Kalstein

Model YR01825

Laboratory pH/Ion Meter

# Instruction Manual

Thank you very much for purchasing our Laboratory pH/Ion Meter YR01825.

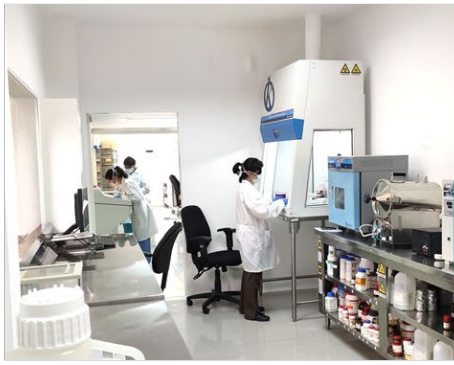
Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a hand place for future reference.

 Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

OUR SERVICES

# Benefits and Support

In Kalstein France, we take care of the full satisfaction of our customers, that is why we provide value-added services of the highest level based on our experience.



### Online Inductions and Trainings

In any part of the world, receive your induction or training from our specialized team of engineers

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Our work team is always available to response all your consults or questions, in order to support you in any situation.

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### Kalstein Worldwide

With more than 25 years growing with our customers, Kalstein's multiformat and modern content, is now present in more than 10 countries and increasing.

# Table of Contents

# General Guide

## Introduction

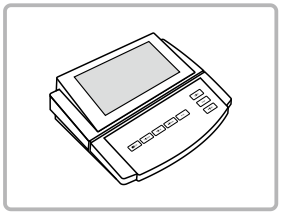
Thank you for selecting the YR01825 laboratory pH/ion meter. This manual provides a step-by-step guide to help you operate the meter, please carefully read the following instructions before use.

### Unpacking

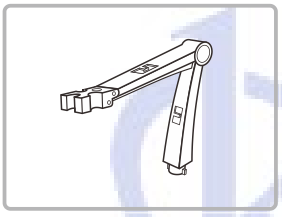
Before unpacking, ensure that the current work environment meets the following conditions.

- Relative humidity is less than 80%.
- Ambient temperature is greater than 0°C/32°F and less than 50°C/122°F.
- No potential electromagnetic interference.

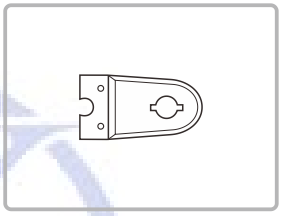
The following list describes the standard components of meter. After the unpacking, please check all components are complete. If any are damaged or missing, please contact the supplier.



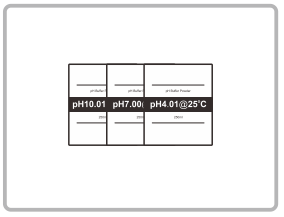
- YR01825 pH/ion meter



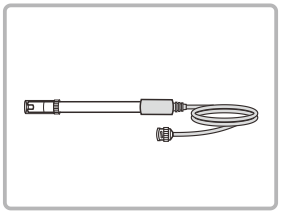
- Electrode arm



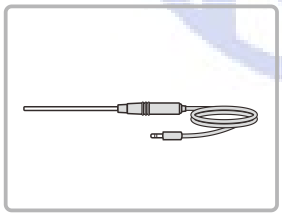
- Base plate



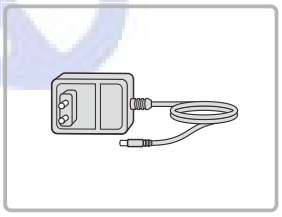

- pH buffer sachets



- pH electrode

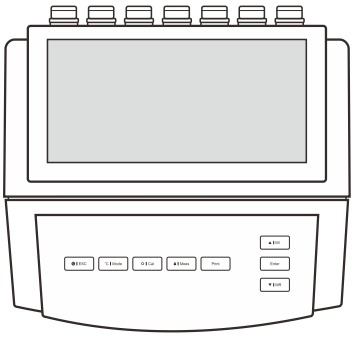


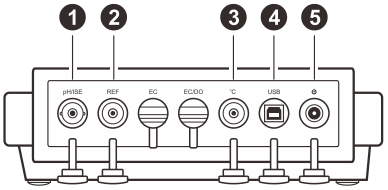
- Temperature probe



- DC12V power adapter

# Meter Overview






## Connector

| No. | Name and Icon | Description |
|---|---|---|
| 1 | pH/ISE | Use for pH, ORP or ion selective electrode |
| 2 | REF | Use for reference electrode |
| 3 | °C | Use for temperature probe |
| 4 | USB | Use for data output to a printer or PC |
| 5 | ⏻ | Use for power adapter |

## Keypad

| Name and Icon | Function |
|---|---|
| ⏻ I ESC | • Switch the meter On/Off.<br>• Exit the calibration or setting and return to the measurement screen. |
| °C I Mode | • Set the temperature (Press and hold the key for 3 seconds).<br>• Select the measurement mode. |
| ☼ I Cal | • Enter the setup menu (Press and hold the key for 3 seconds).<br>• Start calibration. |
| 🔒 I Meas | • Lock the measured value.<br>• Start measurement. |
| Print | • Send the measurement data to a printer. |
| ▲ I MI | • Increase value or scroll up through the menu item.<br>• Store current reading to memory. |

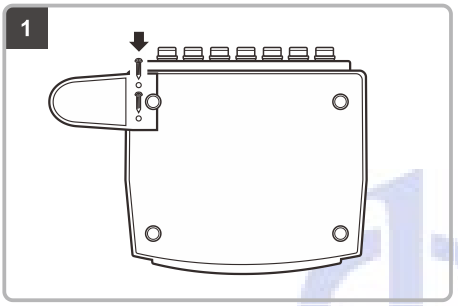
| | |
|---|---|
| ▼ I MR | • Decrease value or scroll down through the menu item.<br>• View the calibration report or data logs. |
| Enter | • Confirm the calibration, setting or displayed option. |

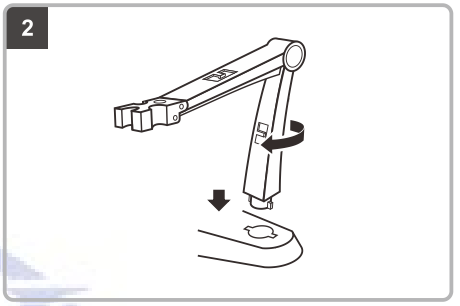


# Installing the Electrode Holder

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 the electrode holder 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.



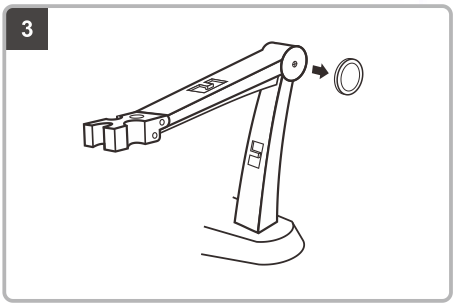

## Adjusting the electrode arm

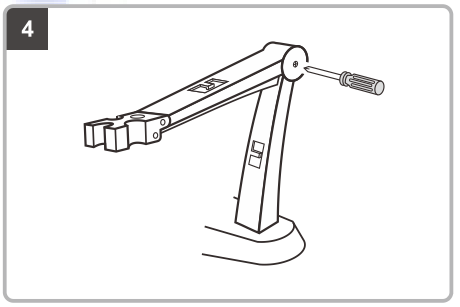
After installation, if the electrode arm automatically rises or falls, you need to adjust the screw until arm locate at any position.

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.



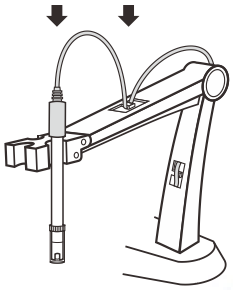
# Connection

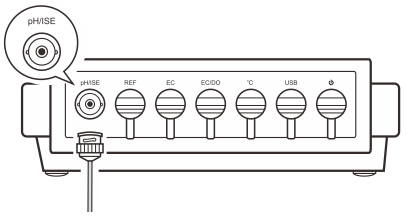
## Connecting the electrode

1.1 Take out the electrode from the packaging. Follow the steps below to place the electrode into left or right side of the electrode arm.

