pH/mV
SD card real time data logger

pH METER

Model : PH-230SD

Your purchase of this pH METER with SD CARD DATA LOGGER marks a step forward for you into the field of precision measurement. Although this meter a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.

OPERATION MANUAL

TABLE OF CONTENTS

1. FEATURES

* pH : 0 to 14.00 pH, mV (ORP) : ± 1999 mV.
* pH measurement can select ATC or manual Temp. adj..
* Optional ATC probe for pH measurement.
* pH measurement can make the auto calibration for pH 7, pH 4 and pH 10 or other value.
* Real time SD memory card Datalogger, it Built-in Clock and Calendar, sampling time set from 1 sec to 8 hour 59 min. 59 sec.
* Manual datalogger is available (set the sampling time to 0), during execute the manual datalogger function, it can set the different position (location) No. (position 1 to position 99).
* Innovation and easy operation, computer is not need to setup extra software, after execute datalogger, just take away the SD card from the meter and plug in the SD card into the computer, it can down load the all the measured value with the time information (year/month/date/ hour/minute/second) to the Excel directly, then user can make the further data or graphic analysis by themselves.
* SD card capacity : 1 GB to 16 GB.
* LCD with green light backlight, easy reading.
* Can default auto power off or manual power off.
* Data hold, record max. and min. reading.
* Microcomputer circuit, high accuracy.
* Power by UM3/AA (1.5 V) x 6 batteries or DC 9V adapter.
* RS232/USB PC COMPUTER interface.
* Wide applications: water conditioning, aquariums, beverage, fish hatcheries, food processing, photography, laboratory, paper industry, plating industry, quality control, school & college, water conditioning.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Custom one-chip of microprocessor LSI circuit.	
Display	LCD size : 52 mm x 38 mm LCD with green backlight (ON/OFF).	
Measurement Function	pH ORP (mV)	
Datalogger Sampling Time Setting range	Auto	1 sec to 8 hour 59 min. 59 sec. *@ Sampling time can set to 1 second, but memory data may loss.*
	Manual	Push the data logger button once will save data one time. *@ Set the sampling time to 0 second.* *@ Manual mode, can also select the 1 to 99 position (Location) no.*
Memory Card	SD memory card. 1 GB to 16 GB.	
Advanced setting	* SD memory card Format * Set clock time (Year/Month/Date, Hour/Minute/ Second) * Set sampling time * Auto power OFF management * Set beep Sound ON/OFF * Decimal point of SD card setting * Set temperature unit to ℃ or ℉ * Set pH manual Temp. compensation value	
Data Hold	Freeze the display reading.	
Memory Recall	Maximum & Minimum value.	
Sampling Time of Display	Approx. 1 second.	
Data Output	RS 232/USB PC computer interface. * *Connect the optional RS232 cable UPCB-02 will get the RS232 plug.* * *Connect the optional USB cable USB-01 will get the USB plug.*	

Operating Temperature	0 to 50 ℃.
Operating Humidity	Less than 85% R.H.
Power Supply	* Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent.
	* DC 9V adapter input. (AC/DC power adapter is optional).
Power Current	Normal operation (w/o SD card save data and LCD Backlight is OFF) : *Approx. DC 14 mA.*
	When SD card save the data and LCD Backlight is OFF) : *Approx. DC 37 mA.*
	* *If LCD backlight on, the power consumption will increase approx. 12 mA.*
Weight	489 g/1.08 LB.
Dimension	177 x 68 x 45 mm (7.0 x 2.7x 1.9 inch)
Accessories Included	* Instruction manual......................1 PC
Optional Accessories	* PH electrode....................... PE-03, PE-11, PE-01, PE-02, PE-07, PE-06HD, PE-04HD, PE-05T, PE-03K7
	* ATC Temp. probe.................TP-07
	* pH 7 buffer solution............. PH-07
	* pH 4 buffer solution............. PH-04
	* ORP Electrode......................ORP-14
	* Hard carrying case...............CA-06
	* Soft carrying case.................CA-05A
	SD memory card (1 GB) SD memory card (2 GB) AC to DC 9V adapter. USB cable, USB-01. RS232 cable, UPCB-02. Data Acquisition software,SW-U801-WIN.

