calibration mode.

5. If the reading is within the calibration range of the automatically recognized standards; 80 (84 µS/cm), 1410 (1413 µS/cm), or 12.90 (12.88 mS/cm), the ✓ icon is displayed when the automatic calibration standard value has been detected.

6. Press ✓ to accept the auto conductivity standard and finish the calibration.

7. Display returns to Measurement window.

Manual Calibration

When the conductivity reading is outside calibration range of the automatic conductivity standards or when TDS or salinity is used, the tester will require manual adjustment.

1. Repeat steps 1 to 4 from "Automatic Calibration for Conductivity".

2. Press ▤ to manually adjust the value to the desired reading.

Note: The adjustment will decrease only, however the adjustment will eventually cycle to the highest available value after decreasing by 40% of the initial value.

3. Press ✓ to accept and finish the calibration when the desired value is selected.

4. To abort calibration, press ⌘ to escape.

5. Once the calibration is finished and user has accepted the changes, measurement window will now show the calibrated reading.

Note: The auto conductivity standards are 84 µS/cm, 1413 µS/cm & 12.88 mS/cm.
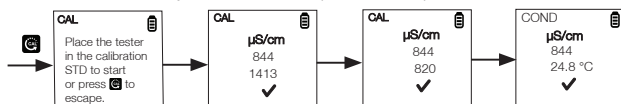
CTS Measurement

1. Press ⏻ to power the tester on if needed.

2. Dip the electrode about 2 cm to 3 cm into the test solution. Stir and let the reading stabilize. The timer icon will blink during this time. Once the reading is stabilized, the timer stops blinking and ✓ will appear to indicate the stability of the reading.

> **CAUTION:** Testing dry samples is not accurate and can lead to sensor damage or breakage. Soils must be wet and free of particulates that may scratch the glass sensor. Excessive force into dry samples can cause glass breakage.

3. Note the CTS value or press ✓ to freeze the reading. To release the reading, press ✓ again.

4. Press ⏻ to turn off tester. If key is not pressed for 8.5 minutes, the tester will automatically shut off to conserve batteries.

User Reset

Reset the CTS calibration to the user's default settings by using the user reset function. Temperature user calibration is not affected by the user reset function.

1. Press ▤ to enter setup window. Scroll down by pressing ▤ to select Reset. Press ✓ to select Reset. The display shows User Reset and Fact Reset.

2. Press ✓ to select User Reset.

3. The display automatically shows No and Yes. Scroll down by pressing ▤ to toggle between No and Yes.

4. Press ✓ to confirm either No or Yes. The display shows the User Reset option with a ✓.
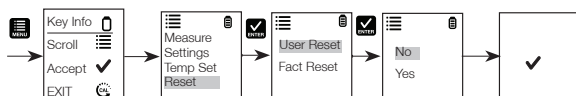
Factory Reset

Reset the CTS tester to the factory default by using the factory reset function.

1. Press ▤ to enter setup window. Scroll down by pressing the ▤ to select Reset. Press ☑ to select Reset. The display shows User Reset and Fact Reset.

2. Scroll down by pressing ▤ to toggle between the resets. Press ☑ to select Fact Reset.

3. The display automatically shows No and Yes. Scroll down by pressing ▤ to toggle between No and Yes.

4. Press ☑ to confirm either No or Yes. The display shows the Factory Reset option with a ✔.

HOLD Function

This feature helps to freeze the display for a delayed observation.

1. Press ☑ button to freeze the measurement.   2. Press ☑ again to release the measurement.

Sensor Maintenance

1. Always keep the sensors electrodes clean. Rinse the electrodes with de-ionized water and wipe them dry with clean cloth before storing with its protective cap. For cup type electrodes, remove the white plastic cup and insert to thoroughly clean viscous solutions. Never scratch electrodes with a hard substance.

2. For better performance, soak the electrode in alcohol for 10 to 15 minutes and rinse with de-ionized water before starting any measurement process. This is to remove dirt and oil stains on the electrode which may affect the accuracy of the measurements.

Applications

The Elite CTS tester can be used for the following:

- Agriculture
- Aquaculture
- Aquariums and fish farms
- Boiler blow-down

- Drinking water Hydroponics
- Electroplating rinse tanks
- Printing industry
- Swimming pools

- Verification of reverse osmosis system operation
- Water and wastewater treatment
- Others

Warranty

This instrument is supplied with a warranty against manufacturing defects for a period of one year from the date of purchase.

Return of Items

Authorization must be obtained from your distributor before returning items for any reason. When applying for authorization, please include information regarding the reason the item(s) are to be returned.

We reserve the right to make improvements in design, construction and appearance of products without notice. Prices are subject to change without notice.

