

**Desktop
DO/O₂/Air/Temp Meter
Model 225D
Instruction Manual**

istek, Inc.



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Chapter I. Introduction

istek's Desktop DO/O₂/Air/TEMP Meter(model 225D) is operated by AC/DC adaptor(DC 9V) and is a high performance model controlled by microprocessor for all measurement needs.

istek's Desktop DO/O₂/Air/TEMP Meter(model 225D) features a clear custom LCD which simultaneously displays various functions along with measurement.

istek's Desktop DO/O₂/Air/TEMP Meter(model 225D) features to obtain a reliable data since its program is treated by setting in detail about compensation factor for an accurate measurement.

The model 225D is capable of storing up to 50 points in memory at once.

The model 225D can be remotely controlled via RS232C interface and transmit information to a printer or computer.

The model 225D displays DO, O₂, Air and ATC(°C).

DO indicates concentration of oxygen presents in the water. (unit mg/L)

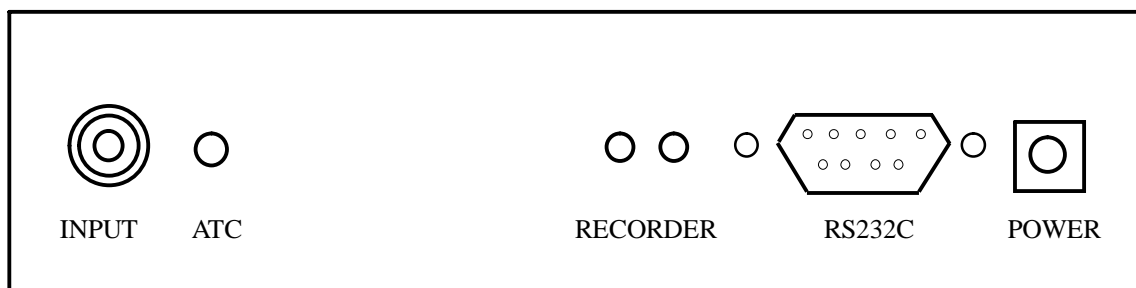
O₂ indicates percentage of oxygen as compared to the amount of oxygen presents in the air. (unit %)

Air indicates percentage of DO or O₂ concentration. (unit %)

ATC For automatic Temperature Compensation, a temperature probe supplied by *istek* must be used. Temperature Compensation is automatically performed while measuring.

Chapter II. Instrument Setup

Rear Panel



Power Source

Connect the supplied adaptor to the meter.

istek supplies AC/DC adaptor(DC 9V) adjusting to 220V.

Electrode Connections

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

ATC probe

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

Recorder connection

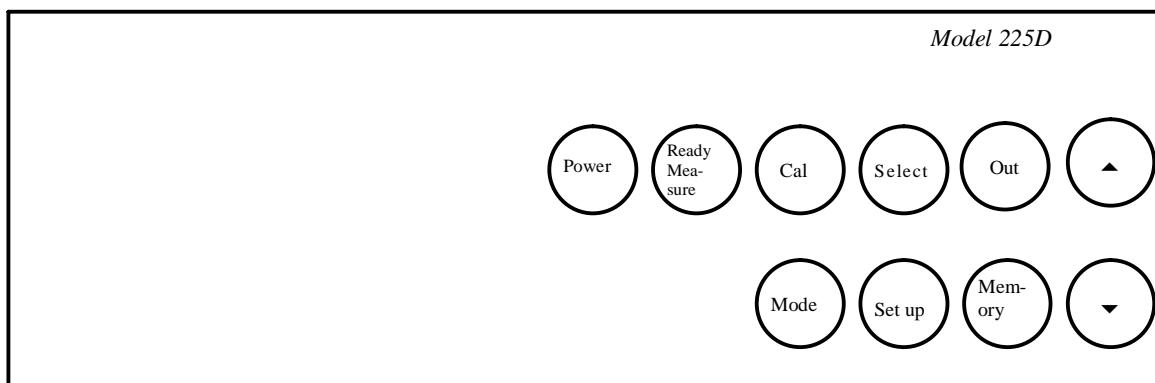
When the recorder is used, connect the recorder to the meter. Output voltage is -1999.9~+1999.9 mV with impedance of 600Ω

