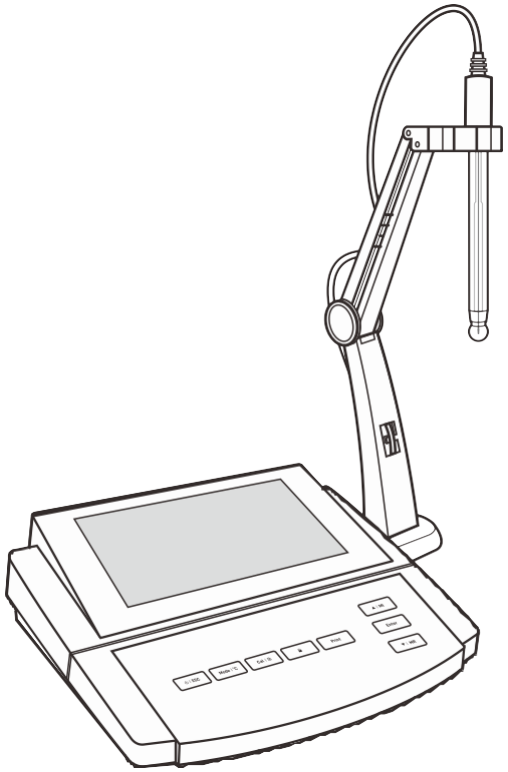
Kalstein®

YR series Laboratory pH/ORP/Ion/Conductivity/DO Meters

Models YR01827 & YR01828

USER MANUAL



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Ion

Conductivity/ TDS/Salinity/Resistivity/Conductivity Ash

Dissolved Oxygen

Data Management

Communication

General Guide

This section is applicable to all models of meters

Introduction

Thank you for selecting the A series laboratory meter, this product series includes models below.

Model	Measurement Parameters
YR01821	pH, mV, ORP
YR01825	pH, mV, ORP, ion, water hardness
YR01827	Conductivity, TDS, salinity, resistivity, conductivity ash
YR01828	Conductivity, TDS, salinity, resistivity
YR01831	Dissolved oxygen, BOD, OUR, SOUR
YR01832	Dissolved oxygen

This user manual provides a step-by-step guide to help you operate the meter, please carefully read the following instructions according to the model you have purchased.

Environmental Conditions

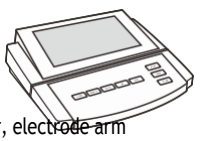
Before unpacking, ensure that current environmental conditions meet the following requirements.

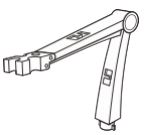
- Relative humidity is less than 80%
- Ambient temperature between 0˚C (32˚F) and 50˚C (122˚F)
- No potential electromagnetic interference
- No corrosive gas exists

Packing List

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

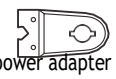
1

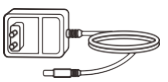




Meter, electrode arm

2





Base plate, power adapter

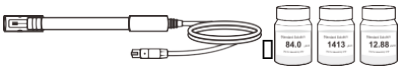
3

pH electrode, pH buffer reagents

4

Ion selective electrode, standard solutions, ionic strength adjuster ★

5



Conductivity electrode, conductivity standard solutions

6

Dissolved oxygen electrode, electrolyte solution, membrane cap

7

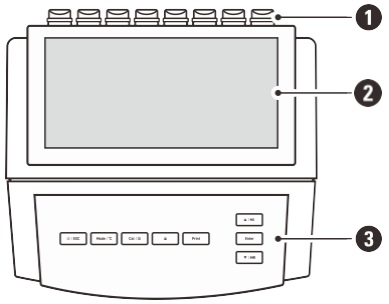
Temperature probe

Index:

Model / Components	1	2	3	4	5	6	7
YR01821/YR01825	•	•	•				•
YR01827/YR01828	•	•			•		•
YR01831/YR01832	•	•				•	

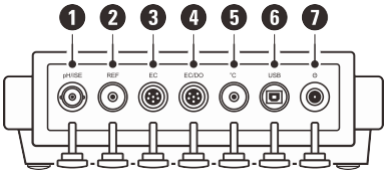
★ A131-Cn cyanide and A131-S sulfide ion meters do not provide above solutions

Meter Overview



1	Sensor connections
2	Display
3	Membrane keypad

Connectors



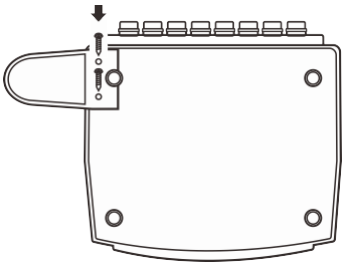
1	Socket for pH, ORP or ion selective electrode (BNC)
2	Socket for reference electrode (3.5 mm jack)
3	Socket for 4-pole conductivity electrode (6-pin DIN)
4	Socket for 2-pole conductivity electrode or dissolved oxygen electrode (6-pin DIN)
5	Socket for temperature probe (3.5 mm jack)
6	USB-B interface to the computer or printer
7	Socket for power adapter

Keypad

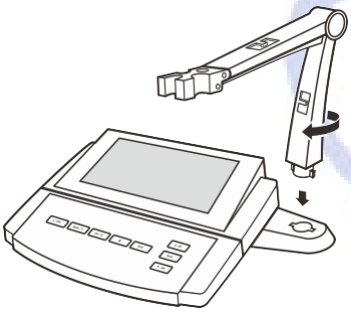
Key	Function
⏻ | ESC	• Switch the meter on or off • Return to measurement mode
Mode | °C	• Select the measurement mode • Press and hold the key to set the temperature
Cal	• Start calibration • Press and hold the key to enter the setup menu
Print	• Lock or unlock the measurement
▲ MI	• Print a measurement
▼ MR	• Store current reading to memory • Increase value or scroll up the menu items
Enter	• View the data log or calibration log • Decrease value or scroll down the menu items
	• Confirm the calibration or displayed option

Installing the Electrode Holder

1.1 Take out the electrode arm and base plate from the accessory box. Turn the meter over. Align the base plate with the circular holes on the meter, moderately tighten two screws.



1.2 The base plate of electrode arm has a circular hole, the electrode arm has a connecting rod. Insert the connecting rod into the circular hole and swivel the electrode arm 90°. Electrode holder is now ready to swing into desired position.

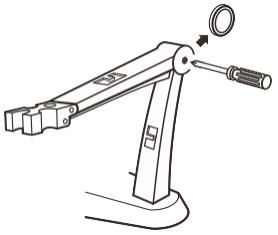


Adjusting the Electrode Arm

After installation, if the electrode arm automatically rises or falls, you are able to adjust the screw until arm locate at any position.

2.1 Remove the plastic cover from the right side of the electrode arm.

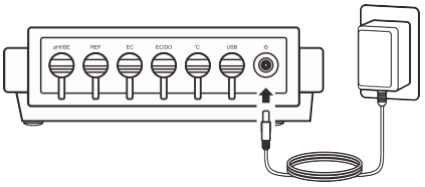
2.2 Use the screwdriver to tighten the screw moderately.



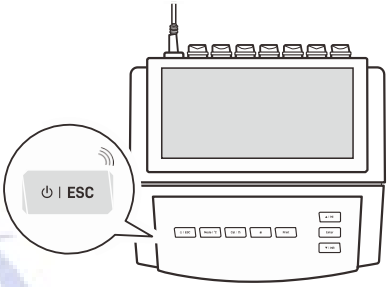
2.3 Insert the plastic cover to previous position.

Switching the Meter On and Off

1. Connect the power adapter to the meter and wall outlet.

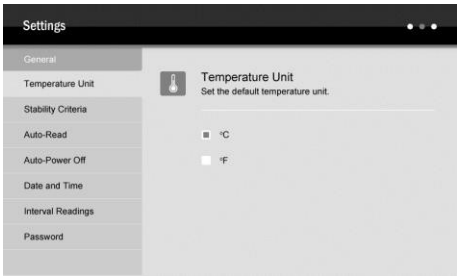


2. Press and hold the ⏻ key to switch on or off the meter.



General Settings

The YR series meter contains 10 general settings in the setup menu,the following table describes the functions of each menu item.