2-2 Electrical Specifications (23± 5 ℃)

pH Electrode	Optional, Any pH electrode with BNC connector.	
Measurement	pH	0 to 14 pH
	mV	-1999 mV to 1999 mV
Input Impedance	10^12 ohm	
Temperature Compensation for pH measurement	Manual	0 to 100 ℃, be adjusted by push button on front panel.
	Automatic (ATC)	With the optional temperature probe (TP-07) 0 to 65 ℃.
pH Calibration	pH7, pH4, and pH10, 3 points calibration ensure the best linearity and accuracy.	

Measurement	Range	Resolution	Accuracy
pH	0 to 14 pH	0.01 pH	± (0.02 pH + 2 d)
mV (ORP)	0 to 1999 mV	1 mV	± (0.5% + 2 d)
* pH accuracy is based on calibrated meter only.			

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3. FRONT PANEL DESCRIPTION
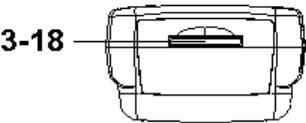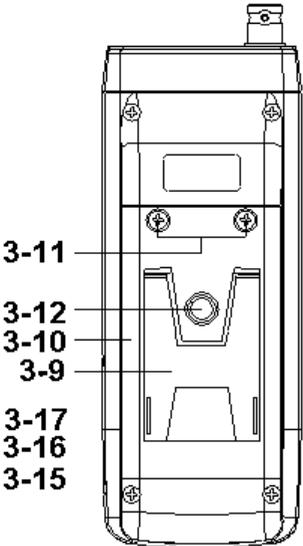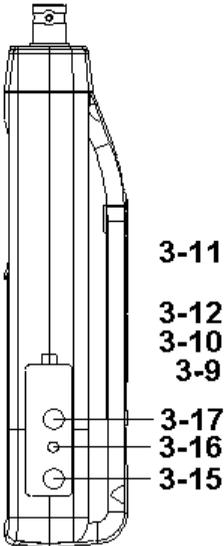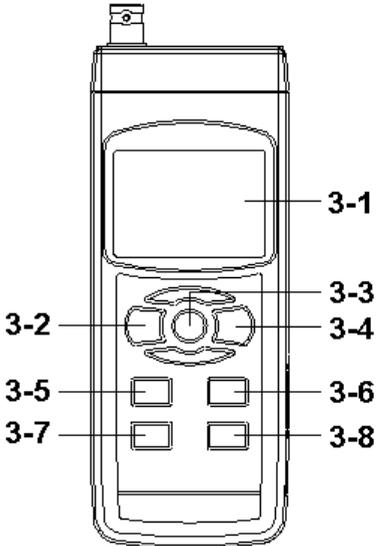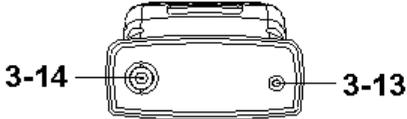
3-1 Display

3-2 Power Button (Backlight Button)

3-3 Hold Button (ESC Button)

3-4 REC Button (Enter Button)

3-5 ▲ Button

3-6 ▼ Button (Function Button)

3-7 Time Button

3-8 Logger Button (SET Button, Sampling check)

3-9 Stand

3-10 Battery Compartment/Cover

3-11 Battery Cover Screw

3-12 Tripod Fix Nut

3-13 Temp. Socket (pH ATC Socket)

3-14 pH Socket (BNC Socket)

3-15 DC 9V Power Adapter Input Socket

3-16 Reset Button

3-17 RS-232 Output Terminal

3-18 SD card socket

4. pH/mV MEASURING and CALIBRATION PROCEDURE

The meter default function are following :
 * The display unit is set to pH.
 * The temperature unit is set to ℃.
 * Manual ATC (without connect the ATC probe)
 * Auto power off.
 * The sampling time of data logger function is
   2 seconds.
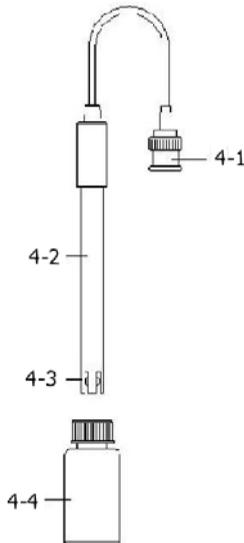
Fig. 2

If the meter is first time to connect the pH electrode, it should make the calibration before operation, the calibration procedures refer to chapter 4-4, page 9.

4-1 pH measurement (manual Temp. compensation)

1) Power on the meter by pressing " Power Button " (3-2, Fig. 1) once.

