SD card real time data recorder
%RH, Welt bulb, Dew point, Type K/J Temp.

PRECISION HYGROMETER

Model : HT-3027SD

Your purchase of this PRECISION HYGROMETER marks a step forward for you into the field of precision measurement. Although this Meter is 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

*   Humidity/Temp., Dew point (Humidity), Wet bulb (Humidity), Type K/J thermometer, 4 kinds measurement are combined into one meter, intelligent and professional.
*   Type K, Type J thermocouple thermometer.
*   Fast humidity measuring response time.
*   Real time SD memory card Datalogger, it Built-in Clock and Calendar, real time data recorder , sampling time set from 1 second to 3600 seconds.
*   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.
*   Separate probe, easy for operation of different measurement environment.

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 Unit	Humidity/Temp. : %RH/℃ or ℉. Dew point (Humidity) : ℃ or ℉. Wet bulb (Humidity) : ℃ or ℉. Type K/J thermometer : ℃ or ℉.
Datalogger Sampling Time Setting range	**Auto** — 1 second to 3600 seconds @ *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 G to 16 G.
Advanced setting	* 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 ℃ or ℉ * Set thermometer type to Type K or Type J
Temperature Compensation	Automatic temp. compensation for the humidity function and the type K/J thermometer.

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 3.5 mA.* When SD card save the data but and LCD Backlight is OFF) : *Approx. DC 28 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)
Standard Accessories Included	* Instruction manual.......................................1 PC * Humidity/Temp. probe...............................1 PC * Soft carrying case (CA-05A)....................1 PC

Optional Accessories	SD Card (4 GB) Type K thermocouple probe. AC to DC 9V adapter. USB cable, USB-01. RS232 cable, UPCB-02. Data Acquisition software,SW-U801-WIN. Hard carrying case, CA-06

2-2 Electrical Specifications (23±5 ℃)

Humidity/ Temperature

	Range	5 % to 95 % R.H.
Humidity	Resolution	0.01 % R.H.
	Accuracy	±2% RH @ 20 %RH to 80 % RH. @ 10 ℃ to 40 ℃.
Temperature	Range	0 ℃ to 50 ℃,32 ℉ to 122 ℉.
	Resolution	0.01 degree
	Accuracy	℃	±0.5 ℃.
@ 5 ℃ to 35 ℃		℉	±1.0 ℉.

Dew Point (Humidity)

℃	Range	-25.3 ℃ to 48.9 ℃
	Resolution	0.01 ℃
℉	Range	-13.5 ℉ to 120.1 ℉.
	Resolution	0.01 ℉.

Remark :
 * Dew Point display value is calculated from the
   Humidity/Temp. measurement automatically.
 * The Dew Point accuracy is sum accuracy value of
   Humidity & Temperature measurement..

Wet bulb (Humidity)

℃	Range	-21.6 ℃ to 50.0 ℃
	Resolution	0.01 ℃
℉	Range	-6.9 ℉ to 122.0 ℉.
	Resolution	0.01 ℉.

Remark :
* Wet bulb display value is calculated from the
  Humidity/Temp. measurement automatically.
* The Welt bulb accuracy is sum accuracy value of
  Humidity & Temperature measurement..

Type K/J thermometer

Sensor Type	Resolution	Range	Accuracy
Type K	0.1 ℃	-50.0 to 1300.0 ℃	± (0.4 % + 0.5 ℃)
		-50.1 to -100.0 ℃	± (0.4 % + 1 ℃)
	0.1 ℉	-58.0 to 2372.0 ℉	± (0.4 % + 1 ℉)
		-58.1 to -148.0 ℉	± (0.4 % + 1.8 ℉)
Type J	0.1 ℃	-50.0 to 1200.0 ℃	± (0.4 % + 0.5 ℃)
		-50.1 to -100.0 ℃	± (0.4 % + 1 ℃)
	0.1 ℉	-58.0 to 2192.0 ℉	± (0.4 % + 1 ℉)
		-58.1 to -148.0 ℉	± (0.4 % + 1.8 ℉)

@ Above specification tests under the environment RF Field Strength
  less than 3 V/M & frequency less than 30 MHz only.