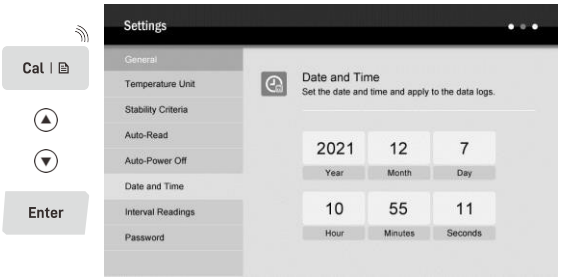
Menu Items and Options	
Temperature Unit Set the default temperature unit.	
°C	Default
°F	
Stability Criteria Set when a measurement is recognized as stable.	
Standard	Default
High-accuracy	
Auto-Read If enabled, the meter will automatically sense a stable reading and lock the measurement, the Hold icon appears on the screen.	
Enable	
Disable	Default
Auto-Power Off If enabled, the meter will automatically switch off if no key is pressed within 3 hours.	
Enable	
Disable	Default
Date and Time Set the year, month, day, hour, minute for data log and calibration log.	
Interval Readings Set the time interval for sending reading to the printer or computer.	
Off	Default
10, 30, 60 seconds	
10, 30 minutes	
Password Set the password protection for calibration and settings. If enabled, the user must enter a 4-digit password to access above modes. If the setting value is 0000, the password protection will invalid.	
Enable	
Disable	Default
Brightness Set the brightness level of backlight.	
Low, mid, high	
Clear Stored Data Delete all data logs in the memory.	
Enable	
Disable	Default
Factory Reset Reset the meter to factory default settings. If enabled, all of the meter settings and calibration logs will be deleted and reset, the meter must be recalibrated.	
Enable	
Disable	Default

Setting a Default Option

1.1 In the measurement mode, press and hold the 🖹 key to enter the setup menu.
1.2 Press the ▲ / ▼ key to select an option or set a value, press the **Enter** key to confirm.
1.3 Repeat the steps above until the meter returns to the measurement mode.

Setting the Date and Time

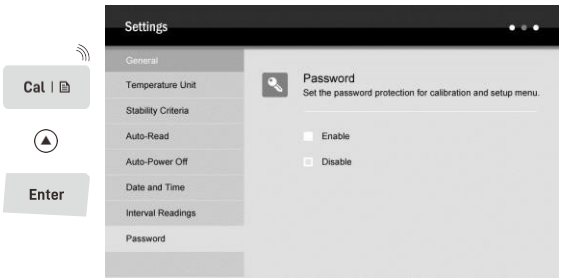
2.1 In the measurement mode, press and hold the 🖹 key to enter the setup menu.
2.2 Press the ▲ key to highlight *Date and Time*, press the **Enter** key to confirm.
2.3 Press the ▲ / ▼ key to set the Year, press the **Enter** key to save and move the cursor to Month.
2.4 Repeat the steps above to set the month, day, hour, minute until the meter returns to the measurement mode.



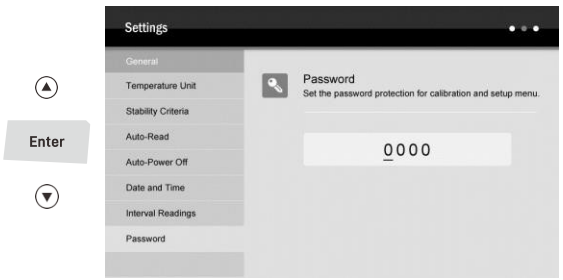
Setting the Password

3.1 In the measurement mode, press and hold the 🖹 key to enter the setup menu.

3.2 Press the ▲ key to highlight *Password*, press the **Enter** key to confirm.



3.3 Press the ▲ key to select the *Enable*. Press the **Enter** key, the screen shows 0000.

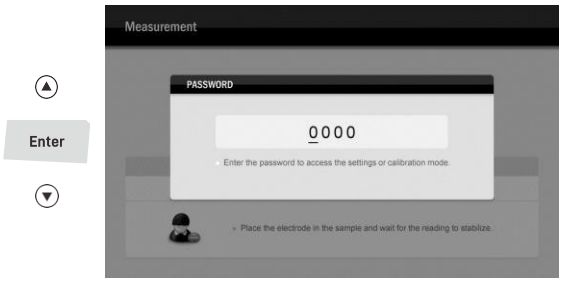


3.4 Press the ▲ / ▼ key to set the password, press the **Enter** key to confirm each digit until the meter returns to the measurement mode.

Unlock the Password

If your password has been created, the meter will show a password protection screen when pressing the🖹**Cal** key. Press the ▲ / ▼ key to enter the password, press the **Enter** key to confirm. If password is correct, the meter will unlock immediately.

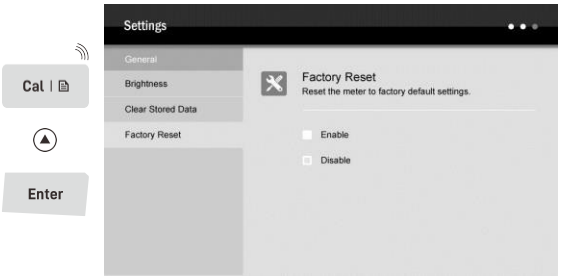
If you forgot your password, please contact the supplier and providing the serial number of meter.



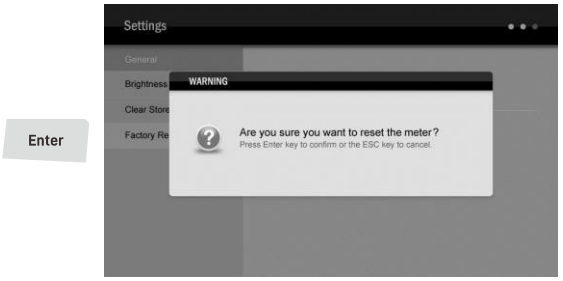
Factory Reset

4.1 In the measurement mode, press and hold the 🖹 key to enter the setup menu.

4.2 Press the ▲ key to highlight *Factory Reset*, press the **Enter** key to confirm.



4.3 Press the ▲ key to select the *Enable*, press the **Enter** key, the screen shows "Are you sure you want to reset the meter?"



4.4 Press the **Enter** key to confirm or the ESC key to cancel.

To exit the setting without saving changes, press the **ESC** key.

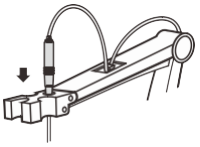
Temperature Calibration

The A series meter is supplied with a TP-10K temperature probe for measurement and temperature compensation. If the measured temperature reading differs from that of an accurate thermometer, the probe needs to be calibrated.

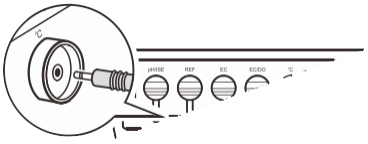
The dissolved oxygen electrode installed with a built-in temperature sensor and do not need to use this probe.

Connecting the Temperature Probe

1.1 Place the temperature probe into the circular hole located at the center of the electrode arm.

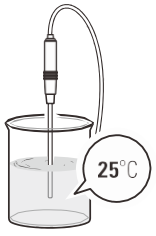


1.2 Insert the jack plug to the connector socket labeled ˚C. Ensure the connector is fully seated.



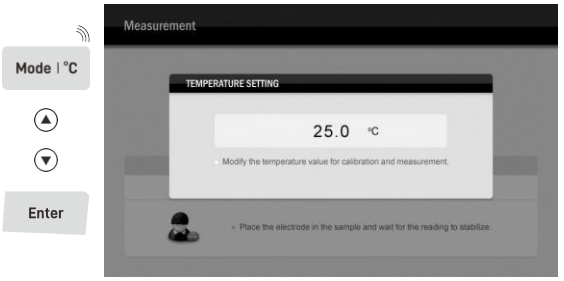
Calibrating the Temperature Probe

2.1 Place the temperature probe in a solution with a known accurate temperature and wait for the reading to stabilize.



2.2 Press and hold the **˚C** key to enter the temperature setting.

2.3 Press the ▲ / ▼ key to modify the temperature value, press the **Enter** key to save.



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

YR01821/YR01825

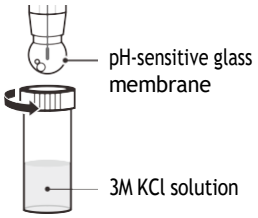
pH Calibration and Measurement

This section is applicable to models YR01821 and YR01825

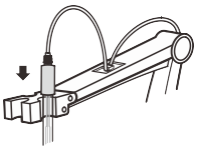
Prior to Use

Connecting the pH Electrode

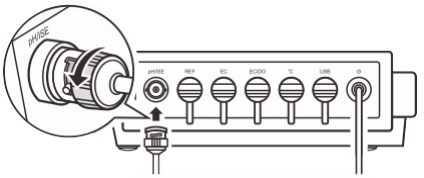
1. Take out the pH electrode from packaging. Remove the protective cap from the bottom of electrode. If tiny air bubbles are present inside the pH-sensitive glass membrane, gently shake the electrode downward to remove air bubbles.



