SD card real time data recorder

PM2.5, %RH, Temp.,CO2,Barometer

AIR QUALITY MONITOR RECORDER

Model : PM-1064SD

Your purchase of this AIR QUALITY MONITOR 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.
* Monitoring air pollutant source from dust, petrochemical industry, steel-making plant, thermal power plant, restaurant, smoke, burning plants, driving automobiles.
* The meter is a real-time air quality monitor instrument used to monitor the concentration of PM2.5, humidity and temperature in the indoor environment.
* PM2.5 : 0 to 250 μg/m³.
* Humidity : 5 to 95 %RH.
* Temperature : 0 to 50 ℃,℃/℉.
* CO2 : 0 to 10,000 ppm
* Barometer : 10.0 to 1100.0 hPa, 7.5 to 825.0 mmHg, 0.29 to 32.48 inHg.
* PM2.5 time weighted average reading.
* Data hold,Record(Max,Min)
* ALARM setting, there is beeper sound output and external device control output,
* Health index(0-9) detection and alarm .
* Can replacement air filter net.
* Built-in clock and Calendar, real time data record with SD memory card, sampling time can be set from 2 second to 3600 seconds. Just slot the SD card into the computer, all the measured values with the time information (year, month, data, hour, minute, second) can be downloaded to the Excel Directly, then user can make the further data analysis by themselves.
* Power by UM3/AA(1.5V) X 6 batteries or DC 9V adapter
* RS232/USB PC computer interface
* Meter can cooperate with 1 GB to 32 GB SD card.
* Patented.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Custom one-chip of microprocessor LSI circuit.	
Display	LCD Size: 2.18 X 2.87” (55.4 X 72.9 mm)(Dot Matrix) LCD with green backlight (ON/OFF).	
Measurement	* PM2.5(Particulate matter) * Humidity * Temperature * CO2 * Barometer	
Over-range	* LCD display show " OL " * The data save into the Micro SD card will show " 999 "(overleap the decimal point).	
Datalogger Sampling Time Setting range	Auto	2 sec to 3600 sec.
	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 32 GB.	
Measurement preparation 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 * Barometer unit setting * Alarm value setting * TWA 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.*
Alarm Output	** Open collector output* ** Input impedance:330Ω* ** Maximum applied voltage: 24 V DC* ** Maximum starting current: 70mA DC*
Power Supply	** DC 1.5 V (UM3, AA) x 6 PCs, or equivalent.* ** AC to DC 9 V power adapter*
Power Current	DC 230 mA approximately. Backlight ON approximately DC 250 mA.
Operating Temperature	0 to 50 ℃. (32 to 122 ℉).
Operating Humidity	Less than 80% R.H.
Weight	387 g/0.85 LB.
Dimension	164 X 93 X 72 mm(6.5 X 3.7 X 2.8 inch)
Accessories Included	Instruction manual..... 1 PC AC to DC 9 V adapter..... 1 PC
Optional Accessories	Air filter net (AF-01) USB cable, USB-01. RS232 cable, UPCB-02. Data Acquisition software, SW-U801-WIN. SD memory card (4 GB)

2-2 Electrical Specifications (23±5 ℃)

PM2.5(Particulate matter)

PM2.5	Range	0 to 250 μg/m³
	Resolution	1 μg/m³
	Accuracy	±(10 % reading + 15μg/m³)

Humidity

Humidity	Range	5 % to 95 % R.H.
	Resolution	0.1 % R.H.
	Accuracy	≧70% RH : ±(3% reading + 1% RH). < 70% RH : ±3% RH.

Temperature

Temperature	Range	0 ℃ to 50 ℃,32 ℉ to 122 ℉.	
	Resolution	0.1 degree	
	Accuracy	℃	±0.8 ℃.
		℉	±1.5 ℉.

CO2 (Carbon dioxide)

CO2 (Carbon dioxide) 23 ± 5 ℃.	Range	0 to 10,000 ppm
	Resolution	1 ppm
	Accuracy	±40 ppm ** ≦1,000 ppm.*
		±(50ppm +3% of reading) ** > 1,000 ppm ≦ 3,000 ppm.*
		±(50ppm +5% of reading) typically ** > 3,000 ppm ≦ 10,000 ppm. ,*
	Repeatability	± 20 ppm ** ≦ 3,000 ppm.*

Barometric pressure(Barometer)

Unit	Range	Resolution	Accuracy
hPa	10.0 to 1100.0	0.1 hPa	± 1.5 hPa
mmHg	7.5 to 825.0	0.1mmHg	± 1.2 mmHg
inHg	0.29 to 32.48	0.01inHg	± 0.05 inHg

