OPERATION MANUAL

PM2.5, CO_2, HUMIDITY, TEMP. WALL MOUNT/DESKTOP DATALOGGER

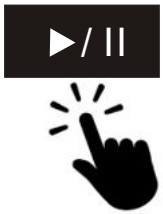
QUICK GUIDE

1 Power up the meter through USB type-C

2 You can start using the logging function 30 minutes after booting

3 Plug & Play. Using Windows computer to setup the logging feature fits you

4 After hanging on the position you like, press ▶/II long time to start logging.



INTRODUCTION

This is an accurate, fast, smart and easy-to-use air quality monitor. In addition to measure the PM2.5 and CO_2 concentration, it also displays the hazardous level and monitor ambient temperature and relative humidity. This monitor not only provides instant value but also record measurement for future check.

Features:

- Large LED displays PM2.5, Health index, CO_2 value, humidity and temperature.
- 12000 times auto logging. USB2.0 plug and play. No need to operate through specific software.
- Wall mount display with dual light bar to provide hazardous level indicator from far distance
- Touch panel to program the setting
- High accuracy laser optical PM2.5 sensor
- NDIR (non-dispersive infrared) waveguide CO_2 technology
- 3-color lightbar (green / yellow / red) gradually changes color for PM2.5 and CO_2 concentration.
- CO_2 **a**utomatic **b**ackground **c**alibration(called ABC) for long time drift compensation
- Buzzer alarm function is included
- Areas of application: Widely used in the office building, school, exhibition hall, shopping mall, meeting room, fitness center, restaurant and other public places where personal comfort and healthy are important.

MATERIAL SUPPLIED

The standard package contains below:

- CO_2 monitor x 1pc
- USB-C cable x 1pc

NOTE: provided USB-C cable is for both data transfer and power charging.

- Operation manual x 1pc
- Sticker & Screws for wall mount hanging, dust filter x 1 pack

POWER UP

This meter is designed as wall mount & desktop use. It is powered up by 5VDC through USB-C cable. For mobility, you may also use power bank for temporary use. Once meter is powered, the LED will auto turn on.

CAUTION

Please take off the AC power adapter when this monitor left idle for long. Please use a standard USB power supply (such as PC's USB port, universal AC adapter with USB port). Improper power supply can cause serious damage to the device, or result in injury or death to the user.

The vents allow the air circulation liquid for measurement of the CO_2 concentration and the ventilation should not be blocked.

DISPLAY , KEYPAD, SPECIFICATION

1. CO_2 concentration, parts per million (ppm). NDIR CO_2 sensor, display up to 9999ppm
2. PM2.5 dust concentration, ug/m^3 (ppm). range 0 to 999 ug/m^3
3. Health index, based on 24 hour PM2.5 average. Scale from 1 to 7. 1 is the best condition.
4. Ambient temperature. C/F switchable. Range -10.0~60.0C(14.0~140.0F)
5. Relative humidity. Range 0.1~99.9%RH
6. 12000 times record auto logging function
7. CO_2 and PM2.5 alarm buzzer. Buzzer is default as OFF and can be activated through keypad
8. Three color light bar. The status of measured CO_2. Default: <800ppm 800~1000ppm >1000ppm
9. Three color light bar. The status of measured PM2.5. Default: <35ug/m^3 35~55ug/m^3 >55ug/m^3

SET

-Setting modes. Long press to enter setting mode

MUTE /+

-While buzzer sounds, short press to mute
-While in setting mode, press to adjust value

▶/ II

-Press longer time to start or stop logging

SPECIFICATION			
Measuring range		Response time	
CO_2	0~9999 ppm,	CO_2	<30 seconds (63% step change)
PM2.5	0~999 ug/m^3	PM2.5	<30 seconds(90% step change)
Temperature	-10.0~60.0°C (14.0~140.0°F)	Tair	<2 mins (90% step change)
Humidity	0.1~99.9% RH	Humidity	<20 minutes (90% step change)
Resolution	1ppm,1ug/m^3, 0.1°C/°F, 0.1%RH	Auto Logging	12000 times record
Accuracy		Operating	0~50°C , 0~95% RH (avoid condensation)
CO_2	±40ppm±3% of reading(400~2000ppm) Other range is 10% of reading	Storage	-20~ 50°C,0~95%RH(avoid condensation)
PM2.5	0-100: +/-10 ug/m^3;101~999:+/-10% rdg.	Power supply	5VDC USB type C port
Temperature	±0.6°C/±0.9°F	Power consumption	<500mA
Humidity	±5%RH (at 25°C, 10~90%RH) ; ±7%RH (at 25°C , other range)	Meter size	257 x 168 x 45.5 mm (L x W x T)
		Weight	610g
		Standard package	Meter, manual, USB type C cable ,Hanging accessories.

