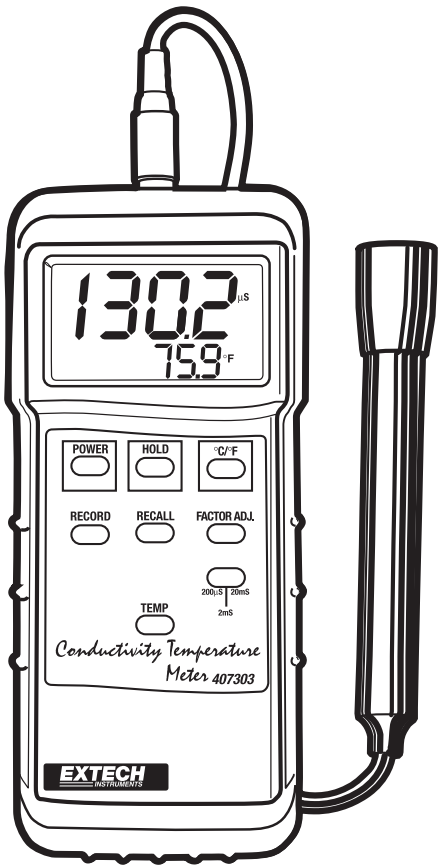
User's Guide

EXTECH INSTRUMENTS

Heavy Duty Conductivity / Temperature

Model 407303



Introduction

Congratulations on your purchase of Extech's Conductivity/ Temperature Meter. This meter offers a dual display for Conductivity and Temperature, a Conductivity Cell calibration adjustment, temperature compensation, and a RS-232 PC Interface. This meter is shipped fully tested and calibrated and with proper use will provide years of reliable service.

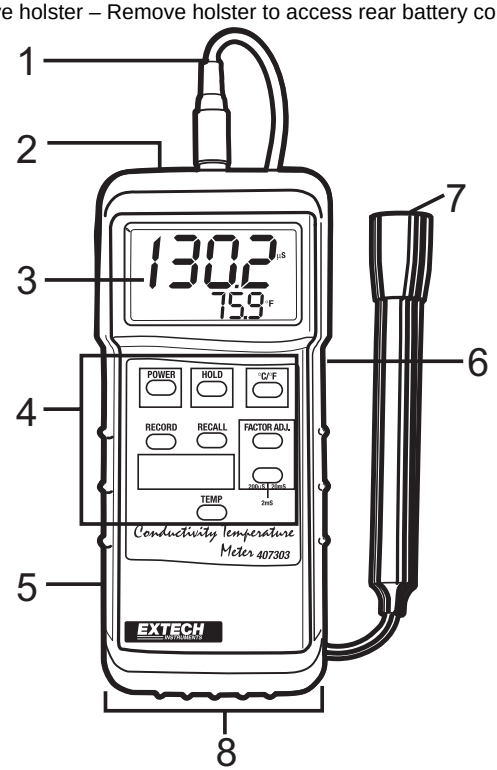
Specifications

Circuit	Custom LSI microprocessor circuit
Display	Dual function 2000 count LCD with contrast adjust
Measurement units	Conductivity in Siemens (µS and mS); Temperature in °C/°F
Data hold	Freezes displayed value
Sensor Structure	Remote Conductivity Sensor: 1K Carbon rod type Temperature sensor: Precision thermistor
Temperature compensation adjust	0 to 5% per °C over the range of 32 to 140°F (0 to 60°C)
Record/Recall	Record the Min/Max/Avg readings for later recall
Auto Power OFF	Automatic power off after 10 minutes
PC Interface	RS 232 serial data output
Operating conditions	Temperature: 32°F to 122°F (0°C to 50°C); < 80% R.H.
Power Supply	9V battery
Power Consumption	Approx. 10 mA DC
Weight	17 oz. (482 g) including batteries & probe
Dimensions	Main instrument: 7.1 x 2.8 x 1.3" (180 x 72 x 32 mm) Probe: 0.87" (22 mm) diameter

Measurement	**Range**	**Resolution**	**Accuracy**
Conductivity	0.1 to 199.9 µS	0.1 µS	±(3% + 1d) FULL SCALE
	0.2 to 1.999 mS	0.001 mS	
	2 to 19.99 mS	0.01 mS	
Temperature	32 to 140°F (0 to 60 °C)	0.1°F (0.1°C)	±1.5 °F (0.8 °C)

Meter Description

1. Sensor input plug – The plug is keyed so that it can only be inserted one way into the sensor jack at top of meter
2. RS-232 PC Interface jack – For use with Model 407001 Data acquisition software and interface cable kit
3. LCD Display indicates Conductivity and Temperature, unit of measure, and other user alert symbols discussed in this manual
4. Push-buttons:
   - POWER – Press to turn the meter ON or OFF
   - HOLD – Press to freeze the displayed reading
   - C/F – Press to select the temperature unit of measure
   - RECORD – Press to begin tracking the MIN/MAX readings
   - RECALL – Press to retrieve the MIN/MAX readings
   - FACTOR ADJUST – Used with the TEMP button for temperature compensation
   - RANGE – Slide switch to manually select the measurement range
   - TEMP – Temperature coefficient compensation button
5. Battery compartment (rear) – Remove protective holster to access the compartment
6. LCD contrast adjustment dial – Adjust to desired view setting
7. Sensor top – Conductivity and Temperature sensor reside in sensor top
8. Rubber protective holster – Remove holster to access rear battery compartment



Operation

Connecting the Sensor

1. Remove the protective sheath from the sensor tip before use. Retain the sheath for sensor storage.
2. The sensor connects to the input jack at the top of the meter. The sensor jack is keyed, thereby allowing the sensor plug to be inserted from only one direction. Line up the plug with the jack before firmly inserting the sensor. Avoid undue force; forcing the sensor into the jack may bend the pins in the sensor plug.