5

3. FRONT PANEL DESCRIPTION
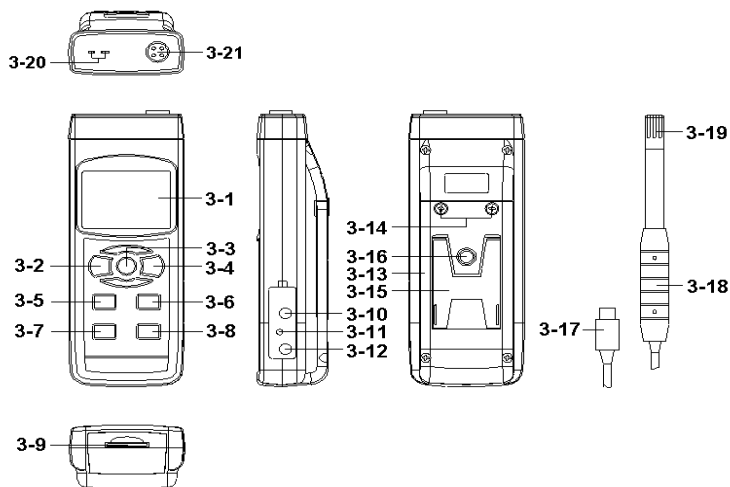
Fig. 1

3-1 Display

3-2 Power Button (Backlight Button)

3-3 Hold Button

3-4 REC Button

3-5 ▲ Button

3-6 ▼ Button (FUNCTION Button)

3-7 TIME Button (SET Button)

3-8 Enter Button (Logger Button)

3-9 SD card socket

3-10 RS-232 Output Terminal

3-11 Reset Button

3-12 DC 9V Power Adapter Input Socket

3-13 Battery Compartment/Cover

3-14 Battery Cover Screws

3-15 Stand

3-16 Tripod Fix Nut

3-17 Probe Plug (Humidity/Temp.)

3-18 Probe Handle (Humidity/Temp.)

3-19 Probe head (Humidity & Temp.)

3-20 Type K/J thermometer socket

3-21 Probe (Humidity/Temp.) input socket

4. MEASURING PROCEDURE

4-1 Function selection
1) Turn on the meter by pressing the " Power Button "
   (3-2, Fig. 1) > 1.5 seconds continuously.

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

2) The meter can select 6 kind function as :

   a. Humidity/Temp, Dew , Wet
   b. Type K/J Thermometer,Humidity/Temp.
   c. Type K/J Thermometer
   d. Humidity/Temp.
   e. Dew point (Humidity)
   f. Wet bulb (Humidity)

   Pressing the " Function Button " (3-3, Fig. 1)
   continuously (not release the button), the Display
   will show the following text in sequence :

% RH Dew		K/J %RH		Type K
Temp. Web	→	Temp.	→	Temp.
↑				↓
Wet		**Dew**		**% RH /**
bulb	←	Point	←	Temp.
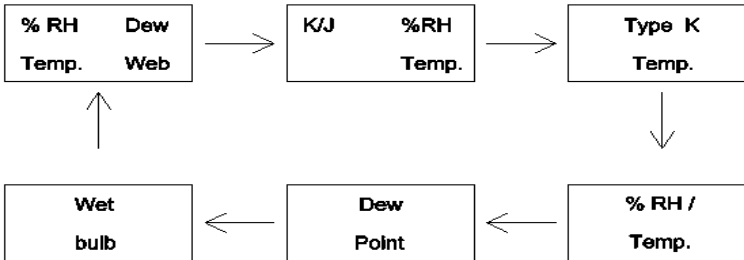
   Until the Display show the desired mode (Function),
   just release the " Function Button " (3-3, Fig. 1), the
   meter will execute this function with default.

3) Humidity / Temperature and Dew point and Wet bilb measurement
    a. Plug the " Probe Plug " (3-17, Fig. 1) into the " Probe
       Input Socket " (3-21, Fig. 1).
    b. Power on the meter by pressing the " Power Button "
       (3-2, Fig. 1).
    c. Function select to " Humidity/Temp,Dew,Wet " measurement. ,
       the LCD shows the unit " %RH " and   " Temp." Dew " Wet "
       ℃ or ℉" the at same time and measured value will show on the
       display (upper display is Humidity and Dew value, the lower
       display is the temperature and Wet value) .

