OMEGA®

1 YEAR WARRANTY

CE

AQM-102

IAQ Carbon Dioxide (CO_2) Logger

INSTRUCTION SHEET

M5444/0517

Shop online at: www.omega.com e-mail: info@omega.com
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MADE IN TAIWAN

FEATURES

1)Super large LCD simultaneously display of CO_2 level, Temp., Relative humidity, Calendar (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)Manual 400ppm calibration.
6)Audible/Visible LED warning for high CO_2 concentration
7)Dew point/ Wet bulb Temperature measurement.

INTRODUCTION

Thank you for purchasing desktop CO_2 monitor.
It is used to measure CO_2 concentration,air temperature and relative humidity with visible and audible 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.

MATERIAL SUPPLIED

(1) Meter (2) Universal Adaptor (3) Operation manual
(4) 4 pcs batteries (5) USB cable

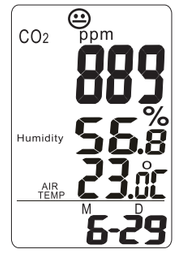
POWER SUPPLY

The meter is powered by an universal adaptor or alkaline batteries AAA x 4 pcs

KEYPAD (CONTROLS)

1) MODE : CO_2 mode,MAX/MIN. TWA,STEL,lps%, cfm/P,STEL,TWA
2) SEL./R : Edit alarm function
Logger mode: Long press to key start/off.
3) TRH.M. : Temp. Humidity mode. DPT,WBT. Setting/ Next
4) UNIT : Select Temp. unit
5) POWER: Turn meter on/off, alarm on/off.

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 Temp.
10) WBT: Wet bulb Temp.
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

OPERATION

WARNING: Remove batteries when not use to prevent battery leakage (Out of warranty) and power consumption.

(a) POWER ON/OFF

Plug with adaptor or put battery, 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) When low battery, meter will restart and logger will stop if user switch to adaptor.
(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.
(3) Battery life approx. 20 hours when continuous used.

(b) TAKING MEASUREMENT

The meter starts the measurements when powered on and readings updated 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) MAXIMUM/MINIMUM MODE

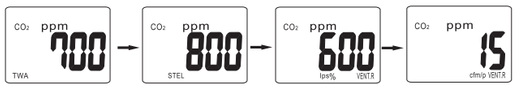
In the normal measurement, press **MODE** button to switch display. The top layer of display will cycle from CO_2, Maximum, Minimum.

NOTE 1:

1) MAX/MIN:
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 and Min of CO_2 ,Temp. and humidity reading, LCD will display "**Clr**".
If current CO_2 reading is near MAX or MIN, you will not be easy to see the difference.

NOTE 2 :

1) TWA: (Time Weighted Average 8 hours)
The meter keeps updating the reading every minute. If the meter has been powered on for less than 8 hours, the TWA value will be the weighted average of readings since powered on.
2) STEL: (Short-Term Exposure Limit in 15 minutes weighted average)
The meter keeps updating readings every minute. If the meter has been powered on for less than 15 minutes, the STEL value shows the weighted average of reading taken since powered on.



3) lps%: Liters Per Second per person.
4) cfm/p: Cubic Feet per Minute per Person
Assuming a conference room with Max. capacity of = 200 persons , If designed ventilation rate= 7 l/s person

The amount of ventilation required= 1,400 l/s (or 5，040 CMH), if number of person is 70, the amount of ventilation only need 490 l/s, we don't need ventilate 1,400 l/s for saving energy.

(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,
HUMIDITY + DEW POINT

(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.

MANUAL CALIBRATION

Before start CO_2 manual calibration make sure the area is ventilation without plant, animal and human. Air with a CO_2 level of approximately 400ppm it's suitable for calibration. Ensure the calibration completed, to use adaptor during calibration is recommended.
►CO_2 meter is completed calibration in factory before packed. Manual calibration is only for meter inaccuracy.

When power on, long press **POWER** button to turn off the meter. Hold **MODE+UNIT** then press **POWER** button. Display shows as figure. Meter will countdown 60seconds for processing 400ppm calibration.

After calibration completed, display will show full LCD icon for a second. Meter will restart automatically to return normal measurement.

BATTERY INDICATION

When battery is low (CO_2 consumes power),the reading of CO_2 will be terribly high , could be couple thousand in ppm. " BAT" will show on the bottom of the screen, near calendar and time. Replace new battery when BAT shows.

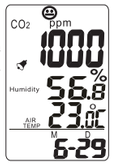
SETTING DATE & TIME

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:
Press **MODE+POWER** button to enter the real date and time setting.
The time default is 24-hours format.

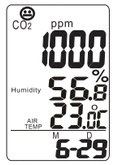
The time default is 24-hours format.
MODE+POWER-->Enter date/time mode
SEL/R--> Number goes up.
TRH/M--> Number goes down.
MODE-->Edit Year or Month/date or Hour/Minute.
UNIT-->Select to edit Month or date, Hour or Minute.
After set up, press **MODE+POWER** to save and exit.