OPERATION

1. Power on and Measure:

-Connect the USB-C cable to a PC or 5VDC wall adapter or power bank to power on the device.
-After power on, the LED count down for 10 seconds during warm-up.
-The device will start to measure PM2.5, CO_2 concentration, ambient temperature and relative humidity after warm-up.
-Suggest to power on for at least 30 minutes before using the logging function.

2. Light bar :

Besides the value display, this meter is also equipped with programmable light bar color feature. There are 3 different light bar color for PM2.5 and CO_2: Green, Yellow and Red. The color auto switches according to the measured value. Yellow color will be skipped if red light setting is identical to yellow.

	PM2.5	**CO_2**
From Green turns into Yellow	Adjustable from 10 to 100 (default as 35)	Adjustable from 700 to 3000 (default as 800)
Yellow turns into flashing Red	Adjustable from 10 to 100 (default as 54)	Adjustable from 700 to 3000 (default as 1000)

3. Buzzer & How to turn off buzzer:

Buzzer function is default OFF in case of using in quiet places. It is required to activate buzzer function in setting mode while audible alarm is needed. While buzzer is activated and measured CO_2 or PM2.5 is over alarm threshold, buzzer sounds once a second till pressing "**MUTE**" key to stop.

4. Health Index:

Long term PM2.5 value brings higher impact to human health. The health index here provides you a quick indication to know the average PM2.5 level of past 24 hours. This index table is defined by USA EPA.

Health index level	**AQI category**	**Breakpoints (ug/m^3, 24H average)**
1	Good	0.0~12.0
2	Moderate	12.1~35.4
3	Unhealthy for sensitive groups	35.5~55.4
4	Unhealthy	55.5~150.4
5	Very Unhealthy	150.5~250.4
6	Hazardous	250.5~350.4
7	Hazardous	350.5~500

5. Setting:

Long pressing **"SET"** key to enter the settings. And then press **"SET"** key to select setting modes in sequence: bL (Brightness of light bar), ALC 2.0 (CO_2 Alarm color), ALC 3.0 (PM2.5 Alarm color), Unit (temperature unit), Buzzer, Pressure compensation and ABC (auto background calibration).
Press **" + "** key to adjust the parameters.
***Note: During the setting process, the device will return to the main screen after 25 sec of idle time.**

5.1 Brightness of light bar (bLt): The brightness of light bar is adjustable. From off to strong is 0 to 10, 0 is turned off and 10 is the strongest. Default as 6. Press **"+"** to adjust the brightness of light bar to fit your need. Though light bar might be set to off, it will still blink at weakest level 1 brightness while measured CO_2 or PM2.5 is higher than alarm threshold.

5.2 Alarm(ALC, 2.0 &2.1): For CO_2, green turns into yellow, adjustable from 700ppm to 3,000ppm, default 800. Yellow turns into red, adjustable from 700 to 3000ppm, default 1000. Red should be larger than yellow, yellow color will be skipped if red light setting is intentionally identical to yellow. Interval is 100ppm. This red light threshold is related to buzzer alarm trigger and red light bar trigger.
To adjust alarm threshold value, Press **"+"** key.

5.3 Alarm(ALC, 3.0 & 3.1): For $PM_{2.5}$, green turns into yellow, adjustable from 10 to 100ug/m^3, default 35. Yellow turns into red, adjustable from 10 to 100ug/m^3, default 55. Red should be larger than yellow, Yellow color will be skipped if red light setting is intentionally identical to yellow. Interval is 1ug/m^3.
This red light threshold is related to buzzer alarm trigger and red light bar trigger.
To adjust alarm threshold value, Press **"+"** key.

5.4 Temperature unit: Press **"+"** to switch between ˚C and ˚F

5.5 Buzzer activation: Buzzer is default OFF for using in quiet places. Press **"+"** to turn it to ON.

5.6 Pressure compensation: Default is 1013hpa, adjustable from 600 to 1100 hPa. This features benefits users who calibrate CO_2 in sea level but then move the device to high mountain location to use.