       Remark :
       The meter Temp. display unit is defaulted to " ℃ ".
       If intend to let the meter's temperature unit default
       to " ℉ " , then please refer chapter 7-7 (page 20).

4) Type K/J thermometer and Humidity / Temperature measurement

    a. Function select to " Type K/J thermometer "and" Humidity / Temp.
    b. install the Humidity " Probe Plug " (3-17),into the " Probe
       Input Socket " (3-21, Fig. 1).
    c. Plug the Thermocouple Temp. Probe (Type K Temp.
       probe or Type J Temp. probe, optional) into " Type
       K/J Probe Input Socket " (3-20, Fig. 1)
       The Display will show the Type K orJ thermometer and
        Humidity / Temperature measuring value .
    d. If the Display show the indicator " K ", it is ready
       for Type K thermometer.
       If the Display show the indicator " J ", it is ready
       for Type J thermometer.

       Remark :
       The meter is defaulted to " Type K thermometer ".
       If intend to select the " Type J thermometer with
       default , please refer chapter 7-8 (page 20).

5) Humidity and Temperature measurement
   a. Plug the " Probe Plug " (3-17, Fig. 1) into the " Probe
      Input Socket " (3-20, Fig. 1).
   b. Power on the meter by pressing the " Power Button "
      (3-2, Fig. 1).
   c. Function select to " Humidity/Temp. " measurement. ,
      the LCD shows the unit " %RH " and " Temp. " ℃ or ℉" at
      the same time and measured value will show on the
      display (upper display is Humidity value, the lower
      display is the temperature value) .

      Remark :
      The meter Temp. display unit is defaulted to " ℃ ".
      If intend to let the meter's temperature unit default
      to " ℉ " , then please refer chapter 7-7 (page 20).

6) Dew point (Humidity) measurement
   a. Function select to " Dew point (Humidity) "
      measurement.
   b..Other procedures same as the " Humidity/Temp. "
      measurement.
   c. The LCD will shows the Dew point value and the
      display will show small text "Dew point "and " ℃ or ℉ " .

7) Wet bulb (Humidity) measurement
   a. Function select to " Wet bulb (Humidity) "
      measurement.
   b..Other procedures same as the " Humidity/Temp. "
      measurement.
   c. The LCD will shows the Wet bulb value and the
      display will show samll text " Wet bulb " and " ℃ or ℉ ".

4-2 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.

4-3 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.

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

   c) To exit the memory record function, just press the
   " REC " button for 1.5 seconds at least. The display will
   revert to the current reading.

4-4 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.

5. DATALOGGER

5-1 Preparation before execute datalogger function

a. Insert the SD card
Prepare a " SD memory card " (1 G to 16 G, optional),
insert the SD card into the " SD card socket " (3-9, Fig. 1).
The front panel of the SD card should face against the
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 7-6 (page 20).

c. Time setting
If the meter is used at first time, it should to adjust the
clock time exactly, please refer chapter 7-1 (page 17).

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
7-5, page 19.

5-2 Auto Datalogger (Set sampling time $\geq$ 1 second)

a. Start the datalogger

Press the " LOGGER Button (3-8, Fig. 1) >1.5 seconds , the LCD
will show the text " LOGGER ", the " LOGGER " will flashing at the
same time the measuring data along the time information will be
saved into the memory circuit.

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 text of " LOGGER " will stop flashing.

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

c.. Finish the Datalogger

During pause the Datalogger, press the " Logger Button "
(3-8, Fig. 1) continuously at least 1.5 seconds, the " LOGGER "
indication will be disappeared and finish the Datalogger.

5-3 Manual Datalogger (Set sampling time = 0 second)

a. Set sampling time is to 0 second

Press the " Logger Button " (3-8, Fig. 1) >1.5 seconds , the LCD
will show the text " LOGGER ", then press the " Logger Button " (
3-8, Fig. 1) once, the " LOGGER " 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.

b. Finish the Datalogger

Press the " Logger Button " (3-8, Fig. 1) continuously at
least two seconds, the " LOGGER " indication will be
disappeared and finish the Datalogger.