3. FRONT PANEL DESCRIPTION

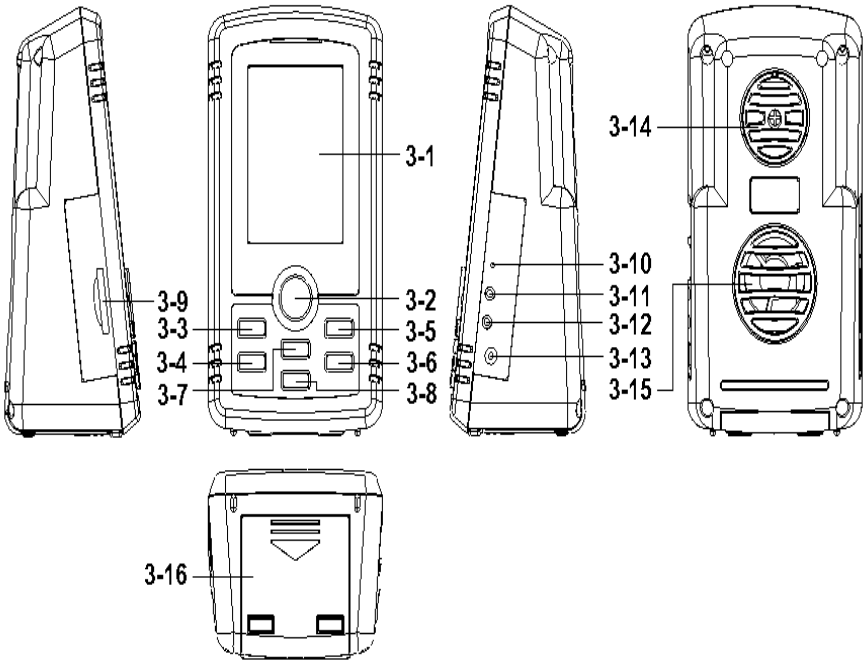


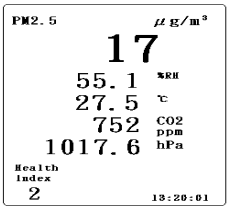
Fig. 1

3-1.Display
3-2.Power/Backlight button
3-3.HOLD key button
3-4.REC key button
3-5.TIME/SET key button
3-6.ENTER/LOG key button
3-7.▲/FUNCTION key button
3-8.▼/ALARM key button
3-9.SD card socket
3-10.RESET button
3-11.ALARM socket
3-12.RS232 socket
3-13.DC 9V power adapter socket
3-14.PM2.5 Air sampling inlet(Air filter net)
3-15.PM2.5 Air sampling outlet
3-16.Battery Cover/Battery compartment

4. Measurement preparation

4-1.The initial boot screen

4-2.Into the measurement screen



4-3.Key outline

4-3-1.POWER/Backlight KEY(3-2,Fig.1):

A.Long press this button> 2 SEC. Native ON / OFF function.

B.In the boot state press the button briefly, for the LCM backlight ON / OFF function.

4-3-2.HOLD KEY(3-3,Fig.1): LCD display value lock function.

A.In measureing:LCD display value lock function.

B.In setting.:Off setting function Back to measurement mode.

4-3-3.REC KEY(3-4,Fig.1): The maximum and minimum record.

4-3-4.TIME/SET KEY(3-5,Fig.1):

A.In the measurement screen press the button will display the year、month、 day and time of the picture.

B.In the measurement screen long press button> 2 SEC, it will Into the setting screen, when the setting screen press the button, change the setting of the first layer option.

4-3-5.ENTER/LOG KEY(3-6,Fig.1):

A.When the setting screen press the button briefly for the storage of set value function.

B.In measuring screen(eg SCREEN1)long press button> 2 SEC. When you Into the data logger function.

4-3-6.▲/FUNCTION KEY(3-5,Fig.1):

A.When the setting screen press the button, the value increases function. Long function. press and hold to quickly increase the value

B.In measuring screen (eg SCREEN1) long press button> 2 SEC., Then switch to the TWA measurement functions (eg SCREEN4).

4-3-7.▼/ALARM KEY(3-6,Fig.1):

A.When the setting screen press the button, the value was down function. Long press and hold down the value of fast function.

B.In measuring screen (eg SCREEN1) long press button> 2 SEC., Then Into the ALARM function (eg SCREEN16).

4-4.Setting function easy instructions:

* SET SD F: Executive SD memory card format.
* SET DATE: Into the year、 month、 day adjustment.
* SET TIME: Into the hours、 minutes 、 seconds adjustment.
* SET SP-T: Data logger sampling time setting.
* SET P-OFF: Auto Power Off Setting.
* SET BEEP: Beeper sound ON/OFF setting
* SET DEC: SD Card Decimal character setting USA or EURO.
* SET T-C/F: Temp. Unit ℃/℉ setting.
* SET hPa(Barometer unit setting)
* SET ALARM: Upper and lower alarm value setting.
* SET PM2.5 Hour TWA: PM2.5 Time-Weighted Average setting.
* SET Meter Altitude(Altitude value setting)
* SET ESC: Escape setting.

