

SD card real time data logger
TDS (Total dissolved solids), Salt
'20 uS/200 uS/2 mS/20 mS/200 mS

CONDUCTIVITY METER

Model : CD-4318SD



Your purchase of this CONDUCTIVITY 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.....	1
2. SPECIFICATIONS.....	2
2-1 General Specifications.....	2
2-2 Electrical Specifications.....	4
3. FRONT PANEL DESCRIPTION.....	6
4. FUNCTION SELECTION.....	7
5. CONDUCTIVITY/TDS MEASURING and CALIBRATION PROCEDURE.....	8
5-1 Conductivity measurement.....	8
5-2 TDS (PPM) measurement.....	9
5-3 Calibration.....	9
6. SALT MEASURING and calibration PROCEDURE.....	12
6-1 Salt measurement.....	12
6-2 Calibration.....	12
7. OTHER FUNCTION.....	13
7-1 Data Hold.....	13
7-2 Record (Max./ Min. reading).....	13
7-3 LCD Backlight ON/OFF.....	14
8. DATALOGGER.....	14
8-1 Preparation before execute datalogger function.....	14
8-2 Auto Datalogger (Set sampling time \geq 1 second).....	15
8-3 Manual Datalogger (Set sampling time = 0 second).....	16
8-4 Check time and sampling time information.....	16
8-5 SD Card Data structure.....	17
9. Saving data from the SD card to the computer.....	18
10. ADVANCED SETTING.....	20
11. POWER SUPPLY from DC ADAPTER.....	25
12. BATTERY REPLACEMENT.....	25
13. SYSTEM RESET.....	25
14. RS232 PC SERIAL INTERFACE.....	26
15. OPTIONAL ACCESSORIES.....	28
16. PATENT.....	29

1. FEATURES

- * One meter for multi purpose operation :
Conductivity, TDS (Total dissolved solids), Salt measurement.
- * Conductivity : 20 μ S/ 200 μ S/2 mS/20 mS/200 mS.
- * Salt : 0 to 12 % salt (% weight).
- * Conductivity measurement can select Temp. Coefficient of measurement solution.
- * ATC for the conductivity measurement.
- * Separate probe, easy for operation of different measurement environment.
- * Real time SD memory card Datalogger, built-in Clock and Calendar, sampling time can set from 1 sec to 3600 seconds
- * Manual datalogger is available, during execute the manual datalogger function, it can set the different 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.
- * It 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	<ul style="list-style-type: none"> * Conductivity (uS, mS) * TDS (Total Dissolved Solids, PPM) * Salt (% Weight) * Temperature (°C, °F) 	
Temperature Compensation	Automatic from 0 to 60 °C (32 - 140 °F), with temperature compensation factor variable between 0 to 5.0% per C.	
Conductivity Probe	Pt glass electrode for long life. High performance for the low conductivity (pure water) measurement.	
Datalogger Sampling Time Setting range	Auto	1 sec to 3600 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	<ul style="list-style-type: none"> * 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 * SD memory card Format * Set temperature unit to °C or °F * Set CD temperature compensation factor * Set probe CELL K 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	Meter	0 to 50 °C .
	Probe	0 to 60 °C .
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) : <i>Approx. DC 6 mA.</i>	
	When SD card save the data and LCD Backlight is OFF) : <i>Approx. DC 37 mA.</i>	
	* <i>If LCD backlight on, the power consumption will increase approx. 12 mA.</i>	
Weight	489 g/1.08 LB.	
Dimension	Meter	177 x 68 x 45 mm (7.0 x 2.7x 1.9 inch)
	Probe	Round, 22 mm Dia. x 120 mm length.
Accessories Included	* Instruction manual..... 1 PC * Conductivity/TDS/Salt pt glass probe, CDPB-04..... 1 PC * Hard carrying case (CA-06)..... 1 PC	

Temperature

Function	Measuring Range	Resolution	Accuracy
°C	0 °C to 60 °C	0.1 °C	±0.8 °C
°F	32 °F to 140 °F	0.1 °F	±1.5 °F
* @ 23±5°C			

