EcoMet

Instruction Manual

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Chapter I. Introduction

Benchtop pH/mV/TEMP Meter, DO/O$_2$/TEMP Meter and Conductivity/ TEMP Meter are operated by adaptor and is controlled by microprocessor for all measurement needs.

Benchtop pH/mV/TEMP Meter, DO/O$_2$/TEMP and Conductivity/TEMP Meter feature a clear LED or custom LCD.

The meter features auto calibration and manual calibration.

If pH reading is stable, LED for the stable lights up or "S(Stable)" is displayed in the left field, therefore measure accurately since user can easily know a stable value.

The model P25, D45 and C75 are capable of storing up to 20 points in memory at once. Refer to Data-Log.

The meter can be remotely controlled via RS232C interface. Refer to Remote Control.

Chapter I.   Introduction

Chapter II. Instrument Setup
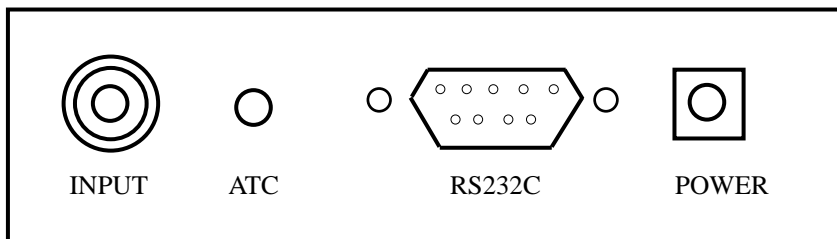
Power Source

Connect the supplied adaptor to the meter.

Electrode Connection

Attach Electrode by sliding the BNC connector onto the sensor input then push down and turn clockwise to lock into position.

ATC probe Connection

Attach the ATC probe to the ATC jack by sliding the connector straight on until firmly in place.

Printer and RS232C interface Cable Connection

Insert printer and RS232C interface cable into the RS232C jack. Use interface cable supplied by *istek*.

Chapter III. General Functions

Keypad Functions

pH/mV/TEMP Meter

Key	Functions
Power	used to turn ON/OFF.
CAL	used to start and set calibration, In addition, exit in the middle of calibration.
Mode	used to change operating modes, such as pH or mV.
STBY/Meas	used to change condition of meter i.e.measure or ready. This is used for changing from ready to measure condition or reversing.
Print	used to print display data. used to access the temperature setup menu.
Memory	used to store data in meter memory while measuring.
up(▲)	In calibration mode, press to increase value. In memory mode, press to increase data number.
down(▼)	In calibration mode, press to decrease value. In memory mode, press to decrease data number.

DO/O$_2$/TEMP Meter

Key	Functions
Power	used to turn ON/OFF.
CAL	used to start and set calibration,
Mode	used to change operating modes, such as DO or O$_2$. In addition, exit in the middle of calibration.
STBY/Meas	used to change condition of meter i.e.measure or ready. This is used for changing from ready to measure condition or reversing.
Setup	used to access the setup menu. This is used for setting instrument parameters. Can set Salinity and Altitude.

Chapter III.   General Functions

Key	Functions
Print	used to print data
Memory	used to store data in meter memory while measuring.
up(▲)	In setup mode, press to increase value.
	In memory mode, press to increase data number.
down(▼)	In setup mode, press to decrease value.
	In memory mode, press to decrease data number.

Conductivity/TEMP Meter

Key	Functions
Power	used to turn ON/OFF.
TC	used to measure conductivity without temperature compensation.
CAL	used to start and set calibration,
	In addition, exit in the middle of calibration.
Setup	used to access the setup menu.
	This is used for setting instrument parameters.
	Can set Temperature Coefficient, Cell Constant and Compensation Temperature.
Print	used to print data
STBY/Meas	used to change condition of meter i.e.measure or ready.
	This is used for changing from ready to measure condition or reversing.
Memory	used to store data in meter memory while measuring.
up(▲)	In calibration and setup mode , press to increase value.
	In memory mode, press to increase data number.
down(▼)	In calibration and setup mode, press to decrease value.
	In memory mode, press to increase data number.

Chapter III.   General Functions

Electrode Storage and Maintenance

pH Electrode Storage
Electrodes are stored in the cap storage solution supplied by *istek*.
Membrane must be kept wet. If there is no storage solution, pH 4 buffer is
best for the single glass electrode and saturated KCl is preferred for a
calomel and Ag/AgCl reference electrode. Saturated KCl is the preferred
solution for a combination electrode. Electrodes are sometimes stored in
distilled water, but this method causes electrode life to decrease.

pH Electrode Maintenance (Electrode Cleaning)
If it takes long time to response or a stable data isn't obtained, can often be
restored to normal performance by one of the following procedures;
Glass electrodes fail because of scratches, deterioration or accumulation of
debris on the glass surface.

- Salt deposits	Recover electrode by alternately immersing it three times each in 0.1N HCl and 0.1N NaOH for approx. five minutes. If this fails, immerse tip in KCl solution for 30s. After recovery, soak in pH 7.00 buffer overnight. Rinse and soak in pH 7.00 buffer. Rinse again with distilled water before use.
- Oil/Grease films	Remove oil/Grease films with detergent, and then rinse electrode with distilled water.
- Clogged Reference Junction	Heat diluted KCl solution to about $60 \sim 80$ °C. The electrode must be stored in this solution for approx. ten minutes, then cool electrode in not heated KCl solution.
- Protein removal	Protein coatings can be removed by soaking glass electrodes in a 10% pepsin solution adjusted to pH 1 to 2.