1.2 Insert the BNC connector into the connector socket labeled **pH/ISE**. Rotate and push the connector clockwise until it locks. After the connection is completed, DO NOT pull on the cable. Always make sure that the connector is clean and dry.

1. Insert the electrode 2. Hook up the cable



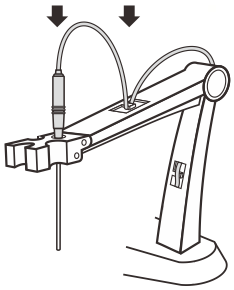


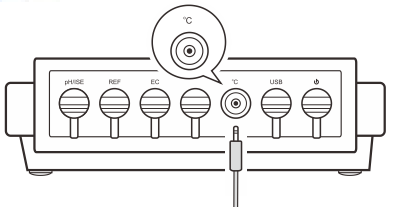

## Connecting the temperature probe

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

2.2 Insert the jack plug to the connector socket labeled **°C**. Ensure the connector is fully seated.

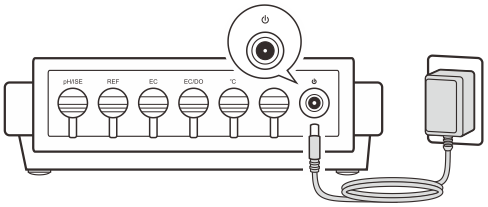
1. Insert the probe 2. Hook up the cable






# Switching the Meter On and Off

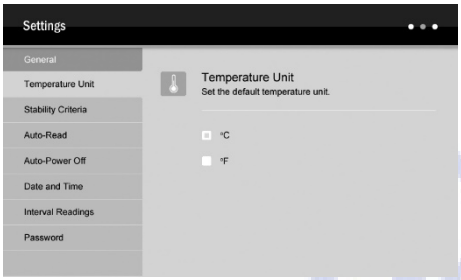
1. Insert the connector of power adapter to the power socket.

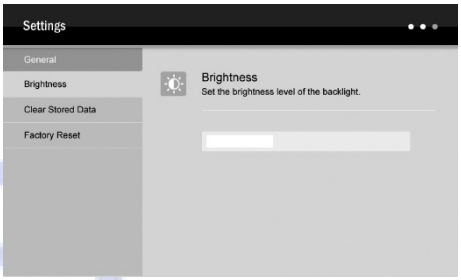





## General Settings

The YR01825 pH/ion meter contains an integrated setup menu that is used to customize the displayed option to meet measurement requirement. In the pH and ion modes, the meter will show the corresponding menu items. Once general settings are changed, the options will be applied to all modes.




| Menu | Options | Description | Default |
|---|---|---|---|
| Temperature Unit | °C | Set the default temperature unit. | °C |
| | °F | | |
| Stability Criteria | Standard | Set when a measurement is recognized as stable. | Standard |
| | High-accuracy | | |
| Auto-Read | Enable | When the option is enabled, the meter will automatically sense a stable reading and lock the measurement. | Disable |
| | Disable | | |
| Auto-Power Off | Enable | When the option is enabled, the meter will automatically switch off if no key is pressed within 3 hours. | Disable |
| | Disable | | |
| Date and Time | Year, month, day, hour, minute | Set the date and time. | --- |
| Interval Readings | Off | Set the time interval for sending measurement data to a printer or PC. | Off |
| | 10, 30, 60 seconds | | |
| | 10, 30 minutes | | |
| Password | Enable | Set the password protection for calibration and settings. | Disable |
| | Disable | | |
| Brightness | Low, mid, high | Set the brightness level of backlight. | Mid |

| | | | |
|---|---|---|---|
| Clear Stored Data | Enable<br>Disable | Delete all data logs in the memory. | Disable |
| Factory Reset | Enable<br>Disable | Reset the meter to factory default settings. | Disable |

## Setting the default option

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2. Press the □ / □ key to select a menu option or set a default value, press the **Enter** key to confirm.
3. Repeat the steps above until the meter returns to the measurement mode.



## Setting the date and time

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2. Press the □ key to select the *Date and Time*, press the **Enter** key to confirm.
3. Press the □ / □ key to set the Year, press the **Enter** key to confirm and move the cursor to Month.
4. Repeat the step 3 to set the date and time. When the setting is completed, the meter will return to the measurement mode automatically.

## Setting the password

The password protection is used to prevent the unauthorized calibration and settings. If enabled, the user must enter a 4-digit password to access the calibration or settings. If the setting value is 0000, the password protection will invalid.

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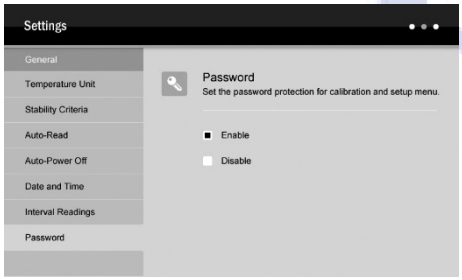
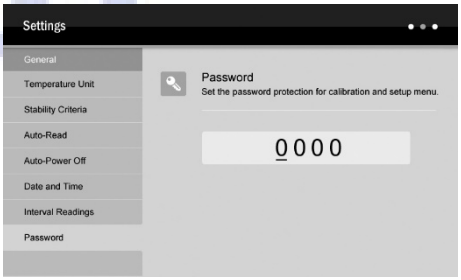
2. Press the □ key to select the *Password*, press the **Enter** key to confirm.
3. Press the □ key to select the *Enable*. Press the **Enter** key, the screen shows 0000 and the cursor appears below the first digit.
4. Press the □ / □ key to set the password, press the **Enter** key to confirm every digit until the meter returns to the measurement mode.




## Unlock the password

If your password has been enabled, the meter will show Password Protection screen when pressing the ☼ **Cal** key. Press the □ / □ key to enter the password, press the **Enter** key to confirm. If the password is correct, the meter will unlock immediately.

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

## Restore factory settings

The Factory Reset option is used to restore the meter back to default settings. If enabled, all of the calibration data and selected options will be deleted or reset, the meter must be recalibrated.

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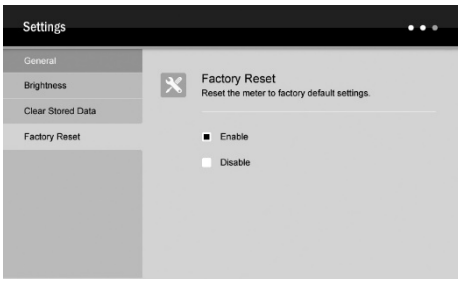
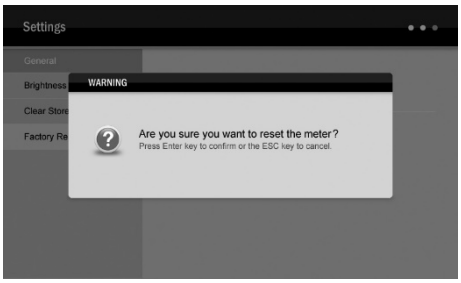
2. Press the □ key to select the *Factory Reset*, press the **Enter** key to confirm.

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




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

## 8 Temperature Compensation and Settings

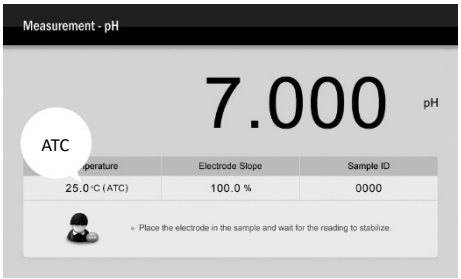
# Temperature Compensation

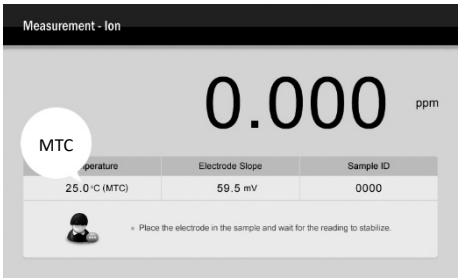
For better accuracy, we recommend the use of either a sensor with a built-in or a separate temperature probe for the calibration and measurement.