Salt

Measurement Range	0 to 12 % salt (% weight).
Resolution	0.01 % salt.
Accuracy	± 0.5 % salt value

3. FRONT PANEL DESCRIPTION

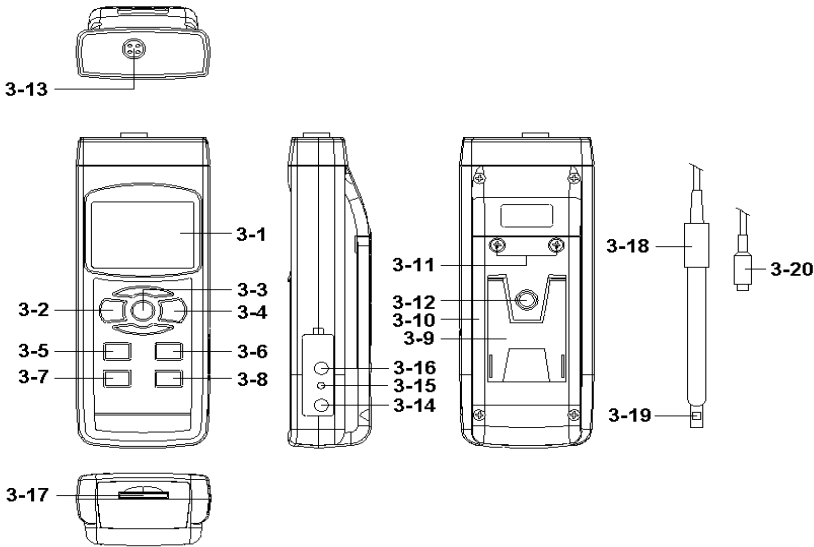


Fig.1

- 3-1 Display
- 3-2 Power Button (Backlight Button)
- 3-3 Hold Button
- 3-4 REC Button
- 3-5 Range Button (▲ Button)
- 3-6 Function Button (▼ Button)
- 3-7 Time Button (SET Button)
- 3-8 Enter Button (Logger Button)
- 3-9 Stand
- 3-10 Battery Compartment/Cover
- 3-11 Battery Cover Screw
- 3-12 Tripod Fix Nut
- 3-13 Probe Socket
- 3-14 DC 9V Power Adapter Input Socket
- 3-15 Reset Button
- 3-16 RS-232 Output Terminal
- 3-17 SD card socket
- 3-18 Probe Handle
- 3-19 Sensing head
- 3-20 Probe Plug

4. FUNCTION SELECTION

1) Power ON the meter by pressing and holding the " Power Button " (3-2, Fig. 1)for at least 1.5 seconds .

** Pressing the " Power Button " (3-2, Fig. 1) continuously and > 1.5 seconds again will turn off the meter.*

2) The meter can select 3 kind Mode as :

- a. **Conductivity measurement**
- b. **TDS measurement**
- c. **Salt measurement**

pressing and holding the " FUNCTION Button " (3-6, Fig. 1) continuously , Display will show the following text in sequence :

CD	Conductivity measurement
TDS	TDS measurement
SALT	Salt measurement

Until the Display show the desired mode the meter will execute this FUNCTION with default.

5. CONDUCTIVITY/TDS MEASURING and CALIBRATION PROCEDURE

The meter default function are following :

- * The display unit is set to conductivity (uS, mS).
- * The temperature unit is set to °C .
- * Temp. compensation factor is set to 2.0% per C.
- * Auto range.
- * Auto power off disable.
- * The sampling time of data logger function is 2 seconds.

Fig. 2

5-1 Conductivity measurement

- 1) Prepare the Conductivity Probe (CDPB-04, standard accessory, included), install the " Probe Plug " (3-20, Fig. 1) into the " Probe Socket " (3-13, Fig. 1).
- 2) Power on the meter by pressing and holding " Power Button " (3-2, Fig. 1) for at least 1.5 seconds .
Select the Meter's measurement FUNCTION to " CD " (Conductivity measurement), refer to chapter 4, page 7 .
- 3) Hold the " Probe Handle " (3-18, Fig. 1) by hand and let the " Sensing head " (3-19, Fig. 1) immersed wholly into the measured solution. Shake the probe to let the probe's internal air bubble drift out from the sensing head.
Display will show the conductivity mS (uS) values.
at the same time the left bottom display will show the Temp. value of the measured solution.