DO Probe Storage
For longer storage, cover the membrane tip with a cap originally supplied by
istek.

Chapter III.   General Functions

DO Probe Maintenance (Probe Cleaning)

If it takes long time to response or a stable date isn't obtained, check membrane.

If air bubble is occurred on membrane, remove air bubble.
Check membrane for damage(i.e. holes and leak, etc.). If membrane gets damage, replace membrane.

Conductivity Cell Storage

A dirty cell will contaminate the solution and cause conductivity to change. It is best to store cells that are immersed in deionized water. Provided the cell has been stored in condition of drying, should be soaked in distilled water for five to ten minutes before using to keep electrode wet.

Conductivity Cell Maintenance (Cell Cleaning)

Glease, oil, fingerprints, and other contaminants on the sensing elements can cause erroneous measurements and sporadic responses.
If it takes long time to response or a stable data isn't obtained, can be often restored to normal performance by using the following procedures;
Clean cells with detergent and/or dilute nitric acid(1%) by dipping or filling the cell with cleaning solution and agitating for two or three minutes. Other diluted acids(e.g. sulfuric, hydrochloric, chromic) may be used for cleaning except for aqua regia. When a stronger cleaning solution is required, try concentrated hydrochloric acid mixed into 50% isopropanol.
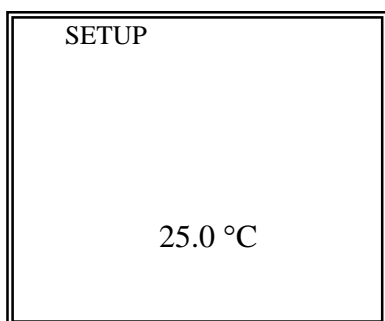
III.   General Functions

Chapter IV. Setup Functions

The setup menu is used to identify and change instrument parameters.

Model P25

Temperature Setting
If temperature on display differs from a real temperature,set a real temperature.

```
SETUP




        25.0 °C


```

In pH ready condition if pressing **Print** key to enter the setup, the display is shown as follows.
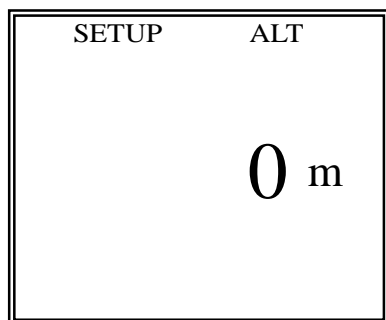Set temperature by using ▲ or ▼ key.
If finishing setup, press **Print** key 2times to return to pH intial display

Model D45

Altitude
In the initial display of DO, press **Setup** key to enter Setup and then the display is shown as follows.

```
SETUP      ALT




     0 m


```
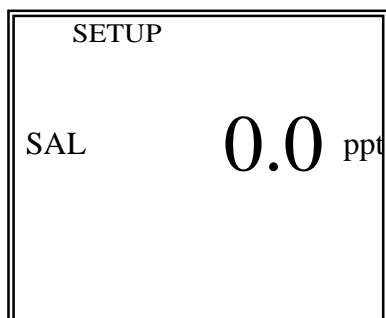
Adjust altitude with ▲ or ▼ key.
The set altitude is automatically compensated.
If finishing the setting of conditions, press **Setup** key to enter the next setup.

IV. Setup Functions

t

Salinity

SETUP

SAL 0.0 ppt

Adjust salinity with ▲ or ▼ key.
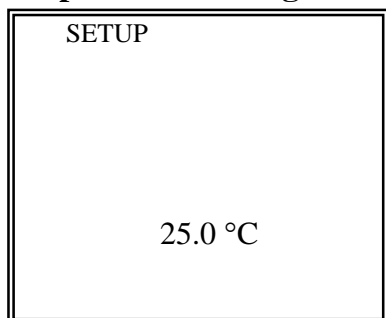The set salinity is automatically compensated.
If finishing the setting of conditions, press **Setup** key to enter the next setup.

Temperature Setting

SETUP

25.0 °C

After setting salinity, press **Setup** key. If temperature on display differs from a real temperature, set a real temperature. Set temperature by using ▲ or ▼ key.
If finishing setup, press **Setup** key exit setup mode.

Model C75

Temperature Coefficient
Press **Setup** key, and then the display is shown as follows.

SETUP

2.1%
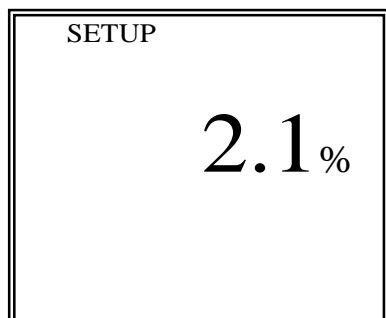
The conductivity of solution with a specific electrolyte concentration will change in accordance with the change of temperature. Each conductive ion has a different temperature coefficient. All *istek*'s meters allow adjusting coefficient for the advanced performance.
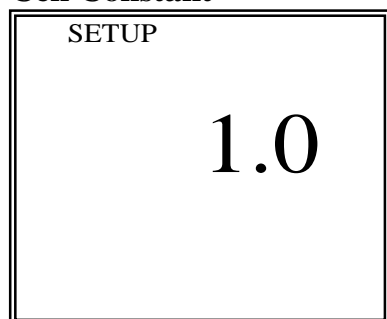Press ▲ or ▼ key until the desired value is displayed.