Automatic temperature compensation:
Connect the temperature probe to the meter (Refer to page 5 “Connection”). The **ATC** icon immediately 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 that 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 for 3 seconds to enter the temperature setting.
2. Press the ▯ / ▯ key to set the temperature value, press the **Enter** key to confirm.



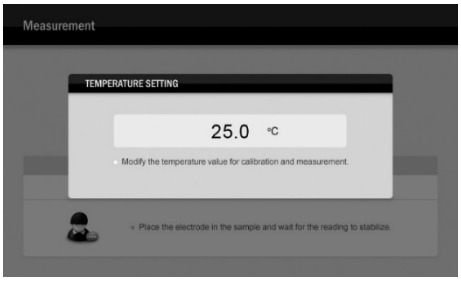

ⓘ Press the ▯ / ▯ key once, the setting value will increase or decrease by 0.1. Press and hold the key, the setting value will increase or decrease by 1.

# Temperature Calibration

During the measurement, if the temperature reading displayed differs from that of an accurate thermometer, the temperature probe needs to be calibrated.

1. Connect the temperature probe to the meter and place into a solution with a known accurate temperature.
2. Press and hold the **°C** key for 3 seconds, the meter shows Temperature Setting screen.

3. Press the  /  key to set the temperature value, press the **Enter** key to confirm. Calibration is completed.

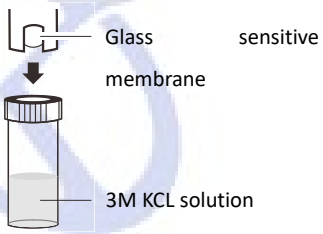





# pH Calibration and Measurement

## Prior to use

Remove the protective cap from the bottom of the pH electrode. If the glass sensitive membrane has dried out, soak the electrode in 3M KCL solution for at least 30 minutes.




## Selecting the measurement mode

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

# pH Settings

The meter contains 7 menu items in the pH mode.

| Menu | Options | Description | Default |
|---|---|---|---|
| Sample ID | 0000 to 9999 | Set the sample ID to associate readings with the data log. | 0000 |
| pH Buffer Group | USA | Set the pH buffer group for calibration and auto-recognition. | USA |
| | NIST | | |
| | DIN | | |
| | Custom (Any 2 to 5 values ≥1 pH apart) | | |
| Calibration Points | 1 to 5 points | Set the number of calibration points. | 3 points |
| Resolution | 0.001 | Set the resolution of the pH measurement. | 0.001 |

| | | | |
|---|---|---|---|
| | 0.01 | | |
| STC | High purity water | The Solution Temperature Coefficient is used to correct the pure water samples with a conductivity of less than 30µS/cm. If enabled, the readings will automatically reference to 25°C. | Off |
| | Sample contained the ammonia or phosphate | | |
| | Off | | |
| Alarm Limits | Enable | Set the high and low limit values to activate alarm. Range: -2.00 to 20.00pH | Disable |
| | Disable | | |
| Calibration Due | Enable | Set the calibration interval to activate alarm. Range: 1 to 31 days | Disable |
| | Disable | | |

### Setting the default option

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2. Press the  /  key to select a menu option or set a value, press the **Enter** key to confirm.
3. Repeat the steps above until the meter returns to the measurement mode.



# pH Calibration

The YR01825 meter allows 1 to 5 points calibration in the pH mode. 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 | pH1.68, 4.01, 7.00, 10.01, 12.45 |
| NIST Standard Buffers | pH1.68, 4.01, 6.86, 9.18, 12.45 |
| DIN Standard Buffers | pH1.09, 3.06, 4.65, 6.79, 9.23, 12.75 |

If the Custom option is selected, the meter will allow only 2 to 5 points calibration. Single point calibration should only be carried out with pH7.00, 6.86 or 6.79, otherwise calibration will not be accepted.

Make sure to calibrate the meter when attaching a new electrode. Do not reuse the calibration solution after calibration, contaminants in solution will affect the calibration and eventually the accuracy of the measurement.
In order to get accurate measuring results, we recommend using a stirrer to create the homogeneous buffer solutions and sample.

### Setting the number of calibration points

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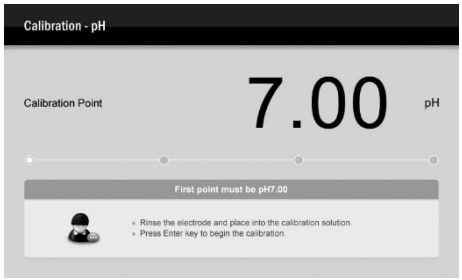
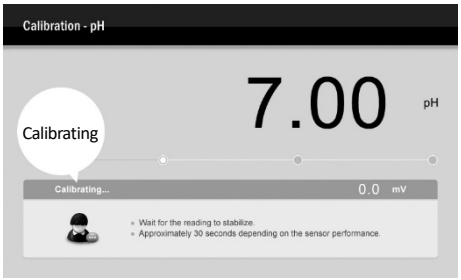
2. Press the  key to select the *Calibration Points*, press the **Enter** key to confirm.
3. Press the  /  key to select 1 to 5 points, press the **Enter** key to return to the measurement mode.

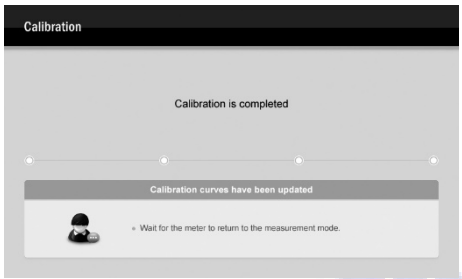
### Single point calibration

1.1 Ensure that the meter is in the pH measurement mode and 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”, or “6.79”, depending on the pH buffer group you selected.
1.3 Rinse the pH electrode with distilled water, place the electrode (and temperature probe) into the pH7.00 buffer solution and stir gently.
1.4 Press the **Enter** key, the status bar shows “Calibrating”.




1.5 Wait for the mV value to stabilize, the meter will automatically show “Calibration is completed” and returns to the measurement mode.




## 11 pH Calibration and Measurement

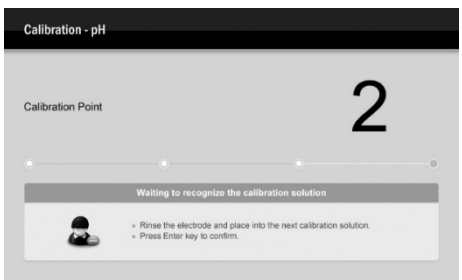
### Multi-point calibration

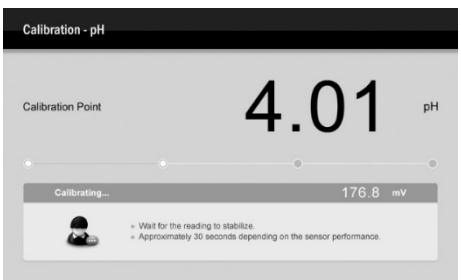
2.1 Ensure that you have selected 2 to 5 points calibration in the setup menu.

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., pH4.01).

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



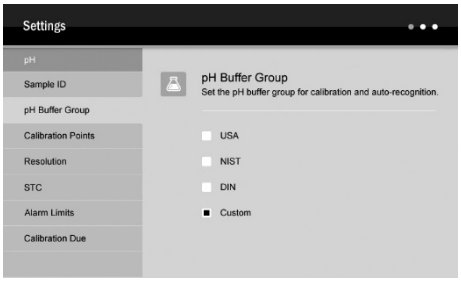




2.5 Wait for the mV value to stabilize, the screen will show “Calibration Point 3”. The meter prompts you to continue with third point calibration.

