



CO₂ EASi
Operator manual

The *Essential*
Green Room CO₂ Sensor & Controller



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Welcome to the simplified world of Harvest Master Gardening

CO₂ EASi Operator manual

The Essential Green Room CO₂ Sensor & Controller

Ver 1.02.03 Revision. See Pg 4: First time Startup.

The CO₂ EASi Controller is the perfect entry level controller, for Indoor Gardeners wanting **maximum crop yields** in **shorter crop cycle** periods.

This controller is a 'One-Box' CO₂ Sensor, coupled with an intelligent processor, and directly linked to an internal high amperage switched output (120vAC single pole). UK, Europe, Australian and NZ versions use external power pack (12vDC) and external relay switch (240vAC x 15amp).

CO₂ EASi is preset to operate at;

- Optimum CO₂ levels for maximum yield 1500ppm,
- Dispense CO₂ only in periods of LIGHTS ON, activating the Output socket to maintain a continuously accurate CO₂ level
- Monitor the climate to be *below* "High Temperature Danger" (100°F / 39°C), or shut off CO₂ delivery

In addition, your CO₂ EASi Controller has two *automated* outputs for the control of COOL and/or FANS. To use these outputs, simply obtain the CO₂ EASi Controller Cable (Part HM0031) and one (or two) Switching Relays (part HMR1 or HMR3) for controlling 120/240vAC 15amp single pole or 240vAC 2 pole 15amp fans or cooling devices.

CO₂ EASi can be used as an upgrade option for the Harvest Master "Climate Controller", used as the CO₂ sensor (and relay switch) to upgrade from **Climate** to **Pro Climate** (or Plus to **Pro Plus**).

Performance Monitoring.

This first ever feature in a controller.

1. KEEPING TRACK OF CO₂ USAGE

The system keeps track of CO₂ delivery.

Uses the life cycle of the previous bottle (CO₂ or Propane) to show estimated CO₂ remaining.

Warns the user when the tank is getting near empty.

2. ROOM EFFICIENCY

How much of the time that high CO₂ levels maintained. A percentage of the total available "high CO₂" time. If your fans are operated due to high temp or humidity, sucking CO₂ out of the room and lowering the CO₂ ppm, the time that CO₂ level is low is monitored. You can fix the problem then!

3. CO₂ SENSOR AUTO CALIBRATION

During the night, the CO₂ EASi tracks the CO₂ concentration, sampling it then when seen to be stable resetting the level to 400ppm.

Operation

CO2-EASI Display

The two line display has a fixed bottom line and a revolving top line.

The display might look like: **25% Of Last Tank**

1550ppm 72F 87%

The top line has revolving messages.

- 1) Time (total) that CO₂ has been delivered from this tank in HH:MM:SS.
- 2) Status. You will see messages such as "Status: WARMUP". See appendix 1 to see what these status messages mean.
- 3) XX% of last tank. A message "25% of Last Tank" means that currently you have used 25% of the time that the previous tank lasted. This message shows once you have completed your first tank of gas (compressed CO₂ or propane for burner).
- 4) CO₂ EMPTY If CO₂ runs out. If you suspend CO₂ delivery (a menu option), the message "CO₂ SUSPENDED" is displayed instead.
- 5) Sensor Fail. See Appendix, pg6 for troubleshooting

The bottom line shows three values:

- 1) **1550ppm**. The concentration of CO₂ in parts per million.
- 2) **72F**. The current temperature in degrees Fahrenheit (F default) or Celcius (C).
- 3) **87%**. The percentage of the current light period that the CO₂ concentration has been at or above the CO₂ target. I.e., If lights have been ON for 10 hours so far, and CO₂ has been above target 8hrs:42mins hours, the display will show 87%.

CO2-EASI Menu

The unit is pre-set for you, with optimum growth and safety settings.

You can use the menu to make adjustments, just press "OK/MENU" (Press "NO/EXIT" to exit) and use the "▲" or "▼" buttons to scroll up or down the options.

Press the OK button when "CO2 Settings" (or desired menu item) is displayed:

CO2 SETTINGS

"CO2Ppm Target"

The ▲ (up) or ▼ (down) arrow scrolls through "CO2Ppm Target", "CO2 Ppm/Min", "CO2 On/Off", "New Tank".