IV. Setup Functions

The following table is a typical temperature coefficients(percentage of change of conductivity per).

Solution	%/°C
Ultrapure Water	4.55
Salt(NaCl)	2.12
5% NaOH	1.72
Dilute Ammonia	1.88
10% HCl	1.32
5% Sulfuric Acid	0.96
98% Sulfuric Acid	2.84

Cell Constant

```
SETUP


      1.0

```

After setting temperature coefficient, press **Setup** key. For conductivity measurement of a solution, you can accurately measure by adjusting cell constant.
Cell constants consist of 0.01, 0.1, 1.0, 10 and 100, and set by using ▲ or ▼ key.

Compensation Temperature

```
SETUP


     25.0

```
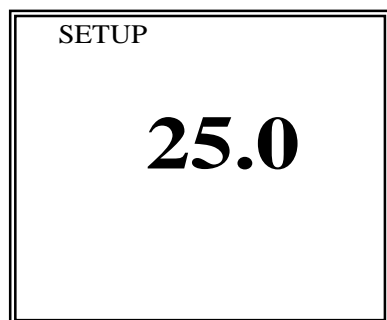
After setting cell constant, press **Setup** key.
Press ▲ or ▼ key to change 25.0 or 20.0.
The conductivity of a solution exhibits at 25.0°C or 20.0°C.

IV.   Setup Functions

Temperature Setting

After setting compensation temperature, press **Setup** key.
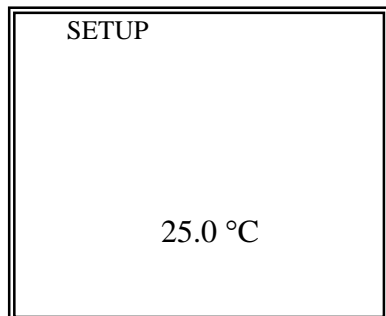
```
┌─────────────────────────┐
│  SETUP                   │
│                          │
│                          │
│                          │
│        25.0 °C           │
│                          │
└─────────────────────────┘
```

If temperature on display differs from a real temperature, set a real temperature. Set temperature by using ▲ or ▼ key.

If finishing setup, press **Setup** key exit setup mode.

IV.   Setup Functions

Chapter V. Calibration and Measurement

Model P25

(1) pH Calibration and Measurement

Perform calibration every two hours to compensation for electrode drift.
There are two ways of calibrations; auto calibration or manual calibration.
Two of more than buffer calibration should be perform before pH is measured. Please note that it is not available to calibrate just only 1 point. If try to exit after calibrating only 1 point, error message ("Err") is displayed.

Auto calibration
1) Calibration of CAL1(Buffer 1)

```
        CAL 1

        7.00

   ATC    25.0

     pH
```
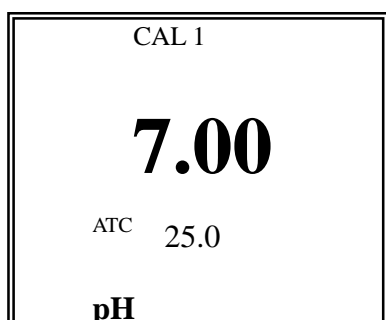
In the pH ready condition, press **CAL** key and then the displays is shown as follows.
Put electrode into the first buffer.
With constant, but not violent, stirring for accurate measurement, press **STBY/Meas** key.

```
                    MEAS

   S    4.09

   ATC    25.0

     pH
```
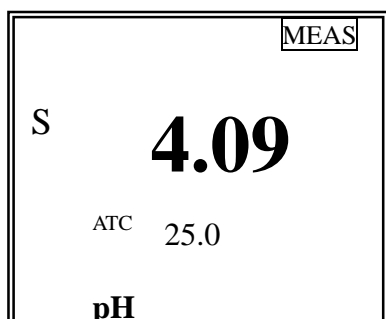
MEAS is displayed above the main field.

If pH reading is stable, "S" appears in the left field.
Press **CAL** key therefore automatically set and then "CAL 1 OK" message is displayed in the upper field.

Chapter V.   Calibration and Measurement

```
        CAL 1 OK


         4.00

    ATC   25.0

      pH
```
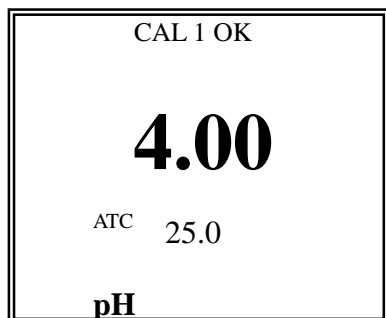
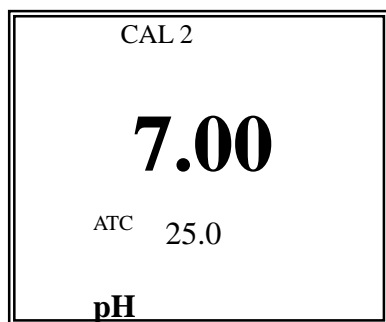The left figure indicates the end of CAL1 calibration. And "CAL 2" message is displayed in the upper field.