ALARM SETTING

Set up alarm function:
In normal measurement, press **SEL/R+POWER** buttons , bell will appear alarm function. Once set up, the red LED will flash if the data exceeding the setting data.



CO_2 alarm on



CO_2 alarm off

CO_2 Hi alarm setting.
SEL/R+POWER→ Enter CO_2 alarm setting.
UNIT→ Change digit.
SEL/R→ Number goes up.
TRH/M→ Number goes down.
After set up **SEL/R+POWER** to save and exit setting.

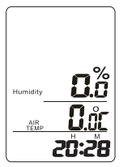
CO 2 alarm ON/OFF:
In normal function, short press **POWER,** bell icon appear alarm on, short press **POWER** again to turn off.

TEMP. HUMIDITY OFFSET

Make sure the meter is off, press **SEL/R+TRH/M** button then plug in the adaptor at the same time to enter offsetting mode.

WARNING: DO NOT USE THIS FUNCTION WITHOUT STANDARD INSTRUMENT.

Example: Standard instrument is 30.2°C, meter shows 30.0°C.Enter temp. offset mode, press **TRH/M** till 0.2 appear.



Offset range of Temp.and RH as below:
Temp.:-9.9C to +9.9C / -9.9°F to +9.9°F
RH%:-9.9% to +9.9%

a) Humidity offset:
MODE→Increase value
SEL/R→Decrease value

b) Air temp. offset
TRH/M→Increase value
UNIT→Decrease value

After setting up , short press **POWER** to save setting and **"%"** icon will flash a second. Then replug adaptor to return normal measurement.

CALIBRATION

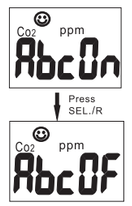
ABC (Automatic Baseline Calibration)

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 14 days continuous monitoring (During power on without any disconnected).

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, these places usually exist high CO_2 reading, the ABC function should be turned off for not being calibrated with high CO_2 level.

Step1: When meter is ON, press **SEL/R+PWR** button to enter alarm setting.
Step2: Press and hold **MODE+UNIT** button to enter ABC function
Step3:Press **SEL/R** to select AbcOn or off.
Step4:Press and hold **MODE+UNIT** button again to back to alarm setting.
Step5:Press **SEL/R+PWR** to save and return to normal measurement.



LOGGER STEUP:

A. Install logger driver for Windows

The PL2303_Prolific_DriverInstaller_v110.exe driver is for Windows operation system,follow the installation steps hereunder:

1.Put the CD into CD driver, click PL2303_Prolific_DriverInstaller_v110.exe for installation the driver.

2.The set up status.
3.Click “NEXT” to continue.
4.After complete the installation , press “Finished”.

B.Install the logger software for Windows XP

Please follow the following steps to install the software
1.Put CD into CD driver , click “ Setup.exe” to install

2.Select the destination folder to save by click“Browse”button
3.Once you finish selecting ,press “Next”.
4.Select “I accept the License Agreemen:(s)” and press NEXT button.
5.Click NEXT button when you see the following.
6.Press FINISH button to complete the installation.
7.Restart the Windows XP system

C. Run the software from Windows XP

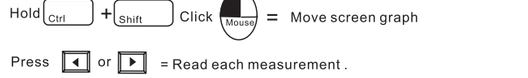
1. Plug the USB cable into USB port, since you have already Installed the USB driver, computer will automatically detect logger ,
2. Find “Datalogger” in START→PROGRAMS
3.Select logger software folder.

Reminder:

After start software message box shows”Get Datalog's Identifier” as Pic.1, then press **SETTING** button to enter Log setting

(Pic.1)

If message box shows“Reminder: Data Logger is not plugged in USB port!” shows as Pic.2
Re-plug in the logger and restart the software.

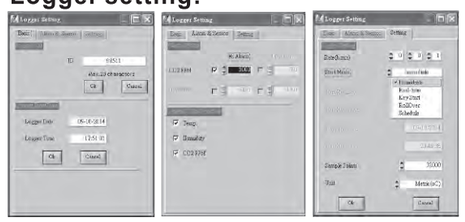


(Pic.2)

NOTE:
After restart software,if message box still show as Pic.2, follow below steps.
1.Click “My computer””Content” in hardware content,click “Device manager” to find the listed (COMx) listed under Ports(COM & LPT as below with red line.If you may Prolific USB-to-Serial Comm. Port , it means the logger is connected to computer properly.

2. Remember the Comm port number and go back to software.
3. Click “Setting” ”Comm port “ select the port number as you see from step 1, then press OK button.

Logger setting:



(Pic.3) (Pic.4) (Pic.5)

BASIC:(Pic.3)

1:ID setting

Maximum 20 characters , name your logger press OK button to confirm
►Please type in capital. Space is unacceptable.

2:Current Date/Time

Clock setting, the system automatically shows current date and time of your pc. Press OK to confirm.
(**NOTE:** Logger’s date & time refer to current pc date and time)
►Please click OK to sync the meter’s date and time every time.