CO2Ppm Target – The default is 1500ppm. Use the ▲ or ▼ arrows to adjust the target CO₂ concentration up to a maximum of 2500ppm. Differential is preset at +200ppm.

CO2 Ppm/Min – This is calculated by the unit and should not be adjusted by the user.

CO2 On/Off – You can use this with optional A/C or Fans control, if you have run out of CO₂ but still want the unit to control temperature while you get your tank filled.

New Tank – Use this to tell the unit you have finished the current tank. This enables the unit to calculate what percentage of the next tank is used up. This function also has a shortcut key. While the unit is operating, press the ▼ button to access "New Tank".

First Time Starting.

- Mount CO₂ EASi on the wall in your growing area. Choose a position at foliage height that is not in the direct path of CO₂ from your cylinder or gas burner. Make sure it gets the breeze from your circulating fan(s).
- Plug your CO₂ solenoid or your CO₂ Burner power connector into CO2-EASi.
- Connect the power to CO2-EASi.

After the CO2-EASi version number is displayed, CO2-EASi begins operating, tuning CO2 Output ON if there is high light levels. Fine calibration of CO2 delivery rates is being calculated in 'background'. The fine calculations are used to maintain accurate delivery of CO₂ in "Lights ON" periods.

* If you have the CoolKit or Dual CoolKit option. Plug your Cooler &/or Fan into the relay switch HMR1 which is connected to a power socket. Connect the RCA control cable to the relay switch connector and to the Controller Output connector marked COOL or FAN.

If for some reason, your unit behaves strangely, this could be due to power spike or RF interference (cellphones, some digital ballasts, lightning), you may need to use the factory reset facility.

Factory Reset. Press "v" and "OK" buttons at the same time). CO2-EASi will display:

**FACTORY RESET
CONFIRM "NO"**

Use the "^" button to change the flashing NO into YES then press OK.

(If you then disconnect the unit from the power while it is displaying **CO2-EASi** and Version 1.xx, next time you start the unit it will be at its factory default settings).

“Temperature”

When “**Temperature**” is displayed.

Press OK to change temp settings or the ^ button to scroll through “CO2 Setting”. To change it back to “Temperature”, press the v button.

TEMPERATURE**“Temp Units”**

The ^ button scrolls through “Temp Units”; “Max Temp”; “Min Temp”; “Target Temp”.

The Ok button selects an item, or use **No/Exit**

Temp Units - Select Fahrenheit (default) or Celcius by using the ^ or v buttons, then **Ok**.

Max Temp - Use the ^ or v buttons to adjust the maximum operating temperature then **Ok**.

Min Temp - Use the ^ or v buttons to adjust the minimum operating temperature then **Ok**.

Target Temp - Use the ^ or v buttons to adjust the target temperature then **Ok**.

Frequently Asked Questions

- 1) How do I change the CO₂ level (from the 1500ppm default)?
 - **Press Ok/Menu, Press ^ to “CO2 SETTINGS” then Ok, and Ok to select “CO2Ppm**
 - **Use ^ or v to change the value up to 2500ppm. If you need a large change in the value, just hold the button down, Ok at the desired value, then Exit menu**

- 2) How can I change the Maximum Temperature (from the 100°F/38°C default)?
 - **Press Ok/Menu for menu, Ok again to select “Temperature”, “Max Temp” then Ok**
 - **Use ^ or v to change the value, then Ok at the desired value, then Exit menu**

- 3) What is the Target Temperature used for? **The COOL output is activated when the temperature rises 4°F above “Target”, and off once the temperature falls 4°F below. It is also used to determine if conditions are right for delivering CO₂.**

- 4) I have changed my CO₂ equipment from a gas cylinder to a LPG burning CO₂ generator. What should I do? **Use the Factory Reset facility. This will cause CO₂ EASi to go through its calibration procedure again.**

- 5) Why does CO₂ EASi show the “CO₂ EMPTY” message even though there is plenty of gas in the tank? **First, check that the valve on the cylinder is open. Second, if CO₂ EASi is not managing your extractor fan, make sure that the extractor fan is not going when CO₂ is flowing. The fan could be sucking out the CO₂ just as fast as it is delivered.**