5-4 Check time and sampling time information
During the normal measurement (not execute the
Datalogger), If press " Time Button " (3-7, Fig. 1
) once , the LCD display will present the time and sampling time
information of Year, Month/Date, Hour/Minute and second,
and show "sampling time:____s"

5-5 SD Card Data structure

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

   ### HTC01

2) If the first time to execute the Datalogger,
   under the route HTC01\, will generate a new
   file name HTC01001.XLS.
   After exist the Datalogger, then execute again,
   the data will save to the HTC01001.XLS until
   Data column reach to 30,000 columns, then
   will generate a new file, for example HTC01002.XLS

3) Under the folder HTC01\, if the total files more
   than 99 files, will generate anew route, such as
   HTC02\ ....

4) The file's route structure :
   HTC01\
      HTC01001.XLS
      HTC01002.XLS
      ....
      HTC01099.XLS
   HTC02\
      HTC02001.XLS
      HTC02002.XLS
      ....
      HTC02099.XLS
   HTCXX\
      ....
      ....

   *Remark :*
   XX : Max. value is 10.

6. 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 " (3-9, 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 : HTC01001.XLS, HTC01002.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	H	I	J	K	L	M
1	Place	Date	Time	Value	Unit	Value	Unit	Value	Unit	Value	Unit	Value	Unit
2	1	2000/1/29	09:46:33	57.85	%RH	27	RHTemp C	17.96	Dew C	20.81	WET C	99999	KTemp C
3	2	2000/1/29	09:46:34	57.6	%RH	27	RHTemp C	17.95	Dew C	20.78	WET C	99999	KTemp C
4	3	2000/1/29	09:46:36	57.24	%RH	27.01	RHTemp C	17.82	Dew C	20.68	WET C	99999	KTemp C
5	4	2000/1/29	09:46:38	57.11	%RH	27.01	RHTemp C	17.81	Dew C	20.68	WET C	99999	KTemp C
6	5	2000/1/29	09:46:40	57.24	%RH	27.01	RHTemp C	17.81	Dew C	20.68	WET C	99999	KTemp C
7	6	2000/1/29	09:46:42	57.33	%RH	27.04	RHTemp C	17.88	Dew C	20.69	WET C	99999	KTemp C
8	7	2000/1/29	09:46:44	57.34	%RH	27.05	RHTemp C	17.88	Dew C	20.7	WET C	99999	KTemp C
9	8	2000/1/29	09:46:46	57.33	%RH	27.05	RHTemp C	17.88	Dew C	20.73	WET C	99999	KTemp C
10	9	2000/1/29	09:46:48	57.32	%RH	27.05	RHTemp C	17.88	Dew C	20.73	WET C	99999	KTemp C
11	10	2000/1/29	09:46:50	57.3	%RH	27.07	RHTemp C	17.87	Dew C	20.73	WET C	99999	KTemp C
12	11	2000/1/29	09:46:52	57.43	%RH	27.08	RHTemp C	17.88	Dew C	20.74	WET C	99999	KTemp C
13	12	2000/1/29	09:46:54	57.59	%RH	27.08	RHTemp C	17.9	Dew C	20.75	WET C	99999	KTemp C
14	13	2000/1/29	09:46:56	57.59	%RH	27.08	RHTemp C	17.94	Dew C	20.78	WET C	99999	KTemp C
15	14	2000/1/29	09:46:58	57.71	%RH	27.08	RHTemp C	17.97	Dew C	20.8	WET C	99999	KTemp C
16	15	2000/1/29	09:47:00	58.26	%RH	27.11	RHTemp C	18.2	Dew C	20.91	WET C	99999	KTemp C
17	16	2000/1/29	09:47:02	58.57	%RH	27.12	RHTemp C	18.29	Dew C	21.01	WET C	99999	KTemp C
18	17	2000/1/29	09:47:04	58.63	%RH	27.14	RHTemp C	18.29	Dew C	21.01	WET C	99999	KTemp C
19	18	2000/1/29	09:47:06	58.76	%RH	27.15	RHTemp C	18.32	Dew C	21.01	WET C	99999	KTemp C
20	19	2000/1/29	09:47:08	58.82	%RH	27.15	RHTemp C	18.34	Dew C	21.03	WET C	99999	KTemp C
21	20	2000/1/29	09:47:10	59	%RH	27.16	RHTemp C	18.45	Dew C	21.07	WET C	99999	KTemp C
22	21	2000/1/29	09:47:12	59.16	%RH	27.18	RHTemp C	18.51	Dew C	21.1	WET C	99999	KTemp C
23	22	2000/1/29	09:47:14	59.01	%RH	27.19	RHTemp C	18.5	Dew C	21.13	WET C	99999	KTemp C
24	23	2000/1/29	09:47:16	59.07	%RH	27.19	RHTemp C	18.5	Dew C	21.14	WET C	99999	KTemp C
25	24	2000/1/29	09:47:18	58.8	%RH	27.21	RHTemp C	18.48	Dew C	21.15	WET C	99999	KTemp C
26	25	2000/1/29	09:47:20	58.4	%RH	27.21	RHTemp C	18.33	Dew C	21.14	WET C	99999	KTemp C
27	26	2000/1/29	09:47:22	58.1	%RH	27.22	RHTemp C	18.26	Dew C	21.05	WET C	99999	KTemp C