2) Calibration of CAL2.to CAL3 (Buffer2 to Buffer3)

```
        CAL 2


         7.00

    ATC   25.0

      pH
```

Clearly rinse electrode and put into the second buffer. The calibration method of CAL2 ~ CAL3 is the same as done in CAL1.
It is available to calibrate buffer up to 3 points, if calibrating up to 3 points change into the initial display.
If pressing **CAL** key after calibrating 2 points, change to the initial display.

Put electrode into sample, and press **STBY/Meas** key.
If pH reading is stable, "S" appears in the left field.

```
                      MEAS

    S     7.09

       ATC   25.0

         pH
```

Chapter V.   Calibration and Measurement

While measuring, can also know millivolt by pressing **Mode** key.

```
                              MEAS

          -2.57
         ATC    25.0

   mV
```
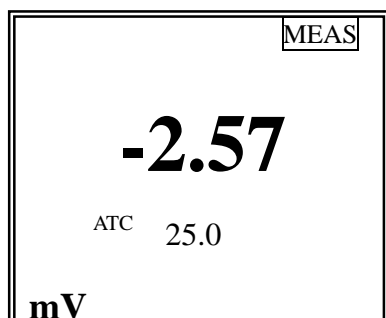
The measured data is stored by pressing **Memory** key manually. Refer to Data-Log of Chapter V.

-Manual Calibration

To calibrate with buffers other than 4.00, 7.00 or 10.00, use the manual calibration.

1) Calibration of CAL1(Buffer 1)

```
    CAL 1        MEAS

  S
          4.09
        ATC    25.0

  m   pH
```
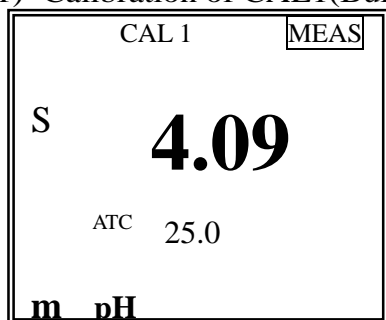
In the pH ready condition, press **CAL** key. Put electrode into the first buffer. With constant, but not violent, stirring for accurate measurement, press **STBY/Meas** key. If pH reading is stable, "S" appears in the left field. Adjust value to the measuring buffer by pressing the ▲ or ▼ key and then "m" to indicate manual calibration appears in the lower field and "S" is disappeared.

Press the **CAL** key to set pH value, and then "CAL 1 OK" message is displayed in the upper field. And "CAL 2" message is displayed in the upper field.

Chapter V.   Calibration and Measurement
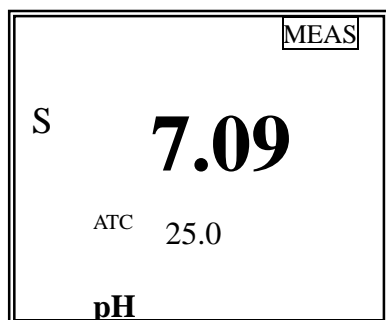
2) Calibration CAL2 to CAL3 (Buffer 2 to Buffer3)
Clearly rinse electrode and put into the second buffer. The calibration method of CAL2~CAL3 is the same as done in CAL1. It is available to calibrate buffer up to 3 points, if calibrating up to 3 points, change into the initial display automatically.

If pressing **CAL** key after calibrating 2 points, change to the initial display.
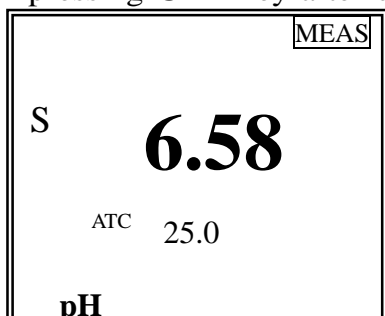
MEAS

S

6.58

ATC   25.0

pH

Put electrode into sample, and press **STBY/Meas** key. If pH reading is stable, "S" appears in the left field.

MEAS

-2.57

ATC   25.0

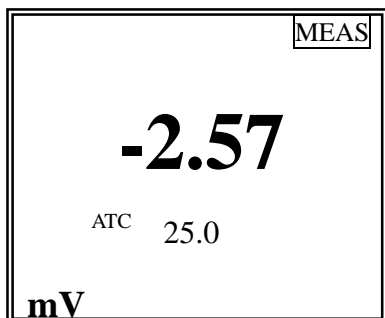**mV**

While measuring, can also know millivolt by pressing **Mode** key.

The measured data is stored by pressing **Memory** key manually. Refer to Data-Log of Chapter V.

(2) Millivolt Measurement

The millivolt modes are useful when performing potentiometric titration or preparing calibration curves. Millivolt is displayed to 0.1mV resolution in the range of −1999.9 to +1999.9 mV. Access the millivolt mode by pressing **Mode** key and then **STBY/Meas** key.