2) Prepare the pH Electrode (optional), install the " Probe Plug " (4-1, Fig. 2) into the " pH Socket/BNC Socket " (3-14, Fig. 1).

3) **Adjust the manual Temp. value same as the solution's temperature exactly, the procedures refer chapter 8-8, page 25.**

4) Hold the " Electrode Handle " (4-2, Fig. 2) by hand and let the " Sensing head " (4-3, Fig. 2) immersed wholly into the measured solution and little shake the electrode.

5) The main display will show the pH value, the bottom display will show the setting manual Temp. value.

4-2 pH measurement (ATC , automatic Temperature)

1) All the procedures are same as

    5-1 pH measurement (manual Temp. compensation) but should prepare one temperature probe (optional, TP-07), insert the TP-07's plug into the " Temp. Socket " (3-13, Fig. 1), immerse the sensing head of temperature probe (TP-07) into the measurement solution.

2) The main display will show the pH value, the bottom display will show the sensing Temp. value of the measured solution (measured from ATC probe, TP-07).

When not use the Electrode, it should immerse the " Electrode sensing head " (4-3, Fig. 2) into the " Protection bottle " (4-4, Fig. 2)

4-3 mV Measurement

The instrument build in mV (millivolt) measurement function, which enable you to make ion-selective, ORP (oxidation-reduction potential), and other precise mV measurements.

1) Press the " Function Button " (3-6, Fig. 1) once, the Display unit " pH " will change to " mV "
    Press the : Function Button " once will return to " pH " function.
2) Prepare the ORP Electrode (optional, ORP-14), install the " Probe Plug " of ORP electrode into the " pH Socket/BNC Socket " (3-14, Fig. 1).
3) The Display will show the mV value.

4-4 pH calibration

Calibration Consideration

The most ideal pH ELECTRODE generates 0 mV at pH 7.00 (177.4 mV at pH 4) and meter has been always calibrated with signals which simulate the most ideal pH ELECTRODE (based on 25 ℃ ambient environment). However not every pH ELECTRODE is as accurate as the most ideal one, so calibration procedures are necessary to be done before the first time measurement.
In addition to the first time measurement, users are also recommended to execute the calibration procedures to ensure the high accuracy measurement.

1) pH ELECTRODE (optional).
2) pH buffer solutions (optional).

Calibration Procedure

1) Prepare the pH Electrode (optional), install the
   " Probe Plug " (4-1, Fig. 2) into the " pH Socket/BNC
   Socket " (3-16, Fig. 1).
2) Power on the meter by pressing " Power Button "
   (3-2, Fig. 1) once.
3) Adjust the " Temperature Compensation Value " to
   make it same as the temperature value of the pH
   buffer solution.

   * **Manual temperature compensation value
     adjustment procedure, refer to 8-8, page 25.**
   * **Automatic temperature compensation, it
     should plug in the ATC probe (optional, TP-07).**
     .
4) Hold the " Electrode Handle " (4-2, Fig. 2) by hand
   and let the " Sensing head " (4-3, Fig. 2) immersed
   wholly into the measured solution and little shake the
   probe. Display will show the pH value.

   * **If use the ATC probe, should imerse the
     ATC ptobe into the solution together.**

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5) Use the two fingers to press the " REC Button " (3-4, Fig 1) and " HOLD Button " (3-3, Fig. 1) at the same time. Until Display will show the following screen then release the both fingers.

```
       PH
   CAL
```
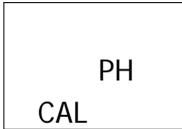
6) Press the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (3-6, Fig. 1) once in sequence to select the following screen.
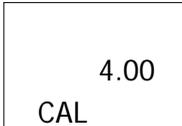
a
```
        4.00
    CAL
```
For pH 4.00 calibration
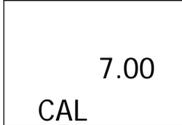
b
```
        7.00
    CAL
```
For pH 7.00 calibration
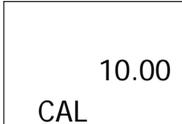
c
```
        10.00
    CAL
```
For pH 10.00 calibration
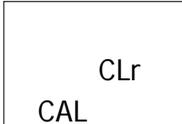
d
```
        CLr
    CAL
```
Clear the existing calibration data

* After the above a, b, c screen is selected, then cooperate
the relative standard solution, for example the
b screen should cooperate the pH 7.00 standard solution.
a screen should cooperate the pH 4.00 standard solution.
Press the " Enter Button " (3-4, Fig. 1) will
save the calibration data and finish the calibration
procedures.
* If select the d screen, press the " Enter Button "
(3-4, Fig. 1) will clear existing calibration data.

