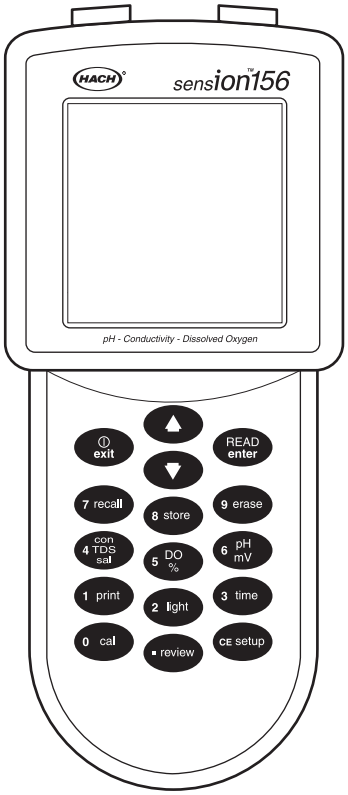
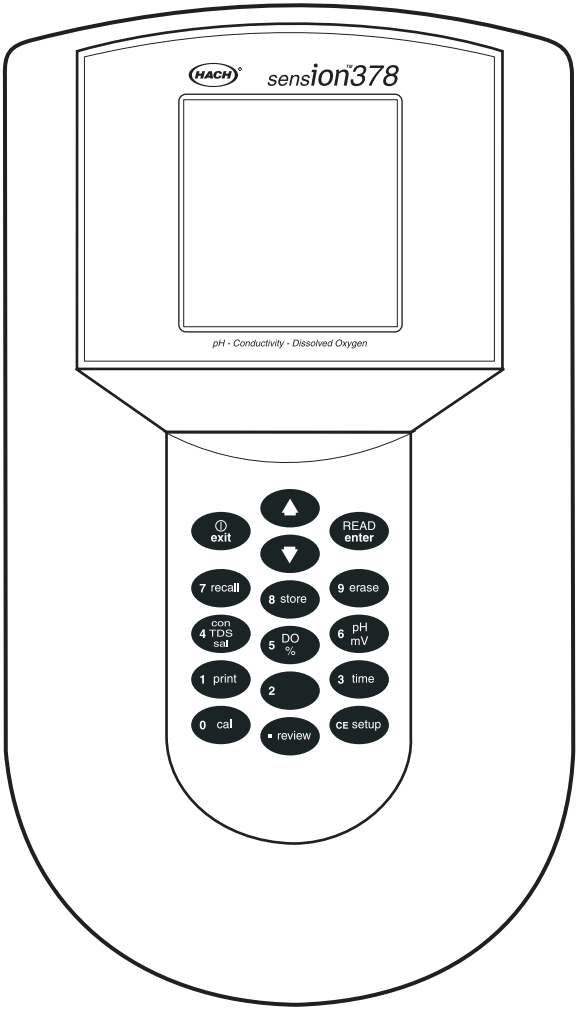
54650-23

QUICK REFERENCE GUIDE

sension™156 and sension™378 Multiparameter Meters





pH Menu Options

Table 1 How to Change pH Menu Options

Setup	How to Get There
Setup 1 **Time**	From any reading mode, press **SETUP**. Press **ENTER**. Use the number keys to change the time. Press **ENTER** to accept the time.
Setup 2 **Date**	From any reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **2**. Press **ENTER**. Press the **UP ARROW** or **DOWN ARROW** to toggle the date format between d/M (day/month) and m/d (month/day). Use the number keys to change the date. Press **ENTER** to accept the date.
Setup 3 **Year**	From any reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **3**. Press **ENTER**. Use the number keys to change the year. Press **ENTER** to accept the year.
Setup 4 **Temperature Units**	From any reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **4**. Press **ENTER** to toggle between °C and °F. The default is °C. When the desired option is selected, press **EXIT** to return to the reading mode.
Setup 5 **Display Lock**	From pH reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **5**. Press **ENTER** to toggle display lock off and on. When the desired option is selected, press exit to return to the reading mode.
Setup 6 **Measurement Resolution**	From pH reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **6**. Press **ENTER** to toggle between the three resolution options. When the desired option is selected, press **EXIT** to return to the reading mode.
Setup 7 **Mid-range Auto Buffer Recognition**	From pH reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **7**. Press **ENTER** to toggle between the buffer value of 6.86 and 7.00. When the desired option is selected, press **EXIT** to return to the reading mode.
Setup 8 **Auto Print Intervals**	From pH reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **8**. Press **ENTER**. Change the print interval by pressing the **UP ARROW** or **DOWN ARROW** keys. Press **ENTER** to accept the print interval.

pH Calibration Using Automatically Recognized Buffers

Note: *Use a 6.86 or 7.0 pH buffer for the mid-range buffer. Choose the pH setup option in Table 1.*

1. Prepare two or three pH buffers according to the electrode instruction manual. Choose from 1.68, 4.01, 7.00 (or 6.86), 10.01, and 12.45 pH buffers.
2. Turn the instrument on. From the pH reading mode, press **CAL**. **CAL** and flashing **?** will appear in the upper display area, along with **Standard** and **1**.
3. Place the pH electrode into one of the buffers.
4. Press **READ**. The instrument will automatically recognize the calibration buffer value. The temperature and pH values will be updated until a stable reading is reached.