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

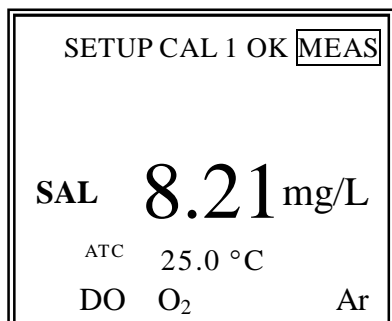
Key Function



Key Name	Description
Power	used to turn ON/OFF.
Mode	used to change operating modes, such as DO, O ₂ or Air.
Resolution	used to change the resolution. For DO mode, can choose 0.1 or 0.01.
Ready/measure	used to change condition of meter, i.e. measure or ready. This is used for changing from ready to measure condition or reversing.
Cal	used to start and set calibration.
Setup	used to access the setup menu. This is used for setting instrument parameters. Can set Salinity and Altitude.
Select	used to move position of cursor.
Enter	used to set a selected data.
Memory	used to store data in meter's memory while measuring. In the ready condition, used to search the memorized data.
Out	used to print data Used to exit in Setup.
up(▲)	In setup, calibration and Data(Memory) mode, press to increase value.
down(▼)	In setup, calibration and Data(Memory) mode, press to decrease value.

Display Description

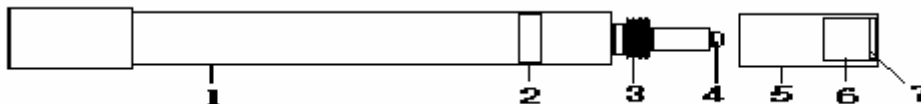
The following display is specially specified.
Even some messages are not shown in the below display, describe together below.



Display	Function
DO	displays concentration of dissolved oxygen with range of 0.00 to 19.99 mg/L.
O ₂	indicates percentage of oxygen as compared to the amount of oxygen presents in the air.
Air	indicates percentage of DO concentration.
ATC(°C)	When a temperature probe is attached, displays a current temperature and indicates that automatic temperature compensation is performed.
MEAS	indicates that meter is in measure condition. If this is not shown, indicates ready condition.
SETUP	indicates that meter is in setup mode.
Cal	indicates that meter is in calibration condition.
Cal OK	indicates whenever finish each calibration.
.	
Err	displays when it is not available to correctly measure because something is wrong in the meter or buffer while calibrating or measuring.

Electrode Structure

DO Polarographic Probe



1. Electrode Body
2. Stainless Steel Ring
3. Screw
4. Sensor; position of response to oxygen
5. Membrane Cover ;
containing with the filling Solution
6. Membrane Protector & Holder
7. Membrane

Probe Storage and Maintenance

DO Probe Storage

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

DO Probe Maintenance (Probe Cleaning)

If it takes long time to response or a stable data 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.

Chapter IV. Setup Functions

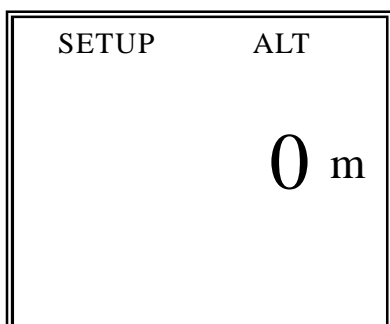
The setup menu is used to identify and change instrument parameters.

Clear data(memory)

If clearing all the stored data, press **Mode** key to enter O₂ mode and then press **Select** key to clear. Therefore all data, which set at setup, are changed to a basic value.

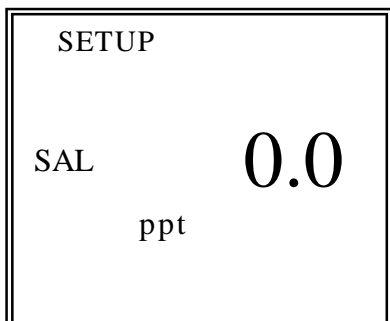
Altitude

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



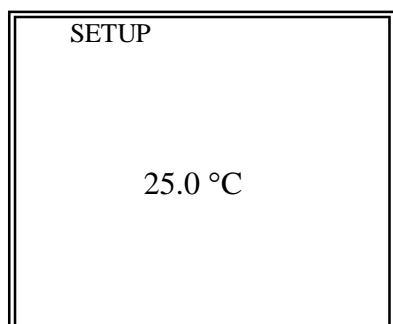
Adjust altitude with ▲ or ▼ key.
The set altitude is automatically compensated.
If finishing the setting of conditions, press **Out** key to exit or **Setup** key to enter the next setup.