7) The complete procedures should execute
the two calibration points :

pH7 calibration
pH4 calibration (or pH10 calibration)

* The calibration procedures should execute start from
pH7 calibration then follow pH4 (or pH10) calibration.
* Rinse the electrode with distilled water again when
make each point calibration (pH7, pH4 or pH10).
* Repeat above two points procedures two times at least.

5. OTHER FUNCTION

5-1 Data Hold

During the measurement, press the " Hold Button " (3-3, Fig. 1) once will hold the measured value & the LCD will display a " HOLD " symbol.
Press the " Hold Button " once again will release the data hold function.

5-2 Data Record (Max., Min. reading)

1) The data record function records the maximum and minimum readings. Press the " REC Button " (3-4, Fig. 1) once to start the Data Record function and there will be a " REC. " symbol on the display.
2) With the " REC. " symbol on the display :
   a) Press the " REC Button " (3-4, Fig. 1) once, the " REC. MAX. " symbol along with the maximum value will appear on the display.
      If intend to delete the maximum value, just press the " Hold Button " (3-3, Fig. 1) once, then the display will show the " REC. " symbol only & execute the memory function continuously.
   b) Press the " REC Button " (3-4, Fig. 1) again, the " REC. MIN. " symbol along with the minimum value will appear on the display.
      If intend to delete the minimum value, just press the " Hold Button " (3-3, Fig. 1) once, then the display will show the " REC. " symbol only & execute the memory function continuously.
   c) To exit the memory record function, just press the " REC " button for 2 seconds at least. The display will revert to the current reading.

5-3 LCD Backlight ON/OFF

After power ON, the " LCD Backlight " will light automatically. During the measurement, press the " Backlight Button " (3-2, Fig. 1) once will turn OFF the " LCD Backlight ".
Press the " Backlight Button " once again will turn ON the " LCD Backlight " again.

6. DATALOGGER

6-1 Preparation before execute datalogger function

a. Insert the SD card
Prepare a " SD memory card " (1 GB to 16 GB, optional), insert the SD card into the " SD card socket " (3-20, Fig. 1). The front panel of the SD card should face against the down case.

b. SD card Format
If SD card just the first time use into the meter, it recommend to make the " SD card Format " at first. , please refer chapter 8-1, page 21.

c. Time setting
If the meter is used at first time, it should to adjust the clock time exactly, please refer chapter 8-2, page 22.

d. Decimal format setting

The numerical data structure of SD card is default used the " . " as the decimal, for example "20.6" "1000.53" . But in certain countries   (Europe ...) is used the " , " as the decimal point, for example " 20, 6 " "1000,53". Under such situation, it should change the Decimal character at first, details of setting the Decimal point, refer to Chapter 8-6, page 24.

6-2 Auto Datalogger (Set sampling time ≥ 1 second)

a. Start the datalogger

Press the " REC Button (3-4, Fig. 1) once , the LCD will
show the text " REC ", then press the " Logger Button "
(3-8, Fig. 1), the bottom text " DATALOGGER " will
flashing, at the same time the measuring data along the
time information will be saved into the memory circuit.

Remark :
  ** How to set the sampling time, refer to Chapter 8-3
   page 23.*
  ** How to set the beeper sound is enable, refer to
   Chapter 8-5, page 24.*

b. Pause the datalogger

During execute the Datalogger function , if press the
" Logger Button " (3-8, Fig. 1) once will pause the
Datalogger function (stop to save the measuring data
into the memory circuit temporally). In the same time
the the text of " DATALOGGER " will be no flashing.

Remark :
*If press the " Logger Button " (3-8, Fig. 1) once again
will execute the Datalogger again, the bottom text of
" DATALOOGER " will flashing .*

c. Finish the Datalogger

During pause the Datalogger, press the " REC Button "
(3-4, Fig. 1) continuously at least two seconds, the " REC "
indication will be disappeared and finish the Datalogger.

6-3 Manual Datalogger (Set sampling time = 0 second)

a. Set sampling time is to 0 second

Press the " REC Button (3-4, Fig. 1) once , the LCD will show the text " REC ", then press the " Logger Button " (3-8, Fig. 1) once, the bottom text " DATALOGGER " will flashing once and Beeper will sound once, at the same time the measuring data along the time information will be saved into the memory circuit. The lower Display will show the Position (Location) no. and saved into the SD card too.