2. Place electrode into the left or right side of the electrode arm.

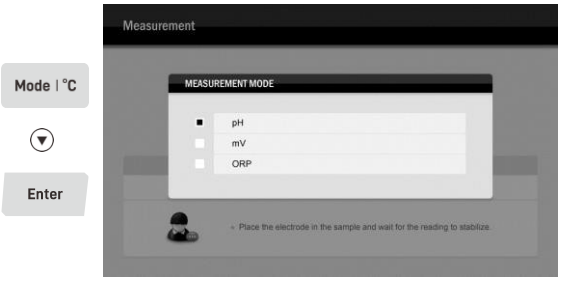


3. Insert BNC connector into the connector socket labeled pH/ISE. Rotate and push the connector clockwise until it locks.



Selecting the Measurement Mode

Press the **Mode** key and the ▼ key to select the *pH*, press the **Enter** key to confirm.



pH Settings

The A series meter contains 7 pH settings and 10 general settings in the setup menu.

Menu Items and Options	
Sample ID Set the sample ID to associate reading with the data log.	
0000 to 9999	Default 0000
pH Buffer Group Set the pH buffer group for calibration and auto-recognition.	
USA	Default
NIST	
DIN	
Custom (any 2 to 5 values > 1 pH apart)	
Calibration Points Set the number of calibration points.	
1 to 5 points	Default 3 points
Resolution Set the resolution of the pH measurement.	
0.001	Default
0.01	
STC Solution Temperature Coefficient is used to correct the pure water samples with a conductivity of less than 30 µS/cm. If enabled, the readings will automatically reference to 25˚C (77˚F).	
High purity water	
Sample contained the ammonia or phosphate	
Off	Default
Alarm Limits Set the high and low limit values to activate alarm.	
Enable (setting range: -2.00 to 20.00 pH)	
Disable	Default
Calibration Due Set the calibration interval to activate alarm.	
Enable (setting range: 1 to 31 days)	
Disable	Default

If you want to change the current settings, press and hold the key to enter the setup menu, press the ▲ / ▼ key to select an option or set a value, press the **Enter** key to confirm.

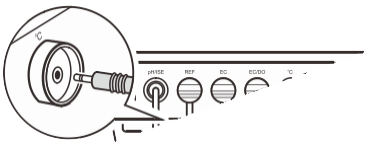
- During the setting process, press and hold the ▲ / ▼ key will make the value change faster.
- To exit the setting without saving changes, press the **ESC** key.

Temperature Compensation

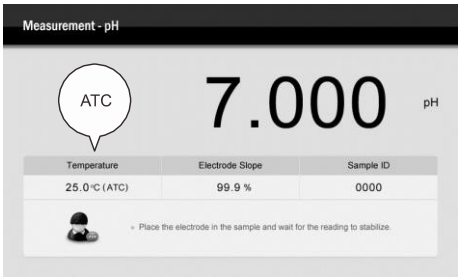
For better accuracy, we recommend the use of either a sensor with a built-in or a separate temperature probe. The meter will calculate the pH slope with measured temperature and show the temperature compensated readings.

Automatic Temperature Compensation

Connect the temperature probe to meter (refer to the ***Connecting the Temperature Probe*** section on page 8).



The ATC icon appears on the screen, the meter is now switched to the automatic temperature compensation mode.



Manual Temperature Compensation

If the meter does not detect a temperature probe, the MTC icon will show on the screen indicating the meter is switched to the manual temperature compensation mode. To set the temperature value follow the steps below.

1. Press and hold the **˚C** key to enter the temperature setting.
2. Press the ▲ / ▼ key to modify the temperature value.
3. Press the **Enter** key to save.

Press and hold the ▲ / ▼ key will make the value change faster.

pH Calibration

The A series meter allows 1 to 5 points pH calibration. We recommend that you perform at least 2 points calibration for high accuracy measurement. The meter will automatically recognize and calibrate to following standard buffer values.

USA Standard Buffers	pH 1.68, 4.01, 7.00, 10.01, 12.45
NIST Standard Buffers	pH 1.68, 4.01, 6.86, 9.18, 12.45
DIN Standard Buffers	pH 1.09, 3.06, 4.65, 6.79, 9.23, 12.75

If the Custom option is selected, the meter will allow 2 to 5 points calibration. Single point calibration should only be carried out with pH 7.00, 6.86 or 6.79, otherwise calibration will not be accepted.

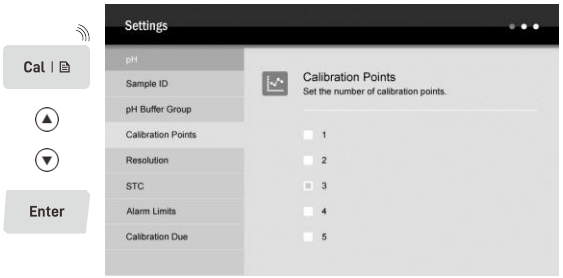
Make sure to calibrate the meter when attaching a new pH electrode or during first use. Do not reuse the buffer solutions after calibration, contaminants in solution will affect the calibration and eventually the accuracy of the measurement.

For better result, we recommend to enable the automatic temperature compensation. If the manual temperature compensation is selected, all buffer and sample solutions must be at the same temperature and you have entered the correct temperature value to the meter.

Stir the standards and samples at a uniform rate that will help you get most accurate readings.

Setting the Number of Calibration Points

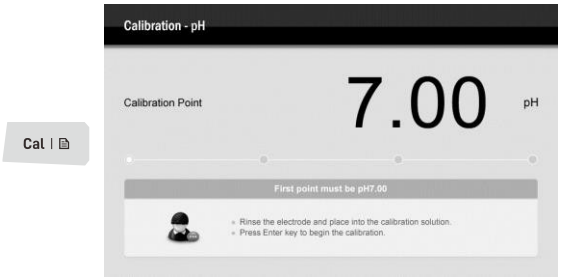
1. Press and hold the 🖹 key to enter the setup menu.
2. Press the ▼ key to highlight *Calibration Points*, press the **Enter** key to confirm.
3. Press the ▲ / ▼ key to select the number of calibration points, press the **Enter** key to save.



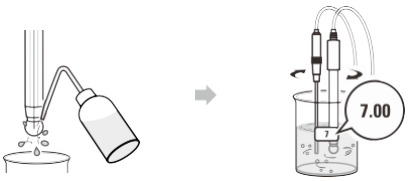
Single Point Calibration

1.1 Ensure that you have selected 1 point calibration in the setup menu.

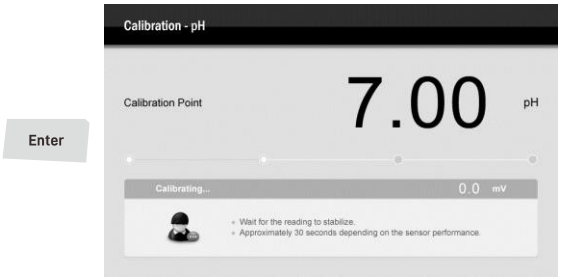
1.2 Press the **Cal** key, the screen shows "Calibration Point 7.00" (or 6.86, 6.79, depending on the selected pH buffer group).



