

CO2 Monitoring Frequently Asked Questions for the CM-7000 Multi Sensor Storage Safety Alarm System

Please find below a conglomeration of frequently asked questions about the CM-7000 safety system, their installation, application, and use. If you cannot find an answer to your questions here please contact the technical sales team at CO2Meter directly at sales@co2meter.com or by calling 877-678-4259.

What comes with the CM-7000?

CO2Meter has created the CM-7000 as the base model for this line of safety devices. The following parts are included in the CM-7000 box:

One (1) CM-7005 Full Color LCD Touchscreen Tablet
Two (2) CM-7003 CO2 Sensor Module
Two (2) CM-7004 Horn/Strobe Modules
One (1) 6 foot long power cable
Two (2) 25 foot long CAT5 cables
Two (2) 6 foot long CAT5 cables
Mounting brackets, screws, and accessories

CO2Meter also offers individual modules that can be added to the CM-7000.

CM-7001 Sensor and Horn/Strobe combination
CM-7002 Key Switch module
CM-7003 CO2 Sensor Module
CM-7004 Horn/Strobe Module
CM-7005 LCD Tablet
CM-7006 Secondary Tablet

How big is this device?

The “tablet” portion of the system is 8.0” wide, 8.75” tall, and 1.5” deep. The screen itself is an 8” LCD touchscreen

The sensor units are 3.5” wide, 5.5” tall, and 1.75” deep.

The key lock and mute units are 3.5” wide, 5.5” tall, and 1.75” deep.

The horn/strobe units are 5.5” wide, 4.5” tall, and 2.75” deep.

Secondary display (only) tablet units are 5.5" wide, 8.5" tall, and 1.25" deep.

The remaining components (cables, mounting brackets, screws, etc.) all vary in size.

Where do I mount the sensors?

The International Fire Code calls for the sensor to be mounted at 12 inches off the floor. Some jurisdictions may allow for different heights depending on obstructions or use cases. Consult your local fire inspector for final recommendations.

Where do I mount the tablet?

The intention of the tablet is for it to be mounted outside or away from the potential hazard area at eye level. Outside beer coolers, outside grow rooms, or in managers offices are the intended locations for the tablet.

Can you give me a power cable longer than 6 feet to power the tablet because it won't reach the closest power outlet?

No. International Electrical Code limits the power cable of the device to 6 feet.

Can I use an extension cord to reach the outlet?

No. International Electrical Code prohibits the use of extension cords to connect the device to an outlet.

Can I hard wire the monitor in to my electrical system, so the plug can't be inadvertently or purposefully unplugged?

Yes. The CM-7000 does allow an electrician to hard wire the device in to any buildings electrical system. By wiring standard 110V electricity to a 48V volt DC power converter and then running the converted power directly in to the monitor the device can be hard wired into the electrical system. Detailed instructions and a 48V DC power converter example are available [here](#).

How do I know which code/regulation I have to meet?

Ask your local fire inspector to provide details about the specific code you are being asked to meet. Typically, it will be a local code, the International Fire Code, the National Fire Protection Association code, or the National Board Inspection Code. The codes are similar but do have some specific requirements you may need to be aware of. You can always contact CO2Meter.com (the manufacturer) for assistance in deciphering your code requirements.

Why can the fire inspector ask me to do something not in the code?

The Inspector is the Authority Having Jurisdiction. The AHJ is given the right to make a code/requirement more restrictive than what is detailed in the published document.

Where does the device need to be mounted in the room?

Sensors should be mounted in the room at 12 inches off the floor. Each sensor will cover approximately 1,500 sq. feet each (length x width of the space).

Beverage Applications – see general mounting instructions. Typically, placement is within 10 feet of the bulk CO₂ storage tank, cylinders, and the BIB rack is sufficient. Sensors should be mounted inside walk-in keg coolers as well as this is the most hazardous location in any facility that serves draft beer.

Agricultural Applications – see general mounting instructions. If using CO₂ for extraction place a sensor in the extraction room as well.

Brewery Applications – see general mounting instructions. Fermentation areas, brite tanks, canning/bottling/kegging lines and draft beer coolers.

