one probe, SD card real time data recorder
CO2, %RH, Temp., Dew point, Wet bulb

CO2 METER + HUMIDITY/Temp.

Model : CO2-9914SD

Your purchase of this CO2 METER ,+ HUMIDITY/Temp. with SD CARD DATA
RECORDER marks a step forward for you into the field of precision measurement.
Although this Meter is a complex and delicate instrument, its durable structure
developed. Please read the following instructions carefull yand always keep
 this manual within easy reach.

OPERATION MANUAL

TABLE OF CONTENTS

1. FEATURES

* Real time recorder, save the data into the SD memory
  card and can be down load to the Excel, extra software
  is no need. User can make the further data or graphic
  analysis by themselves. under the Excel software.
* At the same time, the SD memory card can record `1
  probe 4 Function data (CO2/Temp. , %RH/Temp. /Dew /Wet)
  two group analog data with the time information
  into the one Excel file at the same time.
* Manual datalogger is available, during execute the
  manual datalogger function, it can set the different
  location no. (position 1 to position 99).
* Air quality measurement application, multi-function :
  CO2 (Carbon dioxide), Humidity/Dew/Wet , temperature measurement.
* CO2 range : 0 to 10,000 ppm x 1 ppm.
* Humidity range: 10 to 95 %RH.   x 0.1 % RH
* Dew point Temp. and Wet bulb Temp. measurement.
* Temp. range : 0 to 50.0 ℃, ℃/℉.
* CO2 sensor : NDIR, long term reliability.
* Humidity sensor : Precision capacitance sensor
* Alarm setting with the beeper sound output.
* Sampling time for data recorder is 2 seconds to 3600 seconds.
* Complete set with 1 probes :
  CO2/Temp.,Humidity/Temp probe , main meter and the hard
  carrying case.
* Separate probe, easy for remote measurement.
* Meter can cooperate with 2 GB to 16 GB SD card, SD
  card is optional.
* RS232/USB computer interface.
* Patented.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Custom one-chip of microprocessor LSI circuit.	
Display	LCD size : 52 mm x 38 mm (Dot Matrix) LCD with green backlight (ON/OFF).	
Measurement	CO2 (Carbon dioxide) Humidity Dew point Temp., Wet bulb Temp. Temperature	
Sensor structure	CO2	NDIR * Nondispersive infrared sensor
	Humidity	Precision capacitance sensor
	Temp.	Precision thermistor
Datalogger Sampling Time Setting range	Auto	2 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.*
Data error no.	0.1% of total saved data max.	
Memory Card	SD memory card. 1 GB to 16 GB.	
Advanced setting *@ main setting*	* SD memory card Format * Set clock time * Set sampling time * Auto power OFF management * Set beep Sound ON/OFF * Decimal point of SD card setting * Temp. unit setting * Alarm value setting * Altitude value setting	

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.*

Power Supply	* Alkaline DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent.	
	* DC 9V adapter input. (AC/DC power adapter is optional).	
Power Current	CO2 measure-ment	Normal operation (w/o SD card save data and LCD Backlight is OFF) : *Approx. DC 136.5 mA.*
		When SD card save the data and LCD Backlight is OFF) : *Approx. DC 166 mA.*
	Humidity measure-ment	Normal operation (w/o SD card save data and LCD Backlight is OFF) : *Approx. DC 10.5 mA.*
		When SD card save the data and LCD Backlight is OFF) : *Approx. DC 40 mA.*
	* *If LCD backlight on, the power consumption will increase approx. 12 mA.*	
Operating Temperature	0 to 50 ℃. (32 to 122 ℉).	
Operating Humidity	Less than 80% R.H.	
Weight	350 g/0.77 LB.	
Dimension	Meter	177 x 68 x 45 mm
	CO2/Humidity probe	length 175 mm x § 28

Accessories Included	Instruction manual.. 1 PC
	Hard carrying case, CA-08..................................... 1 PC
	CO2 / Humidity probe.. 1 PC
Optional Accessories	SD memory card (4 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 ℃)