1.3 Rinse the pH electrode with distilled water, place the electrode (and temperature probe) into the pH 7.00 buffer solution, stir gently to create a homogeneous solution.



1.4 Press the **Enter** key, the status bar shows "Calibrating..."

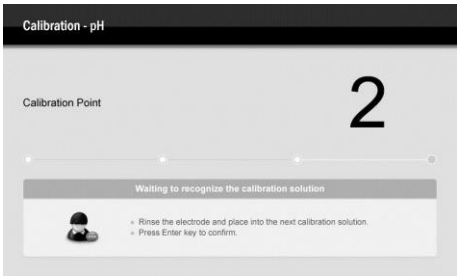


1.5 Wait for the mV reading to stabilize, the meter will automatically show "Calibration is completed" and return to the measurement mode.

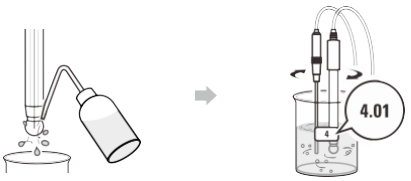
Multipoint Calibration

2.1 Ensure that you have selected 2 to 5 points calibration in the setup menu.

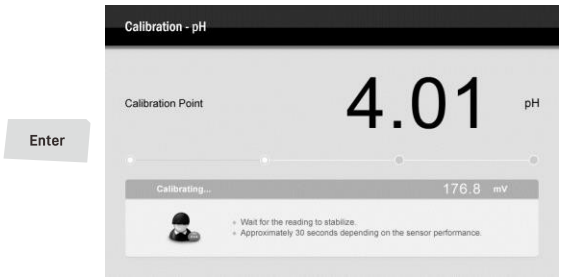
2.2 Repeat steps 1.2 through 1.4 above. When the first calibration point is completed, the screen will show "Calibration Point 2", the meter prompts you to continue with second point calibration.



2.3 Rinse the pH electrode with distilled water, place the electrode (and temperature probe) into the next buffer solution (e.g., pH 4.01).

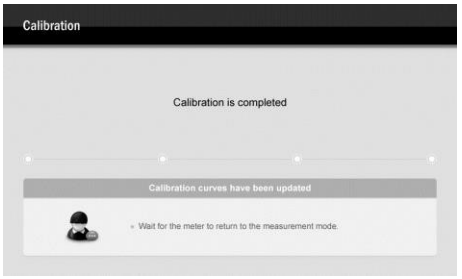


2.4 Press the **Enter** key, the meter automatically recognizes the buffer solution and begins the calibration.



2.5 When the mV reading has stabilized, the screen will show "Calibration Point 3", the meter prompts you to continue with third point calibration.

2.6 Repeat the steps 2.3 and 2.4 above until the meter returns to the measurement mode. Calibration is completed.



pH Calibration with Custom Buffers

3.1 Ensure that you have selected the *Custom* option in the setup menu, the buffer solutions should be at least 1 pH unit apart from each other.

3.2 Rinse the pH electrode with distilled water, place the electrode (and temperature probe) into the buffer solution, stir gently and wait until the measurement is stable.

3.3 Press the **Cal** key, the status bar shows "Setting the calibration value".

3.4 Press the ▲ / ▼ key to set the value, press the **Enter** key to begin the calibration.

3.5 When the mV reading has stabilized, the status bar will show "Setting the calibration value" again, the meter prompts you to continue with second point calibration.

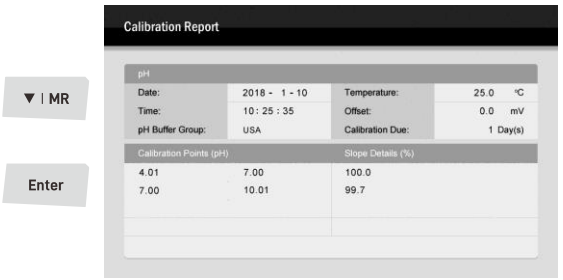
3.6 Repeat the steps 3.2 and 3.4 above until the meter returns to the measurement mode. Calibration is completed.

- If the calculated electrode slope is not between 70% to 110% after the calibration, the pH electrode should be replaced.
- To exit the calibration without saving changes, press the **ESC** key.

Viewing the Calibration Log

4.1 Press the **MR** key, the screen shows a Data Log Menu.

4.2 Press the **Enter** key to view the calibration report.

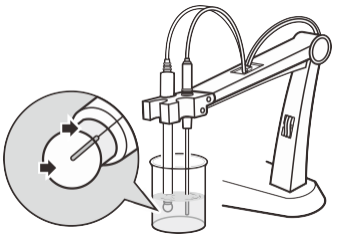


4.3 Press the **ESC** key to return to the measurement mode.

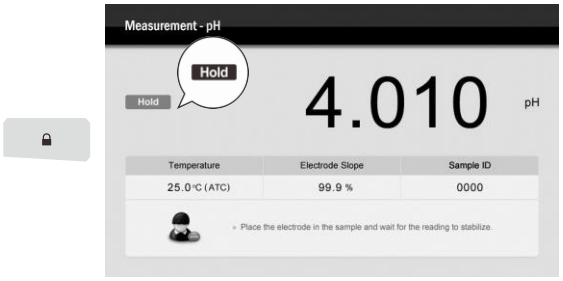
If the meter is not calibrated or custom buffer is used, the calibration report will be unavailable.

pH Measurement

1. Rinse the pH electrode with distilled water. Place the electrode (and temperature probe) into the sample solution and stir gently. Note, the pH-sensitive glass membrane and liquid junction must be completely immersed into the solution.



2. If the Auto-Read option in the setup menu is enabled, the meter will automatically sense a stable reading and lock measurement, the Hold icon appears on the screen. Press the key to resume measuring.
   If the option is disabled, the meter will continuously measure and update the readings.



3. Wait for the measurement to stabilize and record the reading.
4. When all of the samples have been measured, rinse the electrode according to the instructions in the ***Electrode Maintenance***.

- During the measurement process, never wipe the pH-sensitive glass membrane as this will cause static interference, blot dry with a lint-free tissue to remove waterdrops on electrode.
- If your sample is pure water, low ionic or low conductivity water, we recommend measuring the pH in the smallest sample volume possible or adding 0.3 ml of the 3M KCl to 100 ml of the sample solution. Note, only high purity KCl can be used.
- To record the measurement at the predefined time intervals, refer to the ***Interval Readings*** section on page 42.

Electrode Maintenance

Cleaning the pH Electrode

Since pH electrode is susceptible to contamination, thoroughly clean as necessary after each use.

- General Cleaning
  Rinse the pH electrode with distilled water and soak in 3M KCl solution.

- Salt Deposits
  Dissolve the deposit by immersing the electrode in warm tap water. Rinse the electrode with distilled water and soak in 3M KCl solution.

- Oil or Grease
  Place the electrode in the detergent or ethanol solution for 15 minutes. Rinse the electrode with distilled water and soak in 3M KCl solution.

- Protein
  (1) Add 1% pepsin to 0.1M HCl solution.
  (2) Place the electrode in above solution for 15 minutes.
  (3) Rinse the electrode with distilled water and soak in 3M KCl solution.

- Clogged Liquid Junction
  (1) Heat a diluted KCl solution to 60°C (140°F).
  (2) Place the electrode into the heated solution for 10 minutes.
  (3) Allow the electrode to cool in unheated KCl solution.

Reactivating the pH Electrode

If the pH-sensitive membrane has dried out, the electrode response will become sluggish. Immerse the electrode in a pH 4.01 buffer solution for about 30 minutes to rehydrate. If this fails, the electrode requires activation.

1. Soak the electrode in a 0.1M of HCl for 10 minutes.
2. Remove and rinse with distilled water, then place into a 0.1M of NaOH for 10 minutes.
3. Remove and rinse again, and soak in 3M KCl solution for at least 6 hours.

If these steps fail to restore the response, replace the electrode.

Storing the pH Electrode

- For best results, always soak the electrode in 3M KCl solution.
- If above solution is not available, use a pH 4.01 buffer solution.