Salinity



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

Temperature Setting



If temperature on display differs from a real temperature, set a real temperature.
After setting Data On/Off, press **Setup** key and set temperature by using ▲ or ▼ key.
If finishing setup, press **Setup** or **Out** key to return to pH initial display.

Chapter V. Calibration and Measurement

The basic condition is as follows.

i Salinity and Altitude = 0

(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

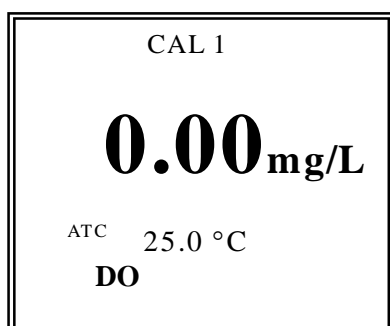
Constantly stir solution by using magnetic stirrer.

Saturate solution with oxygen by the bubbling equipment at least 1~2 hours in advance before calibration.

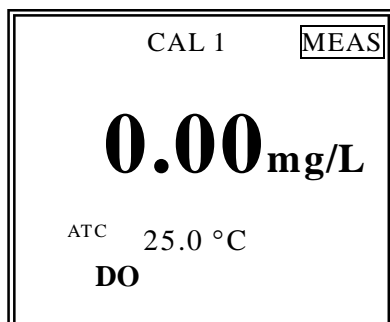
Put saturated solution into BOD bottle and cap to minimize the exposure in the air.

Zero Calibration

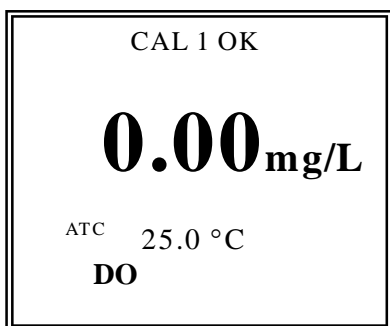
There are two ways of zero calibration. In ready condition, press **Cal** key to enter calibration mode. The display is shown as follows.



- 1) In case of calibration with solution not containing DO, add excess sodium sulfite, Na₂SO₃, and a trace of cobalt chloride, CoCl₂, to bring DO to zero. Put probe into this solution.
- 2) In case of calibration without solution, remove probe from Input and press **Measure** key.



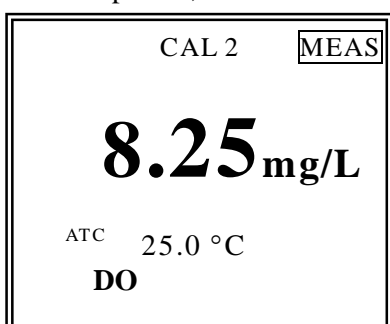
If the reading is stable, press **Cal** key, and then Cal 1 OK message is displayed in the upper field and set automatically.



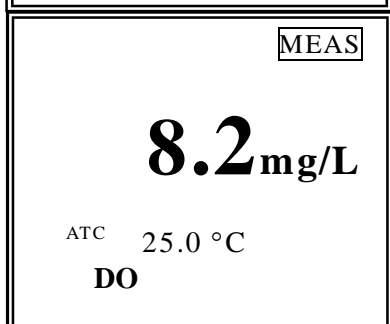
The left figure indicates to finish Zero calibration.

Saturated Calibration

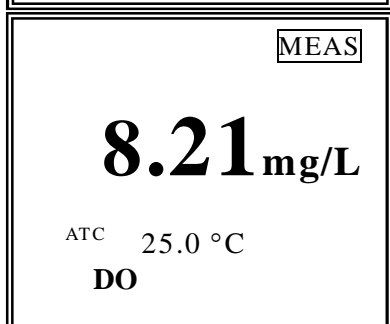
Connect probe, rinse it and dry (blot dry with tissue). Rapidly put probe into the prepared BOD bottle containing water saturated with air to minimize the exposure in the air. Press **Measure** key.



If the reading is stable, press **Cal** key. And then Cal 2 OK message is displayed in the upper field and set automatically.

