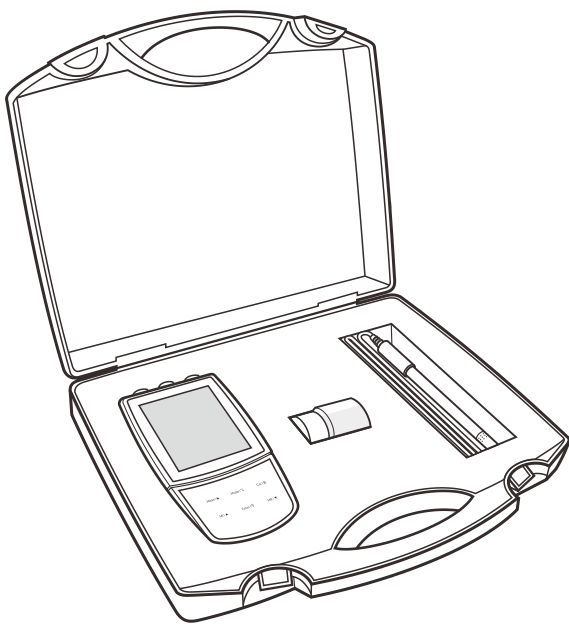


Bante 820 Portable Dissolved Oxygen Meter

# USER MANUAL



## Introduction

Thank you for selecting the 820 portable dissolved oxygen meter. This user manual provides a step-by-step guide to help you operate meter, please carefully read the following instructions before use. Any use outside of these instructions may invalidate your warranty and cause permanent damage to the meter.

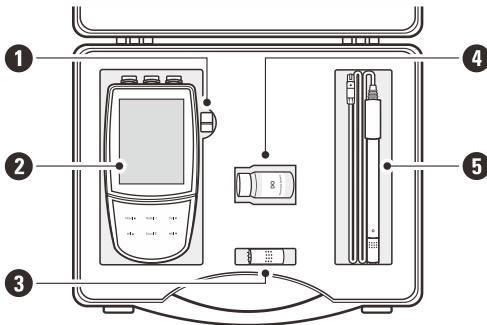
### Environmental Conditions

Before unpacking, ensure that current environmental conditions meet the following requirements.

- Relative humidity is less than 80%
- Ambient temperature between 0°C (32°F) and 50°C (122°F)
- No potential electromagnetic interference
- No corrosive gas exists

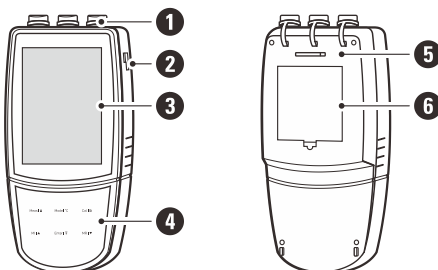
### Packing List

The following list describes all components of the meter. If any items are missing or damaged, contact the supplier immediately.

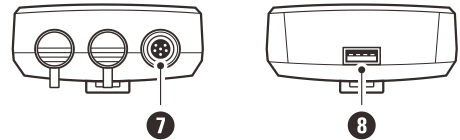


1	Electrode clip	4	Electrolyte solution
2	820 meter	5	Dissolved oxygen electrode
3	Membrane cap		

## Meter Overview

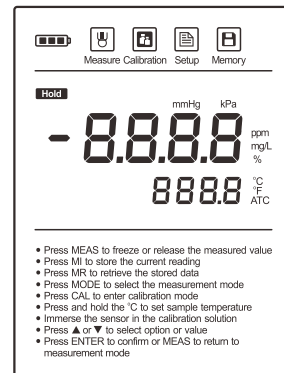


1	Sensor connections	4	Membrane keypad
2	Slot for electrode clip	5	Slot for hand strap
3	Display	6	Battery compartment








7	Socket for dissolved oxygen electrode (6-pin DIN)
8	USB-A interface to the computer or power adapter

### Display



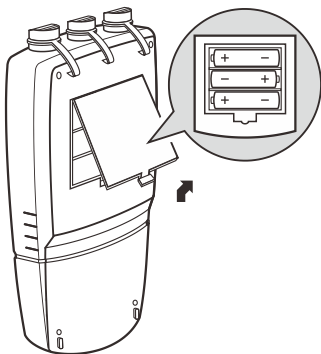
Icon	Description
	Indicates that the meter is in the measurement mode
	Indicates that the meter is in the calibration mode
	Indicates that the meter is in the setup mode
	Indicates that you are viewing the stored readings or a reading is stored into the memory
	When the battery voltage falls below the minimum power requirements, the icon automatically disappears
<b>HOLD</b>	Indicates that the measurement is locked
ATC	Indicates that the automatic temperature compensation is enabled