- DO NOT store the electrode in distilled or deionized water that will deplete the hydration layer of the pH-sensitive membrane and render the electrode useless.
- If you do not use the electrode for a period longer than 1 month, store the electrode in storage solution.

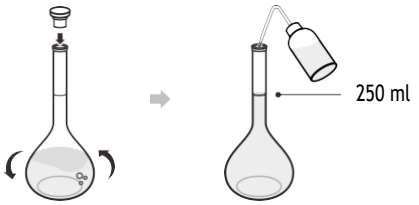
Appendix

Preparation of pH Buffer Solutions

The meter is packaged with the pH 4.01, 7.00, 10.01 buffer reagents required for calibration.

1. Half fill a 250 ml volumetric flask with distilled water and add the pH 7.00 buffer reagent.

2. Swirl the volumetric flask gently to dissolve the reagent and fill to the mark with distilled water.



3. Cap and upend the volumetric flask several times to mix the solution.

- Preparation of pH 4.01 and 10.01 buffer solutions are the same as above.
- Prepared buffer solution should be stored in hermetically sealed glass container and avoid direct sunlight.

Preparation of Electrode Storage Solution

- Dissolve 24.6 grams of analytical grade potassium chloride (KCl) reagent in 100 ml distilled water.
- Add pH 4.01 standard buffer and adjust solution to pH 4.

Optional Accessories

pH Electrodes

Order Code	Description
E201-BNC	For general purpose applications
E202-BNC	For measuring the flat surface samples
P11	For measuring the non-high temperature liquids
P11-LiCl	For measuring the non-aqueous samples
P11-NA	For measuring the biofuels
P13	For measuring the micro-volume samples
P15	For measuring the low conductivity samples
P16	For measuring the liquids with Tris buffers
P18	For measuring the slurries or soils
P19	For measuring the semisolids
P21	For measuring the colloids
P22	For measuring the high temperature liquids

Temperature Probe

Order Code	Description
TP-10K	Range: 0 to 100°C (32 to 221°F), 1 m (3.3 ft.) cable

Solutions

Order Code	Description
PHCS-USA	pH 4.01, 7.00, 10.01 buffer solutions, 480 ml
PHCS-NIST	pH 4.01, 6.86, 9.18 buffer solutions, 480 ml
PHCS-ES	Electrode storage solution, 480 ml
PHCS-GC	Removes inorganic residues, 480 ml
PHCS-PR	Removes protein contamination, 480 ml

Communication and Power Supply

Order Code	Description
USB-2303B	USB connector A to B, 1 m (3.3 ft.) cable
DCPA-12V	DC 12V power adapter, european standard plug

Electrode Maintenance

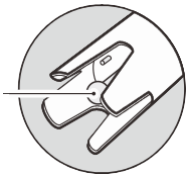
- Rinse the ORP electrode thoroughly with distilled water after use.
- In the corrosive chemicals, viscous solutions and solutions with heavy metals or proteins, take readings quickly and rinse electrode immediately.
- If the electrode response becomes sluggish, refer to theinstructions below to clean the electrode.

(1) Inorganic Deposits
Place the electrode in 0.1M HCl solution for 10 minutes. Rinse the electrode with distilled water and soak in 4M KCl solution for at least 6 hours.

(2) Oil or Grease
Place the electrode in detergent such as dishwashing liquid for about 30 minutes. Rinse the electrode with distilled water and soak in 4M KCl solution.

(3) If the platinum sensing element is severely contaminated, polish the platinum surface gently with an abrasive paper of 600 grid. Place the electrode in 0.1M HCl solution for 10 minutes. Remove and rinse with distilled water, then soak in 4M KCl solution for at least 6 hours.
If the electrode does not restore normal performance, replace the electrode.

Platinum sensing element



Storing the ORP Electrode

If you do not use the electrode for long periods, store the electrode in4M KCl solution or storage solution.

Appendix

Preparation of ORP Standard Solutions

Quinhydrone solution A: Dissolve 3 grams of quinhydrone reagent in 500 ml of the pH 4.01 buffer solution, stir the solution for 10 minutes. Undissolved quinhydrone reagent must be present. If necessary, add the reagent.

Temperature	Potential (±10 mV)
20˚C	268 mV
25˚C	263 mV
30˚C	260 mV

Quinhydrone solution B: Dissolve 3 grams of quinhydrone reagent in 500 ml of the pH 7.00 buffer solution, stir the solution for 10 minutes. Undissolved quinhydrone reagent must be present. If necessary, add the reagent.

Temperature	Potential (±10 mV)
20˚C	94 mV
25˚C	87 mV
30˚C	80 mV

Due to the quinhydrone solution is susceptible to air oxidation in storage, make sure to prepare the fresh solution before use.

Preparation of Electrode Storage Solution

- Dissolve 29.8 grams of analytical grade potassium chloride (KCl) reagent in 100 ml distilled water.
- Add pH 4.01 standard buffer and adjust solution to pH 4.

YR01827/YR01828

Conductivity/ TDS/Salinity/ Resistivity/Conductivity Ash

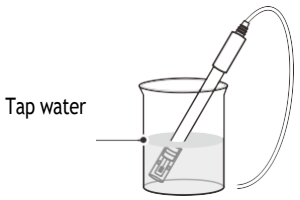
Calibration and Measurement

This section is applicable to models YR01827 and YRO1828 meters

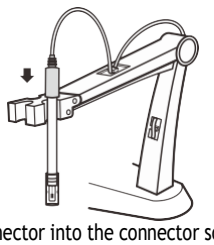
Prior to Use

Connecting the Conductivity Electrode

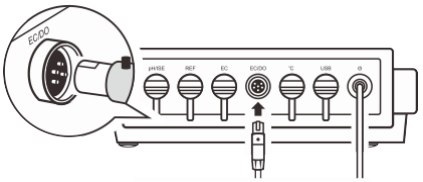
1. Take out the conductivity electrode from packaging. Soak the electrode for about 10 minutes in tap water to remove dirt and oil stains on the sensor surface.



2. Place electrode into the left or right side of the electrode arm.

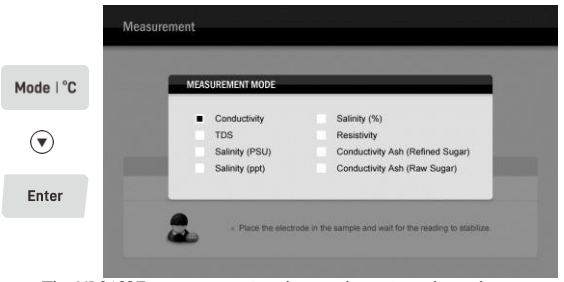


3. Insert 6-pin connector into the connector socket labeled EC/DO. Ensure the connector is fully seated.



Selecting the Measurement Mode

Press the **Mode** key and the ▼ key to select the conductivity, TDS, salinity or resistivity mode, press **Enter** key to confirm.



The YR01827 meter contains the conductivity ash modes.

Conductivity/ TDS Settings

The A series meter contains 9 conductivity settings, 1 TDS setting and 10 general settings in the setup menu.

Menu Items and Options	

Sample ID
Set the sample ID to associate reading with the data log.

0000 to 9999	Default 0000

Cell Constant
Set the cell constant to match connected electrode.

2-pole electrode (K= 0.1)	
2-pole electrode (K=1)	Default
2-pole electrode (K=10)	
4-pole electrode	

Calibration Points
Set the number of calibration points.

1 to 3 points	Default 3 points

Temperature Coefficient
Set the temperature compensation type and coefficient.
The linear temperature compensation is appropriate for most samples. If the current samples are belong to the natural water, using the non-linear compensation is necessary. Note, non-linear compensation can only be performed at temperature from 0 to 36°C. If the temperature reading is out of above range, the meter will show a warning.

Linear (setting range: 0.0 to 10.0%/°C)	Default 2.1%/°C
Non-linear	

Pure Water Coefficient
The pure water coefficient is used to correct the sample solution with a conductivity of less than 5 µS/cm. If enabled, the meter will be automatically calculated and applied coefficient for ultra-pure water measurement.