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

### pH calibration with custom buffers

3.1 Ensure that you have select 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 custom buffer solution. Stir electrode gently and wait until the measurement is stable.
3.3 Press the **Cal** key, the meter enters the calibration mode. The status bar shows “Setting the calibration value”.
3.4 Press the  /  key to set the value, press the **Enter** key to begin calibration.
3.5 Wait for the mV value to stabilize, the status bar will show “Setting the calibration value” again. The meter prompts you to continue with second point calibration.
3.6 Repeat steps 3.2 and 3.4 until the meter returns to the measurement mode. Calibration is completed.

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

## pH Measurement

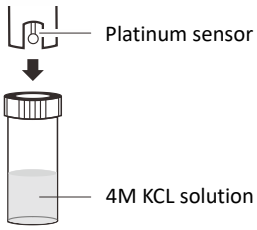
1. Rinse the pH electrode with distilled water. Place the electrode (and temperature probe) into the sample solution and stir gently.
2. Wait for the measurement to stabilize and record the pH and temperature values.
3. When all of the samples have been measured, rinse the electrode with distilled water, store the electrode into the 3M KCL solution.



# ORP Calibration and mV Measurement

### Prior to use

Remove the protective cap from the bottom of the ORP electrode. If the platinum sensor has dried out, soak the electrode in 4M KCL solution for at least 30 minutes.




### Selecting the measurement mode

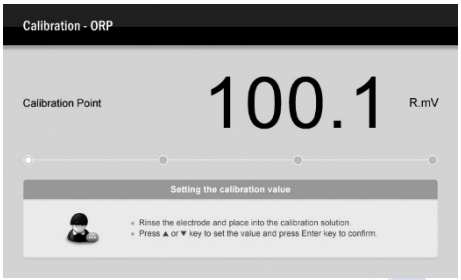
- Absolute millivolt:
  Press the **Mode** key and the  /  key to select the *mV*. Press the **Enter** key, the meter shows measurement unit mV.

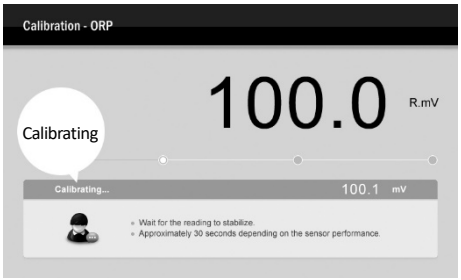
- Relative millivolt:
  Press the **Mode** key and the  /  key to select the *ORP*. Press the **Enter** key, the meter shows measurement unit R.mV.

## ORP Calibration

The YR01825 meter allows 1 point calibration in the ORP mode, but calibration is not necessary unless exact readout agreement with a work standard and at a specific ORP value is needed.

1. Ensure that the meter is in the ORP measurement mode.
2. Rinse the ORP electrode with distilled water, place the electrode into the calibration solution. Stir the electrode gently and wait until the measurement is stable.
3. Press the **Cal** key, the status bar shows “Setting the calibration value”.
4. Press the  /  key to set the value, press the **Enter** key to begin calibration.
5. Wait for the mV value to stabilize, the meter will automatically show “Calibration is completed” and returns to the measurement mode.




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

## mV Measurement

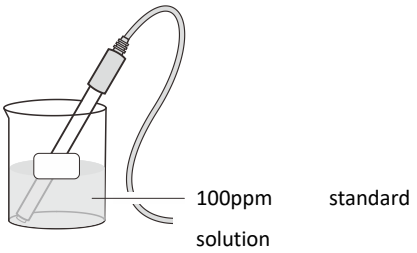
1. Rinse the ORP electrode with distilled water. Place the electrode into the sample solution and stir gently.
2. Wait for the measurement to stabilize and record the mV value.
3. When all of the samples have been measured, rinse the electrode with distilled water, store the electrode into the 4M KCL solution.



# Ion Calibration and Measurement

### Prior to use

Remove the protective cap from the bottom of the ion selective electrode, soak the electrode in 100ppm standard solution for at least 30 minutes.



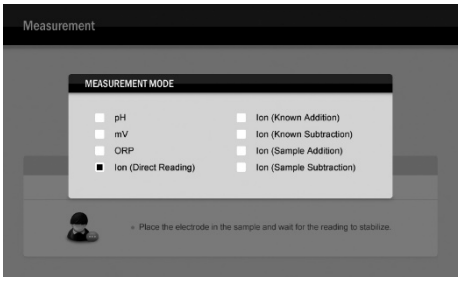

### Selecting the measurement mode

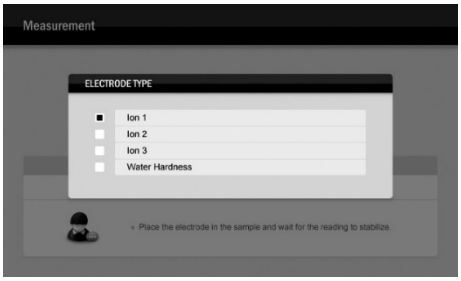
Press the **Mode** key and the  /  key to select the *Ion (Direct Reading)*, press the **Enter** key to confirm.

- Ion concentration mode:
  Press the ▯ / ▯ key to select the *Ion 1* or *Ion 2* or *Ion 3*, press the **Enter** key to return to the measurement mode.

ⓘ The YR01825 meter reserves three electrode type options for storing or recalling the slopes of the ion selective electrodes. For example, you selected the Ion 1 and using the fluoride electrode to calibrate the meter. Selecting the Ion 2 and using the chloride electrode to calibrate the meter. The electrode slopes will be stored in the selected location separately after the calibration.

- Water hardness mode:
  Press the ▯ / ▯ key to select the *Water Hardness*, press the **Enter** key to return to the measurement mode.




## Ion Settings

The meter contains 7 menu items in the ion mode.

| Menu | Options | Description | Default |
|---|---|---|---|
| Sample ID | 0000 to 9999 | Set the sample ID to associate readings with the data log. | 0000 |
| Concentration Unit | ppm | Set the default concentration unit. | ppm |
| | mg/L | | |
| | mol/L | | |
| | mmol/L | | |



| | | | |
|---|---|---|---|
| Water Hardness Unit | °dH | Set the default water hardness unit. | °dH |
| | °e | | |
| | °fH | | |
| | mg/L ($CaCO_3$), mg/L (CaO), mg/L ($Ca^2$) | | |
| | mmol/L | | |
| Calibration Points | 2 to 5 points | Set the number of calibration points. | 2 points |
| Ionic Valency | Monovalent | Set the ion valence of electrode. | Monovalent |
| | Divalent | | |
| Alarm Limits | Enable | Set the high and low limit values to activate alarm.<br>Range: 0 to 30000 | Disable |
| | Disable | | |

| | | | |
|---|---|---|---|
| Calibration Due | Enable | Set the calibration interval to activate alarm.<br>Range: 1 to 31 days | Disable |
| | Disable | | |

### Setting the default option

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2. Press the ▯ / ▯ key to select a menu option or set a value, press the **Enter** key to confirm.
3. Repeat the steps above until the meter returns to the measurement mode.

## Ion Calibration

The YR01825 meter is capable of 2 to 5 points ion calibration with standard solutions, available calibration points include the following options.

| Measurement Mode | Measurement Unit | Calibration Points |
|---|---|---|
| Ion concentration | ppm | 0.001, 0.01, 0.1, 1, 10, 100, 1000, 10000 |
| | mg/L | 0.001, 0.01, 0.1, 1, 10, 100, 1000, 10000 |
| | mol/L | 0.001, 0.01, 0.1, 1, 10 |
| | mmol/L | 0.001, 0.01, 0.1 |
| Water hardness | mmol/L | 0.01, 0.1, 1, 10, 100 |

Before starting the calibration, make sure that the ionic valency option in the setup menu matchs connected electrode, the standard solutions are fresh and uncontaminated. Always stir standards and samples at a uniform, moderate rate.

For better accuracy, we recommend that add the ionic strength adjuster (ISA) to all of the standards and samples. A typical addition would be 2ml ISA to 100ml of standard and sample.