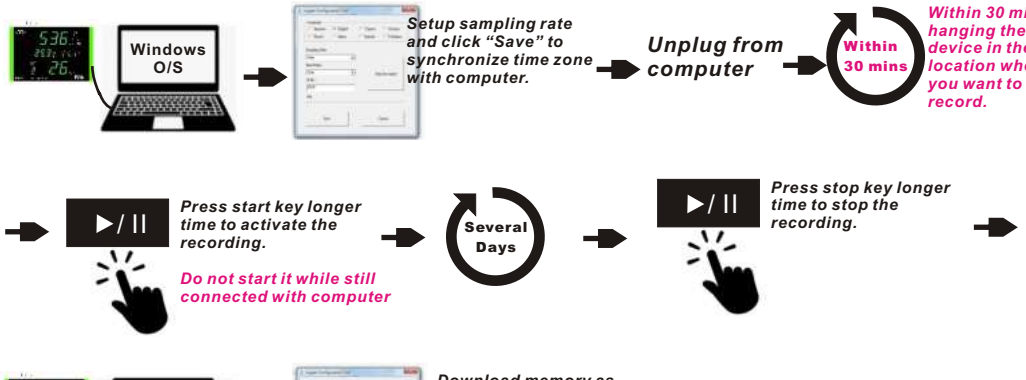
5.7 CO_2 ABC function: ABC means the lowest measured CO_2 value in past 7 days will be used as 400ppm to auto calibrate the CO_2 sensor to reduce the long term drift. It is default as ON.
However, **it is not suggested to turn on ABC feature in hospital, green house, winery or any less ventilated places where CO_2 has no chance to get low.** Press **"+"** to switch between ON and OFF.

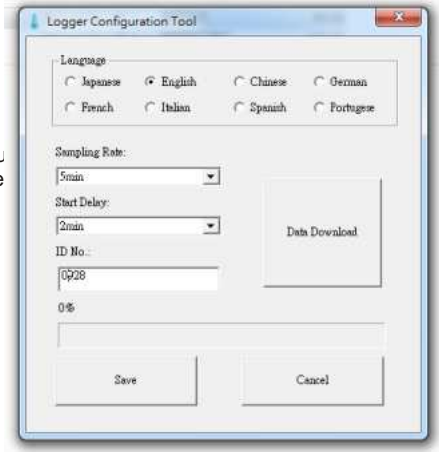
6. Datalogging

In addition to be a real time monitor, you can also setup a recording sampling rate per your need to log the measured value and download the data later for future analysis use.

Before operation this function, **strongly suggest to power on the device for 30 minutes.**

Plug the USB port to any Windows O/S computer, it is plug and play, no need to install specific software ahead.Computer will recognize logger as a CD-ROM and pop up a new screen for configuration. If not, you may go to file management to click a recognized CR-ROM called "PDF Logger "





Double click "Logger configuration tool" to setup the logger. The logger configuration screen offers 8 languages to help you setup easily. The programmable parameters are sampling rate , start delay time and Logger ID.

*The programmable sampling rate is from 1 min to 2 hours.

*The start delay time is from 0 min to 12 hours.
By choosing 5 mins, it means the first record will be taken into memory file 5 mins after you pressing the start key.

*Logger ID is a 4 digit number you can use to give each logger a unique property code, such as 0928.

After setting, click "**Save"** to synchronize the setting and your PC time zone to this datalogger.

Finally, close the setup screen and disconnect logger with computer. Within 30 minutes, Install the logger to the place where you want to monitor and record the indoor air quality.

Long press "**Start**" key to activate the logger till "**REC"** LED flashes. If the logger is programmed as start delay 5 mins, the "**REC"** LED will consistent display and then turn into flashing after 5 minutes.

To stop recording before memory is full, press "**STOP**" key longer time till "**REC**" LED went off. There are 12000 records memory. While memory is full, **FULL** icon will appear on display to remind user.

Connect to computer to read out. The procedure is same like connecting to setup.
Click "**Data Download**" button on setup screen and choose where to save the logged file to.
The read out csv report can be opened by windows excel.

	A	B	C	D	E	F	G	H	I
	Config Time	2022/6/9	14:59:31	Start Time	2022/6/9	14:59:45			
	Start Delay	00:02:00		Sampling Rate	00:02:00				
	ID No.	1041		Total Records	6				
	Index	Date	Time	PM2.5	CO2	TA(C)	RH(%)	HEALTH-INDEX	
	1	2022/6/9	15:01:45	5	599	26.7	69	1	
	2	2022/6/9	15:03:45	8	595	27.3	66.8	1	
	3	2022/6/9	15:05:45	8	591	27.8	65.9	1	
	4	2022/6/9	15:07:45	7	586	28.2	65.1	1	
	5	2022/6/9	15:09:45	8	573	28.6	64	1	
	6	2022/6/9	15:11:45	7	561	28.9	63.4	1	

The saved report contains: Configuration Time, Start Time, Start delay, Sampling rate, ID no. and Total records number.

Each record contains Date and time, PM2.5, CO_2, TA, RH(%) and health index.