Remark :
During execute the Manual Datalogger, press the " ▲ Button " (3-5, Fig, 1) the lower no. (position no.) will flashing. It can use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (3-6, Fig. 1) to set the measuring position (1 to 99, for example room 1 to room 99) to identify the measurement location , the lower Display will show P x (x = 1 to 99).

b. Finish the Datalogger

Press the " REC Button " (3-4, Fig. 1) continuously at least two seconds, the " REC " indication will be disappeared and finish the Datalogger.

6-4 To check the time information

During the normal measurement screen (not execute the Datalogger),

1) If press " Time Button " (3-7, Fig. 1) once , the lower LCD display will present the time information of Hour/Minute/Second (h.m.s) in the lower Display.
2) If press " Time Button " (3-7, Fig. 1) once again , the lower LCD display will present the time information of Year/Month/Date (yy.mm.dd) in the lower Display.
3) If press " Time Button " (3-7, Fig. 1) once again , the LCD will return to normal screen.

6-5 Check sampling time information

During the normal measurement screen (not execute the Datalogger), If press " Sampling Button " (3-8, Fig. 1) once , the lower LCD display will present the Sampling time information in second unit.

6-6 SD Card Data structure

1) When the first time, the SD card is used into the meter, the SD card will generate a route :

   PHA01

2) If the first time to execute the Datalogger,
   under the route PHA01\, will generate a new
   file name PHA01001.XLS.
   After exist the Datalogger, then execute again,
   the data will save to the PHA01001.XLS until
   Data column reach to 30,000 columns, then
   will generate a new file, for example PHA01002.XLS
3) Under the folder PHA01\, if the total files more
   than 99 files, will generate anew route, such as
   PHA02\ ....
4) The file's route structure :
   PHA01\
      PHA01001.XLS
      PHA01002.XLS
      ....
      PHA01099.XLS
   PHA02\
      PHA02001.XLS
      PHAA02002.XLS
      ....
      PHA02099.XLS
   PHAXX\
      ....
      ....

   Remark :
   XX : Max. value is 10.

7. Saving data from the SD card to the computer (EXCEL software)

1) After execute the Data Logger function, take away the SD card out from the " SD card socket " (3-18, Fig. 1).
2) Plug in the SD card into the Computer's SD card slot (if your computer build in this installation) or insert the SD card into the " SD card adapter ". then connect the " SD card adapter " into the computer.
3) Power ON the computer and run the " EXCEL software ". Down load the saving data file (for example the file name : PHA01001.XLS, PHA01002.XLS) from the SD card to the computer. The saving data will present into the EXCEL software screen (for example as following EXCEL data screens) , then user can use those EXCEL data to make the further Data or Graphic analysis usefully.

EXCEL data screen (for example 1)

	A	B	C	D	E	F	G
1	Position	Date	Time	Ch1_Value	Ch1_Unit	Ch2_Value	Ch2_unit
2	1	2009/8/12	13:26:37	7.00	ph	25.0	Degree_C
3	2	2009/8/12	13:26:39	7.01	ph	25.0	Degree_C
4	3	2009/8/12	13:26:41	7.01	ph	25.0	Degree_C
5	4	2009/8/12	13:26:43	7.00	ph	25.0	Degree_C
6	5	2009/8/12	13:26:45	7.00	ph	25.0	Degree_C
7	6	2009/8/12	13:26:47	7.00	ph	25.0	Degree_C
8	7	2009/8/12	13:26:49	7.00	ph	25.0	Degree_C
9	8	2009/8/12	13:26:51	6.99	ph	25.0	Degree_C
10	9	2009/8/12	13:26:53	6.98	ph	25.0	Degree_C
11	10	2009/8/12	13:26:55	6.99	ph	25.0	Degree_C
12	11	2009/8/12	13:26:57	6.99	ph	25.0	Degree_C
13	12	2009/8/12	13:26:59	7.00	ph	25.0	Degree_C

EXCEL data screen (for example 2)

