OPERATION MANUAL

IAQ CARBON DIOXIDE (CO_2) MONITOR / LOGGER

Monitor
98136

CE

Table of contents

INTRODUCTION

Thank you for purchasing MIC's desktop CO_2 monitor.
It is used to measure CO_2 concentration,air temperature and relative humidity with visible alarms. This CO_2 monitor is an ideal instrument for indoor air quality (IAQ) diagnosis and HVAC system performance verification.

Carbon dioxide (CO_2) is a gaseous component of the earth's atmosphere. The concentration of CO_2 in natural ambient air is about 0.04% or 400ppm. With each breath, human convert oxygen (O_2) into carbon dioxide(CO_2). Although carbon dioxide is invisible and odorless, an increased CO_2-content makes is apparent because human will notice increased fatigue and reduced concentration.

FEATURES

1)Super large LCD simultaneously display of CO_2 level, Temp., Relative humidity, Calendar (Y/M/D) and Time (clock).
2)Six (6) smiley icons indicate indoor air quality levels (350/450/700/1000/2500/5000ppm), easy to understand CO_2 concentration.
3)Stable NDIR sensor for CO_2 detection
4)High alarm threshold is selectable.
5)Automatic Baseline Calibration (ABC) function

MATERIAL SUPPLIED

(1) Meter
(2) Adaptor (9V+10%, >=0.5A)(Optional)
(3) Operation manual
(4) Box with color sleeve
(5) USB power cable(Optional)

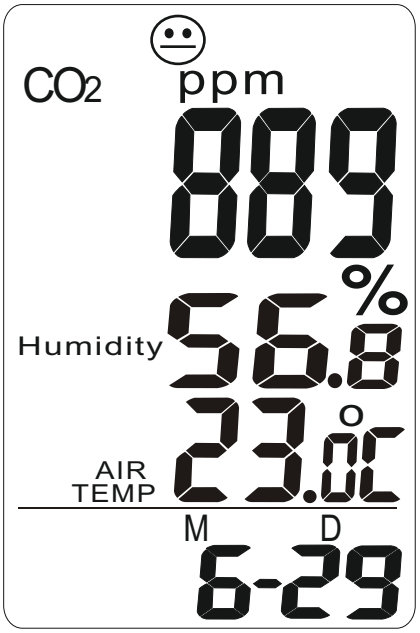
POWER SUPPLY

The meter is powered by an AC adaptor (9V/0.5 A output)

LCD DISPLAY

Symbols:

1) ppm : CO_2 unit
2) icon : 350ppm ~ 450ppm
3) icon : 450ppm ~ 700ppm
4) icon : 700ppm ~ 1000ppm
5) icon : 1000ppm ~ 2500ppm
6) icon : 2500ppm ~ 5000ppm
7) icon : 5000ppm ↑
8) Air Temp.: Ambient Temperature
9) DPT: Dew point temperature
10) WBT: Wet bulb temperature
11) MH : Month / Hour
12) DM: Date / Minute
13) lps% , cfm/p:Vent rate



14) TWA: Time Weighted Average (8 hours)
15) STEL: Short-Term Exposure Limit (15 minutes weighted average)
16)Logging: When it is in the recording mode
17)VOC, NO_2, WBGT, hpa, mbar ,EXT TEMP are not available in these models

KEYPAD (CONTROLS)

1) MODE : CO_2 mode,MAX/MIN.
TWA,STEL,lps%, cfm/P,STEL,TWA
(98138.98139.98538.98539)
2) SEL./R : Edit Date,Time or alarm level
Logger mode: Long press to key start/off.
3) TRH.M. : Temp. Humidity mode. DPT,WBT.
(98138.98139.98538.98539)
Setting/ Next
4) UNIT : Select Temp. unit and backlight
5) POWER : Enter date and time,alarm setting mode

OPERATION

(a) POWER ON/OFF

Plug with adaptor, meter turns on automatically . LCD shows current CO_2, RH & Temperature, Date and Time. Six(6) smiley icons indicate the indoor air quality level and appear on the top of first layer display

Note:

(1) Reset time whenever you turn on the meter.
(2) Please use properly power source, input voltage: 100~240 VAC,50-60Hz
Output voltage: DC 7.5~9.0V
Output current: 0.5A,or the meter will be damaged.

(b) TAKING MEASUREMENT

The meter starts the measurements when powered on and updates reading every 6 sec.
Response time is 10 sec. for CO_2, 2 Sec. for RH.
If the operation environment changes (ex. From high to low temp.), it takes approx. 30 sec. for CO_2 sensor to respond and approx. 30 minutes for RH into stable measurement.