Manual range operation

The meter is default to be used for the auto range mode. by pressing and holding the " Range Button " (3-5, Fig. 1) continuously in sequence will change the range from 20uS , 200 uS, 2 mS , 20 mS, 200 mS and auto range.

Change the Temp. unit to °F

If intend to change the Temp. unit from °C to °F, please refer to chapter 10-7 page 23.

Change the Temp. Coefficient Factor

The default Temp. compensation factor value of the measurement solution is to 2.0% per °C. If intend to change it, please refer to chapter 10-8, page 24 .

Zero adjustment

If the probe not immerse the measurement solution and display not show zero value, pressing the " HOLD Button " (3-3, Fig. 1) continuously at least 10 seconds will let display show zero. The zero function only valid for the 20 uS range and the not zero value is < 2.0 uS.

5-2 TDS (PPM) measurement

The measuring procedures are same as above

5-1 Conductivity (uS, mS) measurement,

except to change the display unit from uS, mS to PPM.

The detail procedures please refer chapter 4, page 7 .

5-3 Calibration

conductivity Calibration

1) Prepare the standard conductivity solution (optional)

For example :

2 mS range calibration solution :

1.413 mS Conductivity Standard Solution, CD-14

200 uS range calibration solution :

80 uS Conductivity Standard Solution

20 mS range calibration solution :

12.88 mS Conductivity Standard Solution

or other Conductivity Standard Solution

2) Install the " Probe Plug " (3-20, Fig. 1) into the " CD Socket " (3-13, Fig. 1).

- 3) Power on the meter by pressing " Power Button " (3-2, Fig. 1) once.
- 4) Hold the " Probe Handle " (3-18, Fig. 1) by hand and let the " Sensing head " (3-19, Fig. 1) immersed wholly into the measured solution. Shake the probe to let the probe's internal air bubble drift out from the sensing head.
Display will show the conductivity mS (uS) values.
- 5) Use the two fingers to press the " ▲ Button " (3-5, Fig. 1) , and " ▼ Button " (3-6, Fig. 1) at the same time. the display will show the following screen as example(Fig. a), release the both fingers , then Press the " Enter Button " (3-8, Fig. 1) , the display will show the following screen as example (Fig. b).



Fig. a

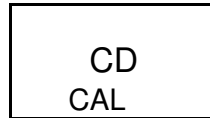
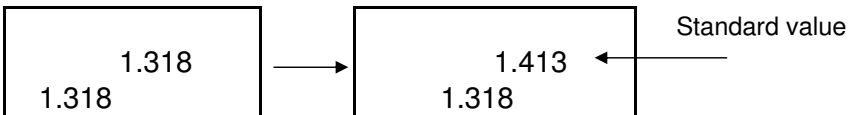


Fig. b

- 6) Press the " Enter Button " (3-8, Fig. 1) , the measuring value will present on both upper and lower Display.
Use "▲ Button " (3-5, Fig. 1) , " ▼ Button " (3-6, Fig. 1) to adjust the up display value exact same as the standard conductivity value. Press the " Enter Button " (3-8, Fig. 1) will save the calibration data and finish the calibration procedures.



- * ***If only intend to make the one point calibration, just execute the 2 mS range (1.413 mS Cal.) is enough.***
- * ***Multi-points calibration procedures should execute the 2 mS range (1.413 mS Cal.) calibration at first, then make other ranges (20 uS range, 20 mS range or 200 mS range) calibration procedures following if necessary.***

Temperature Calibration

- 1) Install the " Probe Plug " (3-20, Fig. 1) into the " CD Socket " (3-13, Fig. 1).
- 2) Power on the meter by pressing " Power Button " (3-2, Fig. 1) once.
- 3) Hold the " Probe Handle " (3-18, Fig. 1) by hand and let the " Sensing head " (3-19, Fig. 1) immersed wholly into the measured solution. Shake the probe to let the probe's internal air bubble drift out from the sensing head.
Display will show the conductivity mS (μ S) and Temperature values.