Larger spaces may require additional monitors.

Enclosed rooms/ spaces (closets, offices, bathrooms, and keg coolers) may require additional monitoring as gas can be trapped in these spaces because they are confined spaces.

My bulk tank or cylinders are stored outside. Do I still need a monitor?

Outside storage of tanks and cylinders is allowed by the code and the manufacturers of these storage vessels. However, the gas is being used INSIDE the facility and a monitor will be required at the “first point of use” inside. Your local inspector may ask for you to have more than one sensor based on the size and configuration of your space(s).

The CO₂ provider ran the CO₂ lines above the drop ceiling. The inspector wants a sensor above the drop ceiling. What do I do?

First, ask your CO₂ provider if they will move the CO₂ lines down below the ceiling. Second, explain to your inspector that CO₂ is like water and will find the lowest level. It will not stay above the drop ceiling.

If the lines can't be moved and the inspector will not relent, then you will need to comply with the inspector's request and install a sensor above the drop ceiling.

The CO₂ lines run over the top (or through) an office/bathroom. Do I need a sensor in those rooms?

An inspector may ask you to monitor these rooms as they are technically considered confined spaces.

What are the alarm settings for the device?

Each individual sensors setting can be configured directly from the tablet. Alarm settings and levels can range from as low as 5,000 ppm all the way to 40,000 ppm. Custom configurations are also available.

What alarm settings does CO₂Meter recommend and why?

CO₂Meter recommends the following industry recognized alarm settings.

5,000 ppm Time Weighted Average (a rolling 8 hr. average designed to measure someone's exposure over an 8-hour work cycle). This is an OSHA requirement.

The International Fire Code and some local jurisdictions are asking that Alarm 1 be set at 5,000 ppm instantaneous. CO₂Meter does not recommend this setting because even minor gas fluctuations can set off this alarm (Ex. empty soda bags can set off a 5,000 ppm alarm).

15,000 ppm (aka 1.5%). 15,000 ppm is OSHA and NIOSH's recommended Half Short Term Exposure Limit for CO₂.

30,000 ppm (aka 3.0%). 30,000 ppm is OSHA and NIOSH's Short-Term Exposure Limit.

40,000 ppm (aka 4.0%). 40,000 ppm is OSHA and NIOSH's Immediately Dangerous to Life and Health limit.

The CM-7000 allows the user to configure the alarm settings to their own specifications from the drop-down menu on the tablet. Simply enter the unlock code and use the drop down tabs next to the ppm levels to create custom settings.

What happens when the device "goes off"?

Upon breaching the prescribed alarm threshold, the sensor unit will trigger its corresponding strobe light and horn unit to sound and flash and the tablet will alert the user to the condition change for that sensor. The sensor and horn/strobe combo will continue to annunciate until such time as the sensor detects gas concentrations below the prescribed set point or if the device is muted.

The tablets alarm is a generated voice that announces that a particular sensor has gone into alarm status ("CO₂ alarm in Zone1"). The voice is set at 80 dB and the announcement will recur every :15 seconds until the specific sensor detects safe levels of gas.

Additionally, the individual sensor will change colors on the touchscreen display indicating which sensor has gone into alarm status. The colored LCD will change colors depending on the level of gas detected. Normally operating sensors will appear as **GREEN** on the display indicating normal operation. **YELLOW** displayed sensors indicate that the sensor has gone into an initial alarm status. **AMBER** displayed sensors have surpassed the secondary threshold. **RED** displayed sensors indicate that a sensor has gone into full alarm status. Each sensor will also display if the horn/strobe combination for that sensor has initiated by displaying the horn/strobe icon within the sensor circle.

If the user has enough sensors to where they cannot all be displayed on the screen simultaneously, and a sensor goes into alarm status, the tablet will automatically and immediately scroll to display that sensor for easy identification

Systems can be configured in one of two ways: individual alarming or full system alarming. In the individual mode if any sensor goes into alarm status only that location will alarm. In full system mode any sensor going in to alarm status will trigger the entire system to alarm. These settings can be controlled from the tablet.