MEAS

23.0

ATC   25.0

mV
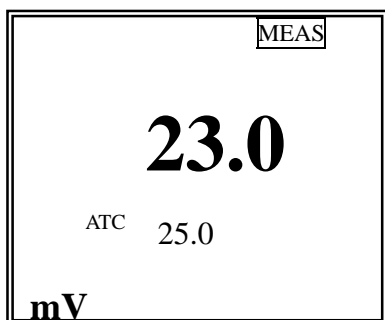
In addition, while measuring pH, can also know millivolt by pressing **Mode** key.

Chapter V.   Calibration and Measurement

Model D45

(1) Preparation

Connect probe and temperature sensor to Input and ATC jack respectively.
Clearly rinse probe with distilled water and blot dry with tissue.
Prepare solution for measurement and magnetic stirrer.
It takes 1~10 minutes to polarize probe because of using polarographic probe.

(2) Calibration and Measurement

- DO Calibration and Measurement

Constantly stir solution by using magnetic stirrer.
Saturate solution with oxygen by the bubbling equipment at least 1~2 hours in advance before calibration.
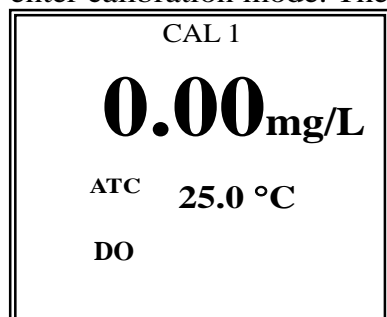Put saturated solution into BOD bottle and cap to minimize the exposure in the air.

Zero Calibration

There are two ways of zero calibration. In ready condition, press **CAL** key to enter calibration mode. The display is shown as follows.

```
┌─────────────────────┐
│        CAL 1        │
│                     │
│   0.00mg/L          │
│                     │
│   ATC   25.0 °C     │
│                     │
│   DO                │
└─────────────────────┘
```

1) In case of calibration with solution not containing DO, add excess sodium sulfite, Na_2SO_3, and a trace of cobalt chloride, $CoCl_2$, to bring DO to zero. Put probe into this solution.
2) In case of calibration without solution, remove probe
   from Input and press **SYBY/Meas** key.
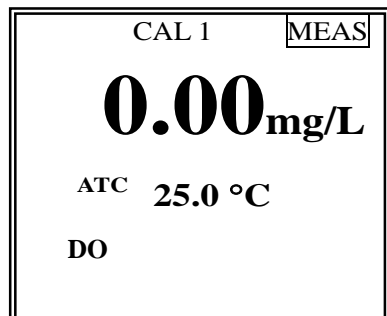
```
┌─────────────────────┐
│   CAL 1      MEAS    │
│                     │
│   0.00mg/L          │
│                     │
│   ATC   25.0 °C     │
│                     │
│   DO                │
└─────────────────────┘
```

If the reading is stable, press **CAL** key, and then Cal 1 OK message is displayed in the upper field and set automatically.

Chapter V.   Calibration and Measurement

```
        CAL 1 OK

   0.00mg/L

  ATC    25.0 °C

  DO
```
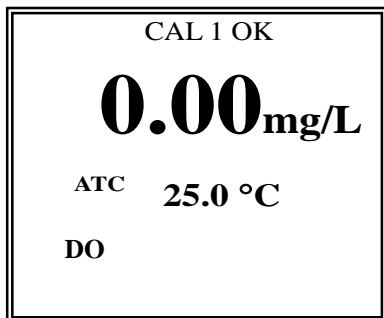
The left figure indicates to finish Zero calibration.

Saturated Calibration

Connect probe, rinse it and dry(blot dry with tissue). Rapidly put probe into

```
   CAL 2        MEAS

   8.25mg/L

  ATC    25.0 °C

  DO
```

the prepared BOD bottle containing water saturated with air to minimize the exposure in the air. Press **STBY/Meas** key.

If the reading is stable, press **CAL** key. And then Cal 2 OK message is displayed in the upper field and set automatically.
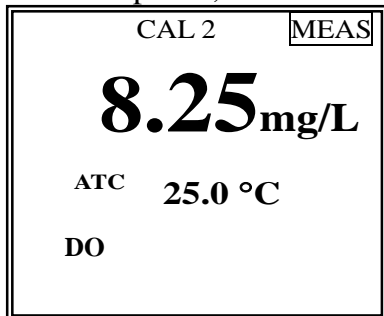
After finishing calibration, change to the initial display automatically. Put probe into sample and press the **STBY/Meas** key.

```
                MEAS

   8.22mg/L

  ATC    25.0 °C

  DO
```
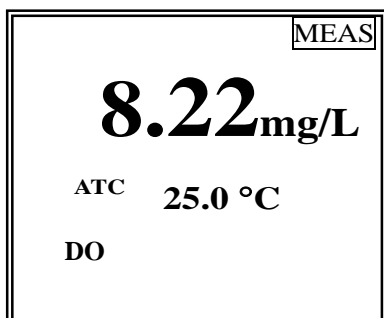
If the reading is stable, store or report it.