EXCEL graphic screen (for example)
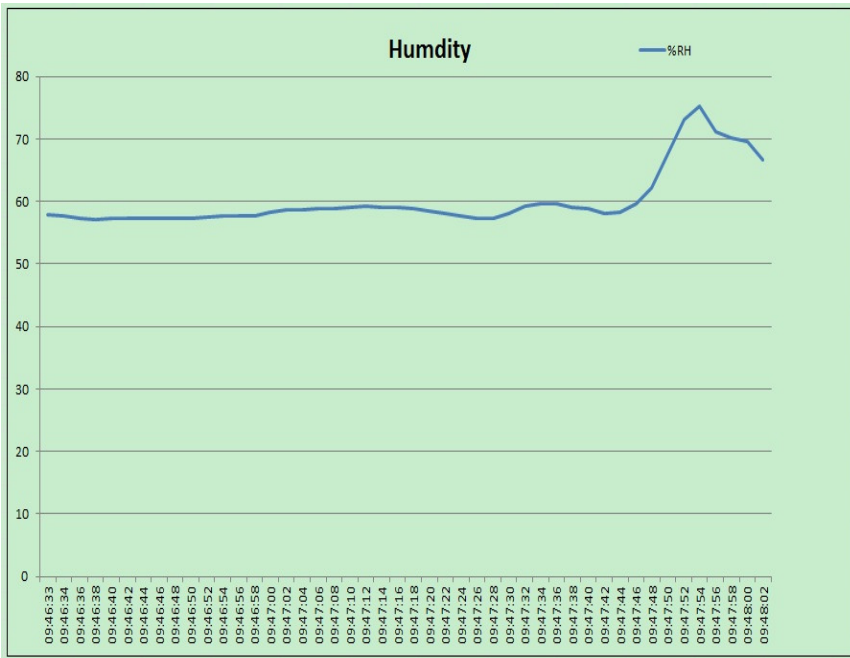
7. ADVANCED SETTING

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

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 ℃ or ℉
TYPE...... Select the Thermometer to Type K or Type J

Remark :
During execute the " Advanced Setting " function,
if press " Power Button " (3-2, Fig. 1) once will exit
the " Advanced Setting " function, the LCD will
return to normal screen.

7-1 Set clock time (Year/Month/Date,
Hour/Minute/ Second)

When the lower display show " DATE "

1) Press the " Enter Button " (3-8, Fig. 1) once,
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).

2) After set all the time value (Year, Month, Date, Hour,
   Minute, Second), the screen will
   jump to " SD card Decimal character " setting screen (
   Chapter 7-5).
   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).