If the CM-7000 has been configured for its relays to trigger third party devices like fans, exhaust systems, or fire panels the systems relays will trigger those third-party devices according to how they have been configured on the tablet.

The alarm can be muted for a user configurable time period of up to 90 seconds.

If the alarm is in latch mode, the sensor must have its latch reset.

Can the monitor trigger a third party device if it goes in to alarm status?

Yes. The devices configurable alarm levels are tied to normally open/closed dry contact relays. The relays can be configured to be default active (to behave like a Normally Closed) or default non-active (to behave like a Normally Open). When the alarms are activated the appropriate relay will trigger the third party device it is wired to. The CM-7000 will NOT power the third party device but will trigger it to turn on/off.

Normally requested third party devices include solenoid shut-off valves, exhaust fans, and fire panels.

What are the specifications for the horn/strobe?

The horn/strobe is designed to be connected to the sensor modules utilizing CAT5/6 cable.

TABLE 4. HORN CURRENT DRAW (mA) AND SOUND OUTPUT - REVERBERANT (DBA)

Pos	Tone	Volume Setting	8-17.5 Volts		16-33 Volts		Reverberant Sound Output (dBA)		
			DC	DC	FWR	8-17.5 V			
						DC	DC	FWR	
1	Temporal	High	39	44	54	84	89	89	
2	Temporal	Low	28	32	54	75	83	83	
3	Non-Temporal	High	43	47	54	85	90	90	
4	Non-Temporal	Low	29	32	54	76	84	84	
5	3.1 kHz Temporal	High	39	41	54	83	88	88	
6	3.1 kHz Temporal	Low	29	32	54	76	82	82	
7	3.1 kHz Non-Temporal	High	42	43	54	84	89	89	
8	3.1 kHz Non-Temporal	Low	28	29	54	77	83	83	
9*	Coded	High	43	47	54	85	90	90	
10*	3.1 kHz Coded	High	42	43	54	84	89	89	

* Settings 9 and 10 are not available on 2-wire horn strobes. Temporal coding must be provided by the NAC. If the NAC voltage is held constant, the horn output remains constantly on.

NOTE: this is for the *horn* only and does not include the strobe. We should see if we can find the same chart for the strobe as the current draw is significantly higher, and the rated candela are potentially as important as the horn. This chart also does not display the dB SPL, and we should cut this chart a bit since we are using 24V only. The chart is not fully useful if the customer does not know what voltage we are using.

How far away from the tablet can the furthest sensor be mounted?

The furthest a sensor on a single or daisy-chained group of sensors can be from the tablet is 250 feet.

To add additional sensors and horn/strobes the end user can purchase and install Power Over Ethernet power boosters from CO2Meter. Doing so will extend the maximum length a sensor or horn/strobe can be placed from the tablet as well as increasing the total number of sensors and horn/strobes that a single tablet can support.

Should I install a sensor in a walk-in keg cooler?

Absolutely yes. The keg cooler is the most dangerous place in any restaurant, bar, nightclub, stadium, and brewery. The cooler traps the CO2 inside and does not allow it to dissipate because the cooler is a confined space.

Do not think that the fan in the cooler is exchanging air or bringing in fresh air. It is not designed to change air only keep the air cold and circulating.

Most CO2 related injuries occur in walk-in keg coolers.

The inspector asked me to get strobe lights for my monitor. Why?

Some inspectors and jurisdictions have required the additional visual notification of strobe lights to monitors. In loud areas and commercial applications like back rooms in restaurants, breweries, stadiums, and grow facilities the added visual notification of strobe lights IS recommended. CO2Meter only supplies strobe lights that meet or exceed the 100 candela limits prescribed by most jurisdictions.

Additionally, the horn/strobe included with the CM-7000 have an audible alarm that can be adjusted from as low as 90 dB to as high as 120 dB and allows for user configurable frequencies.

Can I see the readings wirelessly? Why is it still hardwired?

The CM-7000 will not communicate wirelessly. All sensors and horn/strobes will need to be connected using CAT5/6E cables. Components will come with accompanying cables however, if longer cables are need, they can simply be purchased at your local retailer. DO NOT splice CAT5/6 cables as different manufacturers utilize different color coding.