## Keypad

Key	Function
<b>Meas</b>   	<ul style="list-style-type: none"> <li>Switch the meter on or off</li> <li>Lock or unlock the measurement</li> <li>Exit the calibration, settings, data logs and return to the measurement mode</li> </ul>
<b>Mode</b>   °C	<ul style="list-style-type: none"> <li>Select the % saturation or mg/L mode</li> <li>Press and hold the key to enter the temperature setting</li> </ul>
<b>Cal</b>   	<ul style="list-style-type: none"> <li>Start calibration</li> <li>Press and hold the key to enter the setup menu</li> </ul>
<b>MI</b>   	<ul style="list-style-type: none"> <li>Store current reading to memory</li> <li>Increase value or scroll up through a list of options</li> </ul>
<b>MRI</b>   	<ul style="list-style-type: none"> <li>View the data log or calibration log</li> <li>Decrease value or scroll down through a list of options</li> </ul>
<b>Enter</b>   	<ul style="list-style-type: none"> <li>Confirm the calibration or displayed option</li> <li>Press and hold the key to switch the backlight on or off</li> </ul>

## Installing the Batteries

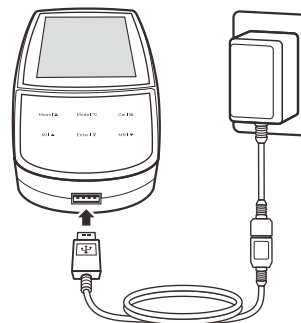
- Remove the battery compartment cover from the backside of the meter, insert three AA batteries into the battery compartment, note polarity.



- Replace the battery compartment cover to its original position, push the limiter until it locks.



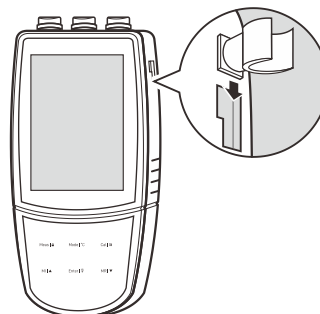
The meter allows using the DC 5V power adapter (order code: DCPA-5V) or the USB port on computer as a power supply.



Note, take out the batteries before connecting an external power supply.

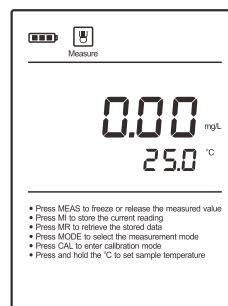
## Installing the Electrode Clip

The electrode clip is designed for mounting a sensor, but it is not a necessary component for meter. If you want to install this accessory, insert the electrode clip into the slot on the right of the meter.



## Switching the Meter On and Off

- Press the **Meas** key and release to switch on the meter.
- Press and hold the **Meas** key to switch off the meter.



## Meter Setup

The 820 meter contains an integrated setup menu for customizing the displayed option to meet measurement requirements. The following table describes the functions of each menu item.

Menu Item	Option and Description
CAL	<b>Calibration Points</b> Set the number of calibration points.
	1 1 point (default)
	2 2 points
PRES	<b>Pressure Coefficient</b> Set the barometric pressure coefficient according to the local altitude (refer to page 4).
	760 450 to 850 mmHg (default 760 mmHg) 60.0 to 113.3 kPa (default 101.3 kPa)
SALT	<b>Salinity Coefficient</b> Set the salinity compensation coefficient of sample.
	0.0 0.0 to 50.0 ppt (default 0.0 ppt)
UNIT	<b>Measurement Unit</b> Set the default temperature unit.
	°C Degrees Celsius (default)
	°F Degrees Fahrenheit
HOLD	<b>Auto-Hold</b> If enabled, the meter will automatically sense and lock the measurement endpoint.
	YES Enable
	NO Disable (default)
OFF	<b>Auto-Power Off</b> If enabled, the meter will automatically switch off if no key is pressed within 30 minutes.
	YES Enable
	NO Disable (default)
CLR	<b>Clear Stored Data</b> Delete all data logs in the memory.
	YES Enable
	NO Disable (default)

