3100 Orbisphere LDO - Measurement SOP

EQUIPMENT:

1. Hach Orbisphere Series 3100 Portable Oxygen Analyzer
2. 3 meters of tubing
3. One tool kit(see below)
4. External power supply adapter.
5. USB thumb drive
6. Computer with *Windows 7, Vista, and XP operating systems.*

TOOL KIT:

1. 1 ea. Cross head screwdriver
2. 1 ea. Syringe
4. 1 ea. Box 10 meshes for particle filter
5. 1 ea. Particle filter
6. 1 ea. Flat head screwdriver
7. 1 ea. USB key containing PC software

REAGENTS:

1. Cylinder of oxygen free gas (minimum 99.999% purity)
2. Ethanol

STANDARDS AND CONTROLS:

The Hach 3100 is calibrated in 99.999% nitrogen. Standards are not available.
A known elevated D.O. liquid is not readily available, but it is possible to use calibration gas of the appropriate concentration, should a second validation point be necessary. The following checks must be undertaken to monitor instrument performance.

High level check for Meters Set Up For Carbonated Samples

At a minimum of once per month, run all in service meters on a carbonated liquid (Beer or adjusted water) with the highest level D.O. available. Service any meters that are found to be > +/- 5 ppb from the mean. See reaction plan. Document all readings.

CALIBRATION PROCEDURE:

The 3100 analyzer requires a quarterly calibration. Follow the procedures below to perform a zero point calibration.

<table>
<tr><th colspan="2">Zero Calibration</th></tr>
<tr><td>

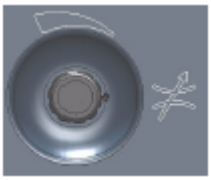
- Turn the analyzer on by pressing the top button on the left side of the analyzer.

</td><td>  </td></tr>
<tr><td>

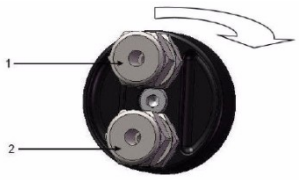
- Fill the syringe (from the tool kit) with 20 ml of ethanol
- Connect the syringe to the sample input of the analyzer and rinse flow path.
- Once the ethanol has been pushed through the analyzer refill the syringe with air reconnect to the sample input and push the ethanol out of the flow path.

</td><td>  </td></tr>
<tr><td>

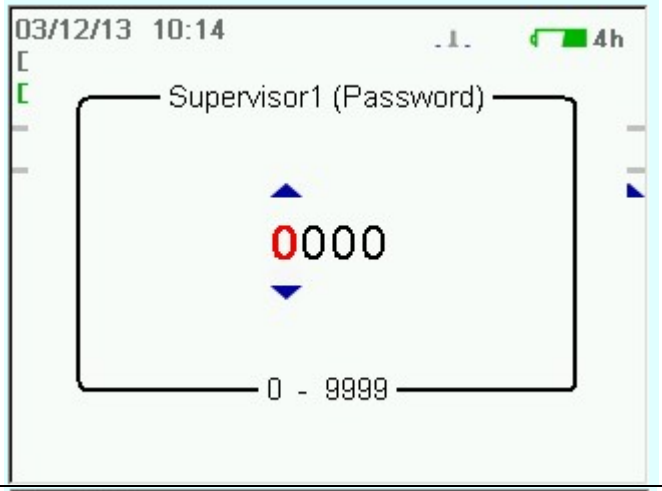
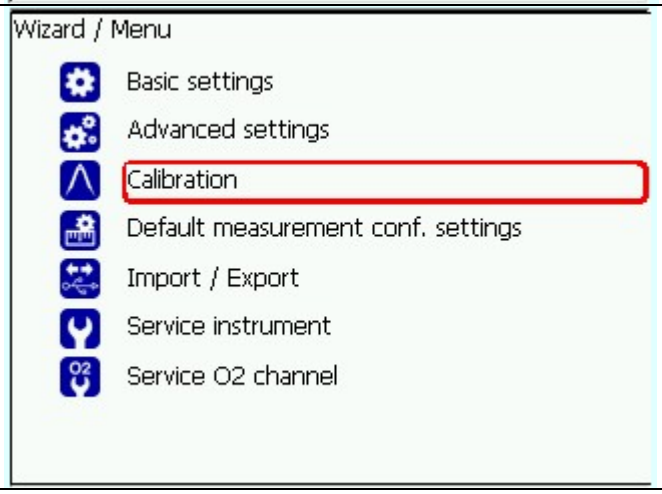
- Connect the 99.999% N2 calibration gas to the sample inlet port on the analyzer.
- Ensure that the flow path is rotated to the open position (strait up/down)
- Ensure the flow meter is knob is fully open