	A	B	C	D	E	F	G	H	
1	Position	Date	Time	Ch1_Value	Ch1_Unit	Ch2_Value	Ch2_unit		
2	1	2009/8/12	13:26:37	7.00	ph	25.0	Degree_C		
3	2	2009/8/12	13:26:39	7.01	ph	25.0	Degree_C		
4	3	2009/8/12	13:26:41	7.01	ph	25.0	Degree_C		
5	4	2009/8/12	13:26:43	7.00	ph	25.0	Degree_C		
6	5	2009/8/12	13:26:45	7.00	ph	25.0	Degree_C		
7	6	2009/8/12	13:26:47	7.00	ph	25.0	Degree_C		
8	7	2009/8/12	13:26:49	7.00	ph	25.0	Degree_C		
9	8	2009/8/12	13:26:51	6.99	ph	25.0	Degree_C		
10	9	2009/8/12	13:26:53	6.98	ph	25.0	Degree_C		
11	10	2009/8/12	13:26:55	6.99	ph	25.0	Degree_C		
12	11	2009/8/12	13:26:57	6.99	ph	25.0	Degree_C		
13	12	2009/8/12	13:26:59	7.00	ph	25.0	Degree_C		

EXCEL data screen (for example 3, graphic)

20
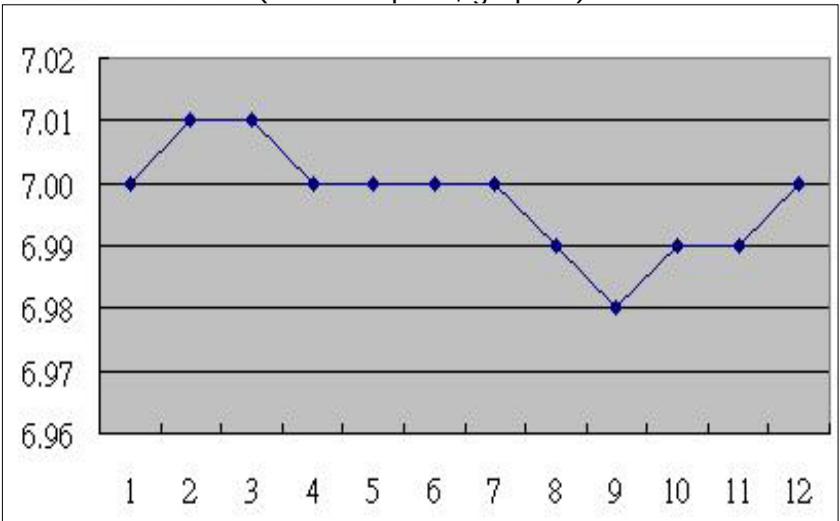
8. ADVANCED SETTING

Under do not execute the Datalogger function,
press the " SET Button " (3-8, Fig. 1) continuously at
least two seconds will enter the " Advanced Setting " mode.
then press the " SET Button " (3-8, Fig. 1) once a while
in sequence to select the eight main function, the
display will show :

Sd F..... SD memory card Format
dAtE..... Set clock time (Year/Month/Date, Hour/Minute/
Second)
SP-t...... Set sampling time (Hour/Minute/Second)
PoFF..... Auto power OFF management
bEEP..... Set beeper sound ON/OFF
dEC....... Set SD card Decimal character
t-CF...... Select the Temp. unit to ℃ or ℉
t-SEt..... Set pH manual Temp. compensation value, pH only
ESC...... Escape from the advanced setting

Remark :
During execute the " Advanced Setting " function,
if press " ESC Button " (3-3, Fig. 1) will exit the
" Advanced Setting " function, the LCD will return
to normal screen.

8-1 SD memory card Format

When the lower display show " Sd F "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (
   3-6, Fig. 1) to select the upper value to " yES " or
   " no ".

yES - Intend to format the SD memory card
no - Not execute the SD memory card format

2) If select the upper to " yES ", press the " Enter Button
" (3-4, Fig. 1) once again, the Display will show text
" yES Enter " to confirm again, if make sure to do the
SD memory card format, then press " Enter Button "
once will format the SD memory clear all the existing
data that already saving into the SD card.

8-2 Set clock time (Year/Month/Date, Hour/Minute/ Second)

When the upper display show " dAtE "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
(3-6, Fig. 1) to adjust the value (Setting start from
Year value). After the desired value is set, press the
 " Enter Button " (3-4, Fig. 1) once will going to
next value adjustment (for example, first setting
value is Year then next to adjust Month, Date, Hour,
Minute, Second value).

Remark :
The adjusted value will be flashed.

2) After set all the time value (Year, Month, Date, Hour,
Minute, Second), press the " SET Button " (3-8, Fig.
1) once will save the time value, then the screen will
jump to Sampling time " setting screen (Chapter 8-3).