Enable	
Disable	Default

Reference Temperature
Set the normalization temperature for measurement, the readings will automatically compensate to the selected temperature during the measurement.

25°C	Default
20°C	

TDS Factor
Set the default TDS conversion factor.

0.01 to 1.00	Default 0.50

Alarm Limits
Set the high and low limit values to activate alarm.

Enable (setting range: 0 to 999 µS/cm or mS/cm)	
Disable	Default

Calibration Due
Set the calibration interval to activate alarm.

Enable (setting range: 1 to 31 days)	
Disable	Default

If you want to change the current settings, press and hold the key to enter the setup menu, press the ▲ / ▼ key to select an option or set a value, press the **Enter** key to confirm.

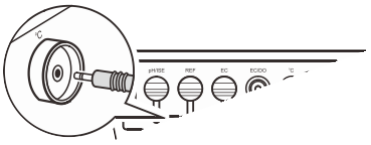
- During the setting process, press and hold the ▲ / ▼ key will make the value change faster.
- To exit the setting without saving changes, press the **ESC** key.

Temperature Compensation

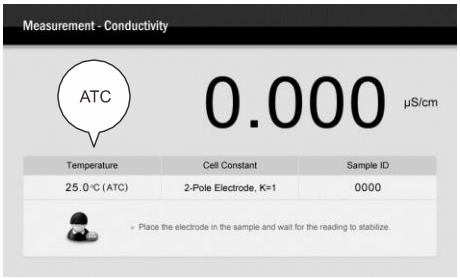
The temperature compensation has a large effect on the conductivity measurement. If enabled, the meter will use the measured conductivity and temperature readings to calculate the result and automatically compensate to the selected reference temperature. If the temperature coefficient is set to 0, the temperature compensation will be disabled, the meter only shows the actual conductivity at the measured temperature.

Automatic Temperature Compensation

Connect the temperature probe to meter (refer to the ***Connecting the Temperature Probe*** section on page 8).



The ATC icon appears on the screen, the meter is now switched to the automatic temperature compensation mode.



Manual Temperature Compensation

If the meter does not detect a temperature probe, the MTC icon will show on the screen indicating the meter is switched to the manual temperature compensation mode. To set the temperature value follow the steps below.

1. Press and hold the **°C** key to enter the temperature setting.
2. Press the ▲ / ▼ key to modify the temperature value.
3. Press the **Enter** key to save.

Press and hold the ▲ / ▼ key will make the value change faster.

Selecting a Conductivity Electrode

The A series meter is capable of using three types of the conductivity electrodes. Before the calibration and measurement, ensure that you have selected a suitable electrode according to the anticipated sample conductivity. The following table lists the selectable electrode and its effective measurement ranges.

Electrode	Measurement Range	Cell Constant
CON-0.1	0.5 to 100 µS/cm	K = 0.1
CON-1	10 µS/cm to 20 mS/cm	K = 1
CON-10	100 µS/cm to 200 mS/cm	K = 10

If the 4-pole conductivity electrode is selected, its best measurement range will be 100 µS/cm to 200 mS/cm.

Conductivity Calibration

The A series meter allows 1 to 3 points conductivity calibration. Before calibration, ensure that selected cell constant (K=0.1, 1, 10) matches connected electrode.

For better accuracy, we recommend to perform 3 points calibration or select a standard solution closest to the sample conductivity you are measuring. The meter will automatically detect the standard solution and prompt the user to perform the calibration. The following table shows the default standard solution for each measurement range.

Measurement Range	Default Standard Solution
0 to 20 µS/cm	10 µS/cm
20 to 200 µS/cm	84 µS/cm
200 to 2000 µS/cm	1413 µS/cm
2 to 20 mS/cm	12.88 mS/cm
20 to 200 mS/cm	111.8 mS/cm

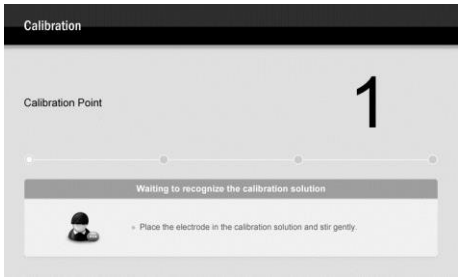
Single Point Calibration

1.1 Ensure that the meter is in the conductivity mode and you have selected 1 point calibration in the setup menu.

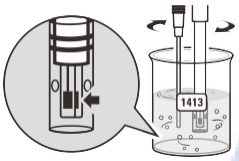
1.2 Rinse the conductivity electrode with distilled water, then rinse with a small amount of standard solution.

1.3 Press the **Cal** key, the meter shows "Calibration Point 1" and waits for recognizing the standard solution.

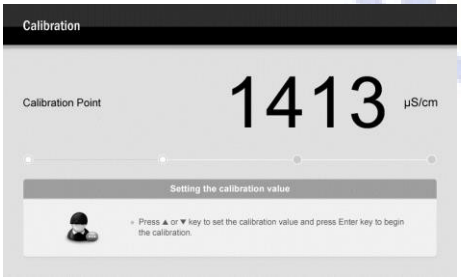
Cal | 🖹



1.4 Place the electrode (and temperature probe) into the standard solution, stir gently to remove air bubbles trapped in the slot of the sensor.

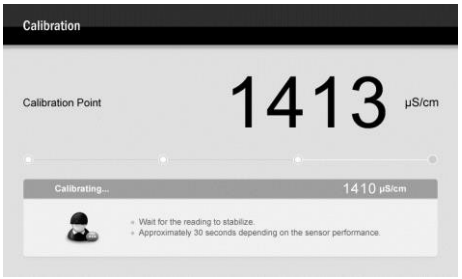


The meter will automatically show current calibration standard (e.g., 1413 µS/cm). If necessary, press the ▲ / ▼ key to modify the calibration value.

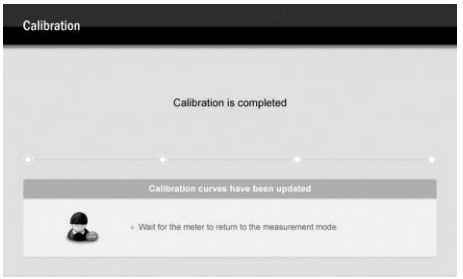


1.5 Press the **Enter** key, the status bar shows "Calibrating…"

Enter



1.6 Wait for the conductivity reading to stabilize, the meter will show "Calibration is completed" and return to the measurement mode.



Multipoint Calibration

2.1 Ensure that you have selected 2 to 3 points calibration in the setup menu. When the first calibration point is completed, the screen will show "Calibration Point 2", the meter prompts you to continue with second point calibration.

2.2 Rinse the conductivity electrode with distilled water, then rinse with a small amount of standard solution.

2.3 Repeat the steps 1.4 and 1.5 above until the meter returns to the measurement mode. Calibration is completed.

- Performing the conductivity calibration will simultaneously calibrate the corresponding TDS, salinity, resistivity and conductivity ash values.
- To exit the calibration without saving changes, press the **ESC** key.

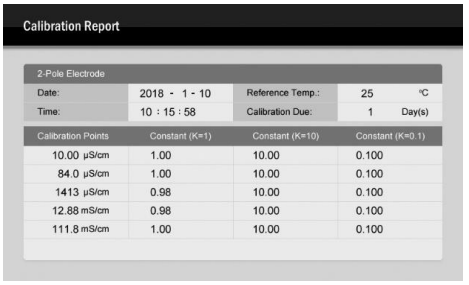
Viewing the Calibration Log

3.1 Press the **MR** key, the screen shows a Data Log Menu.

3.2 Press the **Enter** key to view the calibration report.

▼ | MR

Enter



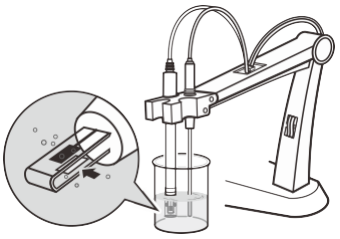
3.3 Press the **ESC** key to return to the measurement mode.

If the meter is not calibrated, the calibration report will be unavailable.