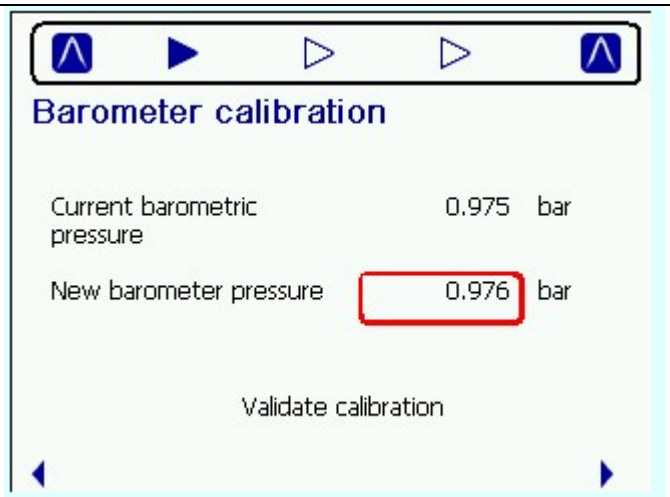
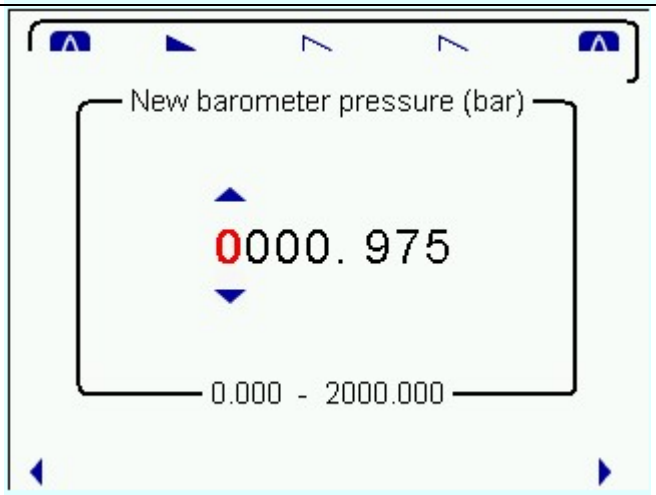
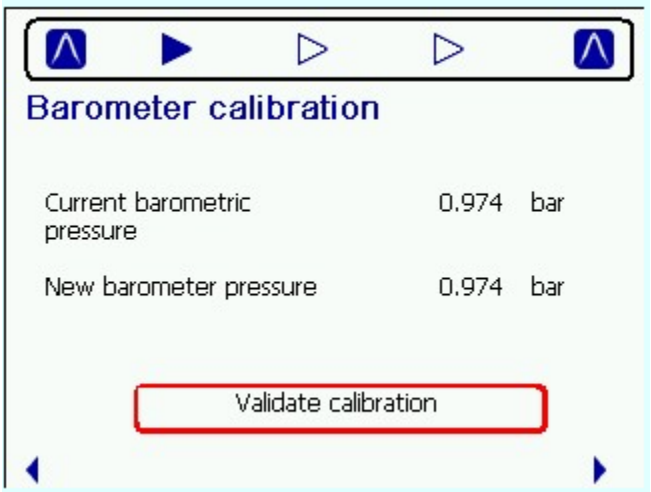