Remark :
After the time value is setting, the internal clock will
run precisely even Power off if the battery is under
normal condition (No low battery power).

8-3 Set sampling time (Hour/Minute/Second)

When the upper display show " SP-t "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to adjust the value (Setting start from
   Hour value). After the desired value is set, press the
   " Enter Button " (3-4, Fig. 1) once will going to next
   value adjustment (for example, first setting value is
   Hour then next to adjust Minute, Second value).

   Remark :
   The adjusted value will be flashed.

2) After set all the sampling time value (Hour, Minute,
   Second), press the " SET Button " (3-8, Fig. 1) once
   will save the sampling value with default then the
   screen will jump to " Auto power OFF " setting
   screen (Chapter 8-4).

8-4 Auto power OFF management

When the lower display show " PoFF "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to select the upper value to " yES " or
   " no ".

   yES - Auto Power Off management will enable.
   no - Auto Power Off management will disable.

2) After select the upper text to " yES " or " no ", press the
   " Enter Button " (3-4, Fig. 1) will save the setting
   function with default.

8-5 Set beeper sound ON/OFF

When the lower display show " bEEP "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to select the upper value to " yES " or
   " no ".

   yES - Meter's beep sound will be ON with default.
   no - Meter's beep sound will be OFF with default.
   **   is power ON.**

2) After select the upper text to " yES " or " no ", press the
   " Enter Button " (3-4, Fig. 1) will save the setting
   function with default.

8-6 Decimal point of SD card setting
The numerical data structure of SD card is default used
the " . " as the decimal, for example "20.6" "1000.53" .
But in certain countries   (Europe ...) is used the " , " as
the decimal point, for example " 20,6 " "1000,53".
Under such situation, it should change the Decimal
character at first.

When the lower display show " dEC "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to select the upper text to " bASIC " or
   " Euro ".

   bASIC - Use " . " as the Decimal point with default.
   Euro - Use " , " as the Decimal point with default.

2) After select the upper text to " bASIC " or " Euro ",
   press the " Enter Button " (3-4, Fig. 1) will save the
   setting function with default.

8-7 Select the Temp. unit to ℃ or ℉

When the lower display show " t-CF "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to select the upper Display text to " C " or
   " F ".

   C - Temperature unit is ℃
   F - Temperature unit is ℉

2) After Display unit is selected to " C " or " F ", press the
   " Enter Button " (3-4, Fig. 1) will save the setting
   function with default.

8-8 Set pH manual Temp. compensation value

When the lower display show " t-SEt "

1) This function only for the pH measurement of
   adjusting the pH electrode's manual Temp.compensation
   value. The default value is 25 ℃ (77 ℉).
2) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to select the upper value to the desired
   Temp. compensation value (℃ or ℉), then press the
   " Enter Button " (3-4, Fig. 1) will save the setting
   value with default.

8-9 ESC

When the display show " ESC "

When the Display show the text " ESC ", then press the
" ESC Button " (3-3, Fig. 1) will finish the Advanced
Setting procedures and return to the normal measuring
screen.

Remark :

During execute the " Advanced Setting " function, if press " ESC Button " (3-3, Fig. 1) will exit the " Advanced Setting " function, the LCD will return to normal screen.

9. POWER SUPPLY from DC ADAPTER

The meter also can supply the power supply from the DC 9V Power Adapter (optional). Insert the plug of Power Adapter into " DC 9V Power Adapter Input Socket " (3-15, Fig. 1). The meter will permanent power ON when use the DC ADAPTER power supply (The power Button function is disable).

10. BATTERY REPLACEMENT

1) When the left corner of LCD display show " ⊏╳⊐ ", it is necessary to replace the battery. However, in-spec. measurement may still be made for several hours after low battery indicator appears before the instrument become inaccurate.
2) Loose the screws of the " Battery Cover " (3-10, Fig. 1) and take away the " Battery Cover " from the instrument and remove the battery.
3) Replace with DC 1.5 V battery (UM3, AA, Alkaline/heavy duty) x 6 PCs, and reinstate the cover.
4) Make sure the battery cover is secured after changing batteries.

11. SYSTEM RESET

If the meter happen the troubles such as :

CPU system is hold (for example, the key button can not be operated...).

Then make the system RESET will fix the problem.
The system RESET procedures will be either following method :

During the power on, use a pin to press the " Reset Button " (3-16, Fig. 1) once a while will reset the circuit system.