4-5.Setting screen Description:

4-5-1.SET SD F(SD memory card format):

A.Press ▲ or ▼ buttons to select YES or NO, when YES is selected and press ENTER key to start the Format function.

B.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting(SET SD F → SET DATE).

4-5-2.SET DATE(Real time clock setting):(Year/Month/Date,Hour/Minte/Second)

A.Press ▲ or ▼ key year value adjustment, ▲ or ▼ then press and hold up, down fast adjustment. Press ENTER then the set value is stored and the month of adjustment functions, and so on the day / time / minute / second to do the setting.

B.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting(SET DATE → SET SP-T).

4-5-3.SET SP-T(Data logger sampling time setting):

A. Press ▲ or ▼ key to Data logger sampling time setting, press ENTER KEY will set the value of the store and into the next function is set (SET SP-TeSET P-OFF).

B.0 S: Representative Manual Logger function.

C.2～3600 S: Representative Auto Logger function.

D.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting (SET SP-T → SET P-OFF).

4-5-4.SET P-OFF(Auto power off setting):

A.Press ▲ or ▼ KEY to select YES or NO, when select YES and press ENTER KEY AUTO POWER OFF function is started and go to the next function setting (SET P-OFF → SET BEEP).

B.When inserted into the DC 9V power adapter in battery mode will be automatically canceled AUTO POWER OFF function.

C.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting (SET P-OFF → SET BEEP).

4-5-5.SET BEEP(Beeper sound ON/OFF setting):

A.Press ▲ or ▼ KEY to select YES or NO, when you select YES, press ENTER KEY function is to store this setting and proceed to the next function setting (SET BEEP → SET DEC).

B.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting (SET BEEP → SET DEC).

4-5-6.SET DEC(SD Card Decimal character setting):

A.Press ▲ or ▼ KEY select USA or EURO, when the ENTER KEY function is to store this setting and will advance to the next function setting (SET DEC → SET T-C/F).

B.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting(SET DEC → SET T-C/F).

4-5-7.SET T-C/F(Temp. Unit ℃/℉ setting):

A.Press ▲ or ▼ KEY select ℃ or ℉, when the ENTER KEY function is to store this setting and proceed to the next function setting(SET T-C/F → SET ALARM).

B.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting (SET DEC → SET ALARM).

4-5-8.SET hPa BARO(Barometer unit setting):

A.Press ▲ or ▼ KEY select hPa or mmHg or inHg , when the ENTER KEY function is to store this setting and proceed to the next function setting(SET hPa BARO)→ SET ALARM).

B.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting (SET hPa BARO → SET ALARM).

4-5-9.SET ALARM(Alarm value setting):

A.Press ▲ or ▼ KEY select the option you want to set it μg / m³、% RH、℃, ENTER key once to Into the the upper limit of the adjustment, press ENTER KEY again Into the the lower limit of the adjustment, press ENTER KEY again will return to the first parent directory.

B.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting (SET ALARM → SET TWA)

4-5-10.SET PM2.5 TWA(PM2.5 Time-Weighted Average setting):

A.Press ▲ or ▼ KEY select the average time (1~24 Hour), then press ENTER KEY again will store the value and proceed to the next function setting(SET PM2.5 TWA → SET ESC).

B.When no press ENTER KEY store, press TIME / SET KEY proceed to the next function setting (SET PM2.5 TWA → SET ESC).

4-5-11.SET Meter Altitude(CO2 function altitude setting):

A.Press ▲ or ▼ KEY select Meter or Feet , then press ENTER KEY again will into Altitude setting function setting(SET PM2.5 TWA → SET ESC).

B.When entering the height value adjustment, the user can adjust the height based on the current location, then press the ENTER key The set value is stored and will enter next function setting (SET Meter Altitude → SET ESC)

4-5-12.SET ESC(Escape setting): Press the TIME / SET KEY once you leave the setting screen.

5.Measurement procedure:

5-1.METER POWER ON:

Press POWER KEY> 2 SEC. When you Into the the boot screen, about 20 SEC. After you Into the the measurement screen (eg SCREEN1).

5-2.PM2.5 Measurement:

5-2-1.Concentration range display: 0～250 μg/m³, Equivalent measurement values> 250 above screen will show the value 250 and OL alternates (eg SCREEN1、SCREEN2).

5-2-2.Air particle pollution health indicators (Health Index): 0～9, Equivalent measurement value ≧ 5 or more, the value will blink warning(eg SCREEN1).

5-2-3.TWA(Time Weighted Average)Measurement:

A.Press ▲ (FUNCTION) KEY> 2 SEC. Into the this function mode.

B.TWA average time does not arrive, it will display Hour --, when the time arrives value appears(eg Hour 24),(eg SCREEN4、SCREEN5).

5-3.Humidity and Temperature measurement:(eg SCREEN1)

5-3-1.Temperature: screen will show ℃ or ℉ for reading.