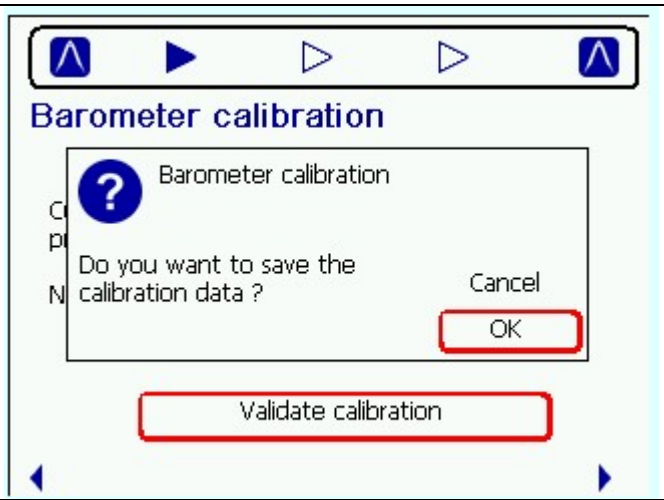
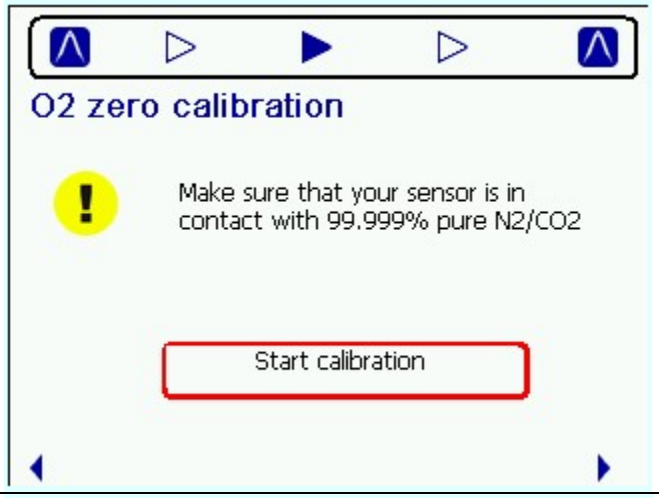
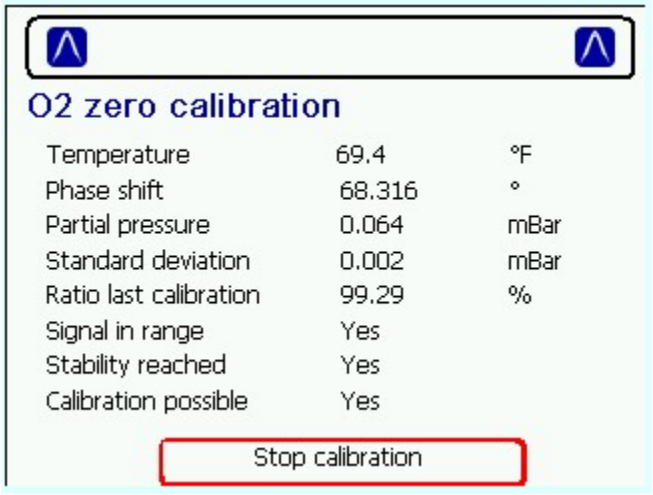
</td><td> 

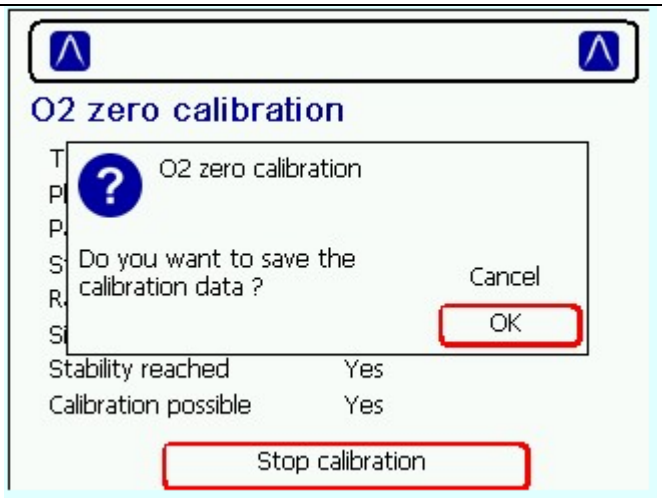


1. Sample inlet
2. Sample outlet</td></tr>
</table>

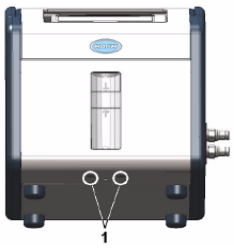
• Using the right arrow button on the key pad scroll through the 3100 menus until you see the “User List View” • Using the down arrow on the key pad highlight the “Supervisor” ID and press the ✓ button on the key pad.	
• Using the up/down button on the key pad to enter digits and use the left/right arrows to advance to the next digit. • Enter the password 5678 and press the ✓ button on the key pad to enter the password.	
• Press the check button on the key pad to open the main menu • Using the down arrow on the key pad select the calibration menu and press the ✓ button on the key pad.	