### Factory Reset

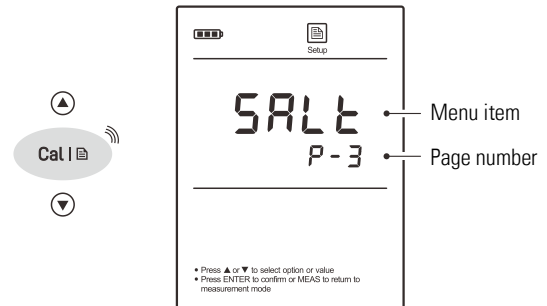
Reset the meter to factory default settings. Note, the meter must be recalibrated.

r 5 t

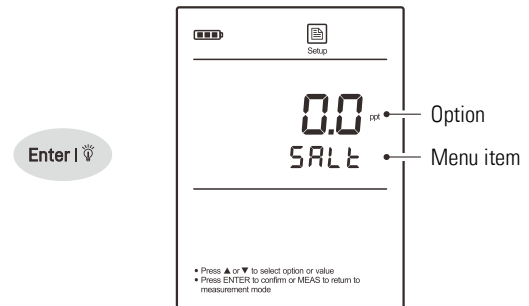
YES	Enable
NO	Disable (default)



### Setting a Default Option

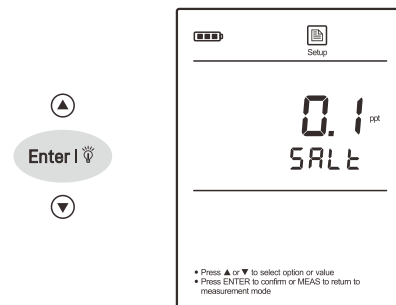
- In the measurement mode, press and hold the  key to enter the setup menu. Press the  /  key to select a menu item.



- Press the **Enter** key, the meter shows the current option.



- Press the  /  key to select a desired option. Press the **Enter** key to save and return to the measurement mode.





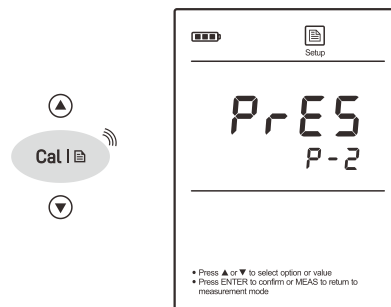
To exit the setup menu without saving changes, press the **Meas** key.

## Setting the Barometric Pressure

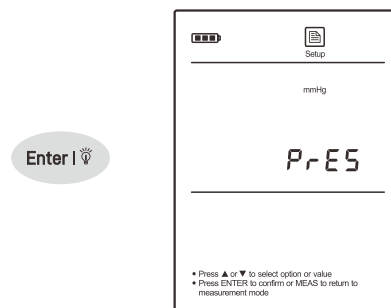
The table below describes the relationship between the altitude and barometric pressure, make sure to set a compatible parameter before the calibration or measurement.



Altitude (m)	kPa	mmHg
0	101.3	760
100	100.1	750
200	98.8	741
300	97.6	732
400	96.4	723
500	95.2	714
600	94.0	705
700	92.8	696
800	91.7	688
900	90.5	679
1000	89.4	671
1100	88.3	662
1200	87.2	654
1300	86.1	646
1400	85.0	638
1500	84.0	630
1600	82.9	622
1700	81.9	614
1800	80.9	607
1900	79.9	599
2000	78.9	592
2100	77.9	584
2200	76.9	577
2300	76.0	570
2400	75.0	563
2500	74.1	556
2600	73.2	549
2700	72.3	542
2800	71.4	536
2900	70.5	529
3000	69.6	522
3100	68.7	515
3200	67.9	509
3300	67.0	502
3400	66.2	496
3500	65.4	490

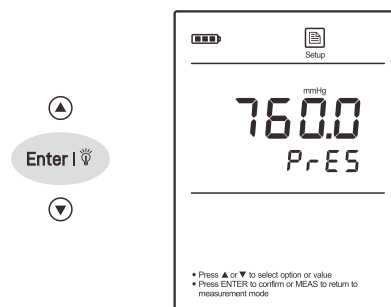
1. In the measurement mode, press and hold the  key to enter the setup menu.
2. Press the  key until the display shows *P-r-E-S* (pressure).