Note: *The pH values for the buffers are given for 25 °C. If the calibration buffer temperature is not 25 °C, the pH values displayed for the buffers will reflect the correct pH value for the calibration buffer temperature.*

Note: *If the meter is measuring in pH mode, it automatically moves to the next calibration step when stabilization is reached (indicated by three beeps). If measuring in mV mode, the three beeps will still sound when the stabilization occurs, but* **ENTER** *must be pressed to accept the reading. This lets the operator control the acceptance point of the buffer.*

5. When the reading has stabilized or been accepted, the standard number will change to **2**.
6. Remove the probe from the first buffer and rinse with deionized water. Place the probe into the second buffer.
7. Press **READ**. The temperature and pH values will be updated until a stable reading is reached.
8. When the reading has stabilized or been accepted, the standard number will change to **3**. (To accept this calibration after two points, press **EXIT**. Press **ENTER** to accept the calibration or **EXIT** to cancel the calibration without saving it.)
9. Remove the probe from the second buffer and rinse with deionized water. Place the probe in the third buffer.
10. Press **READ**. The temperature and pH values will be updated until a stable reading is reached.
11. When the reading has stabilized or been accepted, the slope value and the **Store** and **?** icons will appear.
12. To save the calibration and return to the reading mode, press **ENTER**. To exit the calibration without saving it and return to the reading mode, press **EXIT**.

Conductivity Menu Options

Table 2 How to Change Conductivity Menu Options

Setup	How to Get There
Setup 5 **Display Lock**	From conductivity reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **5**. Press **ENTER** to toggle the display lock off and on. When the desired option is selected, press **EXIT** to return to the reading mode.
Setup 6 **Temperature Correction Value**	From conductivity reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **6**. Press **ENTER**. To select the non-linear function, press the **UP ARROW** or **DOWN ARROW** until the display shows **NaCl**. Press **ENTER** to accept the setting. To select a linear conversion, scroll until the correction coefficient appears (e.g., 2.000%). Enter the desired value using the numeric keypad. Press **ENTER** to accept the value. If a number entry error occurs, start over by pressing **CE**. ***Note:*** *If the compensation factor is set to 0.00%, the conductivity readings will not be corrected for temperature.* When the desired option is selected, press **EXIT** to return to the reading mode.
Setup 7 **TDS Correction Factor**	From conductivity reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **7**. Press **ENTER**. Press the **UP** or **DOWN ARROW** keys to switch between linear and non-linear correction functions. To choose a non-linear conversion, scroll until a flashing **NaCl** appears, then press **ENTER**. To select a linear conversion, scroll until the conversion coefficient appears. Use the numeric keypad to set the value of the coefficient, then press **ENTER**. If an number entry error occurs, start over by pressing **CE**. When the desired option is selected, press **EXIT** to return to the reading mode.
Setup 8 **Auto Print Intervals**	From conductivity reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **8**. Press **ENTER**. Change the print interval by pressing the **UP ARROW** or **DOWN ARROW**. Press **ENTER** to accept the print interval.
Setup 9 **Cond. Standard Reference Temperature**	From conductivity reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **9**. Press **ENTER** to toggle between 20° C and 25° C. The default is 25° C. Press **EXIT** to return to the reading mode.
Setup 10 **Temperature Correction Off and On**	From conductivity reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **10**. Press **ENTER** to toggle between off and on. Press **EXIT** to return to the reading mode.

Conductivity Calibration with a Known Standard

1. Make sure the meter is in Conductivity reading mode.
2. Make sure that the reference temperature in Conductivity Setup 9 matches the reference temperature of the sample.
3. Place the probe in a conductivity standard that is in the expected range of the samples. Agitate the probe to dislodge bubbles in the cell. Avoid resting the probe on the bottom or side of the container.
4. Press **CAL**. The meter will recall the most recent type of calibration.
5. Look at the units field to see what kind of calibration is active. Scroll to the preferred units using the **UP** or **DOWN ARROWS**.
6. Use the number keys to change the numeric value, if desired. It is not necessary to fill up the numeric entry screen before moving on. To clear the numeric display, press **CE**.
7. When the value and units are correct, press **ENTER** to calibrate on the standard. The meter automatically corrects the calibration measurement to the selected reference temperature using the NaCl-based, non-linear temperature coefficient.
8. The meter will return to Conductivity reading mode when the calibration is finished.