7-2 Set sampling time (Seconds)

When the lower display show " SP-T "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (
   3-6, Fig. 1) to adjust the value (1 to 3600 seconds).
   Remark :
   Can use press "Hold Buttom (3-3 Fig. 1) once,to selsct Top lcd "
   ▲▼X1' or " ▲▼X10" , if choice " ▲▼X1 press "▲ Button "or"▼ Button"
   to adjust the value a digits increase or decrease, if choice" ▲▼X10'
   press "▲ Button "or"▼ Button " 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.

7-3 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.

7-4 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.

7-5 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 value 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.

7-6 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
   " 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.

7-7 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 " ℃ " or " ℉ ".

   ℃ - Temperature unit is ℃
   ℉ - Temperature unit is ℉

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

7-8 Select the Thermocouple Type to K or J

When the lower display show " TYPE "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to select the Display unit to " K " or
   " J ".

K - Type K thermometer

J - Type J thermometer

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

8. 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
" (3-12, Fig. 1). The meter will permanent power ON
when use the DC ADAPTER power supply (The power
Button function is disable).

9. 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 " (3-13, 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
   the battery.

10. SYSTEM RESET

If the meter happen the troubles such as :

CPU system is hold (for example, the key button can not be operated...).
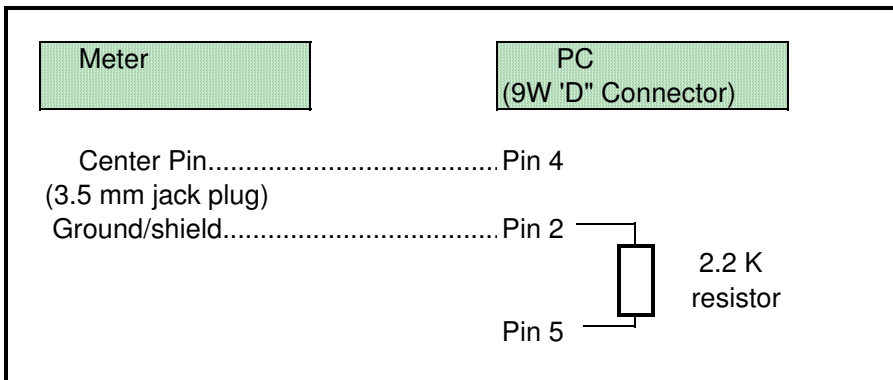
Then make the system RESET will fix the problem.
The system RESET procedures will be either following method :

During the power on, use a pin to press the " Reset Button " (3-11, Fig. 1) once a while will reset the circuit system.

11. RS232 PC SERIAL INTERFACE

The instrument has RS232 PC serial interface via a 3.5 mm terminal (3-10, 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

Pin 5

2.2 K resistor

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 :

D0	End Word		
D1 & D8	Display reading, D1 = LSD, D8 = MSD		
	For example :		
	If the display reading is 1234, then D8 to		
	D1 is : 00001234		
D9	Decimal Point(DP), position from right to the		
	left		
	0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP		
D10	Polarity		
	0 = Positive 1 = Negative		
D11 & D12	Annunciator for Display		
	℃ = 01	℉ = 02	% RH = 04
D13	When send the upper display data = 1		
	When send the lower display data = 2		
D14	4		
D15	Start Word		

RS232 FORMAT : 9600, N, 8, 1

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

12. Optional Type K Temp. probe

(Type K) TP-01	* Max. short-tern operating Temperature: 300 ℃ (572 ℉). * It is an ultra fast response naked-bead thermocouple suitable for many general purpose application.
Thermocouple Probe (Type K), TP-02A	* Measure Range: -50 ℃ to 900 ℃, -58 ℉ to 1650 ℉. * Dimension:12cm tube, 3.2mm Dia.
Thermocouple Probe (Type K), TP-03	* Measure Range: -50 ℃ to 1100 ℃, -58 ℉ to 2012 ℉. * Dimension: 13.6cm tube, 8mm Dia.
Surface Probe (Type K), TP-04	* Measure Range: -50 ℃ to 400 ℃, -58 ℉ to 752 ℉. * Size : Temp. sensing head - 15 mm Dia. Probe length - 120 mm.

13. 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