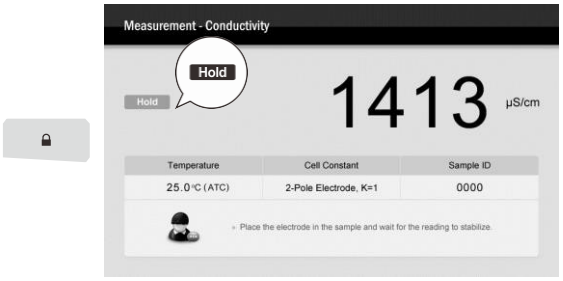
Measurements

Conductivity/ TDS/Salinity/ Resistivity Measurement

1.1 Rinse the conductivity electrode with distilled water. Place the electrode (and temperature probe) into the sample solution and stir gently. Ensure that no air bubbles on the sensor surface.



1.2 If the Auto-Read option in the setup menu is enabled, the meter will automatically sense a stable reading and lock measurement, the Hold icon appears on the screen. Press the key to resume measuring.
If the option is disabled, the meter will continuously measure and update the readings.



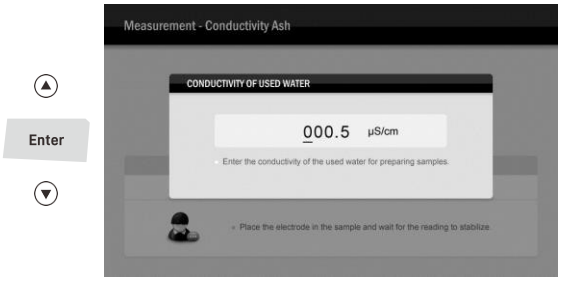
1.3 Wait for the measurement to stabilize and record the reading.
1.4 When all of the samples have been measured, rinse the electrode with distilled water.

- If the meter shows "Measured values exceed the range", replace a conductivity electrode that is appropriate for the conductivity range of the sample solution you are measuring.
- To record the measurement at the predefined time intervals, refer to the ***Interval Readings*** section on page 42.

Conductivity Ash Measurement

The YR01827 meter contains two conductivity ash measurement modes including the Refined Sugar (ICUMSA GS2/3-17 standard) and RawSugar (ICUMSA GS1/3/4/7/8-13 standard).

2.1 Prepare the sugar sample according to the selected ICUMSA method.
2.2 Press the **Mode** key and the ▼ key to select the either Refined Sugar or Raw Sugar measurement mode.
2.3 Press the **Enter** key, the screen shows an input window and waits for entering the conductivity of the used water for preparing sugar solution (range: 0.0 to 100.0 µS/cm).
2.4 Press the ▲ / ▼ key to set the value, press the **Enter** key to confirm. When the setting is completed, the meter will begin the measurement.

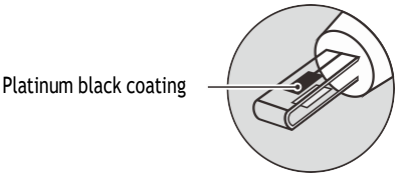


2.5 Rinse the conductivity electrode with distilled water, place the electrode (and temperature probe) into the sample solution and stir gently. Wait for the measurement to stabilize and record the reading.
2.6 When all of the samples have been measured, rinse the electrode with distilled water.

Conductivity ash measurement can only be performed at temperature range from 15°C to 25°C. If the temperature reading is out of above range, the meter will show a warning.

Electrode Maintenance

- Rinse the conductivity electrode thoroughly with distilled water after use.
- Do not touch the platinum black coating on the sensor surface and always keep it clean.



- If there is a build-up of solids inside the sensor, remove carefully, then recalibrate the electrode.
- If you do not use the electrode for long periods, wipe clean with a lint-free tissue and store the electrode in a dry and cool area.
- If your electrode is model CON-10, store the electrode with tap water. This sensor needs to be kept wet always.

Appendix

Preparation of Conductivity Standard Solutions

1. Place the analytical grade potassium chloride (KCl) in a beaker and dry in an oven for about 3 hours at 105˚C (221˚F), then cool to room temperature.
2. Add the reagent to a 1 liter volumetric flask according to the instructions in table below.
3. Fill the distilled water to the mark, mix the solution until the reagent is completely dissolved.

Conductivity Standard	Reagent	Weight
84 µS/cm	KCl	42.35 mg
1413 µS/cm	KCl	745.5 mg
12.88 mS/cm	KCl	7.45 g
111.8 mS/cm	KCl	74.5 g

Calculating the Temperature Coefficient

1. Do not connect the temperature probe to the meter.
2. Press and hold the **˚C** key to enter the temperature setting.
3. Press the ▲ / ▼ key to set the temperature to 25˚C and press the **Enter** key to confirm.
4. Place the conductivity electrode into the sample solution, record the temperature value T_A and conductivity value C_{TA}.
5. Condition the sample solution and electrode to a temperature T_B that is about 5 to 10˚C different from T_A. Record the conductivity value C_{TB}.
6. Calculate the temperature coefficient using the formula below.

$$T_C = [C_{TB} - C_{TA}] / [C_{TA}(T_B - 25) - C_{TB}(T_A - 25)]$$

Where:
T_C = Temperature coefficient
C_{TA} = Conductivity at temperature A
C_{TB} = Conductivity at temperature B
T_A = Temperature A
T_B = Temperature B

Calculating the Cell Constant

1. Reset the meter.
2. Place the electrode into a standard solution and record the reading.
3. Calculate the cell constant using the following formula.

$$K = (C_{std} / C_{meas}) \times G$$

Where:
K = Cell constant
C_{std} = Value of conductivity standard solution
C_{meas} = Measured value
G = Raw cell constant (0.1, 1 or 10)

Calculating the TDS Conversion Factor

To determine the TDS factor of sample solution use the formula below.

Factor = Actual TDS / Actual Conductivity @25˚C

Where:
Actual TDS = value from the high purity water and precisely weighed NaCl or KCL reagent
Actual Conductivity = the meter measured conductivity value

For example:
Dissolve 64 grams of the potassium chloride (KCl) reagent in 1 liter distilled water. If measured conductivity is 100 mS/cm, then TDS factor is 0.64.

Conductivity to TDS Conversion Factors

Conductivity at 25˚C	TDS (KCl)		TDS (NaCl)	
	ppm	Factor	ppm	Factor
84 µS/cm	40.38	0.5048	38.04	0.4755
1413 µS/cm	744.7	0.527	702.1	0.4969
12.88 mS/cm	7447	0.5782	7230	0.5613

Optional Accessories

Conductivity Electrodes

Order Code	Description
CON-0.1	For measuring the pure water
CON-1	For general purpose applications
CON-10	For measuring the high conductivity liquids

Temperature Probe

Order Code	Description
TP-10K	Range: 0 to 100˚C (32 to 221˚F), 1 m (3.3 ft.) cable

Solutions

Order Code	Description
ECCS-84	Conductivity standard solution 84 µS/cm, 480 ml
ECCS-1413	Conductivity standard solution 1413 µS/cm, 480 ml
ECCS-1288	Conductivity standard solution 12.88 mS/cm, 480 ml
ECCS-1118	Conductivity standard solution 111.8 mS/cm, 480 ml

Communication and Power Supply

Order Code	Description
USB-2303B	USB connector A to B, 1 m (3.3 ft.) cable
DCPA-12V	DC 12V power adapter, european standard plug

Data Management

This section is applicable to all models of meters

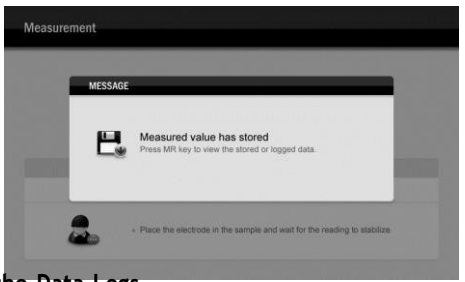
Data Management

The YR series meter is capable of storing and recalling up to 1000 data sets.

Storing a Measurement Result

During the measurement, press the **MI** key to store the reading into the memory, the screen shows "Measured value has stored".