Dissolved Oxygen Menu Options

Table 3 How to Change Dissolved Oxygen Menu Options

Setup	How to Get There
Setup 5 **Display Lock**	From dissolved oxygen reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **5**. Press **ENTER** to toggle display lock off and on. When the desired option is selected, press **EXIT** to return to the reading mode.
Setup 6 **Measurement Resolution**	From dissolved oxygen reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **6**. Press **ENTER** to toggle between 0.0 or 0.00 mg/L. When the desired option is selected, press **EXIT** to return to the reading mode.
Setup 7 **Salinity Factor**	Determine sample salinity. The units for salinity are parts per thousand (0/00). From dissolved oxygen reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **7**. Press **ENTER.** Use the number keys to enter a salinity factor ranging from 0 to 42. Press **ENTER** to accept the value, or **EXIT** to leave the value unchanged. When the desired value is accepted, press **EXIT** to return to the reading mode.
Setup 8 **Auto Print Interval**	From dissolved oxygen reading mode, press **SETUP**. Press the **UP ARROW** until the Setup number is **8**. Press **ENTER**. Change the print interval by pressing the **UP ARROW** or **DOWN ARROW**. To turn this feature off, select **off**. Press **ENTER** to accept the print interval. Press the **EXIT** key.

Dissolved Oxygen Calibration in Water Saturated Air

1. Plug in the DO probe at least 30 minutes before calibrating to polarize the probe.
2. Secure the calibration and storage chamber to the probe cable.
3. Prepare the calibration and storage chamber by holding it under water and squeezing it a couple of times to pull a small amount of water into the lower chamber through the inlet. Alternately, open the bottom of the chamber and insert a water-soaked sponge.

Note: *Avoid completely filling the lower chamber with water.*

4. Insert the DO probe into the calibration and storage chamber. The tip of the probe must not be flooded with water or be holding a drop of water on the membrane.
5. Allow at least ten minutes for the atmosphere in the chamber to reach a steady state.

Note: *Gently squeezing the lower chamber a couple of times to force water saturated air into the probe chamber will speed up stabilization.*

Note: *Keep the DO probe at a uniform temperature. When holding the probe, do not touch the metallic button on the side of the probe. The button is a thermistor that senses temperature. An inaccurate calibration will result if the temperature of the thermistor is different from the probe membrane.*

6. Press the **DO** key to put the meter in DO reading mode.
7. Press the **CAL** key located in the lower left corner of the keypad.
8. The display will show **100%**. Press the **ENTER** key. The stabilizing icon will appear while the meter completes the calibration.
9. When the calibration is complete, the meter will return to reading mode. Press the **EXIT** key during the calibration sequence to back out of the calibration routine, one screen at a time, without completing a calibration.

Measuring Tips

- Turn the meter on and off with the **I/O/EXIT** key.
- To review a calibration, press the **REVIEW** key.
- When using the dissolved oxygen probe, polarize the probe by plugging it into the meter before attempting a calibration or measurement. The length of time required for polarization depends on how long the electrode has been unplugged. It can vary from 60 minutes (for a new probe) to a few seconds (if you momentarily disconnect the probe). If the **CAL** and **?** icons flash after calibrating the DO probe, the probe is not polarized.
- Connect the pH electrode to the black connector, and the DO or conductivity electrodes to the blue connector.
- If the meter is not in reading mode, it may take a few key presses to turn the meter off.
- If the readings do not change when you move an electrode to a new sample, the meter probably has the Display Lock set to **ON** for the parameter you are reading. If the **Lock Icon** appears in the lower left portion of the display, the setting is on. To change the setting, use setup number 5. Or, press **READ** to initiate a new reading.
- When calibrating pH or dissolved oxygen, make sure that the instrument is displaying readings to the correct number of decimal places for your needs. This will assure that your calibration is sufficiently precise. To change the setting, use setup number 6.

HACH COMPANY
WORLD HEADQUARTERS
P.O. Box 389
Loveland, Colorado 80539-0389
Telephone: (970) 669-3050
FAX: (970) 669-2932

FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:
In the U.S.A. - **Call toll-free 800-227-4224**
Outside the U.S.A. - **Contact the HACH office or distributor serving you.**
On the Worldwide Web - **www.hach.com**; E-mail - **techhelp@hach.com**

 ap/dk 1/00 1ed