3. Press the **Enter** key, the meter shows the default pressure unit.



4. If necessary, press the  /  key to select the "mmHg" or "kPa". Press the **Enter** key, the meter shows the default barometric pressure value.



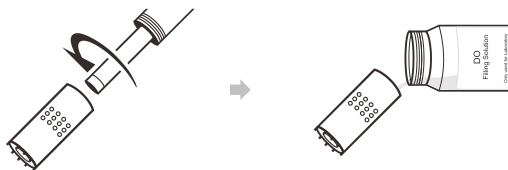
5. Press the  /  key to modify the value, press the **Enter** key to save.

 During the setting process, press the  /  key once, the setting value will increase or decrease by 0.1. Press and hold the  /  key, the setting value will increase or decrease by 1.

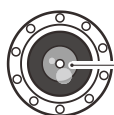
## Prior to Use

### Filling the Electrolyte Solution

- 1.1 Take out the dissolved oxygen electrode from the carrying case. Unscrew the membrane cap from the bottom of the electrode, rinse the inside and outside with distilled water and blot dry.
- 1.2 Fill the membrane cap halfway with electrolyte solution.



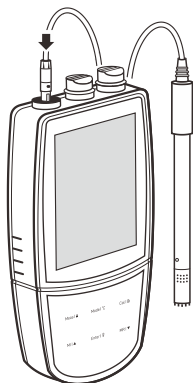
- 1.3 Screw membrane cap back onto the electrode. Some electrolyte solution will overflow during this process.
- 1.4 Check the electrode, ensure that no air bubbles are trapped in the electrolyte solution and membrane is not creased or damaged.



Remove air bubbles

### Polarizing the Electrode

- 2.1 Insert the connector of the dissolved oxygen electrode into the connector socket on meter, ensure that the connector is fully seated.



- 2.2 Switch on the meter and wait 10 minutes for the electrode to polarize.

## Dissolved Oxygen Calibration

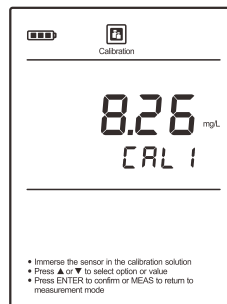
The 820 meter allows 1 or 2 points dissolved oxygen calibration. If you have selected the single point calibration in the setup menu, we recommend that you perform a 100% saturation calibration in the air-saturated water. If the 2 points calibration is selected, the zero oxygen solution needs to be used.

Note: During the calibration and measurement, the temperature sensor on electrode must be immersed in the sample solution completely, the solution should keep 0.3 m/s of minimum flow rate to avoid oxygen starvation at the membrane.



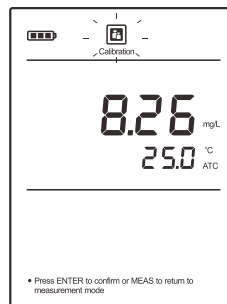
### DO Calibration in mg/L Mode

- 1.1 Press the **Mode** key to enter the dissolved oxygen concentration mode and select the 1 point calibration in the setup menu.
- 1.2 Press the **Cal** key, the display shows 8.26 mg/L / CAL1 (@25°C).



Cal |

- 1.3 Place the dissolved oxygen electrode into the air-saturated water for 10 minutes and stir gently. Press the **Enter** key, the meter begins the calibration, the Calibration icon continuously flashing.