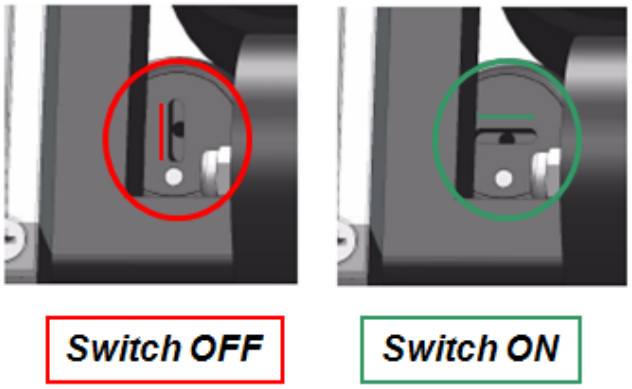
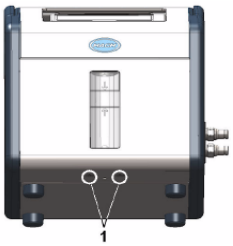
• Using the down arrow key on the key pad select the “New barometer pressure” box and press the ✓ button.	
• Use the up/down button on the key pad to enter digits and use the left/right arrows to advance to the next digit. • Enter the barometric pressure reading from your NIST calibrated barometer and press the ✓ button on the key pad.	
• Use the down arrow key to select the Validate Calibration button and press the ✓ button.	

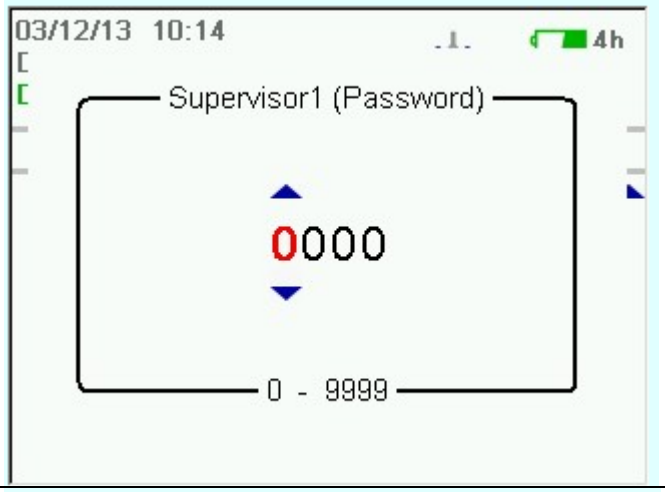
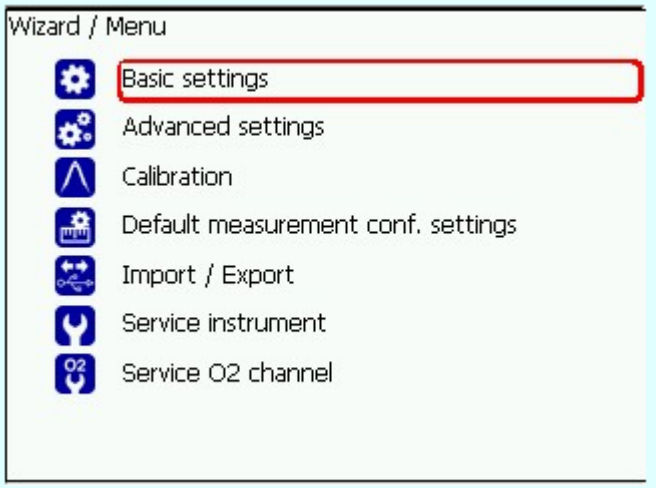
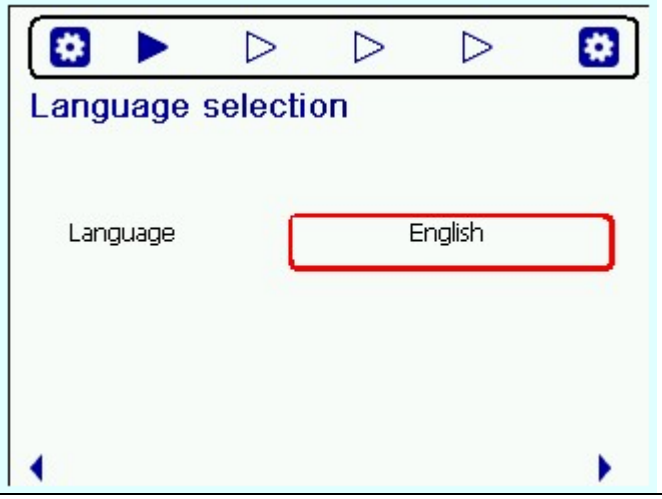
• Use the down arrow key to select the OK button and press the ✓ button. • The new calibration will be stored • Use the right arrow button to advance to the O2 zero calibration screen.	
• Press the ✓ button on the key pad to start the O2 sensor calibration.	
• Ensure gas is flowing through the analyzer at a rate of 5-10 bubbles per second. • Be sure that the gas flows through the analyzer for a minimum of 10 minutes before starting the calibration • Observe the screen and verify the following parameters: • Signal in range Yes • Stability reached Yes • Calibration possible Yes • Once the above criteria is met press the ✓ button on the key pad.	