CO2 (Carbon dioxide)

CO_2 (Carbon dioxide) 23 ± 5 ℃.	Range	0 to 10,000 ppm
	Resolution	1 ppm
	Accuracy	±40 ppm * $\leq$ 1,000 ppm.
		±(50ppm +3% of reading) * > 1,000 ppm $\leq$ 3,000 ppm.
		±(50ppm +5% of reading) typically * > 3,000 ppm $\leq$ 10,000 ppm. ,
	Repeatability	± 20 ppm * $\leq$ 3,000 ppm.
Temperature	Range	0 ℃ to 50 ℃,32 ℉ to 122 ℉.
	Resolution	0.1 degree
	Accuracy	℃ : ±0.8 ℃ ℉ : ±1.5 ℉.

Humidity/Temperature

Humidity	Range	5 % to 95 % R.H.
	Resolution	0.1 % R.H.
	Accuracy	$\geq$70% RH : ±(3% reading + 1% RH). < 70% RH : ±3% RH.
Temperature	Range	0 ℃ to 50 ℃,32 ℉ to 122 ℉.
	Resolution	0.1 degree
	Accuracy	℃	±0.8 ℃.
		℉	±1.5 ℉.

Dew Point Temp. (Humidity)

℃	Range	-25.3 ℃ to 48.9 ℃
	Resolution	0.1 ℃
℉	Range	-13.5 ℉ to 120.1 ℉.
	Resolution	0.1 ℉.

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 Temp. (Humidity)

℃	Range	-21.6 ℃ to 50.0 ℃
	Resolution	0.1 ℃
℉	Range	-6.9 ℉ to 122.0 ℉.
	Resolution	0.1 ℉.

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..

@ Above specification tests under the environment RF Field Strength less than 3

 V/M & frequency less than 30 MHz only.
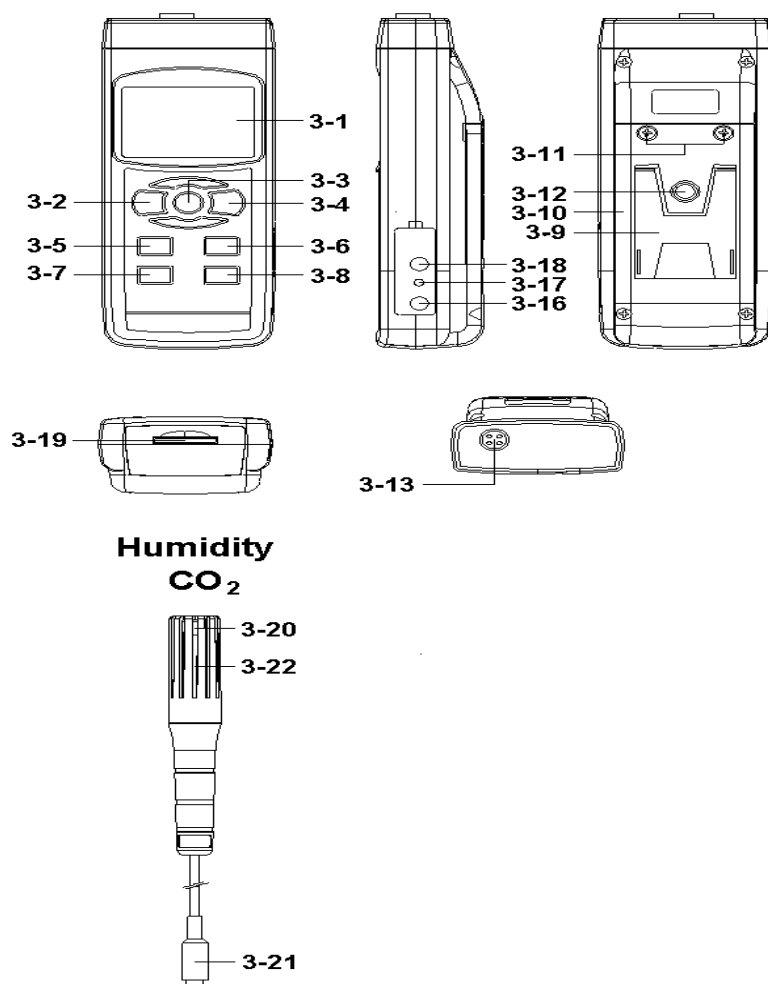
3. FRONT PANEL DESCRIPTION