- 5) Use the two fingers to press the " ▲ Button " (3-5, Fig. 1) , and " ▼ Button " (3-6, Fig. 1) at the same time. the display will show the following screen as example(Fig. a), release the both fingers , then Press the " Enter Button " (3-8, Fig. 1) , the display will show the following screen as example (Fig. b). and press the " ▲ Button " (3-5, Fig. 1) once . the display will show the following screen as example (Fig. c).



Fig. a



Fig. b

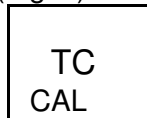
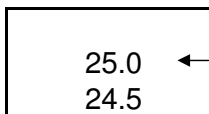
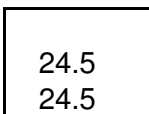


Fig. c

- 6) Press the " Enter Button " (3-8, Fig. 1), the measuring value will present on both upper and lower Display.
Use "▲ Button " (3-5, Fig. 1) , " ▼ Button " (3-6, Fig. 1) to adjust the up display value exact same as the standard Temperature value. Press the " Enter Button " (3-8, Fig. 1) will save the calibration data and finish the calibration procedures.



← Standard value

6. SALT MEASURING and CALIBRATION

6-1 Salt measurement

- 1) Prepare the Probe (CDPB-04, same probe as the conductivity measurement, refer to Fig. 1, page 6), install the " Probe Plug " (3-20, Fig. 1) into the " Probe Socket " (3-13, Fig. 1).
- 2) Power on the meter by pressing and holding " Power Button " (3-2, Fig. 1) for at least 1.5 seconds .
Select the Meter's measurement FUNCTION to " SALT", refer to Chapter 4, page 7 .
- 3) Hold the " Probe Handle " (3-18, Fig. 1) by hand and let the " Sensing head " (3-19, Fig. 1) immersed wholly into the measured solution. Shake the probe to let the probe's internal air bubble drift out from the sensing head.
Display will show the Salt values (% weight).

6-2 Calibration

If the conductivity range already make the calibration completely then the Salt measurement is not necessary to make the calibration again.

7. OTHER FUNCTION

7-1 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.

7-2 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 and the maximum value will appear on the display.
 - b) Press the " REC Button " (3-4, Fig. 1) again, the " REC. MIN. " symbol and the minimum value will appear on the display.
 - b) Press the " REC Button " (3-4, Fig. 1) again, the " REC. " symbol and the REC value will appear on the display.
 - 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.

7-3 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.

8. DATALOGGER

8-1 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 " (3-12, 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 10-6, page 23.

c. Time setting

If the meter is used at first time, it should to adjust the clock time exactly, please refer chapter 10-1, page 20.

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 10-5, page 22.

a. Start the datalogger

Press the " LOG Button (3-8, Fig. 1) > 1.5 seconds continuously, the LCD will show the text of " LOGGER " indicator and flashing per sampling time, 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 10-2, page 21 .**
- * **How to set the beeper sound is enable, refer to Chapter 10-4, page 22 .**

b. Pause the datalogger

During execute the Datalogger function, if press the " LOG Button " (3-8, Fig. 1) once will pause the Datalogger function (stop to save the measuring data into the memory circuit temporarily). In the same time the " LOGGER " symbol will stop flashing.

Remark :

If press the " LOG Button " (3-8, Fig. 1) once again will execute the Datalogger again, the " LOGGER " symbol will flashing.

c. Finish the Datalogger

During execute the Datalogger function, press the " LOG Button (3-8, Fig. 1) > 1.5 seconds continuously again will finish the Datalogger function, the " LOGGER " text will be disappeared and finish the Datalogger function.

second)

a. Set sampling time is to 0 second

Press the " LOG Button (3-8, Fig. 1)>1.5 second, the LCD will show the indicator " LOGGER " and " Position no. " symbol then press the " LOG Button " (3-8, Fig. 1) once , the " LOGGER " symbol 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 .

Remark :

During execute the Manual Datalogger, 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

During execute the Datalogger function, press the " LOG Button (3-8, Fig. 1) > 1.5 seconds continuously again will finish the Datalogger function, the Position no. " PXX " will be disappeared and finish the Datalogger. function. least two seconds, the " LOGGER " indication will be disappeared and finish the Datalogger.