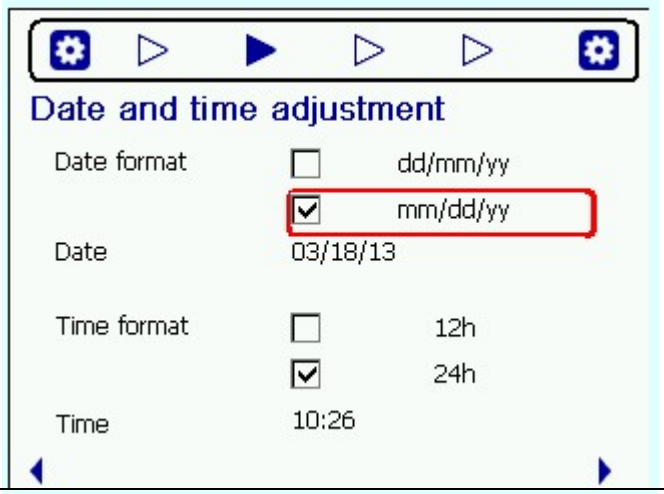
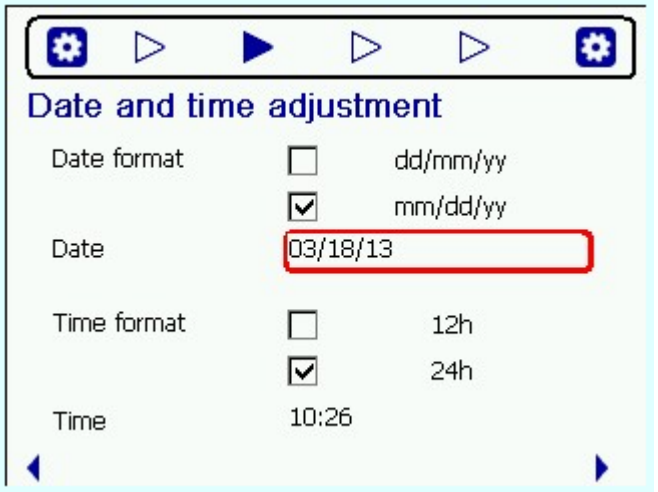
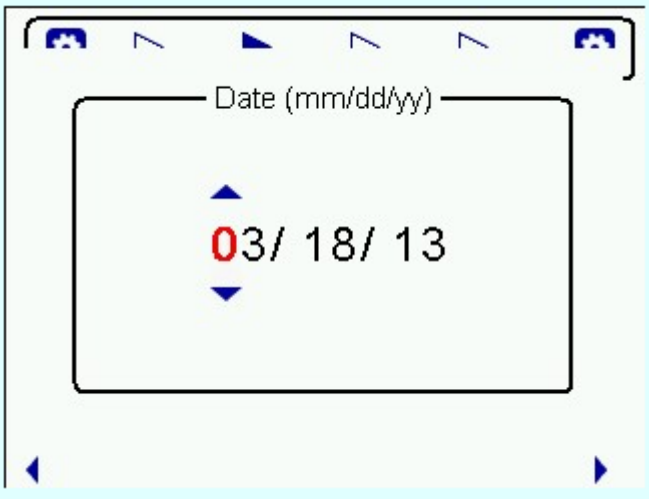
• Use the down arrow key to select the OK button and press the ✓ button. • The new calibration will be stored • To back out to the main menu press the button on the keypad. You should now be ready to measure. • The LCD display will automatically read approximately 1.0 ppb just after calibration while the calibration gas is attached.	