### Setting the number of calibration points

☼

2. Press the ▯ key to select the *Calibration Points*, press the **Enter** key to confirm.
3. Press the ▯ / ▯ key to select 2 to 5 points, press the **Enter** key to return to the measurement mode.

### Setting the measurement unit

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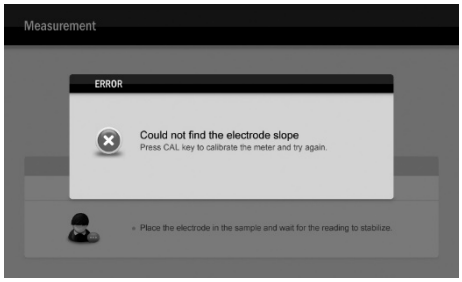
2. Press the ▯ key to select the *Concentration Unit* or *Water Hardness Unit*, press the **Enter** key to confirm.
3. Press the ▯ / ▯ key to select an option, press the **Enter** key to return to the measurement mode.



ⓘ If the meter has not been calibrated or the concentration unit has converted from ppm (or mg/L) to mol/L (or mmol/L), the screen will always show “Could not find the electrode slope” and waits for calibrating the meter.




## Ion concentration calibration

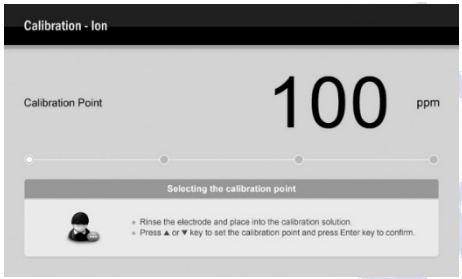
1.1 Ensure that the meter is in the Ion (Direct Reading) mode and selected standard solutions cover the anticipated range of the sample.

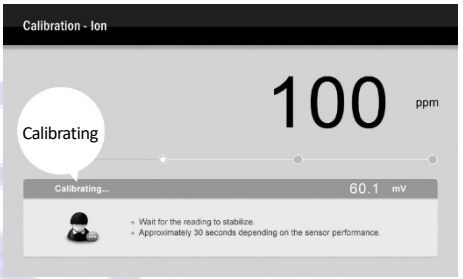
1.2 Press the **Cal** key, the screen shows “Calibration Point 100ppm”.

1.3 Press the  /  key to select a desired calibration point. The meter will perform the calibration from the low to high concentrations automatically.

1.4 Rinse the ion selective electrode with distilled water, then rinse with a small amount of standard solution. Place the electrode into corresponding standard solution and stir gently (e.g., 100ppm).

1.5 Press the **Enter** key, the status bar shows “Calibrating”.

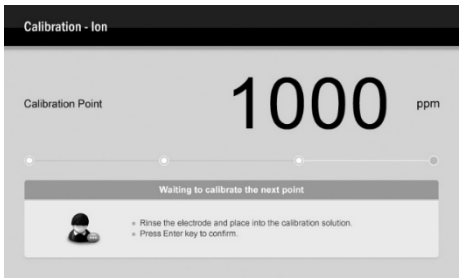


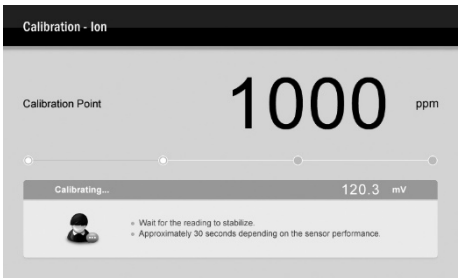




1.6 Wait for the mV value to stabilize, the screen will show “Calibration Point 1000ppm”. The meter prompts you to continue with second point calibration.

1.7 Rinse the ion selective electrode with distilled water, then rinse with a small amount of standard solution. Place the electrode into the next standard solution and stir gently (e.g., 1000ppm).

1.8 Press the **Enter** key, the meter begins calibration.




1.9 Repeat steps 1.7 and 1.8 until the meter returns to the measurement mode. Calibration is completed.

## Water hardness calibration

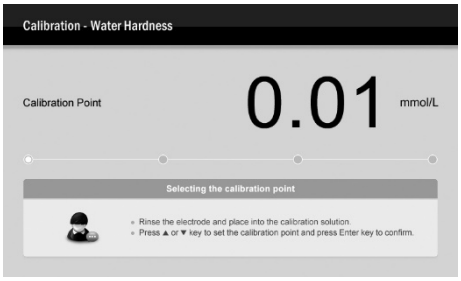
2.1 Ensure that the meter is in the Water Hardness mode and selected standard solutions cover the anticipated range of the sample.

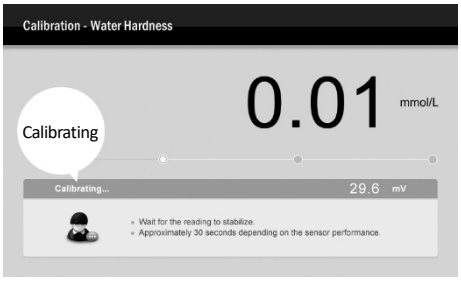
2.2 Press the **Cal** key, the screen shows “Calibration Point 0.01mmol/L”.

2.3 Press the  /  key to select a desired calibration point. The meter will perform the calibration from the low to high concentrations automatically.

2.4 Rinse the water hardness electrode with distilled water, then rinse with a small amount of standard solution. Place the electrode into corresponding standard solution and stir gently (e.g., 0.01mmol/L).

2.5 Press the **Enter** key, the status bar shows “Calibrating”.

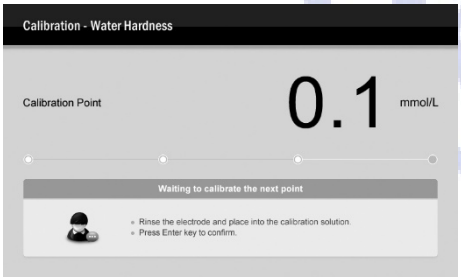


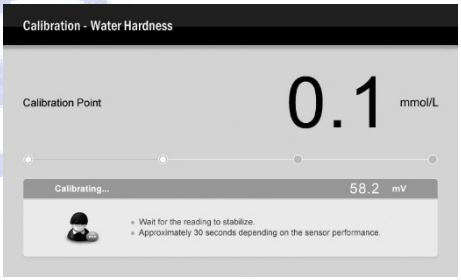




2.6 Wait for the mV value to stabilize, the screen will show “Calibration Point 0.1mmol/L”. The meter prompts you to continue with second point calibration.

2.7 Rinse the water hardness electrode with distilled water, then rinse with a small amount of standard solution. Place the electrode into the next standard solution and stir gently (e.g., 0.1mmol/L).

2.8 Press the **Enter** key, the meter begins calibration.




2.9 Repeat steps 2.7 and 2.8 until the meter returns to the measurement mode. Calibration is completed.

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

# Ion Concentration Measurements

The YR01825 meter contains 5 ion concentration measurement methods, including the direct reading and 4 incremental methods (known addition, known subtraction, sample addition and sample subtraction). If you selected the mol/L or mmol/L as default concentration unit, the incremental methods will be disabled. The screen will always show “Could not find the electrode slope”. The meter must be recalibrated in the concentration unit ppm or mg/L.

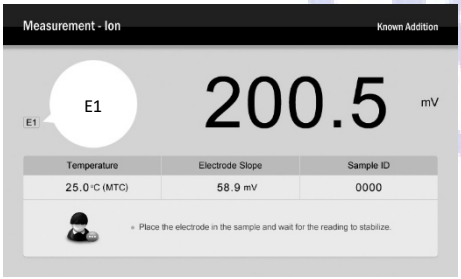
Before starting the measurement, make sure that the temperature of samples are the same as the standard solutions, the maximum error should be controlled within the 0.5°C. For the low level sodium determination (< 1ppm), ensure that using the lab plastic beaker as a container.