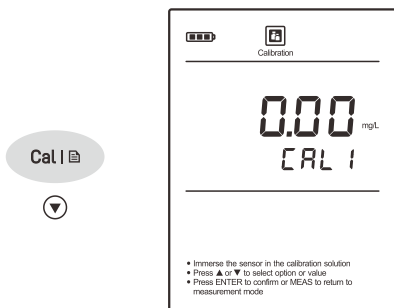
Enter |



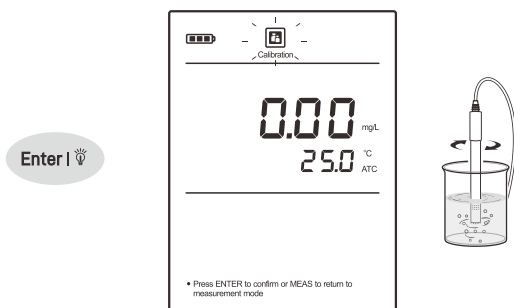
- 1.4 When the reading has stabilized, the meter will show **End** and return to the measurement mode.

## 2 Points Calibration

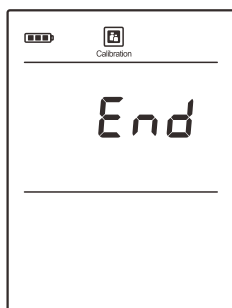
- 2.1 Ensure that you have selected 2 points calibration in the setup menu.
- 2.2 Press the **Cal** key and **▼** key, the meter shows 0.00 mg/L / CAL1.



- 2.3 Place the dissolved oxygen electrode into the zero oxygen solution for about 10 minutes and stir gently. Press the **Enter** key to begin the calibration.



- 2.4 When the reading has stabilized, the display will show 8.26 mg/L / CAL 2 (@25°C). The meter prompts you to continue with second point calibration.
- 2.5 Repeat the step 1.3 above until the meter shows **End**. Calibration is completed.



- 3.2 Press the **Cal** key, the display shows 100.0% / CAL1.
- 3.3 Hold the dissolved oxygen electrode in the air at 100% relative humidity or place the electrode into the air-saturated water for 10 minutes. Press the **Enter** key, the meter begins the calibration.
- 3.4 When the reading has stabilized, the meter will show **End** and return to the measurement mode.

## 2 Points Calibration

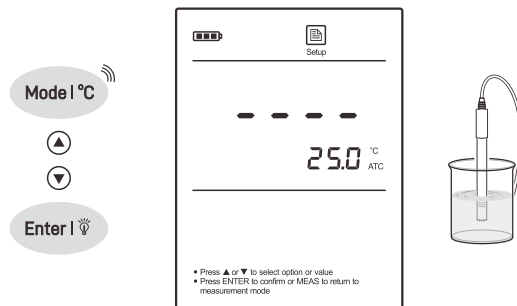
- 4.1 Ensure that you have selected 2 points calibration in the setup menu.
- 4.2 Press the **Cal** key and the **▼** key, the meter shows 0.0% / CAL1.
- 4.3 Place the electrode into the zero oxygen solution for 10 minutes and stir gently. Press the **Enter** key to begin the calibration.
- 4.4 When the reading has stabilized, the display will show 100.0% / CAL2. The meter prompts you to continue with second point calibration.
- 4.5 Repeat the step 3.3 above until the meter shows **End**. Calibration is completed.



To exit the calibration without saving changes, press the **Meas** key.

## Temperature Calibration

1. Place the dissolved oxygen electrode into a solution with a known accurate temperature.
2. Press and hold the **°C** key to enter the temperature setting.
3. Press the **▲** / **▼** key to modify the temperature value.
4. Press the **Enter** key to save.



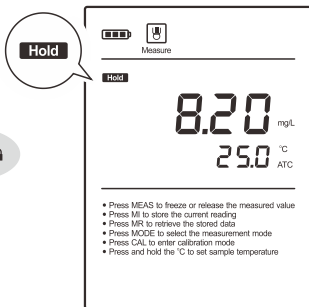
## DO Calibration in % Saturation Mode

- 3.1 Press the **Mode** key to enter the % saturation mode and select the 1 point calibration in the setup menu.

## Measurement

The 820 meter can be used to measure the water, wastewater, brine and other liquids. If your sample is seawater or water containing large amounts of salt, make sure to set the salinity coefficient before measurement. Some gas and steam such as chloride, sulfur dioxide, sulfureted hydrogen and carbon dioxide can permeate the membrane via diffusion. Their existence will influence the measurements. If the sample contains solvent, grease, sulfide and alga, the membrane will be damaged or eroded.