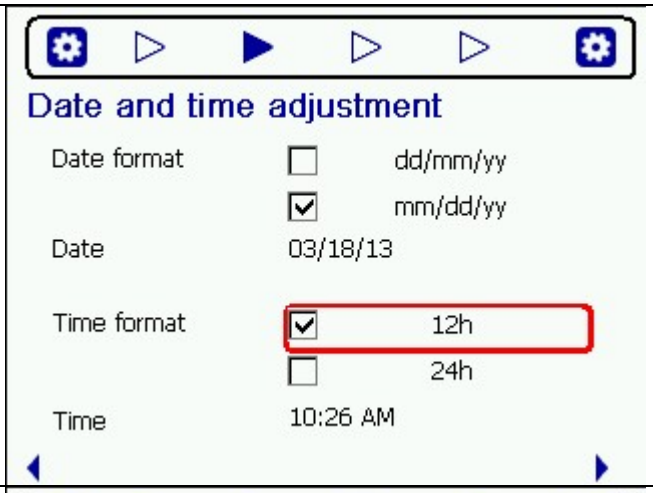
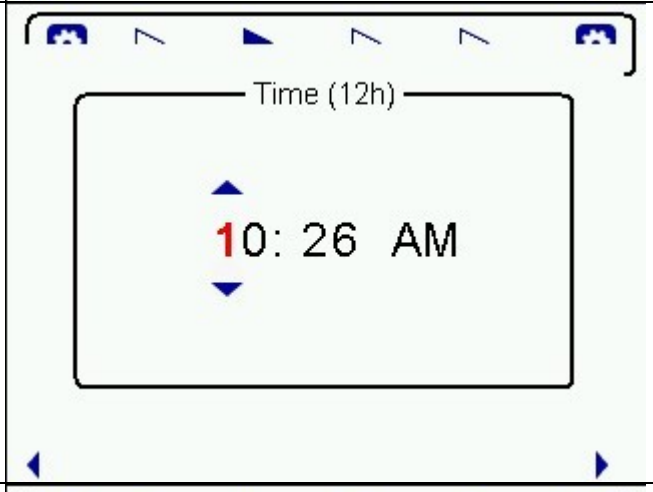
CONFIGURE THE ANALYZER:

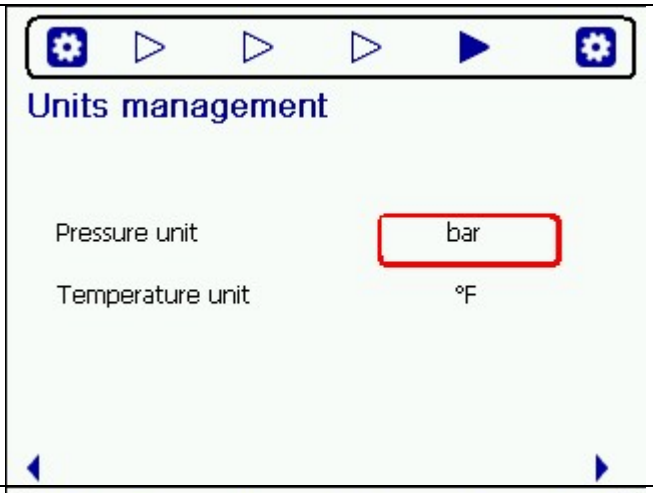
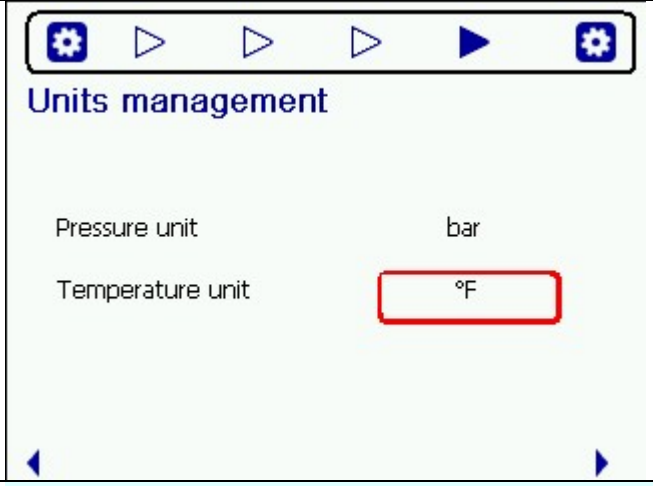
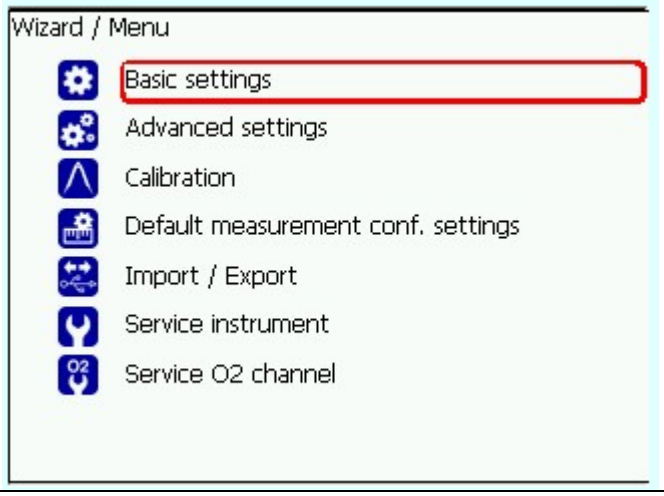
ANALYZER CONFIGURATION	
• Tilt the instrument back to reveal two screws underneath (No. 1) that hold the instrument front panel in place.	
• Using the Philips screwdriver supplied in the tool kit, unscrew and remove these screws. • Lift off the front panel to reveal the internal battery power switch (No. 2).	

• Using the long-bladed flat-head screwdriver supplied in the tool kit, turn the switch a quarter of a turn clockwise to reconnect the battery power. • The diagram to the right shows the switch in the OFF position as delivered (Red) and in the ON position (Green).	
• Replace the front panel and secure back in place with the two screws.	
• Turn the analyzer on by pressing the top button on the left side of the analyzer.	
• Using the right arrow button on the key pad scroll through the 3100 menus until you see the “User List View” • Using the down arrow on the key pad highlight the “Supervisor” ID and press the ✓ button on the key pad.	

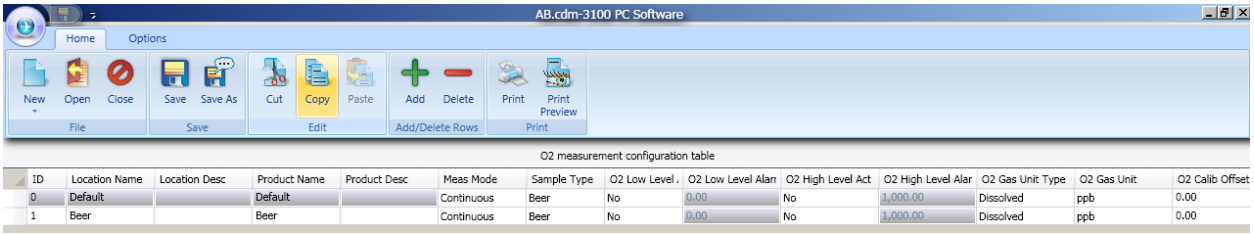
• Using the up/down button on the key pad to enter digits and use the left/right arrows to advance to the next digit. • Enter the password 5678 and press the ✓ button on the key pad to enter the password.	
• Press the ✓ button on the key pad to open the main menu • Using the down arrow on the key pad select the Basic settings menu and press the ✓ button on the key pad. • Press the ✗ button to escape to the previous	
• Press the Check button and select appropriate language	

• Use the right arrow button to advance to the Date and Time adjustment screen. • Use the down arrow to select the Date format	
• Use the down arrow to select Date and press the ✓ button.	
• Using the up/down button on the key pad to enter digits and use the left/right arrows to advance to the next digit. • Enter the correct date and press the ✓ button.	