While measuring DO, can also measure O_2 by pressing **Mode** key.

```
                MEAS

   20.7 %

  ATC    25.0 °C

   O₂
```

Chapter V.   Calibration and Measurement
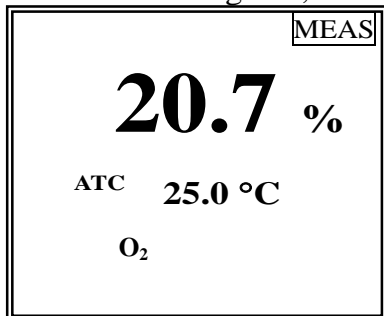
- O$_2$ Calibration and Measurement

Clearly rinse probe with distilled water and dry(blot dry with tissue). Place probe in the air. Press **CAL** key. Press **STBY/Meas** key.
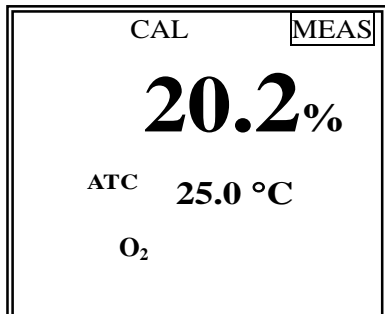
```
┌─────────────────────────┐
│  CAL              MEAS   │
│                          │
│      20.2%               │
│                          │
│  ATC    25.0 °C          │
│                          │
│    O₂                    │
└─────────────────────────┘
```

If the reading is stable, it is calibrated automatically. And then Cal OK message is displayed in the upper field and set automatically.

This value is automatically adjusted in accordance with the selected altitude.

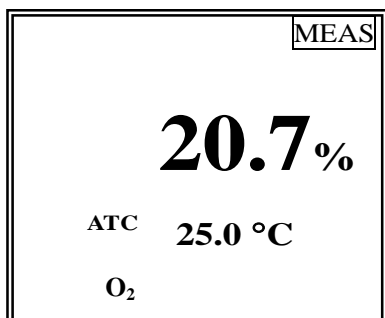If finishing calibration, automatically change to the initial display. Put probe into sample and press the **STBY/Meas** key.

If the reading is stable, store or report it.

While measuring O$_2$, can also measure DO by pressing **Mode** key.

```
┌─────────────────────────┐
│                   MEAS   │
│                          │
│      20.7%               │
│                          │
│  ATC    25.0 °C          │
│                          │
│    O₂                    │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│                   MEAS   │
│                          │
│     8.22mg/L             │
│                          │
│  ATC    25.0 °C          │
│                          │
│    DO                    │
└─────────────────────────┘
```

Chapter V.   Calibration and Measurement
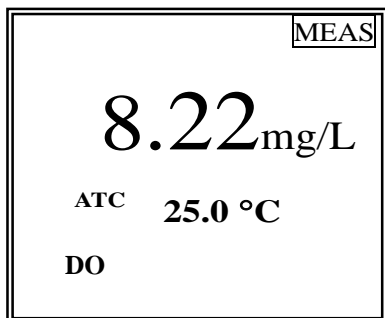
Model C75

(1) Preparation

Connect meter with cell and ATC jack.
Prepare a required buffer for measurement and magnetic stirrer.
Clearly rinse cell with the distilled water and blot dry.
※ With temperature compensation, i.e. when the "CAL 25.0" is displayed above the main field, it is available to calibrate.
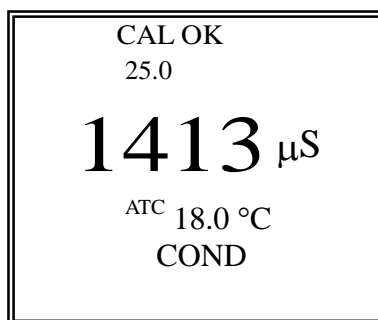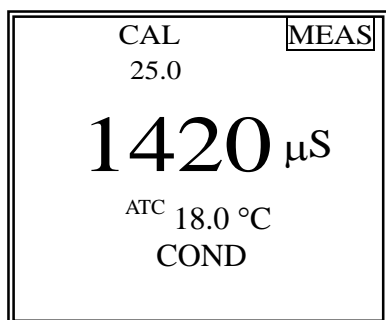
(2) Calibration and Measurement

Put cell into standard solution and press **CAL** key.
Press **STBY/Meas** key. After the reading is stable, adjust value to the measuring standard solution by pressing ▲ or ▼ key.

CAL MEAS 25.0 1420 µS ATC 18.0 °C COND	CAL OK 25.0 1413 µS ATC 18.0 °C COND

Press the **CAL** key to set value, and then "CAL OK" message is displayed in the upper field.

Clearly rinse electrode and put into sample, and press **STBY/Meas** key.

CAL   MEAS 25.0 857.6 µS ATC 18.0 °C COND
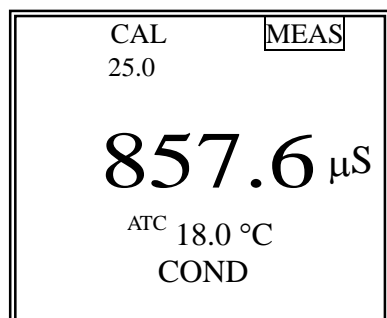
If the reading is stable, record or store it. Refer to Data-Log.

If measuring conductivity without compensation of temperature, press **TC** key to measure conductivity at measuring temperature without compensation of temperature.