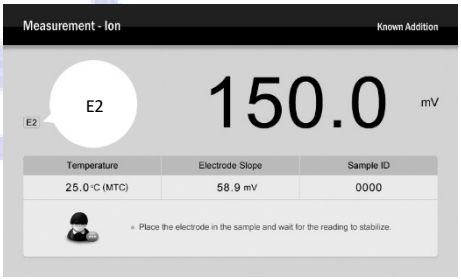
## Direct reading

1.1 Press the **Mode** key and the  /  key to select the *Ion (Direct Reading)*, press the **Enter** key to confirm.
1.2 Press the  /  key to select an electrode type (e.g., Ion 1). Press the **Enter** key, the meter begins the measurement.
1.3 Rinse the ion selective electrode with distilled water, place the electrode (and temperature probe) into the stirring sample.
1.4 Wait for the measurement to stabilize and record the concentration and temperature values.
1.5 When all of the samples have been measured, rinse the electrode with distilled water, store the electrode according to the instructions in the electrode user guides.

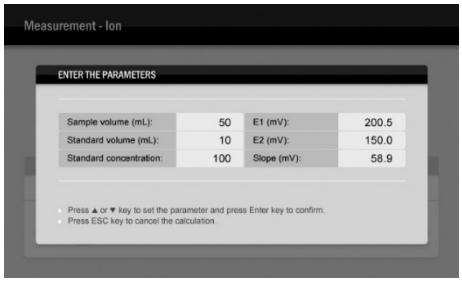
## Known addition method

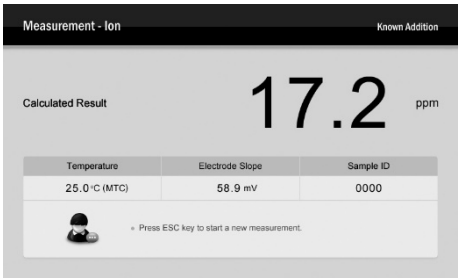
2.1 Press the **Mode** key and the  /  key to select the *Ion (Known Addition)*, press the **Enter** key to confirm.
2.2 Press the  /  key to select an electrode type (e.g., Ion 1). Press the **Enter** key, the meter begins to measure the first mV value. The icon **E1** appears on the screen.
2.3 Rinse the ion selective electrode with distilled water, place the electrode into the stirring sample. Wait for the measurement to stabilize. 2.4 When the reading is stable, press the **Enter** key. The meter begins to measure the second mV value, the icon **E2** appears on the screen.




2.5 Add a known volume of standard solution to the sample and wait for the measurement to stabilize.
2.6 When the reading is stable, press the **Enter** key. The meter shows a parameter list and waits for entering the sample volume, standard volume and standard concentration (ppm or mg/L).
2.7 Press the  /  key to enter the value, press the **Enter** key to confirm. When the setting is completed, the meter will automatically show the known addition result.
2.8 Press the **ESC** key, the meter will take a measurement again.






### Known subtraction method

The procedure for known subtraction is similar to the known addition method. The difference is that the standard does not contain the same ionic species that you are trying to measure in the sample. Instead, it contains an ion that will complex or precipitate the ion of interest, removing it from the sample.

3.1 Press the **Mode** key and the  /  key to select the *Ion (Known Subtraction)*, press the **Enter** key to confirm.

3.2 Repert steps 2.2 through 2.7 above.

### Sample addition method

The procedure for sample addition is similar to the known addition method, except that the sample solution is added to the standard solution.

4.1 Press the **Mode** key and the  /  key to select the *Ion (Sample Addition)*, press the **Enter** key to confirm.

4.2 Press the  /  key to select an electrode type (e.g., Ion 1). Press the **Enter** key, the meter begins to measure the first mV value. The icon **E1** appears on the screen.

4.3 Rinse the ion selective electrode with distilled water, place the electrode into the standard solution. Wait for the measurement to stabilize.

4.4 When the reading is stable, press the **Enter** key. The meter begins to measure the second mV value, the icon **E2** appears on the screen.

4.5 Add a known volume of sample to the standard solution and wait for the measurement to stabilize.

4.6 When the reading is stable, press the **Enter** key. The meter shows a parameter list and waits for entering the sample volume, standard volume and standard concentration (ppm or mg/L).

4.7 Press the  /  key to enter the value, press the **Enter** key to confirm. When the setting is completed, the meter will automatically show the sample addition result.

4.8 Press the **ESC** key, the meter will take a measurement again.

### Sample subtraction method

The procedure for sample subtraction is similar to the known subtraction method, except that the sample solution is added to the standard solution.

5.1 Press the **Mode** key and the  /  key to select the *Ion (Sample Subtraction)*, press the **Enter** key to confirm.

5.2 Repert steps 4.2 through 4.7 above.

### Exit the measurement

To exit the incremental method, press the **Mode** key to convert the measurement mode.

## Water Hardness Measurement

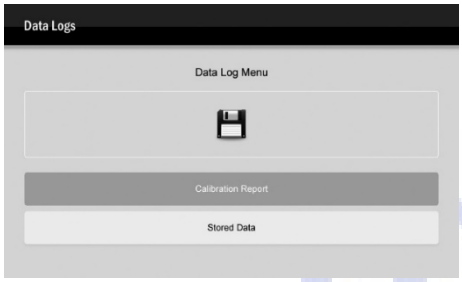
1. Press the **Mode** key and the  /  key to select the *Ion (Direct Reading)*, press the **Enter** key to confirm.
2. Press the  /  key to select the *Water Hardness*, press the **Enter** key to confirm.
3. Rinse the water hardness electrode with distilled water, place the electrode (and temperature probe) into the stirring sample.
4. Wait for the measurement to stabilize and record the concentration and temperature values.
5. When all of the samples have been measured, rinse the electrode with distilled water, blot dry with a lint-free tissue, store the electrode in box.

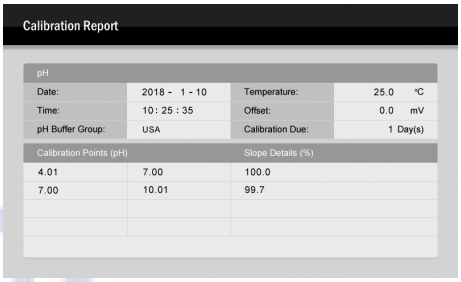
# Data Management

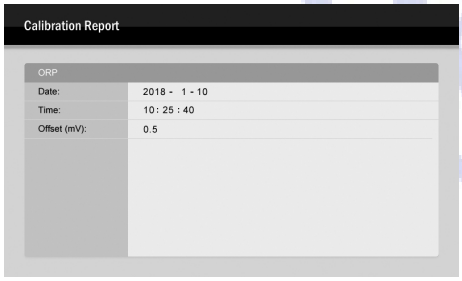
## Viewing the calibration report

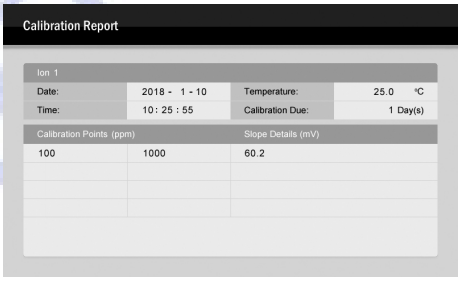
The YR01825 meter provides detailed report for the pH, ORP, ion concentration and water hardness calibrations. If the custom buffers used in last pH calibration, the pH calibration report will not available.

1. Press the **MR** key in the measurement mode, the meter shows the Data Logs screen.
2. Press the  key to select the *Calibration Report*.
3. Press the **Enter** key, the meter shows the calibration information.
4. Press the **ESC** key to return to the measurement mode.



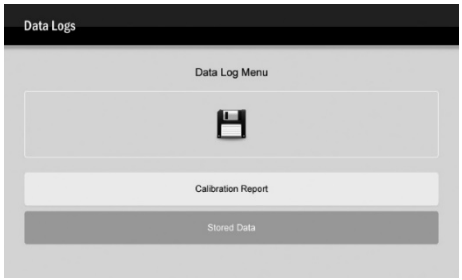



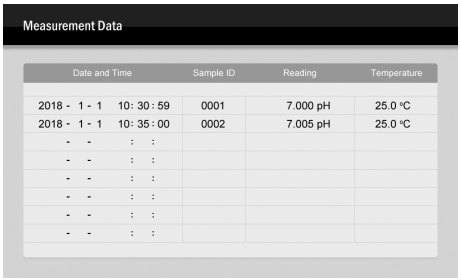

## Storing a measurement result

In the measurement process, press the **MI** key to store the reading into the memory, the screen shows “Measured value has stored”.