8-4 To check the time and sampling time information

During the normal measurement (not execute the Datalogger), If press " Time " (3-7, Fig. 1) once , the LCD display will present the time information of Year/Month, Date/Hour, Minute/Second and the Sampling time information .

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

CDB01

2) If the first time to execute the Datalogger, under the route CDB01\, will generate a new file name CDB01001.XLS.

After exist the Datalogger, then execute again, the data will save to the CDB01001.XLS until Data column reach to 30,000 columns, then will generate a new file, for example CDB01002.XLS

3) Under the folder CDB01\, if the total files more than 99 files, will generate anew route, such as CDB02\

4) The file's route structure :

CDB01\
 CDB01001.XLS
 CDB01002.XLS

 CDB01099.XLS
CDB02\
 CDB02001.XLS
 CDB02002.XLS

 CDB02099.XLS
CDBXX\

Remark :

XX : Max. value is 10.

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

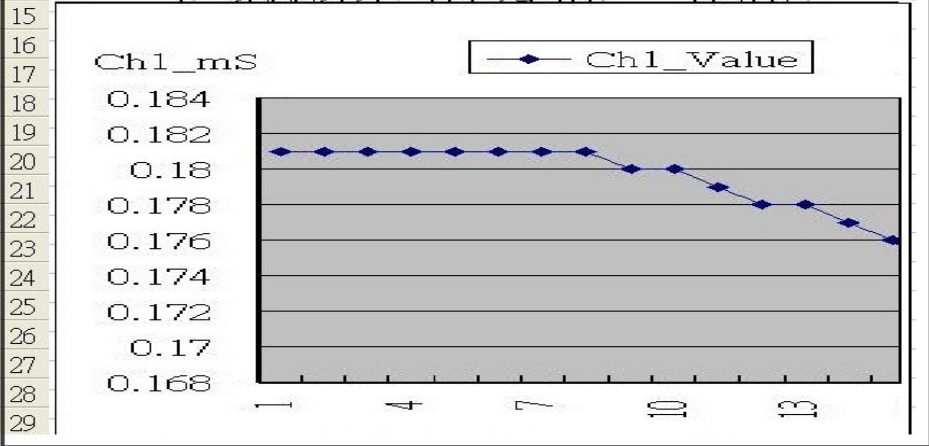
- 1) After execute the Data Logger function, take away the SD card out from the " SD card socket " (3-17, Fig. 1).
- 2) Plug in the SD card into the Computer's SD card slot (if your computer build in this installation) or insert the SD card into the " SD card adapter ". then connect the " SD card adapter " into the computer.
- 3) Power ON the computer and run the " EXCEL software ". Down load the saving data file (for example the file name : CDB01001.XLS, CDB01002.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)