Powering the meter

1. Press the POWER button to turn the meter ON or OFF. If the meter does not switch on when the POWER button is pressed, check the battery. Refer to the battery installation and replacement section later in this manual.
2. This meter is equipped with an Automatic Power OFF feature. To conserve battery energy, the meter shuts off after 10 minutes. To defeat this feature, press the RECORD button to access the Record/Recall mode. In the Record/Recall mode, the meter will remain on until the user turns it off or until the battery weakens.

LCD Contrast Adjustment

It may be necessary to adjust the display contrast due to a change in viewing angle or voltage drift. Use the LCD Contrast adjustment wheel located on the right side of the meter to set the preferred contrast.

Taking Measurements and using the RANGE select slide switch

1. Insert the sensor tip into the solution under test.
2. The conductivity and temperature readings will appear on the LCD. Conductivity measurements appear at the center of the LCD. Temperature readings appear on the bottom of the LCD in smaller digits.
3. Allow time for the measurements to stabilize. The LCD display digits will settle after a short stabilization period.
4. If dashes appear on the top of the LCD measurement area, the reading is over range. Slide the RANGE select switch to a higher range. If dashes appear on the bottom of the measurement display area, the reading is under range. Slide the RANGE switch to a lower range.

Selecting ^{o}C/^{o}F units of measure

Press the ^{o}C/^{o}F button to select the Temperature unit of measure. The display will reflect the currently selected unit of measure.

Temperature Compensation using the FACTOR ADJ and TEMP buttons

This meter has a user adjustable temperature compensation feature that accommodates a change in conductivity due to a change in solution temperature. The default compensation is 2% and applies to most common standard salt solutions. Other solutions have known temperature coefficients and the temperature adjustment allows the user to set it to match the solution. To change the coefficient:

1. Set the meter to the 200µS range via the RANGE slide switch
2. Press the TEMP button
3. Press the Factor Adjust button to select the desired compensation factor (in increments of 0.1% per degree C). The display will show the factor as it is adjusted.
4. Once the desired factor is set, press the TEMP button.

Data Hold

To freeze the LCD display, press the HOLD button. The 'DH' display icon will appear on the LCD when the meter is in the Data Hold mode. Press HOLD again to return to normal operation (the 'DH' icon will switch off).

MIN/MAX/AVG Record/Recall Mode

1. To begin capturing the Minimum (MIN), Maximum (MAX), and Average (AVG) Conductivity and Temperature values, press the RECORD button (REC will appear on the LCD).
2. To recall the MAX reading press the RECALL button. The MAX display icon will appear and the measurement display areas will indicate the highest reading encountered since the RECORD button was pressed.
3. Press the RECALL button again to view the MIN reading.
4. Press the RECALL button again to view the AVG reading.
5. Press the RECORD button to exit and return to normal operation. The REC, MAX, MIN, and AVG icons should be off when the meter has exited the MIN/MAX/AVG Record/Recall mode.

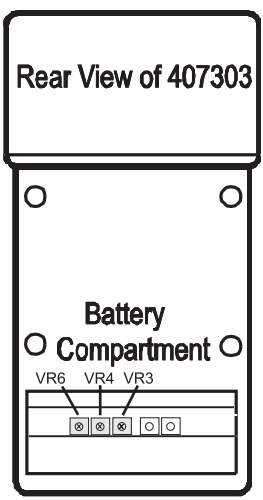
Conductivity Calibration

1. Keep the battery connected to the meter, but remove it from the battery compartment..
2. Prepare a standard conductivity solution of one or all of the following: 200uS, 2.000mS and 20.00mS.
3. Place the probe into the calibration solution and adjust the corresponding potentiometer in the battery compartment until the meter reads the value of the standard solution. Other VR potentiometers located in the battery compartment should not be adjusted.

   VR3 200uS

   VR4 2.000mS

   VR6 20.00mS



Sensor Care

Sensor Storage

On sheathed cells, replace the sheath when storing. For non-sheathed versions, soak the sensor tip in de-ionized water in storage.

Sensor Cleaning

After each use, the sensor tip should be rinsed with de-ionized water. If solids build up inside the sensor, carefully remove them with a cotton swab soaked in solvent. However, do not touch the metal parts inside the sensor.

RS-232 PC Interface

This meter is equipped with an RS-232 PC Interface jack. The jack is located at the top of the meter next to the sensor input jack. The interface is intended for use with the data acquisition software and hardware kit. For more information contact Extech or refer to the Software User Manual.

Battery Replacement

The low battery indicator **LBT** appears on the LCD when the battery runs low. To replace the battery:

1. Remove the meter's rubber protective cover to access the rear battery compartment.
2. Pry open the battery compartment cover using a small coin or screwdriver.
3. Replace the 9V battery and attach the compartment cover and protective holster.

Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website at www.extech.com (click on 'Contact Extech' and go to 'Service Department' to request an RA number). A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

Calibration and Repair Services

Extech offers repair and calibration services for the products we sell. Extech also provides NIST certification for most products. Call the Customer Service Department for information on calibration services available for this product. Extech recommends that annual calibrations be performed to verify meter performance and accuracy.

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Support line (781) 890-7440

Technical support: Extension 200; E-mail: support@extech.com

Repair & Returns: Extension 210; E-mail: repair@extech.com

Product specifications subject to change without notice

For the latest version of this User's Guide, Software updates, and other up-to-the-minute product information, visit our website: www.extech.com

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