Humidity
CO$_2$

Fig. 1

3-1 Display
3-2 Power Button (Backlight Button)
3-3 Hold Button (ESC Button)
3-4 REC Button
3-5 Alarm Button (▲ Button)
3-6 Function Button (▼ Button)
3-7 Time Button (SET Button, Sampling check)
3-8 Logger Button (Enter Button)
3-9 Stand
3-10 Battery Compartment/Cover
3-11 Battery Cover Screw
3-12 Tripod Fix Nut
3-13 CO2/Humidity Probe Input Socket
3-16 DC 9V Power Adapter Input Socket
3-17 Reset Button
3-18 RS-232 Output Terminal
3-19 SD Card Socket
3-20 Humidity Sensing Head
3-21 CO2/Humidity Probe Plug
3-22 CO2 Sensing Head

4. MEASURING PROCEDURES

Measuring consideration

a. The meter can plug in the max. 1 probes at the same time.

The thress prones are :

CO2 & Humidity probe .

(It can simultaneously measure two kinds of functions.)

b. Though the meter can plug the above 1 probes, but the
meter Display can show the one probe two kind Function
measurement value at the same time.

c. **If the meter already plug the above 1 probes,**
when make the SD card to record the data, it
can save the one probes two Function measurement value
along the time information at the same time.

Measuring procedures

1) Plug in the " Plug of probe " (3-21 Fig. 1) to meter's
" Probe Input Socket " (3-13, Fig. 1)
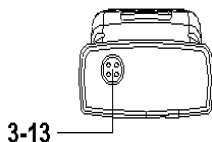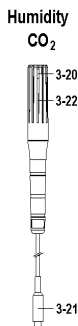
2) Power on the meter by pushing the "Power Button"(3-2, Fig. 1) 2 seconds.

3) Press and hold the " Function Button " (3-6, Fig. 1) into sequence to
   select the measuring function :

CO2 %RH
DEW WET

At the same time test tow kinds of functions,
and display show four functions reading.

%RH
DEW WET

At the same time test four kinds of functions,
and display show four functions reading.

CO2
%RH

At the same time test four kinds of functions,
and display show four functions reading.

CO2

At the same time test tow kinds of functions,
and display show two functions reading.

%RH

At the same time test tow kinds of functions,
and display show two functions reading.

Remark :

After select the desired function, power off the meter then power on
again, the meter circuit memory will save the selected unit with
default.

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

* *It recommend use memory card ≤ 4 GB.*

Prepare a " SD memory card " (1 GB to 16 GB, optional),
insert the SD card into the " SD card socket " (3-19, 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 .

 * *It recommend strongly, do not use memory cards that*
   have been formatted by other meter or by a computer.
   Reformat the memory card with your meter.

c. Time setting

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

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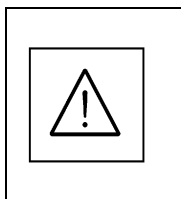
The numerical data structure of SD card is
default used the " . " as the decimal, for
example "20.6" "1000.53" . But in certain
countries   (Europe ...) is used the " , " as the
decimal point, for example " 20, 6 "
"1000,53". Under such situation, it should
change the Decimal character at first, details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

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

```
a. Start the datalogger
```

Press the " Logger Button (3-8, Fig. 1) >2 second , the LCD will
show the text " Scan card ", then press the " Logger Button "
(3-8, Fig. 1), the LCD will show text " DATA LOGGER " 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 .*

 * *How to set the beeper sound is enable, refer to*
    Chapter 8-5 .

```
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 " 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 "
DATA LOGGER " will flashing .