Chapter V.   Calibration & Measurement

Chapter VI. Data-Log

The model P25, D45 and C75 are capable of storing up to 20 points in memory.

The measured data is stored by pressing **Memory** key manually.
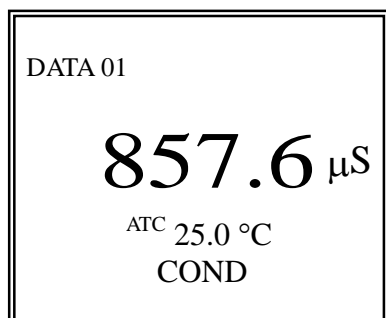If pressing **Memory** key in memory mode, change to the initial display.

```
DATA 01

        7.09

      ATC   25.0

    pH
```

```
DATA 01

      8.22 mg/L

      ATC   25.0 °C

    DO
```

```
DATA 01

      857.6 μS

      ATC 25.0 °C
        COND
```
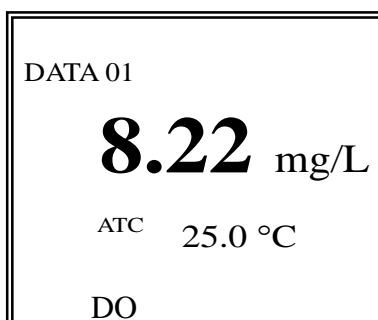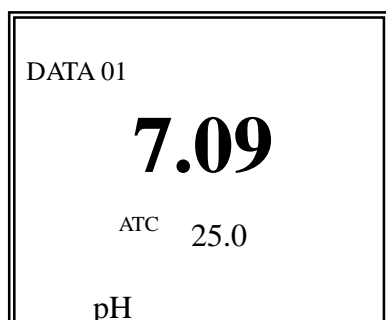
If the data stored in meter is required to print, it is available to output by using printer supplied by *istek*. After searching data stored in instrument by using ▲ or ▼ key, press **Print** key to print data.

The following figure is an example to print.

```
[DATA MODE] No : 1
pH    : 7.09
ATC : 25.0 `C
```

Chapter VI.   Data-Log
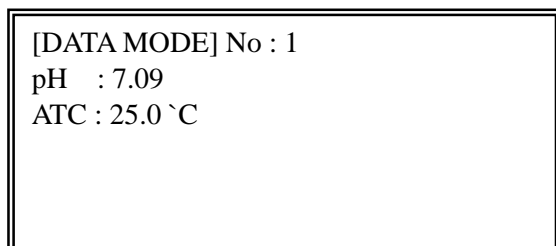
Chapter VII. Remote Control

The meter can be remotely controlled by PC.
After connecting your meter to PC by RS232C interface cable and performing communication program of PC, if pressing **Enter** key of keyboard in ready condition, remotely controlled and keypad button of meter doesn't work.

If inputting "help" while performing communication program, the remote control commands are displayed on the monitor of PC.

Model P25

EcoMet-P25>help ↵

```
:----------- Command   List -------------:
   1. Exit  : Exit Remote Control
   2. pH    : Read pH
   3. mV    : Read mV
   4. temp: Read Temperature
   5. all    : read pH, mV and Temperature
   6. data  : Read the data stored to meter
   7. help  : Display Command Help Message
```

In case of reading the data stored in meter if inputting data, message "Data Reading No :" is displayed and if inputting Data Number the data stored in meter is displayed as follows.

```
   EcoMet-D45>data
   Data Reading No: 1
```

```
 [DATA MODE]    Number : 1
 pH        :    7.09
 ATC       :    25.0 'C
```

Chapter VII.   Remote Control

Model D45

EcoMet-D45>help ⏎

The following messages are the remote control commands.

```
:----------- Command    List -------------:
   1. Exit   : Exit Remote Control
   2. DO     : Read DO
   3. O2     : Read O₂
   4. temp   : Read Temperature
   5. data   : Read the stored data to meter
   6. help   : Display Command Help Message
```

In case of reading the data stored in meter if inputting data, message "Data Reading No :" is displayed and if inputting Data Number the data stored in meter is displayed as follows.

```
   EcoMet-D45>data
   Data Reading No: 1
```

```
[DATA MODE]    Number : 1
DO      :    8.26
ATC     :    25.0 'C
```

Chapter VII. Remote Control

Model C75

EcoMet-C75>help ⌣

The following messages are the remote control commands.

```
:----------- Command   List -------------:
     1. cond      : Read Conductivity
     2. temp      : Read Temperature
     3. data      : Read the data stored to meter
     4. help      : Display Command Help Message
     5. exit      : Exit remote control
```

In case of reading the data stored in meter if inputting data, message "Data Reading No :" is displayed and if inputting Data Number the data stored in meter is displayed as follows.

```
     EcoMet-C75>data
     Data Reading No: 1
```

```
[DATA MODE]    Number : 1
Conductivity : 587.6 µS
ATC       :   25.0 'C
```

Chapter VII. Remote Control

Chapter VIII.
Troubleshooting & Error Description

pH/mV/TEMP Meter

MALFUNCTION	POSSIBLE CAUSE	REMEDY
No display	No power to meter	Press Power key.
		Check that the line converter is correctly plugged.
Error occurred in Cal mode – Reading Out of Range	Electrode failure Out of Range for Buffer	Check that meter is correctly connected with electrode and ATC probe.
	When trying to exit after calibrating only 1 point, error message (Err) appears.	Continue calibration.
Error occurred in measure mode	Out of measuring Range of pH	Check that meter is correctly connected with electrode and ATC probe.