5-3-2.Humidity: screen will show % RH for reading.

5-4.CO2 measurement:(eg SCREEN1)
screen will show CO2 ppm for reading.

5-5.Barometer measurement:(eg SCREEN1)
screen will show hpa or mmHg or inHg for reading.

5-6.Time Display:
5-6-1.During normal measurement, the lower right corner displays only, hours, minutes and seconds. Screen.(eg SCREEN1)
5-6-2.In normal measurement, when short press TIME KEY, the lower right corner of the screen displayed first the year, month, day, hour, minute and second of about 2 SEC. After the displayed data recording function of sampling time, and then back hour, minute and second display.(eg SCREEN6、SCREEN7)

6.Other Function:

6-1.Data HOLD:
6-1-1.Press HOLD KEY once, the screen will appear HOLD symbol will be displayed and the data is locked.(eg SCREEN8)
6-1-2.Press HOLD KEY once, off screen lock feature.(eg SCREEN1)

6-2.Data Record:
6-2-1.Press REC KEY once, the screen will appear REC symbol, at the same time begin PM2.5, %RH and Temp maximum and minimum data processing. (eg SCREEN9)
6-2-2.Press REC KEY once, the screen appears REC MAX symbol, and the reading will display the maximum value.(eg SCREEN10)
6-2-3.Press REC KEY once, the screen appears REC MIN symbol, and the reading will display the minimum value.(eg SCREEN11)
6-2-4.Press ESC KEY once, then return to the "6-2-1" item. (eg SCREEN9)
6-2-5.When you press the REC KEY> 2 SEC. When this function is canceled. (eg SCREEN1)

6-3 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.

6-4.ALARM function:

6-4-1.Upper and lower range of settings: eg 4-5-7 Option Description

6-4-2. After the range setting, press ▼ / ALARM KEY> 2 SEC. ALARM function is entered, and the top right corner of the screen will appear the words ALM. (eg SCREEN16)

6-4-3.When the measured value equivalent ≧ upper limit set value or ≦ lower limit value, and the digital will flash a warning sound, there will be alarm output (Open collector)(3-11, Fig.1).

A.Hysteresis = Measured value * 5 %.

B. High ALARM status:

Measured value ≦ (upper limit set value - Hysteresis value), the Alarm goes OFF.

C. Low ALARM status:

Measured value ≧ (lower limit value + Hysteresis value), the Alarm goes OFF.

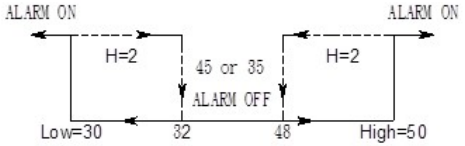
D.Example: PM upper limit set value=50, PM lower limit value=30.

D-1.When the measured value PM=50, then ALARM to ON.

D-2.When the PM when the measured value=45, H=50 * 5%=3, (45 ≦ (50-3)), so 45 ≦ 47 ALARM goes OFF.

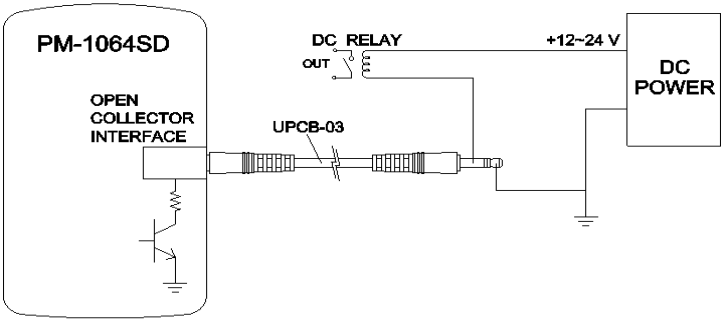
D-3.When the measured value PM=30, then ALARM to ON.

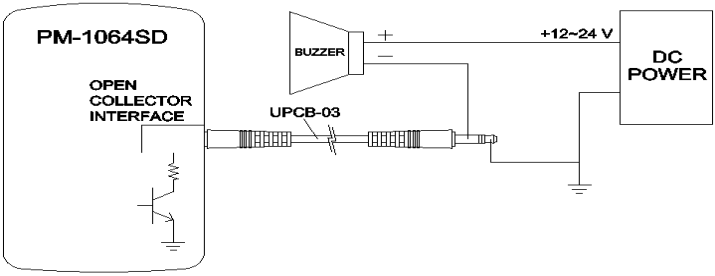
D-4.When the measured value PM=35, H=30 * 5% =2, (35 ≧ (30+2)), so 35 ≧ 32 ALARM goes OFF.



6-4-4.Press ▼ / ALARM KEY> 2 SEC. ALARM function is canceled. (eg SCREEN1)

6-4-5. ALARM function interface Description.