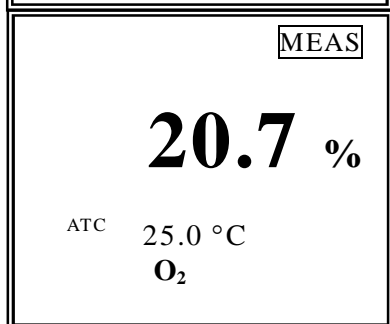


After finishing calibration, change to the initial display automatically. Put probe into sample and press the **Measure** key. If the reading is stable, store or report it. While measuring DO, can also measure O₂ or Air by pressing **Mode** key.



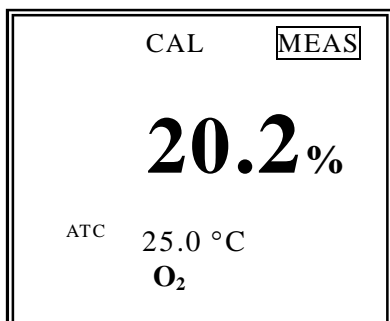
If pressing **Resolution** key, change resolution

If the reading is stable, store or report it. While measuring DO, can also measure O₂ by pressing **Mode** key.



- O₂ Calibration and Measurement

Clearly rinse probe with distilled water and dry (blot dry with tissue). Place probe in the air. Press **Cal** key.

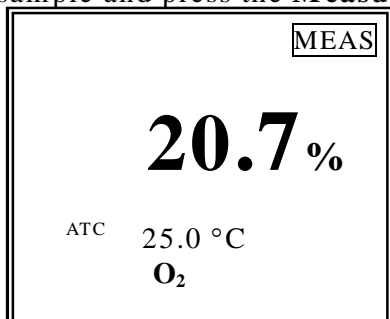


Press **Measure** key.

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

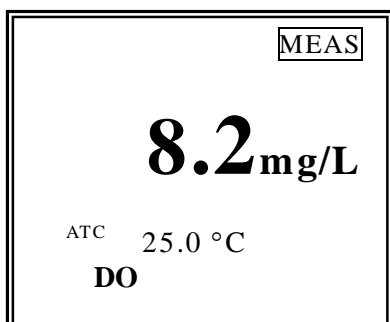
This value is automatically adjusted in accordance with the selected altitude.

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



If the reading is stable, store or report it.

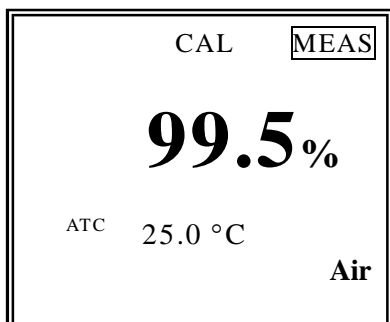
While measuring O₂, can also measure DO or Air by pressing **Mode** key.



- Air Calibration and Measurement

In O₂ Mode, change to Air mode using **Mode** key

Clearly rinse probe with distilled water and dry (blot dry with tissue). Place probe in the air. Press **Cal** key. Press **Measure** key.



If the reading is stable, press **Cal** key. 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.

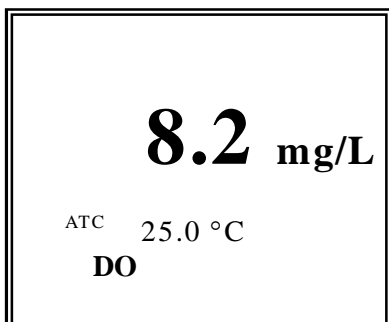
If finishing calibration, automatically change to the initial display. Put probe into sample and press **Measure** key to measure percentage of dissolved oxygen.

While measuring air, can also measure DO or O₂ by pressing **Mode** key.

Chapter VI. Data-Log

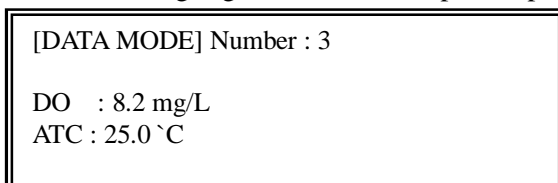
Model 225D can transmit information to printer or computer using RS232 interface.

Memory Data-Log



The measured data is stored by pressing **Memory** key manually.
Up to 50 points is stored in memory at any one time.
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 **Select** key, press **Out** key to print data.