• Use the down arrow to select Time format press the ✓ button.	
• Enter the correct date and then press the ✓ button.	
• Use the right arrow button to advance to the Backlight management screen. • Ensure that the backlight level is set to Comfortable	

• Use the right arrow button to advance to the Units management screen. • Set the Pressure unit to display in bar	
• Use the down arrow to select Temperature unit and press the button. • Set the Temperature unit to display in °F.	
• Use the right arrow button to advance to the Main menu. • Press the button to save the changes	
• Install the PC software by inserting the USB key into your PC and running the setup program.	

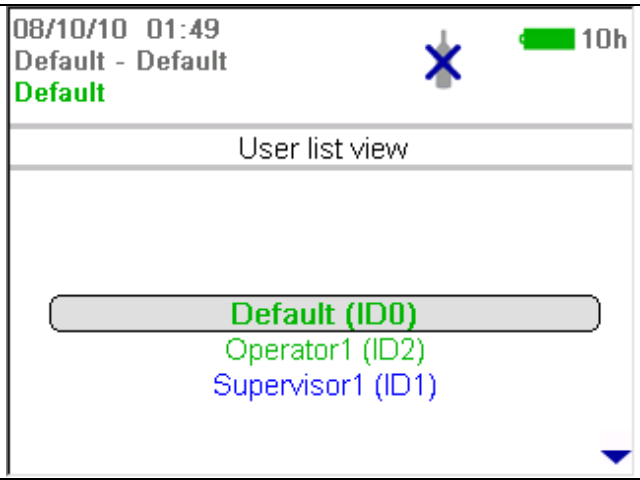
Open the PC software and configure the measurement configuration list as seen below.



- Save the file to the USB drive supplied in the maintenance key and name it ***.cdm**

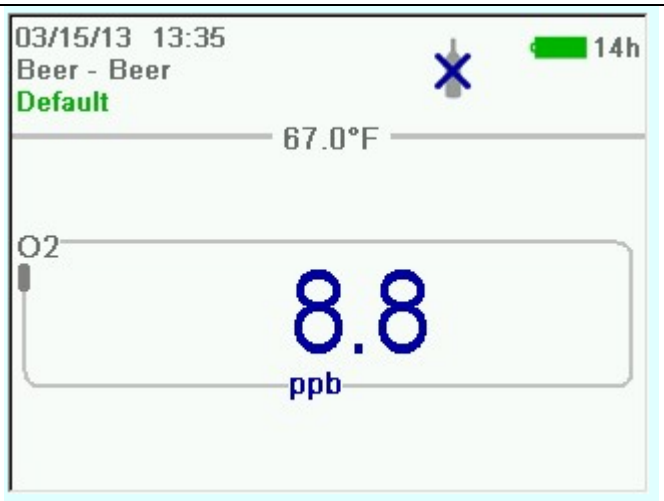
• Needs Data	

SAMPLING ANALYSIS

3100 OPERATION	
• Turn the analyzer on by pressing the top button on the left side of the analyzer.	
• Using the left arrow on the key pad scroll to the User List View and select Default user and press the ✓ button on the key pad.	

• Using the left arrow on the key pad scroll to the Measurement Configuration List and select • Beer – Beer and press the ✓ button on the key pad.	
• The configuration of profile Beer – Beer will be displayed. Press the ✓ button to continue.	
• Attach the inlet tubing of the analyzer to the sample valve.	

• Turn the instrument valve counter-clockwise as far as it will go. • Open the sample valve • Allow the sample to flow through the bypass valve for 10 seconds to flush the air from the line.	 
• Turn the instrument valve clockwise to the analyzer flow path (vertically up and down).	 
• Control the sample flow using the flow control valve located on the side to the analyzer • Ensure flow meter knob is fully open. • If you see degassing in the flow meter add some back pressure to the sample flow path by adjusting the flow control valve.	

• When the readings stabilizes record the dissolved oxygen value and temperature.	
• Close the sample valve and remove tubing from the tank.	
• When all measurement have been made rinse the analyzer with adjusted water. • Turn the instrument valve clockwise as far as it will go to trap adjusted water in the analyzer • Store the analyzer in ???	 

*****END*****