6-5.User calibration function:

6-5-1.Press HOLD and REC KEY> 3 SEC.then Into the the user calibration function. (eg SCREEN17)

6-5-2.PM2.5 calibration:

A.Low level calibration (PML): In SCREEN 17 screen, then press ENTER KEY Into the SCREEN18 adjust the picture,after this time,the low-level calibration should be less than 15μg / m³, wait 10 minutes this unit with the standard machine value is stable, press ▲ or ▼ KEY adjust the standard value of the machine calibration(eg SCREEN18) as a standard machine, determined to press ENTER KEY the values are stored, then enter the high-level calibration (PMH) correction (eg SCREEN19).

B.High level calibration (PMH): After the measured value must be greater than 60 μg / m³, wait 10 minutes this unit with the standard machine value is stable, press ▲ or ▼ KEY adjust the standard value of the confidential correction (eg SCREEN19) as the standard machine after determining the value press ENTER KEY store, then back to the first layer PM calibration screen (eg SCREEN17), then press TIME / SET KEY proceeds% RH screen (eg SCREEN20).

6-5-3. %RH calibration: In SCREEN20 screen, press ENTER KEY proceeds SCREEN21 adjust the picture, when the machine with a standard value of a given machine steady, press ▲ or ▼ KEY to adjust the value of the machine calibration standard (eg SCREEN21) as a standard machine after determining setting press ENTER KEY value store, then back to the first layer % RH calibration screen, then press TIME / SET KEY proceeds Temp screen (eg SCREEN22).

6-5-4.Temp calibration: In SCREEN22 screen, press ENTER KEY proceeds SCREEN23 adjust the picture, when the value of the machine with a standard machine is stable, press ▲ or ▼ KEY adjust the machine calibration standard value (eg SCREEN23) as a standard machine, after determining press ENTER KEY to store the value, then back to the first

layer Temp calibration screen (eg SCREEN22), at this time press HOLD and REC KEY> 3 SEC. Then away from the user calibration screen and return to the measurement screen(eg SCREEN1).

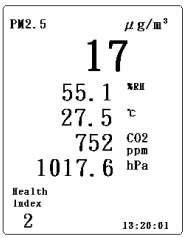
6-5-5. CO2 calibration: In SCREEN24 screen, press ENTER KEY proceeds SCREEN25 adjust the picture, when the machine with a standard value of a given machine steady, press ▲ or ▼ KEY to adjust the value of the machine calibration standard (eg SCREEN25) as a standard machine after determining setting press ENTER KEY value store, then back to the first layer% RH calibration screen, then press TIME / SET KEY proceeds BARO screen (eg SCREEN26).

6-5-6.BARO calibration: In SCREEN26 screen, press ENTER KEY proceeds SCREEN23 adjust the picture, when the value of the machine with a standard machine is stable, press ▲ or ▼ KEY adjust the machine calibration standard value (eg SCREEN27) as a standard machine, after determining press ENTER KEY to store the value, then back to the first layer Temp calibration screen (eg SCREEN26), at this time press HOLD and REC KEY> 3 SEC. Then away from the user calibration screen and return to the measurement screen(eg SCREEN1).

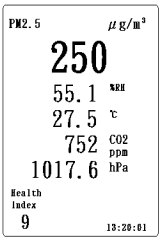
6-5-7.Clear user adjustment :

A. During power off , Press and hold the " ▼ " key then press power on ,

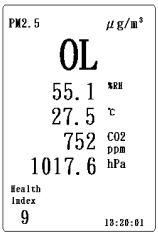
B. When power on screen show from (eg SCREEN 28) to (eg SCREEN 28), then release the " ▼ " key ,until into measurement screen (eg SCREEN 1), meter will clear up the adjustment and be filled with factory calibration data.