Sensor Replacement

Replace the sensor module at the fraction of the cost of a new tester. When the tester fails to calibrate or gives fluctuating readings in calibration standards, you need to change the electrode.

1. With dry hands, grip the ring with sensor facing you. Twist the ring clockwise. Save the ring for later use.
2. Pull the old sensor module away from the tester.
3. Align the four tabs on the new module so that they match the four slots on the tester.
4. Gently push the module onto the slots to sit it in position. Push the smaller O-ring fully onto the new sensor module. Push the other O-ring over the module and thread it into place by firmly twisting counter clockwise.

Note: It is necessary that you recalibrate your tester prior to measurement after a sensor replacement.
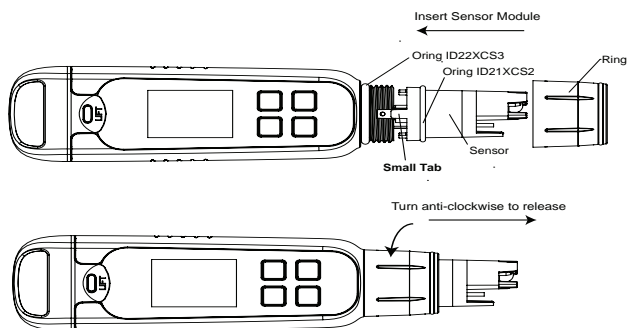
Self Diagnostic Messages

🔋	Batteries are weak and need replacement soon.
stable error	Appears when calibration is attempted but the reading is not yet stable. Wait for the reading to stabilize or manually confirm the calibration by pressing enter.
over range	The reading is above the measuring range of tester.

Specification	Elite CTS
Conductivity	
Conductivity range	0.0 to 200.0 µS, 200 to 2000 µS, 2.00 to 20.00 mS
Resolution	0.1 µS, 1 µS, 0.01 mS
Relative accuracy	±1% full scale
Normalization temperature	25.0ºC (77ºF)
Temperature Co-efficient	0.0% to 10.0%
Calibration Points	Up to 3 points
TDS	
TDS Range	0 .0 to 100.0 ppm 100 to 1000 ppm 0.10 to 10.00 ppt (TDS Factor 0.5)
Resolution	0.1 ppm, 1 ppm, 0.01 ppt
Relative accuracy	±1% full scale
Calibration points	Up to 3 points
TDS Factor	0.40 to 1.00 (Selectable)
Salinity	
Salinity range	0.00 to 10.00 ppt
Resolution	0.10 ppt
Relative accuracy	±1% full scale
Calibration points	One
Temperature	
Temperature range	0°C to 60°C (32.0°F to 140.0°F)
Temperature resolution	0.1°C / 0.1°F
Temperature accuracy	from 0°C to 50°C (±0.5ºC / ±0.9ºF + 1 LSD); from 50ºC to 60ºC (±1.0ºC / ±1.8 ºF + 1 LSD)
Temperature compensation	Yes (Automatic Temperature Compensation)

Specification	Elite CTS
General	
Display	Graphics, Dot Matrix 80X100 Pixel
Auto off	8.5 minutes (From Last Key press)
Reset	User / Factory
Power requirement	Four AAA 1.5 V batteries
Battey life	>150 hours
Water proofing	IP67
Environmental operating conditions	
Ambient operating temperature	5°C to 45°C
Relative humidity	5% to 85% Non-Condensing
Storage temperature	-20°C to 60°C
Storage humidity	5% to 85% Non-Condensing

Accessories

Ordering Code	Product Description
CTS Tester	
ELITECTSPIN	Conductivity/TDS/salinity pocket tester with batteries
ELITECTSCUP	Conductivity/TDS/salinity pocket tester with batteries
Conductivity Standard Solutions and Sachets	
ECCON100BT	100 µS/cm KCl, 480 mL
ECCON1413BT	1413 µS/cm KCl, 480 mL
ECCON1288BT	12.88 mS/cm KCl, 480 mL
ECCON1413BS	1413 µS/cm KCl, box of 20 x 20 mL sachets
TDS 442* Standard Solutions	
EC442300BT	300 ppm 442, 480 mL
EC4421000BT	1000 ppm 442, 480 mL
Salinity (NaCl) Solutions	
ECNACL5PPT	5 ppt NaCl, 480 mL
Other Accessories	
ELITECAP	Replacement sensor cap
TFLANYARD	Tester lanyard

The 442 scale simulates fresh water dissolved solids as a mixture of 4 parts sodium sulfate, 4 parts sodium bicarbonate, and 2 parts sodium chloride (40% Na_2SO_4, 40% $NaHCO_3$, 20% NaCl).