NOTE: Do not hold the meter close to your mouth or any other source of CO_2.

(c) CO2 MODE

In the CO_2 Mode, press **MODE** button to switch CO_2 display. The top layer of display will cycle 3 from CO_2, Maximum, Minimum.

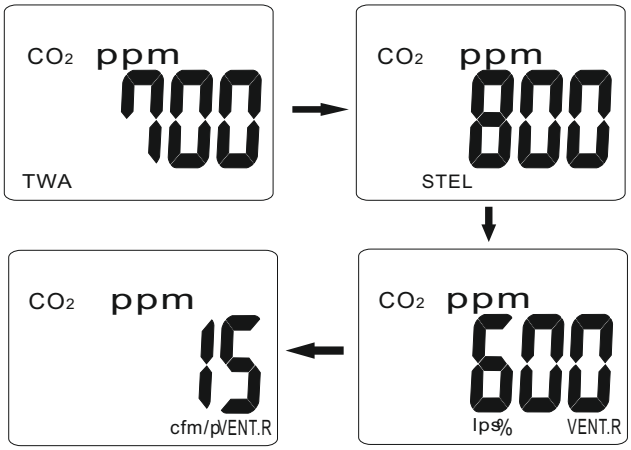
Note 1:

1) MAXIMUM. MINIMUM:

The unit automatically records maximum reading and minimum reading after powered on.

2) RESET MAX/MIN:

Press **MODE** button to get MAX or MIN reading, under MAX or MIN mode, Long press **MODE** button to reset Max.or Min values.If current CO_2 reading is near MAX or MIN, you will not be easy to see the difference.



(d) TRH MODE : Temperature / Relative Humidity mode

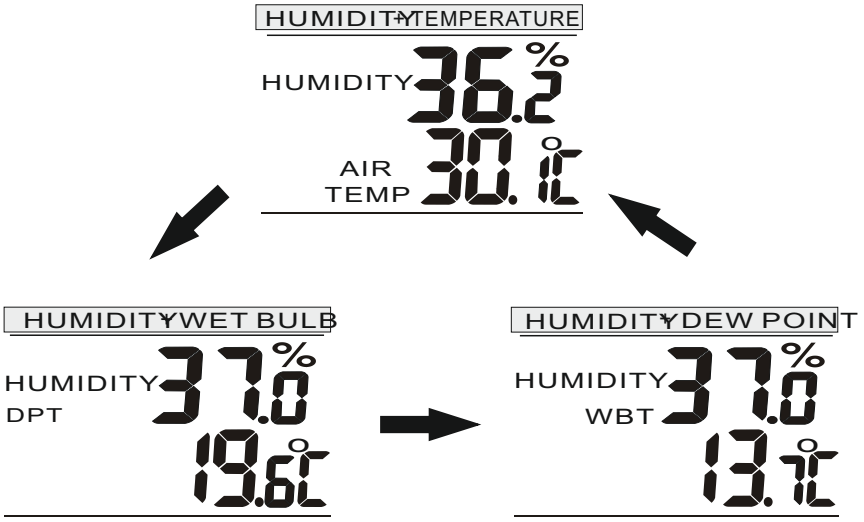
In the **TRH** Mode, the meter displays both related humidity and air Temperature simultaneously.

Press **TRH.M** button, the second layer of display will cycle from:

HUMIDITY + AIR TEMP.,

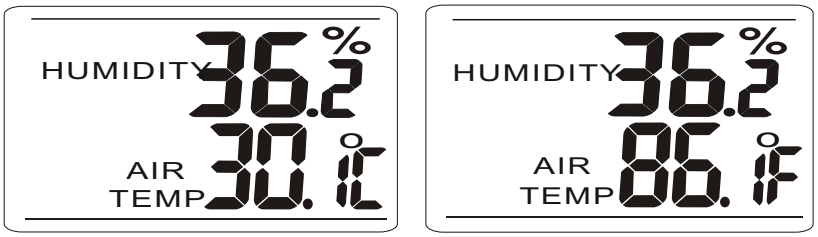
HUMIDITY + WET BULB,(98138.98139.98538.98539 only)

HUMIDITY + DEW POINT(98138.98139.98538.98539 only)



(e) Temperature unit (°C or °F) selection

Press **UNIT** button to toggle the temperature unit (°C or°F) .



MAINTENANCE

Cleaning and storage:

1). The meter should be cleaned with a damp cloth and mild detergent when necessary.