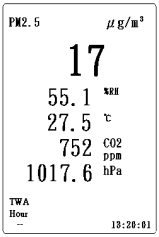
SCREEN1



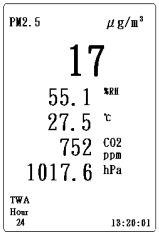
SCREEN2



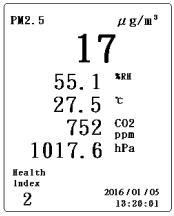
SCREEN3



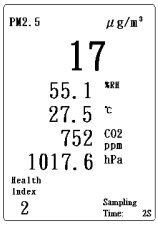
SCREEN4



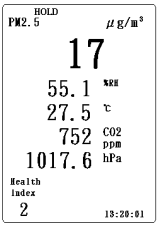
SCREEN5



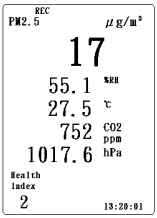
SCREEN6



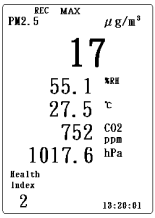
SCREEN7



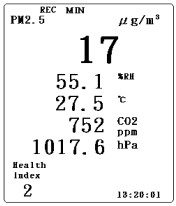
SCREEN8



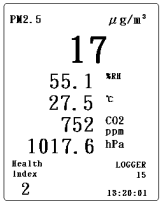
SCREEN9



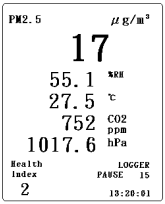
SCREEN10



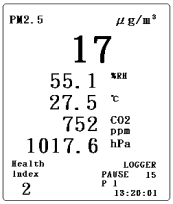
SCREEN11



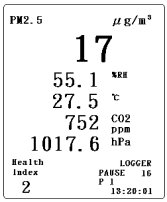
SCREEN12



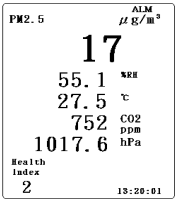
SCREEN13



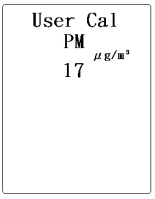
SCREEN14



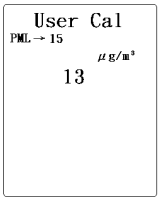
SCREEN15



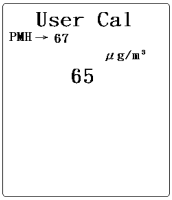
SCREEN16



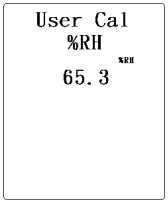
SCREEN17



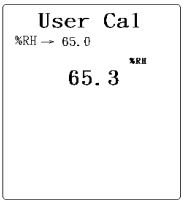
SCREEN18



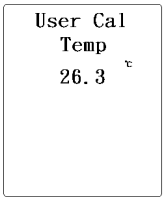
SCREEN19



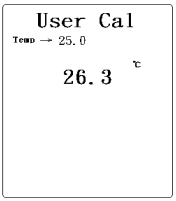
SCREEN20



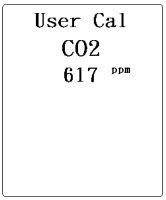
SCREEN21



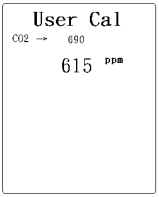
SCREEN22



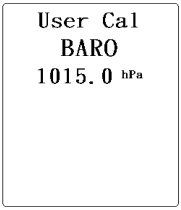
SCREEN23



SCREEN24



SCREEN25



SCREEN26

SCREEN27

SCREEN28

SCREEN29

7. DATALOGGER

7-1 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 32 GB),
insert the SD card into the " SD card socket " (3-9, 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 4-5-1 , page 7 .

* *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 4-5-2 , page 7 .

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 4-5-6 , page 8 .

7-2 Auto Datalogger (Set sampling time ≧ 2 second)

a. Start the datalogger

Press the " Logger Button (3-6, Fig. 1) >2 second , the LCD will show the logger function (eg SCREEN12) , the display will show symble " LOGGER " 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 4-5-3 page 8 .*
* *How to set the beeper sound is enable, refer to Chapter 4-5-5 page 8 .*

b. Pause the datalogger

During execute the Datalogger function , if press the " Logger Button " (3-6, Fig. 1) once will pause the Datalogger function (stop to save the measuring data into the memory circuit temporally (eg SCREEN13)).

Remark :
If press the " Logger Button " (3-6, Fig. 1) once again ,will execute the Datalogger again (eg SCREEN12).

c. Finish the Datalogger

During pause the Datalogger, press the "Logger Button " (3-6, Fig. 1) continuously at least two seconds, the " LOGGER " indication will be disappeared and finish the Datalogger.

7-3 Manual Datalogger (Set sampling time = 0 second)

a. Set sampling time is to 0 second

Press the " Logger Button (3-6, Fig. 1) >2 second , the display will show the text "LOGGER "(eg SCREEN14), then press the " Logger Button " (3-6, Fig. 1) once, the display " LOGGER count " text will be increase once (eg SCREEN15) and Beeper will sound once, at the same time the measuring data along the time information will be saved into the memory circuit. The Display will show the Position (Location) no. and saved into the SD card too.

Remark :
During execute the Manual Datalogger, press the " ▲ Button " (3-7, Fig, 1) the Display will show position no. (eg SCREEN14). It can use the " ◢ Button " (3-7, Fig. 1) or " ◤ Button " (3-8, Fig. 1) to set the measuring Location no. (1 to 99, for example room 1 to room 99) to identify the measurement location , the Display will show P x (x = 1 to 99)(eg SCREEN14) .

b. Finish the Datalogger

Press the " Logger Button " (3-6, Fig. 1) continuously at least two seconds, the " LOGGER " indication will be disappeared and finish the Datalogger.

7-4 To check the time, sampling time information

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

1) If press " Time Button " (3-5, Fig. 1) once , the LCD display will present the time information of Year/Month/Date/Hour/Minute/Second (h.m.s) in the Display (eg SCREEN 6).