1. Set the barometric pressure and salinity coefficient in the setup menu.
2. Rinse the electrode with distilled water, place the electrode into the sample solution and stir gently.
3. If the Auto-Hold option in the setup menu is enabled, the meter will automatically lock the measurement endpoint and show HOLD icon. Press the **Meas** key to resume measuring. If the option is disabled, the meter will continuously measure and update the readings.



4. Wait for the measurement to stabilize and record the reading.
5. When all of the samples have been measured, rinse the electrode with distilled water.



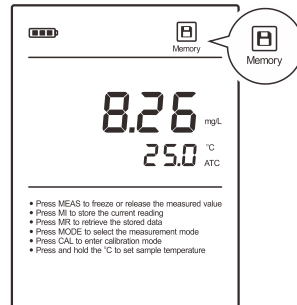
If the meter shows ---- indicating the measurement exceeds the range, remove the electrode from the sample solution immediately.

## Data Management

The 820 meter is capable of storing and recalling up to 100 data sets.

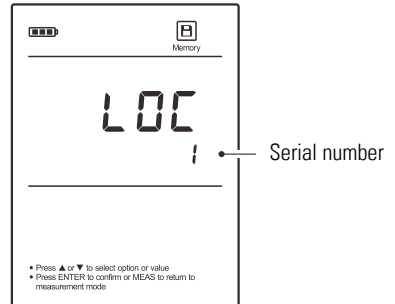
### Storing a Measurement Result

In the measurement process, press the **MI** key to store the reading into the memory, the Memory icon appears on the display.

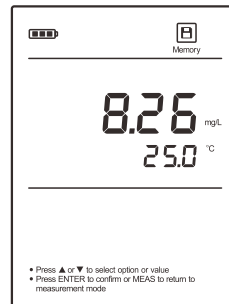


### Viewing the Data Logs

- 1.1 Press the **MR** key in the measurement mode, the meter shows the serial number of the stored data.



- 1.2 Press the ▼ key to view the stored data.



- 1.3 Press the ▼ key to view the next data set.
- 1.4 To exit the data log, press the **Meas** key.



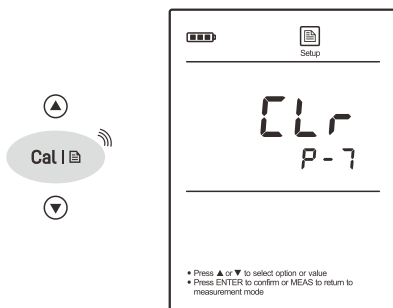


If the meter does not store any reading, the display will show ---- only.

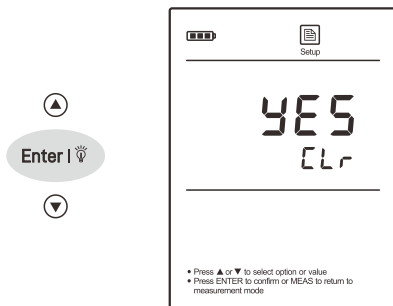
## Clearing the Data Logs

If the memory is full, the meter will show *FULL* when the **MI** key is pressed. To delete the data logs, please follow the steps below.

- 2.1 Press and hold the **Cal I** key to enter the setup menu.
- 2.2 Press the **▲** key until the meter shows *CLR/P-7*.



- 2.3 Press the **Enter** key, the meter shows *YES/CLR*.
- 2.4 Press the **▲** key to select the *YES/CLR*.
- 2.5 Press the **Enter** key to confirm.



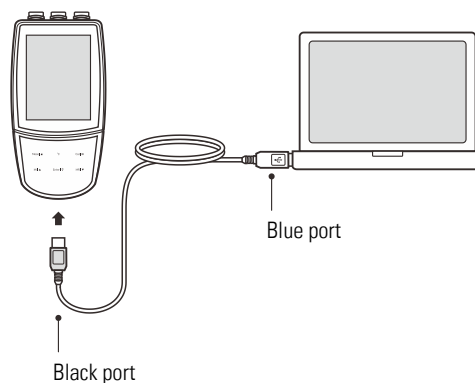
## Communication

The 820 meter can transfer the data to a computer or import the data to Excel by a DAS software. You are able to download this software from our official website.

Before installation, make sure that the Windows 10 operating system has been installed on your computer and you have a USB-2303A data cable.