2). Store the meter in an area with moderate temperature and humidity.

CALIBRATION

ABC (Automatic Baseline Calibration)

The monitor is designed with high accuracy NDIR CO_2 sensor with ABC (Automatic Baseline Calibration) function which establishes a baseline calibration to eliminate the zero drift of the infrared sensor.

The ABC function is always “ON” when the meter is turned on. ABC is designed to calibrate the meter at the minimum CO_2 reading detected during 7.5 days continuous monitoring (power on).

DISABLE ABC FUNCTION

The meter is default with ABC for automatically
It assumes that the area being tested receives fresh air with a CO_2 level of approximately 400ppm at some period of time during the seven days. It is not suitable to use desktop CO_2 in closed areas with consistently high CO_2 levels 24 hours a day.
For example, if the monitor is located in 24 hours area, such as hospital or convenient stores, places usually have high CO_2 reading, the ABC function should be turned off for not being calibrated with high CO_2 level.

When adaptor plug in, long press **POWER** button to turn off the meter. Hold **MODE+UNIT** and press **POWER** button. Display shows “AbcOn”. Press **SEL/R** to select ABC function ON or OFF. Long press **TRH/M** to save setting and meter will restart automatically.

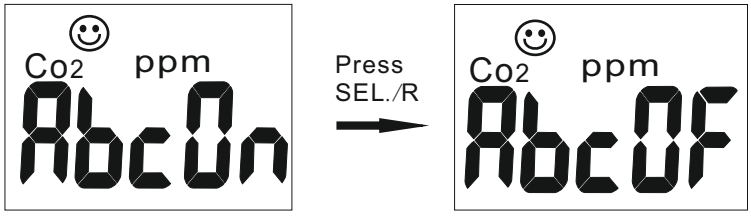
Step1:Long press **POWER** turn off meter

Step2:Hold **MODE+UNIT**

Step3:Press **POWER** to enter ABC function. Display shows below.

Step4:Press **SEL/R** to select AbcOn or off.

Step5:Long press **TRH/M** to save. Meter restarts automatically.



SETTING DATE & TIME

a) Real time and date:
The meter shows Mo./Date and Hr/Min on the 3rd layer of display, and each cycle is 16 seconds.

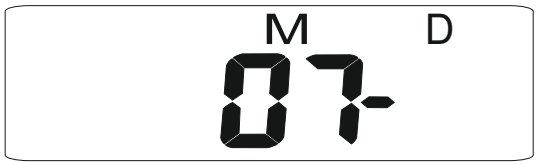
b) Month/Date and Hour/Min
Short press **POWER** button to enter the real date and time setting. The time default is 24-hours format.

Though the logger shows only Month/Date, the setting up for YEAR,too.
Enter setting up mode, edit by **SEL/R** or press **TRH/M** button to the next setting. After Month and date setting, it displays Hour and Minute , the same operation to set up, always press **TRH/M** to save and exit.

Setting Year

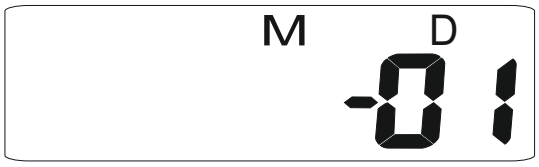
When the number “2012"flash, press **SEL./R** button to increase year(2010-2030).Press **TRH/M** button to save and move to next setting.

Setting Month



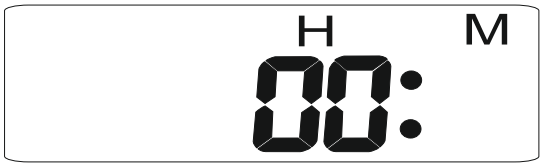
When the number “07" flash on the LCD, press **SEL./R** button to increase Mo. (01-12). Press **TRH/M** button to save and move to next setting.

Setting Date



When the number “01" flash on the LCD , press **SEL./R** button to increase Date (01-31). Press **TRH/M** button to save and move to next setting.

Setting Hour



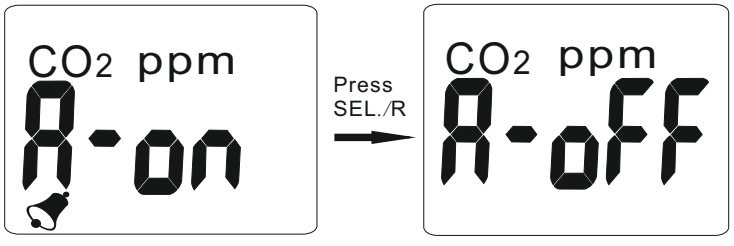
When the number “00" appear on the LCD , press **SEL./R** button to increase Hr (01-24). Press **TRH/M** button to save and move to next setting.