2) Then the display will present the Sampling time information of second unit. in the Display (eg SCREEN 7).

7-5 SD Card Data structure

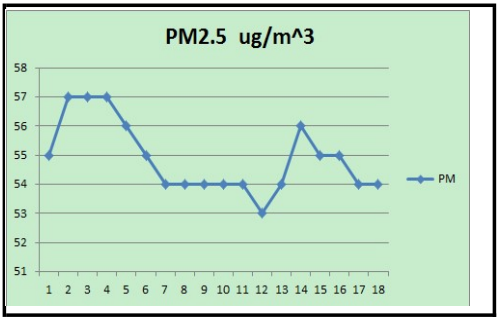
1) When the first time, the SD card is used into the meter, the SD card will generate a route :
   PAB01
2) If the first time to execute the Datalogger, under the route PAB01\, will generate a new file name PAB01.XLS.
   After exist the Datalogger, then execute again, the data will save to the PAB01.XLS until Data column reach to 30,000 columns, then will generate a new file, for example PABXX001.XLS
3) Under the folder PAB01\, if the total files more than 99 files, will generate anew route, such as PAB01\ .....
4) The file's route structure :

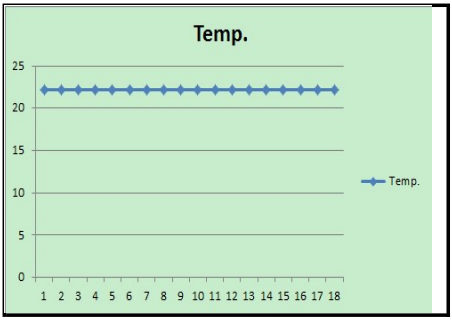
```
PAB01\
    PAB01001.XLS
    PAB01002.XLS
    ......................
    PAB01099.XLS

PAB02\
    PAB02001.XLS
    PAB02002.XLS
    ......................
    PAB02099.XLS
PABXX\
    ......................
    ......................
```

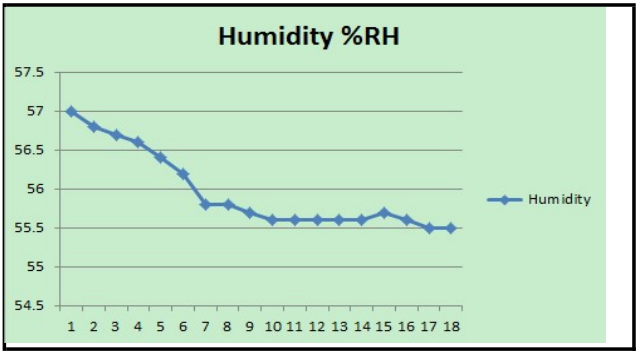
Remark :
XX : Max. value is 10.

8. 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 : PAB01001.XLS, PAB01002.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.







	A	B	C	D	E	F	G	H	I	J	K
1	Position	Date	Time	PM	Unit	Humidity	Unit	Temp.	Unit	Health Index	
2	1	2016/1/7	19:30:47	55	μg/m^3	57	%RH	22.2	DEGREE	6	
3	2	2016/1/7	19:30:49	57	μg/m^3	56.8	%RH	22.2	DEGREE	5	
4	3	2016/1/7	19:30:51	57	μg/m^3	56.7	%RH	22.2	DEGREE	6	
5	4	2016/1/7	19:30:53	57	μg/m^3	56.6	%RH	22.2	DEGREE	5	
6	5	2016/1/7	19:30:55	56	μg/m^3	56.4	%RH	22.2	DEGREE	5	
7	6	2016/1/7	19:30:57	55	μg/m^3	56.2	%RH	22.2	DEGREE	6	
8	7	2016/1/7	19:30:59	54	μg/m^3	55.8	%RH	22.2	DEGREE	5	
9	8	2016/1/7	19:31:01	54	μg/m^3	55.8	%RH	22.2	DEGREE	6	
10	9	2016/1/7	19:31:03	54	μg/m^3	55.7	%RH	22.2	DEGREE	6	
11	10	2016/1/7	19:31:05	54	μg/m^3	55.6	%RH	22.2	DEGREE	6	
12	11	2016/1/7	19:31:07	54	μg/m^3	55.6	%RH	22.2	DEGREE	6	
13	12	2016/1/7	19:31:09	53	μg/m^3	55.6	%RH	22.2	DEGREE	6	
14	13	2016/1/7	19:31:11	54	μg/m^3	55.6	%RH	22.2	DEGREE	6	
15	14	2016/1/7	19:31:13	56	μg/m^3	55.6	%RH	22.2	DEGREE	5	
16	15	2016/1/7	19:31:15	55	μg/m^3	55.7	%RH	22.2	DEGREE	5	
17	16	2016/1/7	19:31:17	55	μg/m^3	55.6	%RH	22.2	DEGREE	4	
18	17	2016/1/7	19:31:19	54	μg/m^3	55.5	%RH	22.2	DEGREE	6	

9. Air filter net REPLACEMENT

When the meter show " ⚠ " information ,
This " symbol " meaning is please replace the meter filter,
Please carry out according to the following replacement steps.