12. RS232 PC SERIAL INTERFACE

The instrument has RS232 PC serial interface via a 3.5 mm terminal (3-17, Fig. 1).

The data output is a 16 digit stream which can be utilized for user's specific application.

A RS232 lead with the following connection will be required to link the instrument with the PC serial port.

Meter	PC (9W 'D" Connector)

Center Pin.........................Pin 4
(3.5 mm jack plug)
Ground/shield.....................Pin 2 ─┐
                                         │ 2.2 K
                                         │ resister
                                Pin 5 ─┘
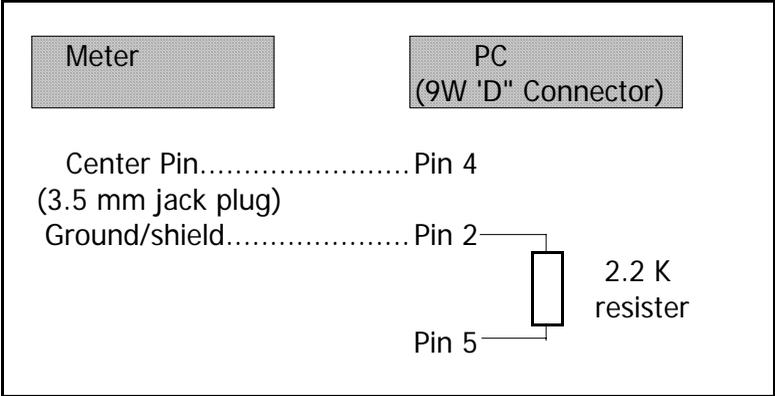
The 16 digits data stream will be displayed in the following format :

D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0

Each digit indicates the following status :

D15	Start Word
D14	4
D13	When send the upper display data = 1
	When send the lower display data = 2
D12, D11	Annunciator for Display
	PH = 05 | mV = 18 |
D10	Polarity
	0 = Positive 1 = Negative
D9	Decimal Point(DP), position from right to the left
	0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP
D8 to D1	Display reading, D1 = LSD, D8 = MSD
	For example :
	If the display reading is 1234, then D8 to D1 is : 00001234
D0	End Word

RS232 FORMAT : 9600, N, 8, 1

Baud rate	9600
Parity	No parity
Data bit no.	8 Data bits
Stop bit	1 Stop bit

13. OPTIONAL ACCESSORIES

RS232 cable UPCB-02	* Computer interface cable.
	* Used to connect the meter to the computer (COM port).
USB cable USB-01	* Computer interface cable.
	* Used to connect the meter to the computer (USB port).

Data acquisition software SW-U801-WIN	* The SW-U801-WIN is a multi displays (1/2/4/6/8 displays) powerful application software, provides the functions of data logging system, text display, angular display, chart display, data recorder high/low limit, data query, text report, chart report.. .xxx.mdb data file can be retrieved for EXCEL, ACESS.., wide intelligent applications.
Power adapter	AC 110V to DC 9V. USA plug.
Power adapter	AC 220V/230V to DC 9V. Germany plug.

pH electrodes	pH Electrode, 1 to 13 pH. Model : PE-11
	pH Electrode, 1 to 13 pH. Model : PE-03
	pH Electrode, 0 to 14 pH. Model : PE-01
	* Glass body heavy duty pH Electrode, 0 to 14 pH. Model : PE-02
	* Glass body plane pH Electrode, 0 to 14 pH. Model : PE-08
	* Industrial in line pH Electrode, 0 to 14 pH. Model : PE-21
	SPEAR pH Electrode Model : PH-06HD, PH-04HD
	pH Electrode + Temp. probe, 2 in 1 Model : PE-03K7
	pH Electrode + Temp. probe, 2 in 1 Model : PE-05T

ATC Temp. probe	Temperature probe（ATC probe） Model : TP-07

pH buffer solution	pH 7 BUFFER SOLUTION Model : PH-07
	pH 4 BUFFER SOLUTION Model : PH-04

ORP Electrode	ORP electrode Model : ORP-14

Mmory card	SD memory card（1 GB） SD memory card（2 GB）

Carrying case	Hard carring case Model : CA-06

18. PATENT

The meter（SD card structure）already patent pending in following countries :

Germany	Nr. 20 2008 016 337.4
JAPAN	3151214
TAIWAN	M 358970
	M 359043
CHINA	ZL 2008 2 0189918.5
	ZL 2008 2 0189917.0
USA	Patent pending

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