## Viewing the data log

1. Press the **MR** key in the measurement mode and the  key to select the *Stored Data*.
2. Press the **Enter** key, the meter shows a data list.
3. If necessary, press the  /  key to switch pages.
4. Press the **ESC** key to return to the measurement mode.



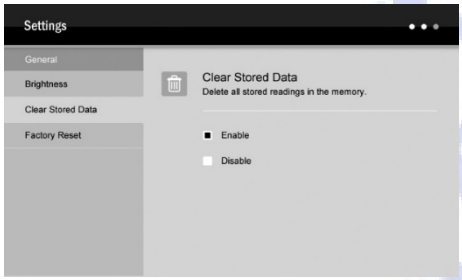



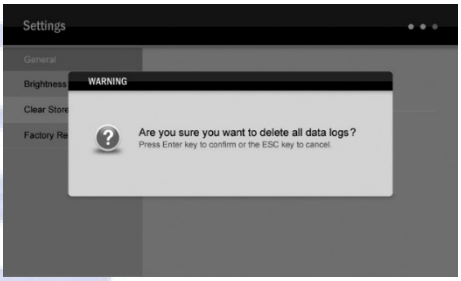



### Deleting the data log

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

2. Press the ☼ key to select the *Clear Stored Data*, press the **Enter** key to confirm.
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?"
4. Press the **Enter** key to confirm or the **ESC** key to cancel.



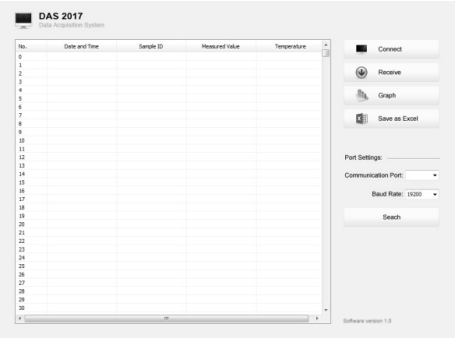

## Communication

The YR01825 meter is capable of transfering the measurement data to computer or importing the data to Excel by a DAS software. You are able to download this software from our official website. Before installation, ensure that Windows 7/8/10 operating system has been installed on your computer.

### Receiving data

1. Connect the USB cable (Order code: USB-B2303) to meter and computer. Click the **DAS_A_Series** icon, the system will automatically scan an available communication port and show the message box "Found a port on your computer".
2. Click the **OK** button, the application starts.

ⓘ If your computer can not find a communication port, please click the file PL2303_Prolific_DriverInstaller_V1190 to update the drive program.




3. Click the **Connect** button, the screen shows “Port is connected” indicating that the communication between the meter and the computer has been established.
4. Click the **OK** button to confirm.
5. Click the **Receive** button, the stored data automatically transfer to computer.

21 Data Management

### Create the Excel file

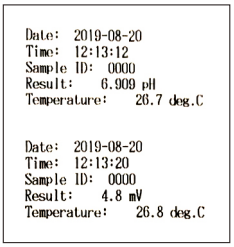
When the transfer is completed, click the **Save as Excel**, the measured values in the data sheet will automatically convert to Excel file.

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

## Printing the Data

The meter is capable of connecting a thermal printer for printing the measurement data (Order code: AB58-GK).

1. Connect the USB cable to meter and printer.
2. Press the **Print** key to print the displayed readings.

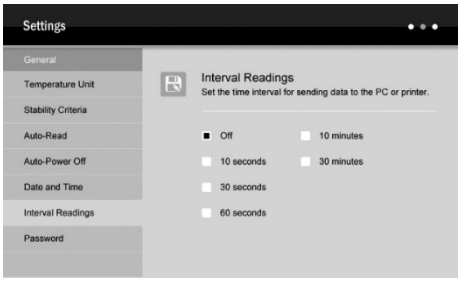



## Interval Readings

The YR01825 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 interval until the measurement mode is exited.

☼

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 measured values will automatically transfer to DAS software. Note, the first data needs 1 minute to be shown on screen. DO NOT press any key on meter during the Interval Readings mode, it will cause the communication interruption.
5. If the meter has been connected to a printer, press the **Print** key to print the displayed readings.



# Electrode Care and Maintenance

## pH electrode

Since pH electrode is susceptible to dirt and contamination, clean as necessary depending on the extent and condition of use.

- General deposits: Rinse the electrode with distilled water, store the electrode into the 3M KCL solution.
- Salt deposits: Soak the electrode in warm tap water to dissolve deposits, then thoroughly rinse with distilled water.
- Oil or grease: Wash the glass sensitive membrane of electrode in some detergents and water. If necessary, use the alcohol to clean, then rinse with distilled water. Place the electrode in the 3M KCL solution for at least 30 minutes.
- Protein deposits: Prepare a 1% pepsin solution in 0.1M of HCL. Place the electrode in the solution for 10 minutes. Rinse the electrode with distilled water.
- Clogged reference junction: Heat a diluted KCl solution to 60°C to 80°C. Place the electrode into the heated solution for about 10 minutes. Allow the electrode to cool in some unheated KCl solution.

If stored and cleaned properly, the electrode should be ready for immediate use. However, a dehydrated glass sensitive membrane may cause sluggish response. To rehydrate the sensitive membrane, immerse the electrode in a pH4.01 buffer solution for 10 to 30 minutes. If this fails, the electrode requires activation.

1. Soak the electrode in 0.1M HCl for 5 minutes.
2. Remove and rinse with distilled water, then place in 0.1M NaOH for 5 minutes.
3. Remove and rinse again, and soak in 3M KCL solution for at least 30 minutes.

## ORP electrode

- General deposits: Rinse the electrode with distilled water, store the electrode into the 4M KCL solution.
- Inorganic deposits: Soak the electrode in 0.1M HCl for 10 minutes. Remove and rinse with distilled water, then place in alcohol for 5 minutes. Remove and rinse again, soak the electrode in pH4.01 buffer solution for 30 minutes.
- Oil or grease: Wash the electrode in some detergents and water. Place the electrode in the 4M KCL solution for at least 30 minutes.

## Ion selective electrode

- Rinse the electrode with distilled water, blot dry with a lint-free tissue, store the electrode in a dry, cool and well-ventilated area.
- Avoid touching the membrane surface.

# Appendix

## Specifications

| | | |
|---|---|---|
| pH | Model | YR01825 |
| | Range | -2.000~20.000pH |
| | Accuracy | ±0.002pH |
| | Resolution | 0.01, 0.001pH, selectable |
| | Calibration Points | 1 to 5 points |
| | pH Buffer Options | USA, NIST, DIN or Custom |
| | Temperature Compensation | 0~100°C, 32~212°F, manual or automatic |
| mV | Range | -2000.0~2000.0mV |
| | Accuracy | ±0.2mV |
| | Resolution | 0.1mV |
| | Calibration Points | 1 point (Only for relative mV mode) |
| Ion Concentration | Range | 0.001~30000ppm, mg/L, mol/L, mmol/L (Depending on range of ISE) |
| | Accuracy | ±0.5% F.S (Monovalent), ±1% F.S (Divalent) |
| | Resolution | 0.001, 0.01, 0.1, 1 |
| | Calibration Points | 2 to 5 points |
| | Calibration Solutions | 0.001, 0.01, 0.1, 1, 10, 100, 1000, 10000ppm, mg/L, mol/L, mmol/L |
| Water Hardness | Range | 0.05~200mmol/L |
| | Accuracy | ±1% F.S |
| | Resolution | 0.01, 0.1, 1 |
| | Calibration Points | 2 to 5 points |
| | Calibration Solutions | 0.01, 0.1, 1, 10, 100mmol/L |
| Temperature | Range | 0~105°C, 32~221°F |
| | Accuracy | ±0.5°C, ±0.9°F |
| | Resolution | 0.1°C |
| | Calibration Points | 1 point |
| General Specification | Memory | Stores up to 1000 data sets |
| | Output | USB communication interface |
| | Connector | BNC |
| | Display | 7" TFT display |

| | | |
|---|---|---|
| | Power Requirements | DC12V/2A, using AC adapter, 220V/50Hz |
| | Dimensions | 240 (L) × 220 (W) × 80 (H) mm |
| | Weight | 1.7kg |



# Preparation of Standard Solution

## pH buffer solution

1. Open the pH7.00 buffer sachet, place the reagent into a 250ml volumetric flask.
2. Fill the volumetric flask to the mark with distilled water, mix the solution until the reagent is completely dissolved.
3. Preparation of pH4.01 and 10.01 buffer solutions are the same as above. Prepared standard buffer solutions should be stored in hermetically sealed glass containers.