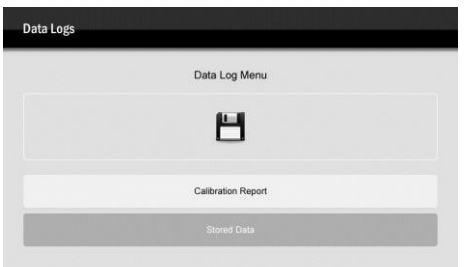
▲ | MI



Viewing the Data Logs

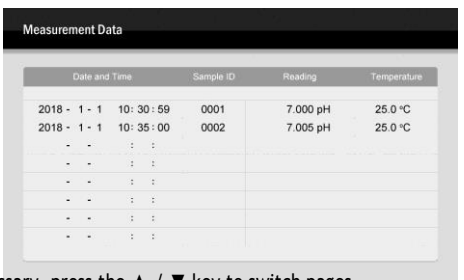
1.1 Press the **MR** key and the ▼ key to select the *Stored Data*.

▼ | MR



1.2 Press the **Enter** key, the screen shows a measurement data list.

Enter



1.3 If necessary, press the ▲ / ▼ key to switch pages.
1.4 Press the **ESC** key to return to the measurement mode.

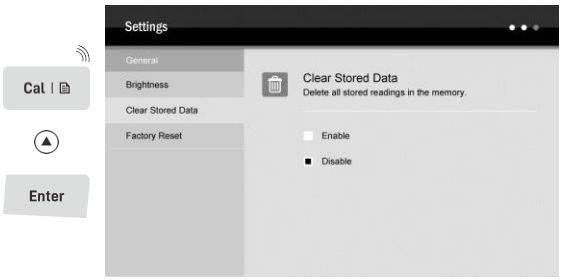
If the meter is not store any data, the screen will show a blank page only.

Deleting the Data Logs

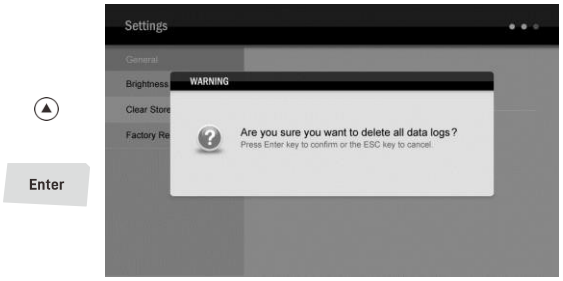
If the memory is full, the meter will automatically show a reminder when the **MI** key is pressed. To delete data log, please follow the steps below.

2.1 Press and hold the key to enter the setup menu.

2.2 Press the ▲ key to select the *Clear Stored Data*, press the **Enter** key to confirm.



2.3 Press the ▲ key to select the *Enable*. Press the **Enter** key, the screen shows "Are you sure you want to delete all date logs?"



2.4 Press the **Enter** key to confirm or the ESC key to cancel.

Print

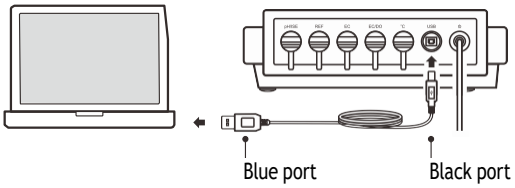
Connect the USB cable to the meter and printer (order code: AB58-GK). Press the **Print** key to print the displayed reading or data logs.

Communication

The YR series meter can transfer the data to a computer or import thedata to Excel by a DAS software. You are able to download this software from our official website. Before installation, ensure that the Windows 10 operating system has been installed on your computer and you have a USB-2303B 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_A_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.

Interval Readings

The A series meter contains an Interval Readings option in setup menu. If enabled, the meter will automatically send the measurement data to a printer or computer at the predefined time.

1. Press and hold the key to enter the setup menu.
2. Press the ▲ key to select the *Interval Readings*, press the **Enter** key to confirm.
3. Press the ▲ / ▼ key to select a predefined time, press the **Enter** key to return to the measurement mode.
4. If the meter has been connected to a computer, click the **Receive** button, the measurement data will automatically transfer to DAS software.
   If the meter has been connected to a printer, press the **Print** key to print the displayed reading.

- Note, the first data needs 1 minute to be shown on the screen.
- Do not press any key on meter during the Interval Readings mode that will cause the communication interruption.

Specifications

This section is applicable to all models of meters

Meter Specifications

pH

Range	-2.000 to 20.000 pH
Resolution	0.001, 0.01 pH
Accuracy	±0.002 pH
Calibration Points	1 to 5 points
pH Buffer Options	USA (pH 1.68, 4.01, 7.00, 10.01, 12.45)
	NIST(pH 1.68, 4.01, 6.86, 9.18, 12.45)
	DIN (1.09, 3.06, 4.65, 6.79, 9.23, 12.75)
Temperature Compensation	0 to 100°C (32 to 212°F)

ORP

Range	±2000.0 mV
Resolution	0.1 mV
Accuracy	±0.2 mV
Calibration Point	1 point (only for ORP mode)

Ion Concentration

Range	0.001 to 30000 ppm, mg/L, mol/L, mmol/L
Resolution	0.001, 0.01, 0.1, 1
Accuracy	±0.5% F.S. (monovalent)
	±1% F.S. (divalent)
Calibration Points	2 to 5 points
Calibration Solutions	0.001, 0.01, 0.1, 1, 10, 100, 1000, 10000
Temperature Compensation	0 to 100°C (32 to 212°F)

Water Hardness

Range	0.05 to 200 mmol/L
Resolution	0.01, 0.1, 1
Accuracy	±1% F.S.
Calibration Point	2 to 5 point
Calibration Solutions	0.01, 0.1, 1, 10, 100 mmol/L
Temperature Compensation	0 to 50°C (32 to 122°F)

Conductivity

Range	0.01 µS/cm to 200.0 mS/cm
Resolution	0.001, 0.01, 0.1, 1
Accuracy	±0.5% F.S.

Calibration Points	1 to 3 points
Calibration Solutions	10 µS/cm, 84 µS/cm, 1413 µS/cm,
	12.88 mS/cm, 111.8 mS/cm
Temperature Compensation	0 to 100°C (32 to 212°F)
Temperature Coefficient	Linear (0.0 to 10.0%/°C)
	Non-linear
	Pure water
Reference Temperature	20°C or 25°C
Cell Constant	2-pole electrodes (K=0.1, 1, 10)
	4-pole electrode

TDS

Range	0.00 to 100.0 g/L (max. 200 g/L)
Resolution	0.01, 0.1, 1
Accuracy	±1% F.S.
TDS Factor	0.01 to 1.00 (default 0.50)

Salinity

Range	0.00 to 80.00 ppt, 0.00 to 42.00 psu
	0.00 to 8.00%
Resolution	0.01
Accuracy	±1% F.S.

Resistivity

Range	0.00 to 30.00 MΩ
Resolution	0.01, 0.1
Calibration Solutions	±1% F.S.

Conductivity Ash

Range	0.00 to 100%
Resolution	0.01, 0.1, 1
Accuracy	±1% F.S.
Measurement Modes	Refined sugar or raw sugar

Dissolved Oxygen

Range	0.00 to 20.00 mg/L, 0.0 to 200.0% saturation
Resolution	0.01
Accuracy	±0.2 mg/L, ±2.0%
Calibration Points	1 or 2 points
Temperature Compensation	0 to 50°C (32 to 122°F)
Pressure Correction	60.0 to 112.5 kPa, 450 to 850 mmHg
Salinity Correction	0.0 to 50.0 g/L

Temperature

Range	0 to 105°C (32 to 221°F)
Resolution	0.1°C (0.1°F)
Accuracy	±0.5°C (±0.9°F)
Calibration Point	1 point

Other Specifications

Memory	1000 data sets
Communication Interface	USB-B
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	7 in. TFT LCD
Power Requirements	DC 12V/2A power adapter
Dimensions	240 (L) × 220 (W) × 80 (H) mm (9.4 × 8.6 × 3.1 in.)
Weight	1.7 kg (3.7 lb)

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 electrodes and standard solutions.
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.