- 6) Why does CO₂ EASi try to cool my room lower than the ‘minimum temperature’ during the time the lights are off? **Temperature settings at “night”, are reduced 9°F/5°C. Plants expect this.**

Appendix – “Display Status”. What it means.**CO2NONE** – Tank is empty**CO2LOOK** – Tank seems to be empty – waiting before trying again**WARMUP** – The lights have just come on – waiting for things to warm up**PREPARE** – Looking for the right conditions to release CO₂**READY?** – Urgently looking for the right conditions to release CO₂**FANWAIT** – Waiting for the fan to completely stop**FLOWING** – Monitoring flowing CO₂**HOTFLOW** – Monitoring flowing CO₂ and the temperature is close to maximum**CHECK1** – Looking for the maximum CO₂ level reached**CHECK2** – Second check. Awaiting maximum CO₂ stabilised level**CO₂ Sensor Fail.** This is displayed in the unlikely event that the CO₂ Sensor in CO2EASi fails. If this is not fixed by a simple power off/on cycle, contact sales@harvest-master.com for help.**Temp Sensor Fail.** This message is displayed in the unlikely event that the Temperature Sensor in CO2EASi fails. If this is not fixed by a simple power off/on cycle, contact sales@harvest-master.com

Default Settings

Temperature Units - Fahrenheit

Maximum Temperature - 100°F / 38°C

Minimum Temperature - 59°F / 15°C

Target Temperature - 78°F / 25°C

Target CO₂ Concentration – 1500ppm**Tips for Using CO₂**

To use CO₂ efficiently, the temperature of the room should stay near the Target temp. It must be above the minimum & below the maximum temperature during the LIGHTS ON period. This is best achieved using cooling, rather than exhaust fans, which waste the rich CO₂ levels.

COOL. Is best achieved by using a cooling device such as an Air Conditioner (and by ducting the lights). COOL is the first output activated in LIGHTS ON periods

Ducted lights are mounted in a sealed reflector or Pyrex (glass) tube. An in-line fan blows air from outside, through ducting, over the light, then through more ducting to take the heated air outside, without removing CO₂rich air.

FANS. If the temperature of the room rises to the maximum, CO₂ EASi will turn on the extractor fan which will suck out the CO₂ enriched air and replace it with fresh air from outside, reducing the CO₂ concentration in your enclosure. FANS are the first call in NIGHT period, but if hot air is detected, COOL will be activated instead.

Using a cylinder. Keep the regulator turned down to something like 10 - 20 cubic feet **per hour**. CO₂ EASi should take a few minutes to deliver the CO₂ rather than a few seconds. When the regulator is turned up high you run the risk of the solenoid icing up in the open position causing your cylinder to empty in one shot.

Circulating fans are very important to keep the breeze moving past the leaves. They also distribute the CO₂ evenly in the room so that the CO₂ EASi sensor accurately detects the actual CO₂ parts per million, rather than a localized concentration.

Plants get increased growth with carbon dioxide concentrations up to about 2500ppm. Optimum growth is between 1500 and 2000ppm. The CO₂ EASi uses target (1500ppm) + 200ppm to maintain a good level of CO₂, topping up when it drops to the target level.

Notes:

Unit purchase date:

Store purchased

Settings:

CO2 ppm

Temp Maximum

Temp Minimum

Temp Target

Any setup conditions to remember?

Power Surges and Spike Protection.

The Harvest Master controller you have purchased is a highly functioned microcomputer. Power surges can cause data corruption or erratic operation.

- First line of defence is to use a Power Surge protector.
- More protection would be provided by a dedicated Power Conditioner/UPS.

We strongly recommend that if you have power outages, spikes or brownouts, that you obtain and fit power protection when you install the controller. (High power usage / Many lights? See "Power Pack" below)

In the event of a power spike, shut down and restart the Harvest Master unit. This will generally revert to the correct operating settings.

If there is still erratic operation, a full "reset to factory settings" is advised.

CO₂ EASi:

Power ON.

When display shows Harvest Master CO₂ EASi

Press **OK and V arrow** together.

Press OK to reset



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