```
c. Finish the Datalogger
```

During pause the Datalogger, press the "Logger Button Button "
(3-8, Fig. 1) continuously at least two seconds, the " DATA LOGGER "
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 " Logger Button (3-8, Fig. 1) >2 second , the LCD will show the text " DATA LOGGER ", then press the " Logger Button " (3-8, Fig. 1) once, the bottom text " DATA 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.

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 Location no. (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 " Logger Button " (3-8, Fig. 1) continuously at least two seconds, the " DATA LOGGER " 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 LCD display will present the time information of Hour/Minute/Second (h.m.s) in the Display , as shown below.

2015/08/04
yy   mm   dd
01:46:04
h   m   s
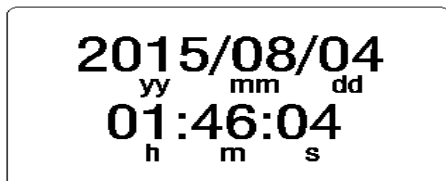
2) Then the LCD will present the Sampling time information of second unit. in the Display , as shown below.
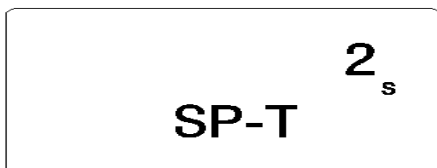
```
                    2
                      s
        SP-T
```

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 :
   C2A01
2) If the first time to execute the Datalogger, under the route C2A01\, will generate a new file name C2A01001.XLS. After exist the Datalogger, then execute again, the data will save to the C2A01001.XLS until Data column reach to 30,000 columns, then will generate a new file, for example C2A01002.XLS
3) Under the folder C2A01\, if the total files more than 99 files, will generate anew route, such as C2A02\ ....

4) The file's route structure :

   C2A01\
    C2A01001.XLS
    C2A01002.XLS
    ....
    C2A01099.XLS
   C2A02\
    C2A02001.XLS
    C2A02002.XLS
    ....
    C2A02099.XLS
   C2AXX\
    ....
    ....
   Remark : XX : Max. value is 10.

14

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 " (3-19, 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 : AQB01001.XLS, AQB01002.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.
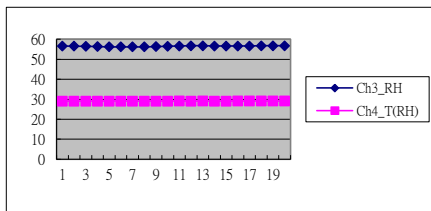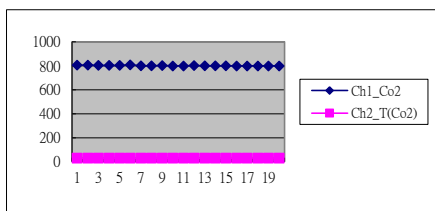
#	PositDate	Time	Ch1_	Ch1_unit	Ch2_	Ch2_unit	Ch3_	Ch3_unit	Ch4_	Ch4_unit	Ch5_	Ch5_unit	Ch6_	Ch6_unit	Ch7_	Ch7_unit	Ch6_1	Ch6_unit
1	2015/5/18	13:40:12	805	Co2_PPM	29.1	Degree_C	56.7	%RH	29.1	Degree_C	19.6	Dew_C	22.3	Wet_C	2	CO_PPM	25.2	Degree_C
2	2015/5/18	13:40:15	805	Co2_PPM	29.1	Degree_C	56.6	%RH	29.1	Degree_C	19.5	Dew_C	22.3	Wet_C	1	CO_PPM	25.2	Degree_C
3	2015/5/18	13:40:17	804	Co2_PPM	29.1	Degree_C	56.5	%RH	29.1	Degree_C	19.5	Dew_C	22.3	Wet_C	1	CO_PPM	25.2	Degree_C
4	2015/5/18	13:40:19	804	Co2_PPM	29.1	Degree_C	56.4	%RH	29.1	Degree_C	19.5	Dew_C	22.3	Wet_C	2	CO_PPM	25.2	Degree_C
5	2015/5/18	13:40:21	804	Co2_PPM	29.1	Degree_C	56.3	%RH	29.1	Degree_C	19.5	Dew_C	22.3	Wet_C	2	CO_PPM	25.2	Degree_C
6	2015/5/18	13:40:23	807	Co2_PPM	29.1	Degree_C	56.3	%RH	29.1	Degree_C	19.5	Dew_C	22.3	Wet_C	2	CO_PPM	25.2	Degree_C