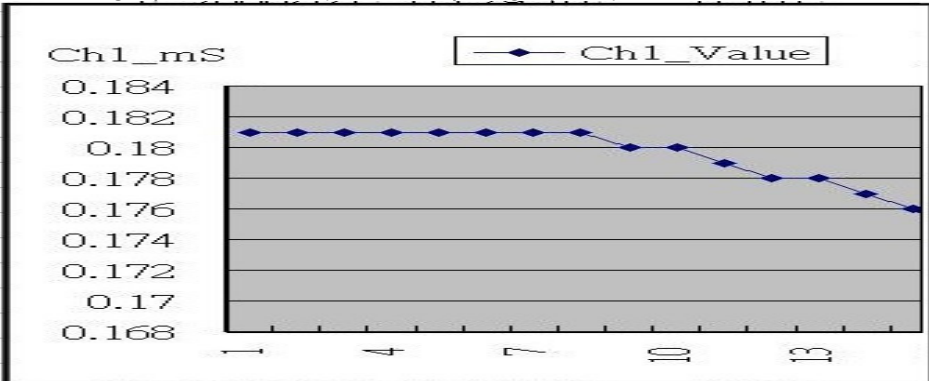
	A	B	C	D	E	F	G	
1	Position	Date	Time	Ch1_Valu	Ch1_Unit	Ch2_Valu	Ch2_unit	
2	1	2000/1/1	03:29:07	0.181	mS	24.3	Degree C	
3	2	2000/1/1	03:29:08	0.181	mS	24.3	Degree C	
4	3	2000/1/1	03:29:10	0.181	mS	24.3	Degree C	
5	4	2000/1/1	03:29:12	0.181	mS	24.3	Degree C	
6	5	2000/1/1	03:29:14	0.181	mS	24.3	Degree C	
7	6	2000/1/1	03:29:16	0.181	mS	24.3	Degree C	
8	7	2000/1/1	03:29:18	0.181	mS	24.3	Degree C	
9	8	2000/1/1	03:29:20	0.181	mS	24.3	Degree C	
10	9	2000/1/1	03:29:22	0.18	mS	24.6	Degree C	
11	10	2000/1/1	03:29:24	0.18	mS	24.7	Degree C	
12	11	2000/1/1	03:29:26	0.179	mS	24.8	Degree C	
13	12	2000/1/1	03:29:28	0.178	mS	25.2	Degree C	
14	13	2000/1/1	03:29:30	0.178	mS	25.2	Degree C	
15	14	2000/1/1	03:29:32	0.177	mS	25.5	Degree C	
16	15	2000/1/1	03:29:34	0.176	mS	25.7	Degree C	
17	16	2000/1/1	03:29:36	0.174	mS	26.2	Degree C	
18	17	2000/1/1	03:29:38	0.174	mS	26.2	Degree C	
19	18	2000/1/1	03:29:40	0.177	mS	25.5	Degree C	
20	19	2000/1/1	03:29:42	0.179	mS	24.8	Degree C	

EXCEL data screen/graphic screen (for example)

	A	B	C	D	E	F	G	H
1	Position	Date	Time	Ch1_Valu	Ch1_Unit	Ch2_Valu	Ch2_unit	
2	1	2000/1/1	03:29:07	0.181	mS	24.3	Degree C	
3	2	2000/1/1	03:29:08	0.181	mS	24.3	Degree C	
4	3	2000/1/1	03:29:10	0.181	mS	24.3	Degree C	
5	4	2000/1/1	03:29:12	0.181	mS	24.3	Degree C	
6	5	2000/1/1	03:29:14	0.181	mS	24.3	Degree C	
7	6	2000/1/1	03:29:16	0.181	mS	24.3	Degree C	
8	7	2000/1/1	03:29:18	0.181	mS	24.3	Degree C	
9	8	2000/1/1	03:29:20	0.181	mS	24.3	Degree C	
10	9	2000/1/1	03:29:22	0.18	mS	24.6	Degree C	
11	10	2000/1/1	03:29:24	0.18	mS	24.7	Degree C	
12	11	2000/1/1	03:29:26	0.179	mS	24.8	Degree C	
13	12	2000/1/1	03:29:28	0.178	mS	25.2	Degree C	
14	13	2000/1/1	03:29:30	0.178	mS	25.2	Degree C	



EXCEL graphic screen (for example, graphic)



10. ADVANCED SETTING

Under do not execute the Datalogger function, press the " SET Button " (3-7, Fig. 1) continuously at least two seconds will enter the " Advanced Setting " mode. then press the " SET Button " (3-7, Fig. 1) once a while in sequence to select the eight main function, the display will show :

- 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
- SD F**..... SD memory card Format
- T CF**..... Select the Temp. unit to °C or °F
- PCNT**..... Set CD temperature compensation factor
- CELL**..... CELL K Value setting

Remark :

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

10-1 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 " (3-8, 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 " (3-7, Fig. 1) once will save the time value, then the screen will jump to " Sampling time " setting screen (Chapter 10-2).

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).

10-2 Set sampling time (Seconds)

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 (0 to 3600 seconds).

Remark :

press and holding "▲ Button "or"▼ Button " to adjust the value, *will be a digits increase or decrease .*

if press and holding "▲ Button "or"▼ Button " > 2 second to *adjust the value, ten digits increase or decrease .*

- 2) After the Sampling value is selected, press the " Enter Button " (3-8, Fig. 1) will save the setting function with default.