ALARM&SENSOR:(Pic.4)

1.Edit alarm setting and check it to open alarm.
2.Appear the parameter..
CO_2 model default with Temp. and RH sensor.

SETTING:(Pic.5)

1: Set sample point (K=1,000 multiple basis within total memory points).

2.Set sample rate, start mode to record:

Select “hour(1~6), “minute(0~59)”,“second(0~59)” time interval.
Select 5 start modes from:
- Immediate
- Real-time(PC is always connected with the logger)
- Key start/off (Start/stop recording by long pressing SEL/R button)
- Roll-over (when memory are full, logger covers the earliest memory automatically)
- Schedule

3.Select Unit : Select Temperature unit °C/°F for recording, press OK to confirm.

▪Immediate start mode:

Logger starts recording immediately.

▪Schedule start mode:

Select the date and time meter will start recording.
The recording start time as software’s current time not meter’s.
Please set up the current time correctly.

▪Real-time start mode:

1.After set start mode at real-time,datalogger starts login records. When logger records, the green fan at left corner shows it is under recording.(Meter should be connected with pc all the time ,under this mode.)
2.In real-time mode, it shows “STOP” button instead of “DOWNLOAD” at the right corner. Press STOP to stop real-time recording.
►Before exit software data has to be saved. Once exit the previous online data will not exist.

▪Key-start/off mode:

Select the mode to record once long press **SEL/R** button for 3 seconds. Long press **SEL/R** button again to stop recording. Data has to be downloaded before next key-start.
LCD display appear “Logging” at left corner.

NOTE: After key off the recording, the data has to download before restart the Key-Start function.

▪Roll-over mode:

After Roll-over mode is selected. Press OK, the meter will start to record. When the data is full, it will cover the earliest memory. After download the data , long press **SEL/R** button to record without reset up each parameter and selection.

IMPORTANT:

The data is stored in the memory(except realtime mode) till next setting start, meter will clean previous data automatically. So if you start next data logging, there is no way you can find the data you haven't stored.

Logger status:

Before download data, press **LOGGER status** to show ID, Records, Sample rate, Unit.
NOTE: Once **Download** button is pressed, recording is inactivated.

Software function keypad:

Download data:

Press DOWNLOAD button, data download in few seconds. Graph shows automatically
NOTE: Please do not press DOWNLOAD button if you won’t stop record.
You can press LOGGER STATUS button to see record points.

Retrieve file:

Press RETRIEVE FILE button to select file and show the graph.

Save data:

Press SAVE button to save txt.file.
After save as txt. may print as pdf. file if needed.

View Data Table:

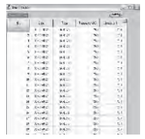
Press View button to get data table with details.(pic.6)

Print graph:

Press PRINT button and print graph. Follow the print setting below to print full screen graph. Press OK to print pdf file.(pic.7)

Print Table Data:

Press table data, the screen shows the record range, enter the start number to the end number (For example: 1~500 or 200~1000...or leave it blank for printing all data).(pic.8)
Save each pdf. files with different names.

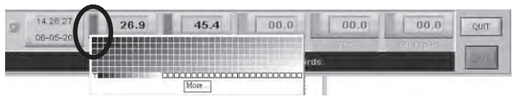


(pic.6)

(pic.7)

(pic.8)

Line color selection:



1.Click the color beside the reading(Temp. RH. CO_2), color box appear.
2.Move mouse to review and select color.
3.Click to save, the color appear on line and bar.

Zoom in/out& move:

Hold Ctrl + Click Mouse = Screen graph zoom in

Hold Ctrl + Click Mouse = Screen graph zoom out

Hold Ctrl + Shift Click Mouse = Move screen graph

Press ◄ or ► = Read each measurement .

NOTE: May follow the line color selecting, the graph size will go back to default.

SPECIFICATIONS

	AQM-102
CO2 meas. Range	0~9999 ppm
CO2 accuracy	±30ppm+3% of rdg (400~5000ppm), unspecified
Resolution	1 ppm
Temp.range	-40~85℃(-40~185℉)
Temp. accuracy	±0.6℃ (-20~50℃), others ±1.2℃
Resolution	0.1℃/℉
RH range	0.00% ~ 99.9%RH
RH accuracy	±3%RH(at25℃ ,10~90RH), others ±5%RH
TWA.STEL	YES
VENT rate: lps%, cfm/P	YES
Dew Point Temp.	YES
Wet Bulb Temp.	YES
Memory capacity	YES
Operating Temp. RH	0~50℃, <80%RH
Sensor life	Sensor life: 15 years in normal comm. Environments with ABC on
Storage Temp.	-40~70℃
USB Interface	YES

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 : Sensor is failed
E-2 : Out of measurement range

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.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA’s WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA’s customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA’s Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA’s WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA’s control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a “Basic Component” under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA’S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:
1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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