### Receiving the Data

1. Connect the black port of the data cable to meter and the blue port to computer.



2. Click the **DAS\_ECO\_Series** icon, the system automatically scans an available communication port and shows a message box "Found a port on your computer".
3. Click the **OK**, the application starts.
4. Click the **Connect**, the screen shows "Port is connected".
5. Click the **OK**, then click the **Receive**, the stored data will transfer to computer automatically.



If your computer can not find a communication port, click the "PL2303\_Prolific\_DriverInstaller\_v1190.exe" to update the drive program.

### Creating an Excel File

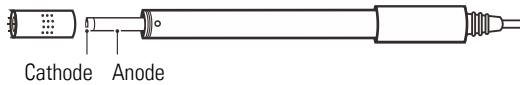
When transfer is completed, click the **Save as Excel**, the readings in data sheet will automatically convert to Excel file.



Note, once the software is closed, all received data will be lost and can not be recovered.

## Electrode Maintenance

- Rinse the dissolved oxygen electrode thoroughly with distilled water after use.
- Do not touch the membrane and always keep it clean and wet.
- If you do not use the electrode for long periods, screw off the membrane cap, rinse the electrode anode, cathode, membrane cap with distilled water and blot dry. Install the electrode and store dry.



## Appendix

### Optional Accessories

#### Dissolved Oxygen Electrode and Components

Order Code	Description
DO100	Dissolved oxygen electrode, range: 0 to 20 mg/L
DO-MEM	Membrane cap, 2 PCS/set

#### Solution

Order Code	Description
DO-ES	Electrolyte solution, 30 ml

#### Communication and Power Supply

Order Code	Description
USB-2303A	USB connector A to A, 1 m (3.3 ft) cable
DCCA-5V	DC 5V power adapter, european standard plug

### Preparation of Zero Oxygen Solution

Dissolve 500 mg of the sodium sulfate ( $\text{Na}_2\text{SO}_4$ ) reagent and a small amount of cobalt (II) chloride hexahydrate ( $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ ) in the 250 ml distilled water, mix the solution until reagent is completely dissolved.

### Preparation of Air-Saturated Water

Use an air-pump to blow air into distilled water at least 1 hour, while stirring the solution.

### Meter Specifications

Model	Bante 820
<b>Dissolved Oxygen</b>	
Range	0.00 to 20.00 mg/L
Resolution	0.01 mg/L
Accuracy	$\pm 0.5$ mg/L
Calibration Point	1 or 2 points
Temperature Compensation	0 to 50°C (32 to 122°F), automatic
Barometric Pressure Correction	450 to 850 mmHg, 60.0 to 113.3 kPa, manual
Salinity Correction	0.0 to 50.0 ppt, manual
<b>% Saturation</b>	
Range	0.0 to 200.0%
Resolution	0.1%
Accuracy	$\pm 2.0\%$
<b>Other Specifications</b>	
Memory	100 data sets
Communication Interface	USB-A
Operating Temperature	0 to 50°C (32 to 122°F)
Storage Temperature	0 to 60°C (32 to 140°F)
Relative Humidity	< 80% (non-condensing)
Display	LCD, 80 × 60 mm (3.15 × 2.36 in.)
Power Requirements	3 × 1.5V AA alkaline batteries or DC 5V power adapter
Auto-Off	30 minutes after last key pressed
Dimensions	170 (L) × 85 (W) × 30 (H) mm, (6.69 × 3.35 × 1.18 in.)
Weight	300 g (10.5 oz.)

### Troubleshooting

Fault	Cause and Corrective Action
Screen shows - - - -	Dissolved oxygen electrode does not connect to the meter or measured value is out of range.
Drifting erratic readings	Check whether the membrane cap is contaminated or the electrolyte solution is depleted.
Screen shows E r r	Electrode is broken. Replace the dissolved oxygen electrode.
Keypad is not working	Replace the batteries.

## Disposal

This product is required to comply with the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC and may not be disposed of in domestic waste. Please dispose of product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.



## Warranty

The warranty period for meter is one year from the date of shipment. Above warranty does not cover the electrode and electrolyte solution.

Out of warranty products will be repaired on a charged basis.

The warranty on your meter shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer
- Unauthorized modification or misuse
- Operation outside of the environment specifications of the products

For more information, please contact the supplier.



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