10-3 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 " (3-8, Fig. 1) will save the setting function with default.

10-4 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 " (3-8, Fig. 1) will save the setting function with default.

10-5 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 " USA " or " EURO".

USA - Use " . " as the Decimal point with default.

EURO - Use " , " as the Decimal point with default.

- 2) After select the upper text to " USA " or " EURO ", press the " Enter Button " (3-8, Fig. 1) will save the setting function with default.

10-6 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 " (3-8, Fig. 1) once again, the Display will show text " Enter SD F " 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.

10-7 Select the Temp. unit to °C or °F

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 °C

F - Temperature unit is °F

- 2) After Display unit is selected to " C " or " F ", press the " Enter Button " (3-8, Fig. 1) will save the setting function with default.

10-8 Set CD temperature compensation factor

When the lower display show " PCNT "

- 1) This function only for the Conductivity (PCNT) mode of adjusting the probe's Temp.compensation value in %/per °C unit. The default value is 2 %/ per °C.
- 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 (%/per °C), then press the " Enter Button " (3-8, Fig. 1) will save the setting value temporarily.

10-9 CELL K Value setting

When the display show " CELL "

When the Display show the text " CELL ", Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (3-6, Fig. 1) Adjustment CELL(Probe) K Value setting, than press the " Enter Button " (3-8, Fig. 1) will save the setting.


Remark :

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

11. 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 " (3-14, Fig. 1). The meter will permanent power ON when use the DC ADAPTER power supply (The power Button function is disable).

12. 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 " (3-11, 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.

13. 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 :

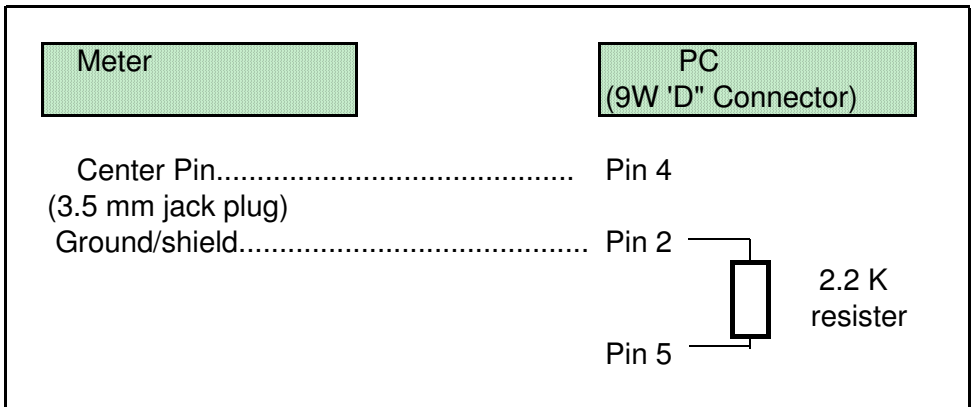
During the power on, use a pin to press the " Reset Button " (3-15, Fig. 1) once a while will reset the circuit system.

14. RS232 PC SERIAL INTERFACE

The instrument has RS232 PC serial interface via a 3.5 mm terminal (3-16, 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.



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						
	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;">uS = 13</td> <td style="width: 33%;">mS = 14</td> <td style="width: 33%;">PPM = 19</td> </tr> <tr> <td>% = 03</td> <td></td> <td></td> </tr> </table>	uS = 13	mS = 14	PPM = 19	% = 03		
	uS = 13	mS = 14	PPM = 19				
% = 03							
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

15. OPTIONAL ACCESSORIES

Memory card	SD memory card (1 GB) SD memory card (2 GB)
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 data recorder high/low limit, data report, chart report. .xxx.mdb data file can be retrieved for EXCEL, ACCESS., wide intelligent applications. wide intelligent applications.
Power adapter	AC 110VAC 110V to DC 9V. USA plug USA plug. AC 220VAC 220V/230V to DC 9V. Germany Germany plug.
Conductivity standard solution	1.413 mS standard solution. Model : CD-14

16. PATENT

The meter (SD card structure) already get patent or 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