1) Loose the screws of the " Air filter net Cover " (3-14, Fig. 1) and take away the " Air filter net Cover " from the instrument and remove the Air filter net.
2) Replace with Air filter net and reinstate the cover.
3) Make sure the cover is secured after changing Air filter net.
4) please power off the meter ,press and hold the HOLD key & REC key then power on the meter, at the same time the meter will be show power on screen and one down counter and " Replace Time Clear " text , when the down counter decries to zero, the " Replace Filter " Information will be remove.

10. POWER SUPPLY from DC ADAPTER

The meter also can supply the power supply from the DC 9V Power Adapter . Insert the plug of Power Adapter into " DC 9V Power Adapter Input Socket "(3-13, Fig. 1), Then Press and hold " Power Button"(3-2, Fig. 1) > 2 sec. The meter will be power ON .

11. 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 " (3-16, 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.

12. 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,and meter will be power oFF. The system RESET procedures will be either following method :

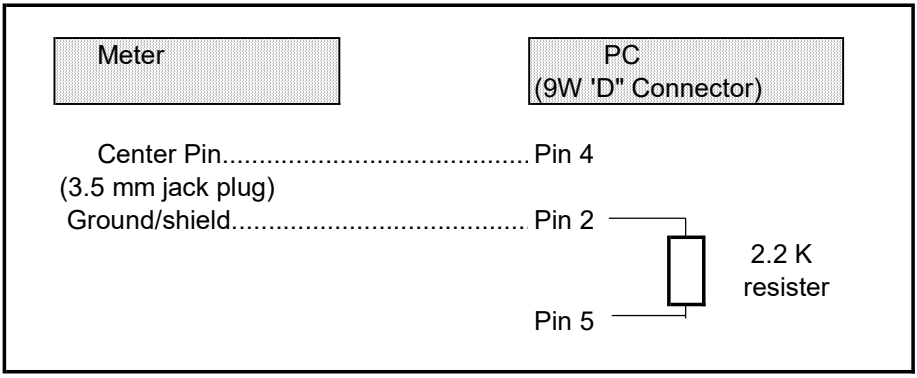
During the power on, use a pin to press the " Reset Button " (3-10, Fig. 1) once a while will reset the circuit system.

13. RS232 PC SERIAL INTERFACE

The instrument has RS232 PC serial interface via a 3.5 mm terminal (3-12, 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 PM2.5 data = 1 When send the %RH data = 2 When send the Temp. data = 3		
D12, D11	Annunciator for Display		
	μg/m^3 = H0	% RH = 04	℃ = 01
	℉ = 02	CO2 = 19	hPa = 91
	mmHg = 78	inHg = 80	
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

14. Micro suspend the particle (PM2.5) Parallel table of the indicator and activity are proposed

Micro suspend the particle (PM2.5) value index

index	μg/m^3	General people The activity is proposed	Sensitiveness ethnicity The activity is proposed
1	0-11	Normal outdoor sports	Normal outdoor sports
2	12-23		
3	24-35		
4	36-41	Normal outdoor sports	The adults and children of heart, respiratory tract and cardiovascular vessel disease experience until symptom, should consider reducing the physical demands, especially reduce the outdoor sports.
5	42-47		
6	48-53		
7	54-58	If no one is uncomfortable, for instance eyes aches, cough or have a sore throat etc., should consider reducing the outdoor sports.	There are the adults and children of heart, respiratory tract and cardiovascular vessel disease,should reduce the physical demands, especially reduce the outdoor sports.
8	59-64		
9	65-70		
9	≧ 70	There are the adults and children of heart, respiratory tract and cardiovascular vessel disease, should reduce the physical demands, especially reduce the outdoor sports.	There are the adults and children of heart, respiratory tract and cardiovascular vessel disease,should reduce the physical demands, especially reduce the outdoor sports.

PSI value and health influence
AIR PSI INDEX

0~50	Good	To that general people are healthy have not been influenced.
51~100	Moderate	Have not influenced the sensitive ethnicity immediately healthily.
101~199	Unhealthful	Will have phenomenon that slight symptom worsens to the sensitive ethnicity, such as the ozone thickness is in this range, the eyes nose will have some the excitement.
200~299	Very Unhealthful	Will have phenomenon obviously worsened to the sensitive ethnicity, reduce its ability of movement; General masses look at the health, may produce all kinds of symptoms.
>300	Hazardous	Except discomfort symptom is apparent worsens and causes some diseases to begin ahead of time to the sensitive ethnicity; Lower normal people's movement ability.

15. 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