We do not currently allow the CM-7000 to communicate wirelessly because the average facilities construction materials (steel, concrete, etc.) can prevent an uninterrupted wireless signal which would render this safety device ineffective.

Future versions of the CM-7000 will have wireless connectivity built-in. As of the date of publication of these FAQ's CO2Meter expects the remote connectivity in the CM-7000 to be operable in 2023.

Can I connect my CO2 monitor to a battery back-up system?

The device can be plugged in to a Universal Power Supply (UPS) for temporary back-up power.

Will this monitor allow me to control things like a fan, trigger a shut-off valve, or be run to the fire panel?

Yes. Utilizing the terminal strip on the rear of the tablet an electrician can connect the relays on the CM-7000 to turn any third-party device on/off. The CM-7000 will NOT power the third-party device. CO2Meter recommends a minimum of 14-gauge electrical wire for these connections.

Can multiple tablets be connected to the same sensors?

CO2Meter offers a secondary display tablet – the CM-7006. The typical scenario would involve a room with two entrances. In this scenario, a tablet can be mounted on the outside of each entrance to warn of a hazard inside the room.

Be advised that the CM-7006 Tablet is a “read only” display. No touchscreen functionality exists on this tablet. All configurations must be made from the main tablet.

What if I only need one sensor and the tablet?

In some circumstances only one sensor is needed for an application. In these instances CO2Meter recommends utilizing the **RAD-0102-6 Remote CO₂ Storage Safety Three Alarm System**. This device was designed with a single sensor application in mind.

My inspector told me I need to add more sensors and strobe lights to my system. What do I do?

Inspectors are often updating or altering requirements as they become more familiar with the hazards of CO₂ and your applications. Often, an inspector may ask for you to “upgrade” your safety monitor with additional sensors and horn/strobes.

The CM-7000 is designed to allow you to add additional sensors and horn/strobes after initial installation is complete. Simply order the correct accessories and follow the detailed instructions CO2Meter has provided for upgrading your system.

Customers can always contact CO2Meter’s technical sales team or support staff for information and assistance.

How can I test the device to see if it’s working correctly?

Often setting off the monitor helps you, employees, and inspectors know the device is operating correctly. The solution is so easy it will take your breath away – literally.

Lean down close to the sensor and blow your exhaled breath ACROSS the entrance to the sensor. 10-15 deep breaths should suffice. DO NOT blow directly into the sensor as the humidity in your breath may “fog” the sensor. We like to suggest to customers that they “imagine just finishing the Boston Marathon” to understand the process. The CO₂ from our lungs when we exhale (about 1 liter of CO₂ per adult exhaled breath) should be enough to put the device at least in to its initial alarm stage.

If you or an inspector wants a more precise manner of setting the device off you can purchase a small cylinder of CO₂ from your local gas provider. Please ask them for the following precise mixture of gas: 5% CO₂ and 95% Nitrogen. You will also need to purchase a flow regulator.

Set the flow regulator to 0.5 liters per minute of flow and direct that flow at the sensor unit. 10-15 seconds of mixed gas flow at the sensor should set the device in to its initial alarm stages.

Can the sensors be calibrated?

Yes. CO2Meter provides written and video instructions for customers to complete the full field calibration procedure. Sensors can be returned to CO2Meter for factory calibration for a nominal fee.

Can I get a calibration certificate with my device?

If you request the calibration certificate at the time of purchase CO2Meter can provide it free of charge. We cannot provide calibration certificates once the device has left the facility.

Can the CM-7000 be set so employees cannot tamper with the settings?

The CM-7000 is designed with a “lock out code” for just this purpose. Knowing the code will allow designated employees or managers only to alter or reset the devices settings.

CO2Meter recommends that more than one person possess the code so as to not render the device inoperable should something happen to the code holder.

The lockout code for all CM-7000's is “CO2Meter”.

Can multiple horn/strobes be run from a single sensor module?