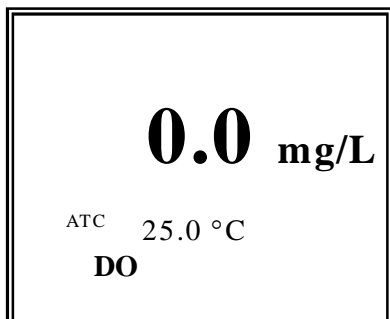
The following figure is an example to print.



Chapter VII. Remote Control

The meter can be remotely controlled by PC.

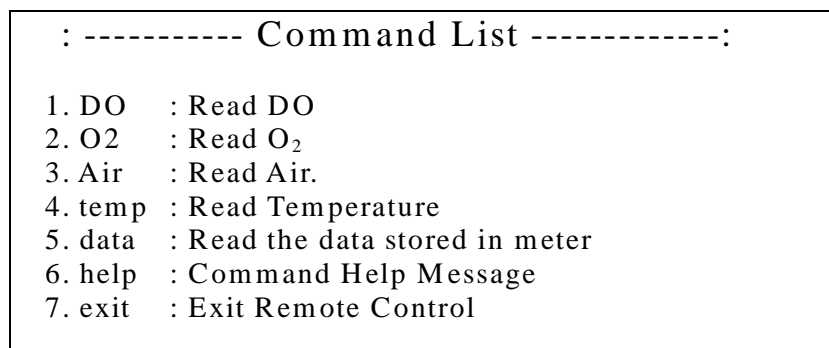
After connecting your meter to PC by RS232C interface cable and performing communication program of computer, if pressing **Enter** of keyboard, remotely controlled and key button of meter doesn't work.



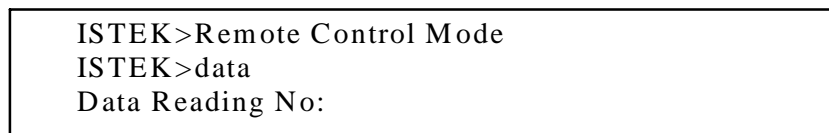
If inputting help while performing communication program, the remote control commands are displayed on the monitor of computer.

ISTEK>help

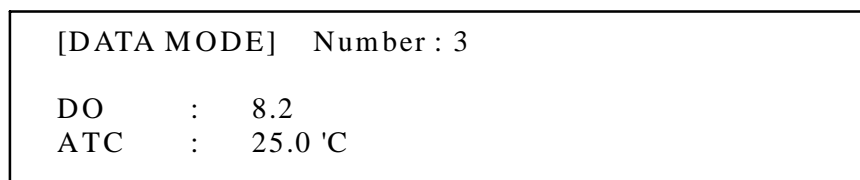
The following messages are the remote control commands.



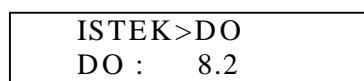
The following figure is an example of the remote control using communication program.



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. This is also used by storing in "screen capture" or recording.



The following message is to read a measuring DO.



Chapter VIII. Troubleshooting & Error Description

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.

If the cause can't know, clear memory(data).
Refer to Clear Memory(data) of Setup Functions.

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

Chapter IX. Specifications

The details refer to Catalog or contact *istek*.

Model	225D
DO	
Range	0.00 to 19.99 mg/L
Resolution	0.01/0.1
Relative Accuracy	±0.5%
O₂(%)	
Range	0.0 to 60.0%
Resolution	0.1%
Relative Accuracy	±1 digit
Air Saturation(%)	
Range	0.0 to 199.9%
Resolution	0.1%
Relative Accuracy	±1 digit
Temperature	
Range	-10°C to 60 °C
Resolution	0.1 °C
Relative Accuracy	± 0.4 °C
Salinity Correction	0 to 70 ppt
Altitude Correction	0 to 4000 m
Temperature Compensation	Auto
Calibration	Auto
Data-Log	50 points
Print Capability	Yes
Display	Custom LCD
Inputs	One BNC, ATC, Power, RS232C
Outputs	Recorder, RS-232C(Computer/Printer)
Power	AC/DC Adaptor

Chapter X. Ordering Information

- ※ Other items contact *istek*.
For further information on other accessories, please feel free to contact *istek* at any time.

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