If the cause can't know, Clear memory(data) to eliminate all data.

Clear Memory(data)

Model P25

If clearing all the stored data, press **Memory** key to enter Memory mode and then press **CAL** key to clear.

Chapter VIII.   Troubleshooting & Error Description

DO/O₂/TEMP Meter

MALFUNCTION	POSSIBLE CAUSE	REMEDY
	No power to meter	Press Power key.
		Check that the adaptor is correctly plugged.
Out of range reading or unstable reading	Probe failure	Clearly rinse electrode and blot dry.
		If air bubble is occurred on membrane, remove air bubble.
		Check membrane for damage (i.e. holes and leak, etc.) If membrane gets damage, replace membrane.

<u>Clear Memory(data)</u>

Model D45
If clearing all the stored data, press **Memory** key to enter Memory mode and then press **Cal** key to clear.

Chapter VIII.   Troubleshooting & Error Description

Conductivity/TEMP Meter

MALFUNCTION	POSSIBLE CAUSE	REMEDY
No display	No power to meter	Press Power key.
		Check that the adaptor is correctly plugged.
Drift (reading slowly changing in one direction), Noisy or Unstable Readings (readings continuously or randomly changing		Check that meter is correctly connected with cell and ATC probe. Clearly rinse sensor of cell to remove interference.

Clear Memory(data)

Model C75

If clearing all the stored data, press **Memory** key to enter memory mode and then press **CAL** key to clear.

If the problem persists, please contact *istek* **Product Service Department**.

Chapter VIII.   Troubleshooting & Error Description

Chapter IX. Specifications

pH/mV/TEMP Meter

Model	*P25*
pH	
Range	*0.00 ~ 14.00*
Resolution	*0.01*
Relative Accuracy	*±0.02*
Calibration	*Auto(3 points)/ Manual(3 points)*
Millivolts	
Range	*0.0 ~ ±1999.9 mV*
Resolution	*0.1 mV*
Relative Accuracy	*±0.2 mV*
Temperature	
Range	*-10℃ to 110 ℃*
Resolution	*0.1 ℃*
Relative Accuracy	*±0.4 ℃*
Display	*Custom LCD*
Dat-Log	*20 points*
Inputs	*BNC, ATC, Power, RS232C*
Outputs	*RS-232C (Computer/Printer)*
Power	*Adaptor*

Chapter IX.   Specifications

DO/O$_2$/TEMP Meter

Model	*D45*
DO	
Range	*0.00 to 19.99 mg/L*
Resolution	*0.01*
Relativie Accuracy	*±0.5%*
O$_2$(%)	
Range	*0.0 to 60.0%*
Resolution	*0.1%*
Relativie Accuracy	*±1 digit*
Temperature	
Range	*-10℃ to 60 ℃*
Resolution	*0.1 ℃*
Relative Accuracy	*± 0.4 ℃*
Data-Log	*20 points*
Display	*Custom LCD*
Inputs	*BNC, ATC, Power, RS232C*
Outputs	*RS-232C (Computer/Printer)*
Power	*Adaptor*

Chapter IX.   Specifications

Conductivity/TEMP Meter

Model	C75
Conductivity	
Range	0 ~ 499,999 in 6 range
Resolution	0.01/0.1/1.0 autorange
Relativie Accuracy	±0.5% ± 1 digit
Temperature	
Range	-10 ~ 110 ℃
Resolution	0.1 ℃
Relative Accuracy	± 0.4 ℃
Display	Custom LCD
Data-Log	20 points
Inputs	BNC, ATC, Power, RS232C
Outputs	RS-232C
Power	Adaptor

Chapter IX.   Specifications

Chapter X. Ordering Information

Other items contact *istek*.
For further information, please feel free to contact *istek* at any time.

pH/mV/TEMP Meter

A. Standard
* Combination pH Electrode/ATC Probe
* AC/DC Adaptor
* Buffer Solutions (pH4.00, 7.00, 10.00) 125ml
* Instruction Manual

B. Option
* Luxury Third-Arm Stand
* pH Electrode Storage Solution 475 ml
* pH Electrode Filling Solution 125 ml
* Buffer Solutions (pH4.00, 7.00, 10.00) 475ml
* RS232C Interface Cable

DO/O$_2$/TEMP Meter

A. Standard
* DO Polarographic Electrode/ATC Probe
* AC/DC Adaptor
* DO Membrane
* Filling Solution
* Instruction Manual

B. Option
* Luxury Third-Arm Stand
* DO Membrane Kit
* RS232C Interface Cable

Chapter X.   Ordering Information

Conductivity/TEMP Meter

A. Standard
* Conductivity Cell(K=1.0)/ATC Probe
* AC/DC Adaptor
* Standard Solution(1413µS/cm)
* Instruction Manual

B. Option
* Luxury Third-Arm Stand
* Conductivity Standard Solution
* RS232C Interface Cable

Chapter X.   Ordering Information