## ORP standard solutions

- Add 3 grams of quinhydrone to 500ml buffer pH4.01 and stir for 15 minutes. Un-dissolved quinhydrone powder must be present. Potential @ 25°C = +263mV (±10mV)

- Add 3 grams of quinhydrone to 500ml buffer pH7.00 and stir for 15 minutes. Un-dissolved quinhydrone powder must be present. Potential @ 25°C = +87mV (±10mV)

## Ion standard solutions (1000ppm)

1. To half fill a 1 liter volumetric flask with distilled water and add the analytical grade reagent below.

| Ion | Reagent | Weight (g) |
|---|---|---|
| Fluoride ($F^-$) | Sodium Fluoride (NaF) | 2.21 |
| Chloride ($Cl^-$) | Sodium Chloride (NaCl) | 1.65 |
| Bromide (Br) | Sodium Bromide (NaBr) | 1.29 |
| Cyanide ($Cn^-$) | Sodium Cyanide (NaCn) | 1.88 |
| Sodium ($Na^+$) | Sodium Chloride (NaCl) | 2.542 |
| Nitrate ($NO_3^-$) | Sodium Nitrate ($NaNO_3$) | 1.37 |
| Calcium ($Ca^{2+}$) | Calcium Chloride ($CaCl_2 \cdot 2H_2O$) | 3.67 |
| Ammonium ($NH_4^+$) | Ammonium Chloride ($NH_4Cl$) | 2.97 |
| Cadmium ($Cd^{2+}$) | Cadmium Nitrate ($Cd(NO_3)_2 \cdot 4H_2O$) | 2.74 |
| Cupric ($Cu^{2+}$) | Copper Nitrate ($Cu(NO_3)_2 \cdot 3H_2O$) | 3.80 |
| Iodide ($I^-$) | Sodium Iodide (NaI) | 1.18 |
| Lead ($Pb^{2+}$) | Lead Perchlorate ($Pb(ClO_4)_2 \cdot 3H_2O$) | 2.22 |
| Potassium ($K^+$) | Potassium Chloride (KCL) | 1.91 |
| Silver ($Ag^+$) | Silver Nitrate ($AgNO_3$) | 1.57 |
| Sulphide ($S^{2-}$) | Sodium Sulfide ($Na_2S \cdot 9H_2O$) | 7.49 |
| Ammonia ($NH_3$) | Ammonium Chloride ($NH_4Cl$) | 3.82 |

2. Swirl the flask gently to dissolve the reagent and fill to the mark with distilled water.
3. Cap the flask and invert several times to mix the solution.

### Water hardness standard solution (0.1mol/L)

1. To half fill a 1 liter volumetric flask with distilled water and add 14.7 grams of analytical grade calcium chloride ($CaCl_2 \cdot 2H_2O$).
2. Swirl the flask gently to dissolve the reagent and fill to the mark with distilled water.
3. Cap the flask and invert several times to mix the solution.



# Electrode Selection Guide

## pH electrode

| Sample/Order Code | P11 | P12 | P13 | P15 | P16 | P18 | P19 | P21 | E201 | E202 |
|---|---|---|---|---|---|---|---|---|---|---|
| Agar | | | | | | | | | | • |
| Beer | • | • | • | | | | | • | • | • |
| Blood Products | • | • | • | | | | | • | | • |
| Bread, Dough | | | | | | • | • | | | |
| Cement | • | | | | | | | | | |
| Cosmetics | • | • | • | | | | | • | • | • |
| Dairy Products | • | • | • | | | | • | | | • |
| Education | • | | | | | | | | • | • |
| Fats/Cream | | | | | | | • | | | |
| Field Use | | | | | | • | | | • | • |
| Fish Products | | | | | | | • | | | • |
| Lab Flasks | | • | | | | | | | | |
| Low Ionic | • | | | • | | | | • | | |
| Meat, Cheese | | | | | | | • | | | • |
| Micro Samples | | | • | | | | | | | |
| Paint | | • | • | | | | | | | • |
| Photographic | | | | | | | | | | |
| Soil | | | | | | • | • | | | |
| Surface | | | | | | | | | | • |
| Test Tubes | | • | | | • | | | | | |
| Tris Buffer | | | | | • | | | | | |
| Viscose Samples | | | | | | | | | | • |

## ORP electrode

| Order Code | Application |
|---|---|

| | |
|---|---|
| 501 | Use for the sample with strong redox potential, plastic body, temperature range: 0~80°C |
| 502 | Use for the sample with weak redox potential, plastic body, temperature range: 0~80°C |
| 504 | Use for the high temperature samples, glass body, temperature range: 0~100°C |



## Ion selective electrode

| Order Code | Description | Range (ppm) |
|---|---|---|
| F-US | Fluoride ($F^-$) | 0.02~saturation |
| CL-US | Chloride ($Cl^-$) | 1.8~35500 |
| Br-US | Bromide (Br) | 0.4~79900 |
| Cn-US | Cyanide ($Cn^-$) | 0.2~260 |
| Na-US | Sodium ($Na^+$) | 0.1~23000 |
| NO3-US | Nitrate ($NO_3^-$) | 0.4~62000 |
| Ca-US | Calcium ($Ca^{2+}$) | 0.02~4000 |
| NH4-US | Ammonium ($NH_4^+$) | 0.1~18000 |
| Cd-US | Cadmium ($Cd^{2+}$) | 0.01~11200 |
| Cu-US | Cupric ($Cu^{2+}$) | 0.006~6400 |
| I-US | Iodide ($I^-$) | 0.06~127000 |
| Pb-US | Lead ($Pb^{2+}$) | 0.2~20700 |
| K-US | Potassium ($K^+$) | 0.04~39000 |
| Ag-US | Silver ($Ag^+$) | 0.01~107900 |
| S-US | Sulphide ($S^{2-}$) | 0.003~32100 |
| NH3-US | Ammonia ($NH_3$) | 0.02~17000 |

## Optional accessories

| Order Code | Description |
|---|---|
| TP-10K | Temperature probe, 3.5mm jack plug, 1 meter cable |
| PHR-USA | pH4.01, 7.00, 10.01 buffer sachets. For preparing the 250ml buffer solutions. |
| PHR-NIST | pH4.01, 6.86, 9.18 buffer sachets. For preparing the 250ml buffer solutions. |
| USB-B2303 | USB cable, 1 meter |
| AB58-GK | Thermal printer |
| DCPA-12V | DC12V power adapter, european standard plug, 1 meter cable |

## Hazardous Substance Statement

Kalstein is committed to the reduction and eventual elimination of all hazardous substances in both the manufacturing process and finished products we supply. We have an active manufacturing and procurement program to minimize and eliminate the use of harmful heavy metals such as cadmium, lead, mercury and the like. New technologies and design parameters are also promoting these efforts and we expect to have little or no such materials in our product in the coming years. We welcome our customer suggestions on how to speed up these efforts.

## Warranty

The warranty period for meter is two years from the date of shipment. Above warranty does not cover the electrode and calibration 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.