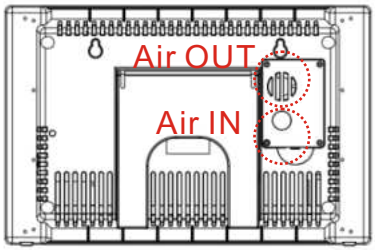
MAINTENANCE

CO_2 CALIBRATION

The meter is calibrated at standard 400ppm CO_2 concentration in factory. While you turn on the meter for the first time, simply leave it in fresh air condition for 5 minutes to check if it is within specification. If it is, no need to do re-calibration.
Nevertheless, you may still do either ABC or manual calibration regularly to maintain good accuracy.
Press **" SET"** + **"+"**keys at the same time till "**CAL"** and "**400**" appears. Long pressing **"SET"** key to start the calibration. During the calibration, **"400"** will flash on display. After 5 minutes, the display return to normal measuring mode to indicate the calibration is done.
During the calibration procedure, long pressing **"+"** key can quit the calibration function.
CAUTION: Do not calibrate the meter in the air with unknown CO_2 level. Otherwise, it will be taken as 400 ppm and leads to inaccurate measurement. The manual calibration is suggested to be done outdoor with good ventilation, fresh air and sunny day where CO_2 level is around 400ppm. Do not calibrate in rainy day because high humidity will affect the CO_2 level in air. Do not calibrate in places crowded with people or close to where exist high CO_2 such as ventilating outlets or fireplaces.

PM2.5 SENSOR MAINTENANCE

1. If dust adhering inside the sensor, the built-in fan will help sensor itself to remove dust, but completely removes all dust are not possible. Please don't consider to do cleaning of the sensor by any method.
2. Please keep the air OUT opening unblocked. The filter installed in front of the air IN opening is to filter the big dust. Please replace filter while necessary.
3. Please avoid condensation inside the sensor. When inside of the sensor is moisturized, this product does not keep its proper function.
4. If the sensor is located close to noise source (such as electric dust collector, etc), the sensor output may be affected by emitted noise.



5. Under the stable atmospheric environment, the sudden fluctuation of air humidity would have strong impact to accumulative rise and abrupt rise of PM concentration.
The strong fluctuation in RH is an essential condition for 32 times higher of abrupt rise in PM concentration so the probability of abrupt rise in PM2.5 concentration is as high as more than 80% due to the aftereffect of strong RH fluctuation
Please note, extremely high (ex: 85%) or low RH (35%) could not have big effect on the change in PM concentration but the fluctuation of RH can . This explains why the PM2.5 value abrupt rise while the wheather is suddenly changed.

6.While see the need to replace sponge filter, simply unscrews the sponge cover on the rear side of meter and then replace with clean sponge filter.

ERROR CODE AND SOLUTIONS

CODE	PROBLEM	SOLUTION
E01	CO_2 or PM2.5 sensor is damaged	Send back to repair
E02	Measured reading is under the lower limit	For CO_2 E02: Re-calibrate. For other E02: leave the meter in room condition for 30 mins. If it not works, send back to repair
E03	Measured reading is above the upper limit	For CO_2 E03: put the meter in fresh air for 5 mins. For other E03: leave the meter in room condition for 30 mins. If it not works, send back to repair
E17	ABC mode of CO_2 sensor is fail	Send back to repair
E31 ▪ 34	Temp./RH measuring circuit is in error	Send back to repair

? Can't power on

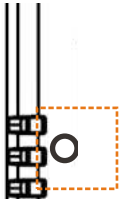
Check whether the adaptor is well plugged and the 5VDC power supply is working.

? Unexpected or expected blackout

While meter is programmed to record data, once the logging is started, blackout will cause the logging function stop. "StoP" and real time CO_2 value will appear in turns.
Please return to computer to download data and re-program again.

? NO response at all

The meter might crash after long term usage. There are two methods to power on again. One, unplug the power cable for 2 hours and then plug again. If you could not wait for 2 hours time to discharge, please use any suitable and available pin to do the hardware reset. The reset hole is on the rear side of meter, lower left hand side, not far away from power connector. Using pin to press the reset key and see the display re-start again.



WARRANTY & RETURN AUTHORIZATION

The meter is warranted to be free from defects in material and workmanship for a period of one year from the date of purchase. This warranty covers normal operation and does not cover misuse, abuse, alteration, neglect, improper maintenance, or damage resulting from leaking batteries. Proof of purchase is required for warranty repairs. Warranty is void if the meter has been opened.

Authorization must be obtained from the supplier before returning items for any reason. When requiring a RA (Return Authorization), please include data regarding the defective reason, the meters are to be returned along with good packing to prevent any damage in delivery and insured against possible damage or loss.

FAMILY PRODUCTS

Other related CO_2 products:
Portable, Wall mount and Desktop.

Accuracy, the Zenith of
Measuring / Testing Instruments !

Hygrometer/Psychrometer
Thermometer
Anemometer
Sound Level Meter
Air Flow meter
Infrared Thermometer
K type Thermometer
K.J.T. type Thermometer
K.J.T.R.S.E. type Thermometer
pH Meter
Conductivity Meter
T.D.S. Meter
D.O. Meter
Indoor Air Quality Meter
Manometer
Tacho Meter
Data logger
Temp./RH datalogger
Wireless datalogger .....

More products available !

2023.12 v.2