Yes. Up to two horn/strobes can be run from a single sensor module. Simply purchase a CAT5/6 splitter and connect both horn/strobes to the same sensor.

A maximum of twelve (12) horn/strobes can be run from each tablet.

What if CO2Meter makes improvements to the CM-7000 in the future? Do I need to buy a new system?

CO2Meter can upgrade the software and firmware in the CM-7000 remotely by sending you the update on a thumb drive. Inserting the thumb drive into your CM-7000 will update the device to the latest versions of software and firmware.

Hardware changes cannot be made remotely.

The device appears to only have five CAT5/6 ports on the back. How can I connect up to 12 modules?

The CM-7000 is designed to allow the end user to configure the sensor array in the manner best suited for their application.

The end user can “daisy chain” 12 modules together and connect them to a single port on the tablet. Another end user could choose to connect two strings of six sensors each to two ports on the tablet. Any combination of sensors can be connected to the tablet.

What is the first CAT5/6 port for in the tablet?

CO2Meter has reserved the first CAT 5/6 port for our use. Do not connect anything to this port.

Where should I mount the horn/strobes in relation to the sensors?

CO2Meter recommends mounting the horn/strobes at least 6 feet above the corresponding sensor. This placement will allow users to see and hear which specific sensor is in alarm status.

CO2Meter provides 6 feet of CAT5/6E cable to connect the sensors and horn/strobes together. If the end user wants to mount the horn/strobe further from the sensor, simply purchase a longer cable from your local retailer. DO NOT splice CAT5/6 cables as different manufacturers utilize different color coding.

My inspector is asking for a different color strobe light? Do you offer that option?

The standard CM-7000 will ship with clear strobes. An extra amber colored lens cap is included in each horn/strobe box. Additional colored lens caps (blue) are available for purchase in the future. Please contact CO2Meter for information and to purchase the caps.

My inspector wants someone to calibrate the sensors on a regular basis? What is the calibration procedure and how much does it cost?

CO2Meter has designed the CM-7000 to be calibrated in the field. While we do offer a factory calibration procedure that process will require the end user to remove the sensor from service and return it for calibration.

Factory calibration is \$150 USD.

The field calibration procedure will take approximately 5 minutes per sensor and will require the end user to obtain the following additional products:

- A cylinder of 100% nitrogen
- A flow regulator for the cylinder
- At least 5 feet of tubing to fit the regulator

**The above components can be purchased from your local gas distributor.

If your inspector requires a 3rd party calibration, please contact CO2Meter as we can typically refer customers to 3rd parties to complete this procedure. Please note that 3rd party service providers are not affiliated with CO2Meter and will charge a fee for calibration services. The 3rd party service provider should calibrate the sensors to CO2Meter's factory standards, but the service provider is in no way affiliated with CO2Meter.

How do I protect the sensor from water?

Many applications require cleaning or sanitizing regularly to maintain the highest standards of cleanliness. Food production, breweries, and restaurants are cleaning all the time – many with caustic solutions and hoses.

CO2Meter recommends temporarily “shrouding” the sensors during these processes. One large brewing partner recommended covering the sensors with garbage bags while hosing down. They called it “a one cent solution for a \$500 problem”. Remember to remove the bags from the sensors after wash-down or the sensor will not have enough access to ambient air to take accurate measurements.

Please note that CO2Meter also understands that accidents do happen. If a sensor module is damaged simply purchase a new module, remove the damaged module, reconnect the cables, slide the new sensor module on to the existing bracket, and that location is operating again. The tablet will recognize the new sensor automatically.

Can the CM-7000 measure other gases besides CO₂?

The current version of the CM-7000 does not allow for multiple gases to be measured simultaneously. As of the publication of this document CO2Meter expects to launch multiple gas sensing options in late 2021.

The CO2Meter screen will not appear. I am stuck on a strange page. How do I get to the CO2Meter page?

If the software does not boot correctly a strange page will appear. Find the phrase “Multi Drop” on the display (sometimes accompanied by the picture of a robot) and tap Multi Drop to initiate the software. If this issue repeats please contact CO2Meter so we can help rectify the issue permanently.