7	2015/5/18	13:40:25	801	Co2_PPM	29.1	Degree_C	56.3	%RH	29.1	Degree_C	19.5	Dew_C	22.3	Wet_C	0	CO_PPM	25.2	Degree_C
8	2015/5/18	13:40:28	801	Co2_PPM	29.1	Degree_C	56.3	%RH	29.1	Degree_C	19.5	Dew_C	22.3	Wet_C	2	CO_PPM	25.2	Degree_C
9	2015/5/18	13:40:30	802	Co2_PPM	29.1	Degree_C	56.4	%RH	29.1	Degree_C	19.5	Dew_C	22.3	Wet_C	2	CO_PPM	25.2	Degree_C
10	2015/5/18	13:40:32	803	Co2_PPM	29.1	Degree_C	56.5	%RH	29.1	Degree_C	19.6	Dew_C	22.3	Wet_C	2	CO_PPM	25.2	Degree_C
11	2015/5/18	13:40:34	801	Co2_PPM	29.2	Degree_C	56.7	%RH	29.2	Degree_C	19.7	Dew_C	22.4	Wet_C	2	CO_PPM	25.2	Degree_C
12	2015/5/18	13:40:36	801	Co2_PPM	29.1	Degree_C	56.8	%RH	29.2	Degree_C	19.7	Dew_C	22.4	Wet_C	2	CO_PPM	25.2	Degree_C
13	2015/5/18	13:40:38	799	Co2_PPM	29.1	Degree_C	56.7	%RH	29.1	Degree_C	19.6	Dew_C	22.3	Wet_C	3	CO_PPM	25.2	Degree_C
14	2015/5/18	13:40:41	800	Co2_PPM	29.1	Degree_C	56.7	%RH	29.1	Degree_C	19.6	Dew_C	22.3	Wet_C	1	CO_PPM	25.2	Degree_C
15	2015/5/18	13:40:45	799	Co2_PPM	29.2	Degree_C	56.7	%RH	29.2	Degree_C	19.7	Dew_C	22.4	Wet_C	1	CO_PPM	25.2	Degree_C
16	2015/5/18	13:40:45	799	Co2_PPM	29.2	Degree_C	56.7	%RH	29.2	Degree_C	19.7	Dew_C	22.4	Wet_C	2	CO_PPM	25.2	Degree_C
17	2015/5/18	13:40:47	799	Co2_PPM	29.2	Degree_C	56.8	%RH	29.2	Degree_C	19.7	Dew_C	22.4	Wet_C	2	CO_PPM	25.2	Degree_C
18	2015/5/18	13:40:49	799	Co2_PPM	29.2	Degree_C	56.8	%RH	29.2	Degree_C	19.7	Dew_C	22.4	Wet_C	0	CO_PPM	25.2	Degree_C
19	2015/5/18	13:40:51	799	Co2_PPM	29.2	Degree_C	56.8	%RH	29.2	Degree_C	19.7	Dew_C	22.4	Wet_C	1	CO_PPM	25.2	Degree_C

8. 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 :

General advanced setting

SD F............... SD memory card Format
SET DATE...... Set clock time (Year/Month/Date, Hour/Minute/
Second)
SP-T............... Set sampling time (Hour/Minute/Second)
P-OFF............. Auto power OFF management
BEEP............. Set beeper sound ON/OFF
DEC............... Set SD card Decimal character
T-C/F............. Set the Temp. unit to ℃ or ℉
ALARM.......... Set the alarm value
ALTITUDE...... Set the altitude value
ESC............... Escape from the advanced setting

Special advanced setting
(only available for the CO2 function)

meter ALTITUDE........ Set the CO2 hight compensation value (meters)
feet ALTITUDE……..... Set the CO2 hight compensation value (feet)

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.

17

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
   " (3-8, 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.

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 " (3-8, 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 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 " (3-8, 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 " (3-7, 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 " (3-8, 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 " (3-8, 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 " USA DEC " or