Setting Minute

When the number “00" appear on the LCD , press **SEL./R** button to increase Min. (00-59). Press **TRH/M** button to save and move to next setting.

c) Alarm setting

After the real date and time is set, the meter will show “A-on” on the top layer of display, press **SEL./R** button to select Alarm on or off. If alarm is on, press **TRH/M** button to save the setting and move to CO_2 alarm setting.



d) CO_2 alarm level setting

The meter shows CO_2 1000 ppm as the default value on the top layer of display. To change Hi alarm value by pressing **SEL./R** button to increase the value. If you pressing the **SEL./R** button, the number starts from Units digit, Tens digit, Hundreds digit and then Thousands digit. Press **TRH/M** button to save and return to CO_2 normal measurement.

SPECIFICATIONS

	98136	
	98137	
Backlight display	-137 (YES)	
CO2 meas. Range	0~9999 ppm	
CO2 accuracy	±75ppm+5% of rdg (0~2000ppm), others out of specified	
Visible alarm	YES	
Hi threshold setting	YES	
Logger mode	N/A	
Temp.range	-10~50¢ J	
Temp. accuracy	±0.6¢ J(-10~50¢ J), others ±1.2¢ J	
RH range	10.0% ~ 90.0%RH	
RH accuracy	±5%RH(at25¢ J10~90RH), others ±7%RH	
TWA.STEL	N/A	
VENT rate: lps%, cfm/P	N/A	
Dew Point Temp.	N/A	
Wet Bulb Temp.	N/A	
USB Interface	N/A	

CE CERTIFICATE

The product complies with EMC directive 2004/108/EC
Technical standard:

Emission EN 61326-1:2006 Class B
EN 55011:2009/A1:2010 Group 1 Class B

Immunity EN 61326-1:2006
EN 61000-4-2:2009
EN 61000-4-3:2006/A2:2010

TROUBLE SHOOTING

(1) When meter appears break character, please find out if meter ever dropped to the floor. If “yes”, please contact with local distributor for technical service.

(2) Error codes:

E-1 : CO2 sensor is failed
E-2 : Humidity sensor is failed
E-3 : Temp. sensor is failed
E-4 : Operation Temp. is too high
E-5 : Operation Temp. is too low
E-6 : Some hardware are failed

WARRANTY

This instrument is warranted for two years from the date of purchase (One year limited warranty applies to cables). A Return Authorization letter must be issued before returning for any reason. This warranty does not apply to defects resulting from action of the user such as misuse, abuse, alteration neglect, improper wiring, improper maintenance or repair, or unauthorized modification, damage resulting from leaking batteries, operation outside of specification.

During the warranty period the manufacturer reserved the right to decide either to repair or replace the product. The meters are to be returned along with good packing to prevent any damage in shipment and insured against possible damage or loss.

The two years’ warranty doesn’t apply to:

- Accessories and batteries (not covered by warranty).
- Claims is not acceptable for improper use (including adaptation to particular applications not foreseen in the instructions manual) or improper combination with incompatible accessories or equipment, or by previous attempts for repair carried out by none skilled or unauthorized personnel.

CO_2 LEVELS AND GUIDELINES

Non-enforced reference levels:

a) 250~350ppm– Background (normal) outdoor air level.

b) 350~1,000ppm – Typical level found in occupied spaces with good air exchange.

c) 1,000~2,000ppm – Level associated with complaints of drowsiness and poor air.

d) 2,000~5,000ppm – Level associated with headaches, sleepiness, and stagnant, stale, stuffy air. Poor concentration, loss of attention, increased heart rate and slight nausea may also be present.

e) > 5,000 ppm – Exposure may lead to serious oxygen deprivation resulting in permanent brain damage, coma and even death.

Regulatory exposure limits:

ASHRAE Standard 62-1989: 1000ppm. CO2 concentration in occupied building should not exceed 1000ppm.

OSHA: 5000ppm: Time weighted average over five 8-hour work days should not exceed 5000ppm

Building bulletin 101 (Bb101): 1500ppm. UK standards for schools say that CO2 at averaged over the whole day(i.e. 9am to 3.30 pm) should not exceed 1500ppm.

Germany, Japan, Australia, UK...: 5000ppm. 8 hours weighted average in occupational exposure limit is 5000ppm.