   " EURO DEC ".

   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.

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 " ℃ T-C/F " or
   " ℉ T-C/F ".
   ℃ T-C/F... Temperature unit is ℃
   ℉ T-C/F ... Temperature unit is ℉

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.

8-8 Set the alarm value

When the lower display show " ALARM "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to adjust the Alarm value.
2) After set the Alarm value, press the " Enter Button "
   (3-8, Fig. 1) will save the Alarm value with default.
3) When measurement value > Alarm set value, the buzzer
   will sound for warning.
   * *Remark :*
     For the O2 function. if the measurement Air oxygen
     value is < 18.0 %O2, the buzzerwill sound for warning.

8-9 ESC

When the display show " ESC "

When the Display show the text " ESC ", then press the
" SET Button " (3-7, Fig. 1) or " ESC Button " (3-3, Fig. 1)
will finish the Advanced Setting procedures.
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.

21

8-10 Set the CO2 hight compensation value (meters)
When the lower display show " meter ALTITUDE "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to adjust the CO2 height compensation
   value (meters) .
2) After set the Alarm value, press the " Enter Button "
   (3-8, Fig. 1) will save the CO2 height compensation
   (meters) value with default.

### *8-11 Set the CO2 hight compensation value (feet)*
When the lower display show " feet ALTITUDE "

1) Use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button "
   (3-6, Fig. 1) to adjust the CO2 height compensation
   value (feet) .
2) After set the Alarm value, press the " Enter Button "
   (3-8, Fig. 1) will save the CO2 height compensation
   (feet) value with default.

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 "
(3-16, 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 " (3-11, 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.

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 "
   (3-17, 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 (3-18, 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.
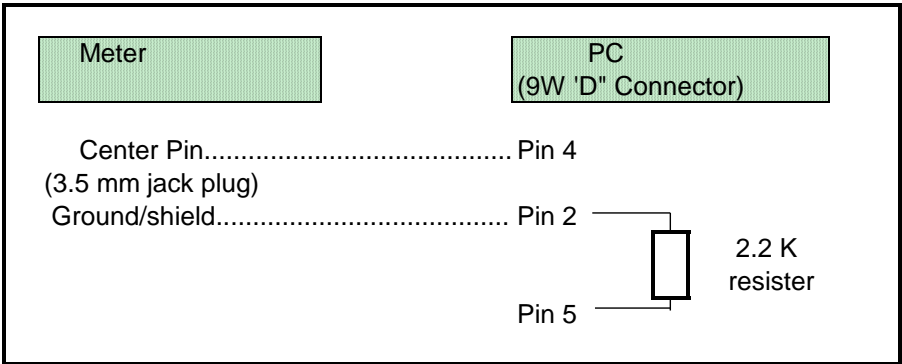
The 16 digits data stream will be displayed in the
following format :

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 %RH data (probe 1) = 1		
	When send the Temp./%RH. data (probe 1) = 2		
	When send the Dew point data (probe 1) = 3		
	When send the Wet bulb data (probe 1) = 4		
	When send the CO2 data (probe 2) = 5		
	When send the Temp./CO2 data (probe 2) = 6		
D12, D11	Annunciator for Display		
	℃ = 01	PPM = 19	% RH = 04
	℉ = 02	PPM_CO2 = G4	
	℃_Dew = G5	℃_WET = G7	
	℉-Dew = G6	℉-WET = G8	
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. PATENT

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

Germany	Nr. 20 2008 016 337.4
JAPAN	3151214
CHINA	ZL 2008 2 0189918.5
	ZL 2008 2 0189917.0